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The Universalism of Mathematics and its Detractors: Relativism and Radical Equalitarianism Threaten STEM Disciplines in the US

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This is a modest personal attempt to understand the ideology behind the current antiscientific trends in STEM, and more specifically in mathematics. In simplified terms, these trends can be traced back to a growing imbalance between the old ideal of fairness based on individual merit and the increasingly predominant, unrealistic expectations of equality of outcomes in all areas of human activities. I draw on specific examples and various scientific studies to show how these trends undermine the teaching of science in the US and, increasingly, research in STEM disciplines.

Once science has to serve, not truth, but the interests of a class, a community, or a state, the sole task of argument and discussion is to vindicate and to spread still further the beliefs by which the whole life of the community is directed. The question which every new scientific theory must ask itself is: 'Do I serve National Socialism for the greatest benefit of all?' (Words of a Nazi minister as related by F. Hayek in *The Road to Serfdom*)

As long as alleged racism remains the only allowable explanation for racial differences, we will continue tearing down excellence and putting lives, as well as civilizational achievement, at risk. (Heather McDonald, *The Diversity Delusion*)

When people get used to preferential treatment, equal treatment seems like discrimination. (Thomas Sowell, web-quotes)

Ours may be the first civilization destroyed not by the power of enemies, but by the ignorance of our teachers and the dangerous nonsense they are teaching our children. In an age of artificial intelligence, they are creating artificial stupidity. (Thomas Sowell, web-quotes)

Evil appears as good in the minds of those whom God leads to destruction. (Antigone, Sophocles)

Introduction

The scientific enterprise in the United States is being seriously challenged by powerful antiscientific trends. Postmodern relativism, under the pretence of anti-racism, anti-sexism, anti-colonialism, anti-ableism, is undermining the very foundations of science as a search for truth. Radical egalitarianism, disguised under the name of equity, is undermining the critically important criteria of selection and rewards based on merit. Our elementary and secondary educational system, already very weak to start with, is being further and irreparably degraded by incompetent and heavily ideological, 'woke' schools of education throughout the country. The process of the bureaucratization of science[a] post Second World War has taken an ominous turn with the extraordinary recent growth of Diversity, Equity, and Inclusion (DEI) bureaucracies in our universities and research institutions, and their increasing interference with the scientific process. According to the American Council of Trustees and Alumni (2020), much of the growth in administrative bloat at universities has come from the excessive growth of DEI bureaucracies. Add to this the disastrous dependence of US STEM disciplines on foreign-born talent as well as the increasing competitiveness of China's universities and research institutions, and you get a rather dire picture of the future of US science and engineering.

To carefully analyse all these factors is far beyond the scope of this article. I will focus instead only on how the first two factors mentioned above, postmodernist relativism and radical egalitarianism, act together to erode the status of mathematics as 'the highest pinnacle and highest height of the culture of rigorous knowledge' (Hilbert, quoted in Reid 1996).

Mathematics as a Universal Enterprise

Among all human activities, mathematics stands alone in terms of the beauty and universality of its content, as well as by its all-pervasive applications. Although its role is often obscured by its esoteric language, Mathematics is largely behind almost all major scientific and engineering advances of Humanity. Bridges stand, planes fly, rockets carry us into space, CT-scans and MRIs can see into our bodies and brains

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based on precise mathematical calculations performed by our all-powerful computers, which were themselves first designed by mathematicians based on simple but powerful mathematical ideas. Even more important than any specific application is the extraordinary fact that all our great physical theories are written in the language of mathematics, see Wigner (1960) and Klainerman (2022). In the magnificent description of Galileo:

> The great book of Nature lies ever open before our eyes and the true philosophy is written in it. But we cannot read it unless we have first learned the language and the character in which it is written… It is written in mathematical language and the characters are triangles, circles, and other geometrical figures. (In Il Saggiatore 1623)

But whatever Mathematics is, its language based on symbols and mental pictures is entirely independent of the culture in which its practitioners live. In the words of Hilbert, one of the most influential mathematicians of the last century, 'Mathematics knows no races. For mathematics, the whole cultural world is a single country'. This is a cultural stage where individuals are free to participate, according to their personal interests and talents, to the greatest and most enduring human achievement – what Hilbert calls 'the highest pinnacle and highest height of the culture of rigorous knowledge' (see Hardy 1934 for a translation of Hilbert's address at the International Congress of Mathematicians in Bologna in 1928, and Siegmund-Schultze 2016 for historical comments).

There is no other human activity in which talented individuals have fewer external barriers to succeed than Mathematics. But we should be careful to reject the superficial, politically correct notion that all individuals, or groups of individuals with a common sense of identity, or nations, have contributed, or are expected to contribute, in equal measure.

It is in fact a common-sense observation that not all civilizations have contributed in the same degree to mathematics. Although all civilizations developed the mathematics needed for their immediate applications, not all were equally interested in pure mathematics (they may have instead expressed their creative spirit in different domains of human activities). Before becoming the universal enterprise it is today, the torch of great mathematical discoveries passed from Sumerians to Egyptians, to Greeks, Romans, Persians, and Arabs, to reach Western Europe at the dawn of its Renaissance, in fourteenth-century Italy. Mathematics flourished spectacularly in western European countries through the discovery of calculus and its myriad applications to natural sciences and engineering.

It is also important to note that, although the content of mathematics knows no boundaries, its practitioners have tended to congregate in places where the conditions were such as to attract top talent from everywhere in the world. It is not the place here to speculate why this was so, suffice it to observe that this was the case in antiquity in places such as Athens and Alexandria, and later, post Renaissance, in various academic centres of European countries such as Italy, France, England and Germany. Göttingen was such a place of unique flourishing of mathematical sciences

in the nineteenth and early twentieth centuries until the advent of Nazism and its racialist policies pursued with the express intent of purifying Aryan Science from the 'noxious influence' of the Jews.

Hitler's racist policies are uniquely responsible for passing the leadership in mathematical sciences from Europe to the United States, to centres such as Princeton, Boston, Berkeley, Los Angeles, Madison, Ann Arbor, Minneapolis, Austin, etc. The top 15–20 US universities strongly dominate mathematical research in the entire World. Yet, unlike the old European centres, which were attracting mainly Europeans, the new American centres of mathematics have been extraordinarily open to talent from all over the world. They hire, despite increasing trends to the contrary, the most accomplished and promising mathematicians, independent of their country of origin, race, sex, ethnicity, religion, cultural preferences, or any other considerations. In all branches of science, not just mathematics, US universities and research institutions know a level of diversity and inclusiveness unmatched anywhere else in the world, now or anytime in the past.[b] As a measure of this, consider the fact that, in the US, close to 60% of the PhDs in mathematics and computer science are foreign-born. The percentage of foreign-born professors in top American mathematics and computer science departments gets closer to 75%. Among the remaining 25% many are second-generation Americans, often Asian Americans. Moreover, according to the 2017 National Foundation for American Policy, in 2017 foreign nationals accounted for 81% of electrical engineering majors and graduate students and 79% in computer science.

