The Universalism of Mathematics and its detractors

Relativism and Radical Equalitarianism threaten STEM disciplines in the US.

Sergiu Klainerman

"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.

1 Introduction

The scientific enterprise in United States is being seriously challenged by powerful anti-scientific trends. Postmodern relativism, under the pretense 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[1] post WWII, has taken an ominous turn with the extraordinary recent growth of Diversity, Equity, and Inclusion (DEI) bureaucracies[2] in our universities and research institutions and their

increasing interference with the scientific process. Add to this the disastrous dependence of our 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 the US science and engineering.

To carefully analyze all these factors is far beyond the scope of this essay. 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].

2 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. Though 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 MRI's can see into our bodies and brains 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], [K]. 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 on 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] for a translation of Hilbert's address at the International Congress of Mathematicians in Bologna in 1928 and [Re] 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 commonsense observation that not all civilizations have contributed in the same degree to mathematics.Though all civilizations developed the mathematics as it needed for its immediate applications, not all were equally interested in pure mathematics (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 of applications to natural sciences and engineering.

It is also important to note that, though the content of mathematics *knows no boundaries*, its practitioners have tended to congregate in places where the conditions were such that 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 like Athens and Alexandria and later, post Renaissance, in various academic centers of European countries such as Italy, France, England and Germany. Göttingen was such a place of unique flourishing of mathematical sciences in the 19th and early 20th century 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 centers 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 centers which were attracting mainly Europeans, the new American centers 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, the US universities and today research institutions know a level of diversity and inclusiveness[3] unmatched anywhere else in the world, now or anytime in the past. As a measure of this, consider the fact that close to 60% of the PhDs in mathematics and computer science are foreign born. The percentage of foreign-born professors in top 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 grad students and 79% in computer science.

Unfortunately, these statistics offer not only a dramatic illustration of the unmatched openness of the US academic institutions but also point out to the heavy dependence of the US STEM disciplines on foreign talent. Together with my colleagues Percy Deift and Svetlana Jitomirskaya, see [DJK], we identified this fact, the direct result of a terrible and rapidly deteriorating elementary and secondary educational system[4], as one of various reasons to be skeptical whether the present un-matched excellence in STEM disciplines in the US can be maintained in the future. 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 of it, that is suffused with a culture of prejudice, discrimination, and racial bias - one that must be radically changed.

2.1 Fairness versus Equity

The key to understanding the obvious discrepancy between the notion that STEM is systemically racist and the reality of an unprecedented diverse and inclusive US scientific institutions is the word "Equity" in DEI 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, 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, centered on a specific identity group to which the person happens to belong.

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[5]. Nazism, on the other hand, divided people into racial groups with Aryans at the top and Jews at the bottom[6]. 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 im-

portant characteristics of a would-be scientist.

Present social justice (SJ) dogma, or wokism, ravaging the US scientific institutions today, divides people in relation 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: "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 favor 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 [JBHE] for example) 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 individuals has its origin in some form of bias and discrimination (e.g. [Kendi]).

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. Unlike fairness, centered on the individual[7], and thus measurable and dealt with by individual-centered 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. See [Sowell] for a comprehensive analysis of the faulty, intellectually dishonest, reasoning of the RED dogma.

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[8] (see [Lee], [Machery], [Corneille]) and micro-aggressions.

Ultimately PR is less dangerous to STEM; its claims, according to which natural science

and mathematics[9] 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[10] than it deserves.

3 Penetration of SJ in Education

Woke ideology, infused with a mishmash of Marxist and postmodernist Western ideas, also advances 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[11]. These ideas, which are now systematically[12] taught to teachers of mathematics and sciences in schools of education throughout the country, 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[13] for mathematics "We Reject Ideas of Natural Gifts and Talents". Such statements and many other aspects of the CMF proposal have been seriously analyzed and debunked by the Stanford mathematician Brian Conrad in his blog "Public comments on the CMF".

CMF is in tune with the notorious Californian educational program "Dismantling Racism in Mathematics Instruction. A Pathway to Equitable Math Instruction" [Path], supported by the Bill and Melinda Gates 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