Unfortunately, these statistics offer not only a dramatic illustration of the unmatched openness of US academic institutions, but also point to the heavy dependence of US STEM disciplines on foreign talent. Together with my colleagues Percy Deift and Svetlana Jitomirskaya (Deift *et al*. 2021), we identified this fact, the direct result of a terrible and rapidly deteriorating elementary and secondary educational system, as one of various reasons to be sceptical whether the current unmatched excellence in STEM disciplines in the US can be maintained in the future. This is happening not only in mathematics but also in reading (The Free Press 2023). Both in mathematics and in reading, an important explanation for the sorry state of US education is the wrong pedagogical methods, with little understanding of content, developed in schools of education. An even more pressing reason of concern, we argued, is the current national obsession with 'Diversity, Equity, and Inclusion' (DEI). All three words have acquired a different, Orwellian, meaning than they used to have. Thus, for example, based on the current DEI understanding, our STEM disciplines are not the most diverse and inclusive anywhere in the world, past and present, but rather the opposite, that is suffused with a culture of prejudice, discrimination, and racial bias – one that must be radically changed.

Fairness versus Equity

The key to understanding the obvious discrepancy between the notion that STEM is systemically racist and the reality of unprecedented diverse and inclusive US

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scientific institutions is the word 'Equity' in DEI. It is understood (in contrast to equality of opportunities or equality under the Law) as equality of (statistical) outcomes among groups of individuals classified by immutable characteristics, such as race and sex.

Contrast this with the traditional notion of 'Fairness', once viewed as the gold standard of how Americans are supposed to judge and treat each other:

> Individuals should only be judged by their intrinsic merits and actions, with no regard for their race, ethnicity, religion, nationality, sex or other personal characteristics and no reference to other individuals, or societal or institutional considerations.

To treat people fairly, according to this definition, means to judge them based on their merits, at the time they are judged, with reference only to the task they are being evaluated for. Contrast this purely local definition with various other nonlocal measures of evaluation, centred on the identity group to which the person belongs.

According to the Communist dogma, for example, people were to be judged not only by their individual merits but also according to the social class (working class versus exploiting class) to which they belonged. Sons and daughters of people deemed to belong to the wrong class were often denied entrance to universities. In the later stages of the Soviet Union, this principle was mostly ignored, replaced instead by a crude scheme that discriminated against Jews and other ethnic minorities (Shifman 2005). Nazism, on the other hand, divided people into racial groups with Aryans at the top and Jews at the bottom.[c] Aryan science and mathematics were considered superior to those produced by Jews or other ethnic groups. Similarly, Soviet science would use class consciousness and dedication to Marxism-Leninism as important characteristics of a would-be scientist.

Present social justice (SJ) dogma, or so-called 'wokism', ravaging US scientific institutions today, divides people according to the perceived position of power of the group, or groups, to which they belong, according to the crude scheme of intersectionality and a reparation strategy that calls for affirmative action or reverse discrimination. In the words of Ibrahim Kendi (2019): 'The only remedy to racist discrimination is antiracist discrimination. The only remedy to past discrimination is present discrimination. The only remedy to present discrimination is future discrimination.' One wonders whether Kendi is aware of the 'discrimination all the way down' cyclic nature of this statement; that is, all those in favour of whom we discriminate today will have to be discriminated against tomorrow, and so on by a never-ending series of iterations.

SJ interprets racial disparities, which are real (see, for example, JBHE 2022), purely as the result of discrimination; rejecting as racist any other possible explanations. It replaces Fairness with 'Equity', based on the dogma that:

> Human beings are roughly identical in terms of talents, intelligence (both cognitive and emotional), interests, motivation, ability to perform various tasks etc. and that, consequently, every visible disparity between groups of

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> individuals has its origin in some form of bias and discrimination. (For example, Kendi 2019)

I will refer to this as the radical equality dogma (RED). RED excludes any other possible factors that could influence outcome inequalities, whether they be biological, cultural, or environmental (Sowell 2019). Unlike fairness, centred on the individual,[d] and thus measurable and dealt with by individual-centred measures, equity understood as equality of outcome requires one to compare individuals based on all possible identity groups to which they belong, a task impossible to accomplish without either setting all against all, in a dystopian state of nature society, or by appealing to a strong authoritarian or totalitarian state to impose its will on how resources are to be divided and how people are to be rewarded or punished.

While postmodernist relativism (PR), according to which Truth is simply a construct of the group in power, provides the philosophical framework for DEI, it is RED that gives it a powerful moral justification. RED excludes both inborn differences between people as well as any explanations based on family or cultural differences. As such, it leads inexorably to the conclusion that all differences of outcomes are due to explicit or implicit biases. Since the former is vanishingly rare, RED has to appeal to fuzzy and unsupported claims about implicit bias (Jussim *et al*. in press; Machery 2022; Corneille and Hüter 2020, and micro-aggressions). According to Jussim *et al*., 'most claims made by its advocates [implicit bias] have been shown to be outright false or at best dubious, contested and controversial'. Cures against bias or implicit biases based on diversity training can also lead to the opposite effect (al-Gharbi 2020).

Ultimately, PR is less dangerous to STEM; its claims, according to which natural science and mathematics[e] are socially constructed, are much too easy to ridicule. Fighting inequality, however, has deep roots in the western tradition and that gives RED a lot more respectability with the public[f] than it deserves.

Penetration of SJ in Education

Woke ideology, infused with a mishmash of Marxist and postmodernist Western ideas, is also said to advance a radical agenda against the West, denouncing its exceptional achievements in music, arts, literature, and sciences as expressions of white male supremacy or nefarious colonial dominance. Regarding mathematics, it reaches the extraordinary conclusion that its content is heavily dependent on the group that has produced it. It can thus be racist or sexist just because so much of it was produced by European white men.

According to Professor Rochelle Gutierrez, holder of many prestigious prizes in education: (1) algebra and geometry perpetuate privilege because 'emphasizing terms like Pythagorean theorem and π gives the impression that math "was largely developed by Greeks and other Europeans"'. (2) 'On many levels mathematics itself operates as Whiteness. Who gets credit for doing and developing mathematics, who is capable in mathematics, and who is seen as part of the mathematical community is generally viewed as White'. (3) 'If one is not viewed as mathematical, there will

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always be a sense of inferiority that can be summoned', therefore this can hurt minorities who 'have experienced micro-aggressions from participating in math classrooms . . . [where people are] judged by whether they can reason'. (It is hard not to note the distasteful racism behind this statement. Minorities cannot reason abstractly?) (4) Gutierrez also states that knowledge is 'relational . . . Things cannot be known objectively; they must be known subjectively' (Airaksinen 2021).

Consider also statements made by Luis A. Levya, professor of mathematics education at Vanderbilt University. In a peer-reviewed article he states:

> The framework developed and presented here illustrates three dimensions of White institutional space—institutional, labor, and identity—that are intended to support mathematics educators in two ways: (a) systematically documenting how whiteness subjugates historically marginalized students of color and their agency in resisting this oppression, and (b) making visible the ways in which whiteness impacts White students to reproduce racial privilege. (Battey and Leyva 2016)

Professor Levya has recently delivered an invited address at the 2023 Joint Mathematics Meeting, the most important yearly gathering of mathematicians in the US, with the title 'Undergraduate mathematics education as a white, cisheteropatriarchal space and opportunities for structural disruption to advance queer of color justice'. That such an invited address was given in the framework of the annual meeting of AMS is by itself a huge sign of concern. Laurie Rubel, math education professor of Brookline College, claims (in the same journal) that both 'meritocracy' and 'colour-blindness' are ideological precepts that hold back racial minorities from succeeding in math classes (Rubel 2017).

These ideas, which are now systematically taught to teachers of mathematics and sciences in schools of education throughout the US,[g] are informing the most recent California Mathematics Framework (CMF), which calls for a radical re-evaluation of the teaching of Mathematics in the state based on equity and social justice. CMF rejects the notion that there exist special aptitudes for mathematics: 'We reject ideas of natural gifts and talents'. It thus argues against separating kids by ability before high school and downplays the importance of giving bright kids access to high-school calculus. It also shows an astonishing ignorance of mathematics by calling for de-emphasizing algebra and calculus in favour of data science. These points were articulated by the Stanford education professor Jo Boaler (LaMar and Boaler 2021; Boaler and Gould 2021). Such statements and many other aspects of the CMF proposal have been seriously analysed and debunked by the Stanford mathematician Brian Conrad in his blog 'Public comments on the CMF' (Conrad 2022; see also Freeman 2022). Concerning Jo Boaler, it is instructive to see how she has been able to monetize her dedication to SJ in mathematics education (*Stanford Review* 2023).

CMF is in tune with the notorious Californian educational programme, 'Dismantling racism in mathematics instruction. A way to equitable math instruction' (Baldwin *et al.* 2020), supported by the Bill and Melinda Gates

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Foundation and even Lawrence Berkeley National Laboratory. According to the Pathway, for example, 'White supremacy culture shows up when the focus is on getting the "right answer" or showing work'. Or, that the very 'concept of mathematics being purely objective is unequivocally false'. The main goal of the programme is 'to dismantle racism in mathematics instruction' and to promote 'antiracist mathematics', with the expressly political aim of 'engag[ing] the sociopolitical turn in all aspects of education, including mathematics'.

See other atrocious statements in 'The folly of "woke" math' (Spivak 2021a). Inspired in part by these Californian initiatives, the Governor of Oregon, Kate Brown, has signed a bill that exempts high school students from the need to pass proficiency tests in reading, writing and math before they graduate (Borrud 2021).[h] Proficiency tests are being attacked as racist in most other states of the Union (Randazzo 2023). Some schools, it is claimed, even go so far as to refuse to notify students who won National Merit awards, all in the name of racial equity (Standing for Freedom Center 2023).

Although intended, supposedly, to reduce the academic performance gap for minorities, these actions mostly have the opposite effect. Kids in well-to-do, educated families have the resources to avoid these woke educational programmes while all others remain captives to their devastating effects. The knowledge gap only gets bigger. This is not just common sense; according to a PNAS 2016 study, 'a universal screening program in a large urban school district led to significant increases in the numbers of poor and minority students who met the IQ standards for gifted status' (Card and Giuliano 2016; see also Henderson 2023). Other studies find that the SAT, ASVAB, and the ACT tests are all highly correlated with IQ (Frey and Detterman 2004).

Penetration of SJ at Universities and Research Institutions

These trends affect not only elementary education but, increasingly, advanced university education and even actual research. In her article 'An existential threat to doing good science', the Brazilian-born biologist Luana Maroja writes:

> The risk of cancellation at Williams College, where I have taught for 12 years, and at top colleges and universities throughout this country, is not theoretical. My fellow scientists and I are living it. What is at stake is not simply our reputations, but our ability to pursue truth and scientific knowledge. (Maroja 2022)

In her articles 'The peril of politicizing science' and 'From Russia with love: science and ideology, then and now', the chemist Anna Krylov compares her experiences as a chemistry professor at USC in 2021 with her experiences as a student in the Soviet Union, concerning:

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> (i) the atmosphere of fear and self-censorship; (ii) the omnipresence of ideology (focusing on examples from science); (iii) an intolerance of dissenting opinions (i.e., suppression of ideas and people, censorship, and Newspeak (such as changing the names of Newton's laws, Schrödinger equation, etc. or discouraging the use of a word such as 'field' because of its remote connection to slavery); (iv) the use of social engineering to solve real and imagined problems. (Krylov 2022; see also Krylov 2021)

It is interesting to note, and a challenge to explain why,[i] that the most egregious attacks on objective, established science (so far) occur in Biology, Medicine and Psychology (e.g., Forgas 2023) in denying (1) that sex is binary and (2) that most human personality traits have a large heritability component.

The most obvious sign of the penetration of SJ dogma into science is the proliferation of mandatory diversity statements in hiring. The American Enterprise Institute reported in 2021 that 19% of postings on leading university job boards require diversity statements (Maranto and Paul 2021). The number is a lot higher for universities ranked in the top 100. Diversity statements are veritable political litmus tests, which require applicants for positions at universities and research institutions (including the National Science Foundation (NSF)[j] and the National Institutes of Health (NIH)) to 'state their belief in the importance of DEI, cite prior efforts to promote DEI, and pledge to integrate DEI into their role as a faculty member' (Spivak 2021b). In its most recent report, the White House Office of Science and Technology Policy claims that 'Bias, discrimination, and harassment plague the science and technology ecosystem . . .' and that 'there is neither a culture of accountability nor systems in place to adequately address these persistent challenges' (OSTP 2022). Who knows what measures these government bureaucrats are now preparing to adopt to combat this invisible, yet omnipresent, alleged discrimination.

Illustrious US academic institutions such as the National Academies of Sciences and the American Academy of Arts and Sciences are themselves becoming obsessed with the task of purging racism and sexism instead of promoting scientific excellence. A new report of the National Academies of Sciences, Engineering and Medicine states: 'Based on decades of research and analysis, racial disparities in STEMM (STEM + Medicine) careers do not rest on individual deficiency in candidates or even primarily on the individual racism of institutional and organizational gatekeepers,' the report says. 'Racism is embedded in our society' (Barabino *et al.* 2023, see also Quinn 2023).

The selection criteria for choosing the members of these illustrious societies are increasingly skewed towards DEI considerations. A recent study published in the *Proceedings of the National Academy of Sciences* (NAS) finds that 'female researchers in mathematics, psychology and economics are 3–15 times more likely to be elected as members of the US National Academy of Sciences (NAS) or the American Academy of Arts and Sciences than are male counterparts who have similar publication and citation records' (Card *et al.* 2023). The paper also finds that

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> since 2019, female researchers have comprised around 40% of new members in both prestigious academies. Historically, across disciplines in each academy, there have been substantially fewer female researchers than male ones. Before the 1980s, female members comprised less than 10% of total academy membership across all scientific fields.

The DEI 'virus' has penetrated most US universities both in blue and red states (e.g., Sibarium 2023). An important reason is the mandates put in place by the federal government. According to John Sailer

> Universities depend on agencies like the NIH and the NSF for research funding—and that funding is increasingly tied to DEI. The Department of Energy, for example, now requires all grant applicants to submit an 'equitable research' plan that explains how their work will 'promote DEI and accessibility'. (Sailer 2023)

Accusations of systemic racism can be found in many, once highly prestigious publications, *Science* (Mervis 2022a, 2022b, 2022c), *Nature* (Nobles *et al.* 2022, Woolston 2022) and *Scientific American* (Crowell 2021).[k,l]

Although mathematical research has so far been spared the worst excesses of RED, there are plenty of alarming signs for the future: to start with, as we have seen, the mathematical education of our children, mediocre to start with, is being further compromised by 'antiracist' statements such as 'objective facts are a tool of white supremacy' (Baldwin *et al.* 2020). This can only make the academic skills gap of under-represented minorities larger still, increasing the accusations for systemic racism.

To expiate for its past and present 'racism', the American Mathematics Society (AMS), the largest and most prestigious mathematics society in the world, has just decided, in the name of the entire mathematical community, to issue an apology to all black US mathematicians. The alleged racism which prompted the apology was described in a report by the 'Task Force on Understanding and Documenting the Historical Role of the AMS in Racial Discrimination' (Inniss *et al.* 2021).[m]

The same AMS, on the other hand, has no reticence to give voice on its website to opinions such as:

> If you are a white cis man (meaning you identify as male and you were assigned male at birth) you almost certainly should resign from your position of power. Remember that you live in a world where people don't succeed in a vacuum; most success happens on the backs of others who did not consent.

The author of the blog recommends universities to 'Stop hiring white cis men . . . until the problem goes away'. She insists that 'If you think this is a bad or un-serious idea, your sexism/racism/transphobia is showing' (Harron 2017).[n]

These statements are still on the website and no apologies have been issued.

Professors of mathematics at prestigious universities make inflammatory, overtly racist, statements, ignored only because they are anti-white. According to Chad

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Topaz, professor of Mathematics at the well-known liberal-arts college Williams, the field of mathematics is 'informed by white supremacy'. To combat this, he has created a 'blacklist' which identifies and shames mathematicians (Institute for the Quantitative Study of Inclusion, Diversity, and Equity 2022). In the name of equity and justice, universities are in the process of eliminating all forms of testing that show disparities between various groups of students. In some cases, these trends are now defended by judicial actions, as is the case of the Ontario Divisional Court's decision to declare mathematics proficiency tests for would-be math teachers as 'anti-constitutional' (Ontario Teachers' Federation 2021).

Is RED's Assumption Justified about Individual Differences in Mathematics?

The policies based on RED might be justified if the main assumption of RED, that there are no inborn differences between individuals, is correct. But is it? In this section I consider the evidence against it in the context of mathematics.

With the obvious exception of music, there is no other subject than mathematics in which interest and talent manifests earlier and in a more dramatic fashion. It used to be universally accepted, based on observation, common sense, as well as various comprehensive studies that, just as some people are born with a talent for music, art or athletics, there is a strong inborn talent for mathematics (Libertus *et al.* 2011). Every open-minded teacher, not blinded by ideology, who has taught mathematics to large groups of young students notices sharp differences between children who have no difficulties whatsoever with learning new computational techniques and concepts, and can thus advance at a faster rate, and kids who are struggling.[o] Here are some of the main takeaways from various studies, such as Knopik (2016), Petrill and Kovas (2016), and Geary (2011). (1) Human studies of general cognitive ability (g) have been conducted for over a century. (2) Family, twin, and adoption studies converge on the conclusion that about half of the total variance of measures of g can be accounted for by genetic factors. (3) Twin correlations for g are about 0.85 for identical twins and 0.60 for fraternal twins. Specific cognitive abilities such as verbal and spatial ability and school achievement such as literacy and numeracy are also substantially heritable. (4) Heritability of g increases during the life course, reaching levels in adulthood comparable to the heritability of height. (5) The influence of a shared environment diminishes sharply after adolescence. In addition, according to Petrill and Kovas (2016), 'no specific replicable markers accounting for variation in mathematical ability', independent of general cognitive abilities, have been found. A majority of the genes involved are 'generalist', i.e., they affect general intelligence and secondarily mathematical ability (as well as linguistic abilities, etc.)

Heritability appears to play a decisive role in the distribution of mathematical talent. There is thus little reason, even given the same quality of education and encouragement, to expect equality of results in mathematical proficiency for different individuals.

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But the *g*-factor is not destiny and human creativity is in no way reduced to mathematical proficiency. Human flourishing depends on myriad other factors equally important and not so easily measurable as the *g*-factor. Competence in mathematics is important in modern society, as it is associated with higher job quality and higher overall satisfaction (see Geary 2011). Yet enforcing RED, when its basic premise seems to be fundamentally wrong, is not going to make things any better. Instead, we should experiment with other solutions such as: (1) encourage and reward people based on the interests and talents they have, rather than those they do not; (2) design mathematics education programmes in such a way that all are taught the minimum necessary to function in society and provide a special path for those who have the talent and interest to pursue mathematics; (3) provide second and third chances for those who become interested to learn more math later in life; (4) make sure that a non-mathematical path is equally valued by society. As has often happened, when artificial methods of combating inequality are being pursued by mandates, it is far more probable that the results will be disappointing or worse.

Is RED's Assumption Justified in Connection with Differences between Sexes?

But maybe RED is still correct when it comes to large groups of individuals, such as men and women? If mathematical talent is equally distributed then we expect that fair policies should indeed lead to equal outcomes, that is, we should expect roughly a 50% ratio of female participation in all STEM disciplines. According to the most recent NSF report 'Diversity and STEM', women represent 35% of people employed in all STEM occupations and 25% of the skilled technical workforce (NCSES 2023). Despite enormous efforts to increase women's participation, the report finds that 'the proportion of the STEM workforce that were women increased by 3 percentage points from 2011 to 2021' (NCSES 2023: 15).

The report also shows that the distribution of women in various fields is highly uneven. Thus, women represent 61% of social and related scientists,[P] 46% of biological, agricultural, and other life scientists, 33% of physical and related scientists, 26% of computer and mathematical scientists, and 16% of engineers. Women earn more than half (53%) of chemistry degrees and about a quarter (24%) of physics degrees. Another important, anomalous, statistic to have in mind is that females represent today 59% of the student population in US universities as well as the majority of the top leadership positions in US universities (MacDonald 2023).

At the top level of my own profession, mathematics, women represent less than 10% of tenured professors, and less than 1% of top mathematical prizes such as Fields, Abel, Wolf, Crafoord, Shaw, etc. According to RED, nothing else can explain this disparity than crass sexist discrimination at all levels of mathematics education, hiring, promotion and various reward systems. Yet huge efforts are made to encourage women to become mathematicians by creating special (women only) associations (AWM), conferences and lecture series or even special courses (e.g., the

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recent University of Toronto course MAT193H1: Women's Mathematics), preferential hiring and promotion to leadership positions to increase their ability to promote change, etc. Women mathematicians now occupy top leadership positions at AMS, NSF, NAS, AAAS, and universities, far more than their proportion in the field. In addition, special prizes[q] and prestigious lectures[r] were created that are restricted to women mathematicians.

Partly due to these extraordinary measures,[s] the proportion of women in mathematics, in the US and elsewhere, has dramatically increased in the last 50 years. Yet, as the data of the NSF report show, there are still large disparities. Part of this disparity may be due to a persistent cultural bias; it may be that in some cultural environments girls are still discouraged from studying mathematics. But what if the assumption that mathematical talent is equally distributed (in a statistical sense) between men and women is false? What if men and women have different interests and talents oriented to different fields?

Even asking this question can get you into trouble, as happened to James Damore in his famous Google memo (Damore 2017). The claims made in the memo, concerning possible variations in mathematical talent between sexes, were analysed in a very comprehensive review (Steven 2017b; see also Steven 2017a). See also Benbow (1988), Baye and Monseur (2016), Hyde and Mertz (2009), Johnson *et al*. (2008; a comprehensive study of the variability hypothesis, 'which posits that general intelligence may be more biologically variable in males than in females'); Reilly (2015), Stewart-Williams and Halsey (2021),[t] and Wai *et al*. (2018)[u] for other thoughtful and up-to-date reviews. Figure 1 illustrates the hypothesis that the variability of intellectual abilities is greater among males than females. Another paper reaches different conclusions (Harrison *et al*. 2022); but its methodology has been criticized (Del Giudice and Gangestad 2023). Here are the main takeaways from these sources.

(1) Men and women differ, on average, in the kinds of occupations that interest them.
(2) There are consistent sex differences favouring males in mathematical reasoning ability and females in verbal abilities.
(3) The differences in mathematical reasoning ability become considerably more pronounced at both tails of the distribution, see Figure 1. They appear to be largest at the highest levels of mathematical reasoning. There are many more males with a profile of higher mathematics ability relative to their verbal ability and vice versa for females.
(4) The differences are stable over time and observed in other countries. Early detected differences predict subsequent sex differences in achievement in mathematics, physics, and engineering, respectively in the humanities, social and biological sciences.
(5) These differences also align with career and lifestyle preferences of men and women.
(6) Primarily environmental explanations (attitudes toward mathematics, perceived usefulness of mathematics, confidence, expectations, encouragement, etc.) are unsupported by numerous studies conducted over many years.

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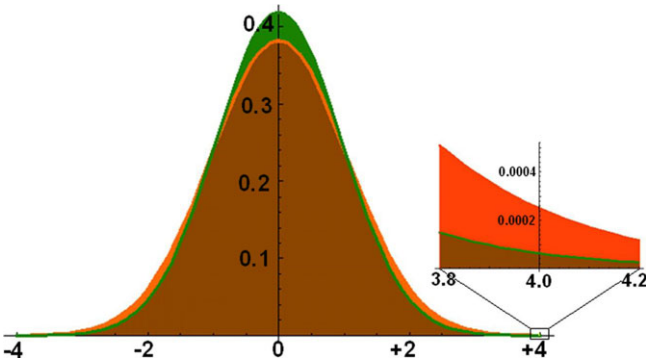

Figure 1. Theoretical normal distributions for males (orange line) and females (green line) when their means are identical and the male-to-female variance ratio is 1.2. The schematic on the right shows an enlargement of the distributions in the region from 3.8 to 4.2 standard deviations above the mean. The orange and green areas are unique to males and females, respectively; the brown area is the overlap of the two distributions. Reprinted from Hyde and Mertz (2009) with permission.

Do these findings explain the observed disparities between the choices made by men and women concerning their career choices? I am by no means an expert, but I don't see how one can reject them out of hand. Is there anything wrong in that there are many more women in humanities and the 'softer sciences' such as psychology, sociology, political sciences, biology and fewer in the 'harder' ones such as mathematics, physics, engineering? The claim made by some feminists and their supporters is that society values the latter more than the former. Is mathematics more valued by society than biology or medicine? Are mathematicians more in demand, on average, than clinical psychologists? Hardly. But even if that claim were true, is the remedy to artificially inflate the number of women in the hard sciences? To keep claiming discrimination until women achieve parity in numbers to precisely 50%? Isn't it a better solution to make sure that the choices made by women are equally respected by society? Paradoxically, less emphasis on enforcing equality may even help bring more women into the STEM disciplines. Thus, it appears that countries with greater gender equality, such as Finland, Norway or Sweden, see a smaller proportion of women taking degrees in STEM disciplines than countries well known for severe gender inequalities, such as Albania and Algeria (Stoet and Geary 2018; see also Leeds Beckett University 2018). I am personally convinced that the differences between men and women, their complementarity in talents and interests, are a source of strength rather than a deficiency, let alone inequity, which must be cured at any price.

The push towards equity = parity hurts not only young men who necessarily would have to be rejected in favour of weaker women, but also those 10–30% women mathematicians who, though professionally on par with most qualified men, see their credentials questioned as if their success was not due to their talent and hard work but to unfair preferences based on their sex.[v] This leads to more biases and with it demands for even more favourable treatment, in a vicious circle.

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Are Environmental Factors Important?

The findings discussed above largely support Damore's claim that the reason there are fewer women in the applicant pool of engineers at Google is, at least in part, due to biological factors. This, of course does not prevent the women who enter the pool from being as capable as the larger number of men in the pool – see the conclusion of Steven (2017b). Efforts to bring more women into mathematics, and more broadly into STEM, are commendable and important as long as they do not sacrifice merit to enforce parity. But what about environmental factors? How important are they? It is fair to say that these factors are less and less important concerning the difference between sexes; after all men and women are educated roughly in the same environment and the biases against women being educated just like men have all but vanished in the USA.

Environmental factors could, however, loom large in terms of differences of outcomes between ethnic and racial groups. RED, of course, denies the relevance of cultural factors; only overt or structural discrimination exercised by the hegemonic group in power, i.e., Whites, is allowed as an explanation of disparities. One problem with that claim is that it makes it impossible to explain why so many ethnic groups, in particular Asians, who have immigrated to the US while having no 'power' whatsoever to start with, have nevertheless been extraordinarily successful. Thus, for example, the median household incomes of Asian Americans at $87,243 and Indian Americans at $126,705 far exceeds that of White Americans at only $65,902. There is in this sense a serious contradiction at the heart of RED. Its ideology seems to be informed by the blank slate hypothesis, according to which all humans are born perfectly equal in all respects and are shaped by environmental factors alone. These could include, in principle, cultural factors, the very ones excluded by RED as being racist, sexist, ableist, etc. The only acceptable 'environmental' explanation of disparities, according to RED, must be due to naked exploitation by the dominant group. But then how could one explain the extraordinary, recent, success stories of the Asians?

Why is it not admissible to draw distinctions between the success rates of children educated in two-parent families, possibly under the care of an obsessively controlling Asian tiger mom, and those educated by single mothers on welfare? According to the census bureau, only 38.7% of children below the age of 18 live in two-parent families. The number for White Americans is 74.3% and is over 85% for Asian Americans. Approximately 49% of Blacks and 36.2% of Hispanics live on welfare. Are there no differences of outcomes between kids who are consistently being read books by their parents and those who are not so fortunate? According to at least one study (Logan *et al*. 2019) around 25% of caregivers never read to their children (see also the classic study of Hart and Risley 1995). I am no way implying that there is a linear causal relationship between environmental factors (such as two-parent families or reading at home) and bad educational outcomes. Genetic factors often play an important indirect role (genetic confounding) which may strongly interfere with simplistic causation. For example, 'children with a family history of dyslexia have a 45% chance of dyslexia despite adequate instruction and practice' (Hart *et al*. 2021). According to van Bergen *et al*. (2017),

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> Children's basic reading skill is related to several aspects of the home literacy environment, but most seem to be masked genetic effects. That is, they seem to correlate with child reading because children inherit from their parent both a genetic tendency for a certain reading level and the home environment they are exposed to.

Do the Measures Advanced by DEI Help the People they are Intended to Help?

It could be that, although aggressive affirmative action measures promoted by DEI bureaucracies in universities hurt the overall competitiveness of the STEM disciplines, they do help bring more women and minorities into these fields. In the case of women, who have, essentially, the same level of preparedness as men (prior to attending college), this is true to a certain extent. It is less clear, however, that these measures help to bring more Blacks and Hispanics into fields that require a lot of advanced mathematics. The proportion of black STEM scientists does not appear to have significantly increased in recent years.

Proponents of racial preferences argue that race-conscious admissions are important both for helping minorities overcome the legacy of institutionalized discrimination and for majority students to receive the benefits of diverse classrooms. This may be true in the humanities, social sciences, and in law schools, where the skills gap is easier to bridge and the interaction between people with diverse backgrounds could possibly benefit everybody. Lack of mathematical preparedness, however, is much harder to overcome and it is hard to see how diversity (exposure to less prepared students) can help more advanced 'majority' students to achieve better results. If diversity is necessary for a better STEM education, why do people from strongly homogeneous cultures (Taiwan, China, Japan, South Korea) do so well in STEM? Gaps in mathematical education are debilitating in advanced mathematics courses and it is hardly surprising that many bright black kids, who may have dreamt of becoming physicists, computer scientists, chemists or engineers, are discouraged and give up when they realize how far behind they are relative to the better-prepared students in their classes. In that case, affirmative action seriously hurts them, since they could have done better in less selective, slower-paced environments in which they have a better chance to catch up. This is the well-known mismatch hypothesis.

A comprehensive study of the mismatch hypothesis in STEM, based on the analysis of University of California data from the mid-1990s (see Arcidiacono *et al.* 2016), concludes that 'affirmative action harmed many minority students' prospects of earning degrees in the STEM fields':

> Those who gained admission to Berkeley and UCLA, through race-conscious admissions, would have stood a better chance of earning STEM degrees had they instead enrolled at a campus better matched to their level of academic preparation.

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The study also finds that 'well-prepared black, Hispanic, or Native American students, by contrast, had higher graduation rates in the STEM fields at the more-selective campuses than the less-selective ones.' Similar conclusions were reached by Arcidiacono et al. (2011) and Arcidiacono et al. (2012), both based on studies at Duke. The studies show that the mismatch, in that case, was obscured by the fact that many minority students switch to academic majors with easier grading standards (see also Sander and Taylor Jr 2012).

The fact that affirmative action policies may hurt minority students who want to pursue careers in STEM is very troubling and suggests that DEI bureaucrats are more interested in how their policies look (based on bureaucratic goals) and less in how they help minorities to succeed.

Do DEI Policies Improve Racial Harmony on US Campuses?

Although racial preferences pursued by DEI seem to hurt minorities trying to pursue the STEM disciplines, they may still help with respect to their other professed goal – to reduce biases and contribute to a culture of understanding and improved tolerance between racial groups. Unfortunately, this does not seem to be the case either. In a *Wall Street Journal* essay article, Jonathan Haidt and Lee Jussim draw attention to the fact that although affirmative action can help to improve racial harmony, if understood as helping well-prepared minority students to attend top universities, such policies do mostly hurt if they involve different admissions standards for applicants of different races:[w]

> As a result of these disparate admissions standards, many students spend four years in a social environment where race conveys useful information about the academic capacity of their peers. People notice useful social cues, and one of the strongest causes of stereotypes is exposure to real group differences. If a school commits to doubling the number of black students, it will have to reach deeper into its pool of black applicants, admitting those with weaker qualifications, particularly if most other schools are doing the same thing. This is likely to make racial gaps larger, which would strengthen the negative stereotypes that students of color find when they arrive on campus. (Haidt and Jussim 2016).

In a follow-up article, Haidt points out the curious anomaly that 'though universities are among the most progressive and anti-racist institutions in American society', they were racked by the racial protests of 2015–2016 (Haidt 2016).

He writes:

> To add to the puzzle, many of the most high-profile actions occurred at universities widely perceived to be the most devoted to social justice and racial equality – schools such as Brown, Yale, Amherst, Wesleyan, and Oberlin. (Every one of these schools earned a red or yellow light from the

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> Intercollegiate Studies Institute, indicating schools that are not recommended for conservative students.) What is going on? (Haidt 2016)

A simple resolution of the puzzle, he finds, is 'the hypothesis that the anti-racist policies these schools pursue give rise, indirectly, to experiences of marginalization. Haidt and Jussim (2016) write:

> We also analyzed other policies widely used on campus that seem, on the basis of current evidence, to be likely to backfire and exacerbate racial conflict and grievance: creating 'ethnic enclaves' such as identity studies centers and departments, and diversity training, particularly if it discusses 'microaggressions'.

Haidt (2016) also points out that this outcome was presciently predicted in a 1969 letter sent by Macklin Fleming, Justice of the California Court of Appeal, to Louis Pollak, the dean of Yale Law School, at the very start of affirmative action policies in academia (Macklin and Pollak 2023).

Conclusions

Although RED is intellectually incoherent and contradicted by myriad stubborn facts, Wokism = SJ as a movement (a religious-type movement as described by some, e.g., Sowell 2019) succeeds in prospering through the power of the emotions it generates. It continues its destructive march through our institutions by insisting on false assumptions and provably wrong remedies such as:

(1) Dumbed-down admissions, grading, graduation requirements.
(2) The abandonment of testing (as racist) in favour of fuzzy holistic evaluations.
(3) Reliance on quotas to inflate the number of minority students, independent of their level of preparedness. Thus, a black child has four times more chances to be admitted to Harvard or UNC then an Asian child with equal credentials (see Arcidiacono *et al*. 2012).
(4) Encouragement, in the name of anti-racism, of a divisive culture focused on grievances and resentments.
(5) Exaggerated expectations of full gender parity in all STEM disciplines.
(6) Celebration of identities (except whites = oppressor class) rather than individuals and, all in the name of anti-racism, elevating race as an essential category by which people are to be judged. Even pushing for the segregation of dorms, graduations, or special black-only events (see for example the documentaries concerning events at Evergreen College, Pluckrose *et al*. 2020).

The false assumptions of Wokism and its terrible policies, enforced by an out-of-control, omnipresent, DEI bureaucracy, has led to a culture of lying, deceit,[x] cowardice, fear, mistrust, discouragement, opportunism, and mediocrity. Its effects on STEM, if not stopped in time, could be devastating. I am personally optimistic that the madness can be stopped, but only after we all become fully aware of its destructive potential.

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Notes

a. In his well-known 17 January 1961 Farewell Address, Eisenhower warned 'Today, the solitary inventor, tinkering in his shop, has been overshadowed by task forces of scientists in laboratories and testing field. Partly because of the huge costs involved, a government contract becomes virtually a substitute for intellectual curiosity.'

b. Inclusiveness, meant as openness to promote talented individuals wherever they come from based purely on merit is not just a slogan to throw around, it truly is at the heart of the extraordinary success of mathematical sciences, and more broadly STEM, in the US in the last century.

c. Jewish scientists were fired from their academic and research positions, their works condemned and even burned. The spirit of the time is well represented by the letter written by the outstanding young mathematician Oswald Teichmöller (1913–1943) to his Göttingen professor Edmund Landau:

> I know that many academic courses, in particular differential and integral calculus, have broader educational value; they introduce students not only to a new set of terms and concepts, but also lead to a different frame of mind. But because the latter depends very substantially on racial composition of the individual, it wouldn't be a good idea to let, for example, Aryan students be taught by a Jewish professor. My personal experience confirms this.

d. It is interesting to remark that capitalism, insofar as it is based on market laws, is also local in nature and compatible with a decentralized political system founded on local self-governance. As an aside, note that the basic laws of Physics are also local in nature. Local laws determine the global features of a system and not the other way around.

e. The claim that mathematics is socially constructed is ridiculous. The theorem of Pythagoras proved more than 2500 years ago is still valid today, for both men and women, blacks and whites, on any place of the earth. Algebra and calculus are at least as much studied in China, Japan, Vietnam, and South Korea as in the US or in Europe. It is even assumed that mathematical universality is the key for communication with extra-terrestrial civilizations, using primary mathematical objects such as primes.

f. In a 2019 survey Pew Research found that 75% of Americans said it was very or somewhat important for 'companies and organizations to promote racial and ethnic diversity in their workplace'. Only 12% said it was not at all important. On the other hand, in response to the more specific question: 'When it comes to decisions about hiring and promotions, do you think companies and organizations should take a person's race and ethnicity into account, in addition to their qualifications, in order to increase diversity in the workplace (or) should only take a person's qualifications into account, even if it results in less diversity in the workplace?', 74% chose the latter alternative. In a similar poll by NORC General Social Survey in 2018, 72% were opposed to racial preferences, among which 43% were strongly opposed.

g. Just Google 'mathematics is racist, white supremacist or colonialist' and you will find hundreds of articles written by experts of mathematics education. Or look at the mathematics curriculum of the top educational schools in the country. It is not just very thin in mathematical content; it is actually ignorant and infused by political motivation.

h. Supporters of the bill say the old proficiency tests were unfair to students who did not test well and that dropping them would benefit the state's 'Black, Latino, Latinx, Indigenous, Asian, Pacific Islander, Tribal, and students of color.' Note the absurd reference to Asians who are both non-white and perform far better than all other groups including those deemed 'Whites'.

i. To me it seems to be a combination of post modernism dogma, which sees scientific truth as socially constructed, and RED, which pursues a radical project to erase all possible differences between people that cannot be explained by biases alone.

j. Research proposals in mathematics with an excellent review on intellectual merit can be rejected due to a weak review on the 'Broader Impacts' category. Broader impacts used to be understood in terms of applications to different areas of Mathematics, Science or Engineering and reaching out to a wider

audience of researchers. Now they are increasingly interpreted in terms of DEI impact. Thus, for example, quoting from the review of such a proposal (ultimately rejected):

> The panel also expressed concern for what they saw as insufficient attention to promoting diversity and inclusion, particularly noting the lack of women in the list of proposed prominent research mathematicians that were selected to inspire and engage young mathematicians. ... Several members of the panel felt, however, that the broader impacts were limited in scope, and had significant weakness in the realm of diversity and inclusion compared to other proposals.

k. The *Nature* editorial 'Science must overcome its racist legacy' announced four special issues dedicated to systemic racism in science; the first of these issues was vol. 610 (2022), issue 7932.

l. The article by Rachel Crowell also contains the bizarre accusation that, besides Alan Turing, the list of LGBTQ+ mathematicians becomes 'pretty, pretty dry'.

m. Besides a few ugly examples of discrimination prior to 1960, the only serious justification is based on sufficient representation of black mathematicians in the profession. Absent from the report is a frank discussion of the disastrous performance of US schools and its effect on the academic skills gap.

n. The same person has recently designed a new course at Toronto University called 'Liberating Mathematics' with the following abstract:

> Currently, mathematics is at a crossroads between tradition and progress. Progress has been led in large part by women mathematicians, in particular Black women, Indigenous women, and women from visible minorities. Intertwined in their studies of mathematics is a daring critique of traditional mathematics, re-imagining of mathematics culture, and more ...

o. This can be due to the fact that different children develop at different paces. There are plenty of examples of outstanding mathematicians who became interested in mathematics quite late in life.

p. According to the report, the overall high representation of women in this broad STEM field is partly due to the very high share of degrees earned by women in psychology (79% of bachelor's degrees in 2020).

q. Such as the Ruth Lyttle Satter Prize in Mathematics, Louise Hay Award for Contributions to Mathematics Education, Alice T. Schafer Prize for undergraduate women, M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics, AWM-Microsoft Research Prize in Algebra and Number Theory, AWM-Sadosky Research Prize in Analysis, AWM-Joan & Joseph Birman Research Prize in Topology and Geometry, AWM-Ruth I. Michler Memorial Prize, Sylvester Medal of the Royal Society of London, Florence Nightingale David Award (female statisticians), Elizabeth L. Scott Award, Janet L. Norwood Award. There are also three Maryam Mirzakhani New Frontiers Prizes for women mathematicians who have earned PhDs in the previous two years. Among the most recent prizes at JMM2023: six prizes for women only were presented by the Association for Women in Mathematics.

r. Such as AWM Emmy Noether Lecturers, ICM Emmy Noether Lecturers, AWM/MAA Falconer Lecturers, AWM-SIAM Sonia Kovalevsky Lecturers, Krieger-Nelson Prize Lectureship for Distinguished Research by Women in Mathematics, Mary Cartwright Lecturers, Alice Roth Lecturers.

s. Even without all these women-only reward systems, women represented roughly 50% of the entering class in the mathematics department of the University of Bucharest, my alma mater. This situation was common throughout the communist system. It is true however that few chose to pursue research careers.

t. The paper states:

> The idea that men outnumber women in STEM has become the conventional wisdom over the last few decades. Strictly speaking, however, the gender disparity is not in STEM per se, but rather in STEM fields that focus on the non-living world, or that have a strong spatial or mathematical component. [...] STEM fields should be divided into GEEMP fields (geoscience, engineering, economics, mathematics/computer science and the physical sciences) and LPS fields (life science, psychology, and social science). Men outnumber women in GEEMP fields, but women are at parity with men, or even outnumber them, in LPS fields. Overall, men and women are about equally represented in STEM, at least according to some analyses.

u. The full introduction of the paper is very instructive. In conclusion the paper states:

> Our findings in this study confirm adolescent sex differences in ability tilt in the right tail broadly. Such male–female ability tilt differences should therefore be taken into consideration when examining the underrepresentation of women in math or STEM careers and men in verbal

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or humanities careers.lescent sex differences in ability tilt in the right tail broadly. Such male–female ability tilt differences should therefore be taken into consideration when examining the underrepresentation of women in math or STEM careers and men in verbal or humanities careers.

v. Some accomplished women mathematicians have expressed to me their discomfort with this situation. Here is a selection of some comments I have heard: 'They [prominent male mathematicians] are more than eager to hire less qualified women who they expect to be convenient in, say, further promoting their fields. They hate women who dare to voice opinions.' Or, 'You would expect that with various honours and prizes I should get respect in my own department but it is not what happens. Many colleagues don't bother to check that I have many top journal papers or other evidence. They assume that such distinctions don't mean anything for women, saying that to my face (not about my own distinctions, but about others, but it is easy to extrapolate).' Another one: 'This (often huge) positive systemic bias does increase the negative individual bias, leading to a paradoxical effect where many women feel a hostility of the "profession" and lack the sense of belonging despite the huge promotion, prompting some to argue that this warrants even more favourable treatment . . . ' The answer to this bad spiral is not more promotion, but a return to objective criteria and moving away from the quotas as much as possible. This may and probably should also include some decrease in the importance of individual opinions: the more objective the criteria are, the better.

w. 'Although these gaps vary from college to college, studies have found that Asian students enter with combined math/verbal SAT scores on the order of 80 points higher than white students and 200 points higher than black students. A similar pattern occurs for high-school grades. These differences are large, and they matter: High-school grades and SAT scores predict later success as measured by college grades and graduation rates.'

x. It is interesting to compare the relatively transparent old anti-Jewish quotas at the top universities, such as Harvard, Princeton etc., with the opaque ones of today, see the eye-opening article in Tablet by Jacob Savage (2023).

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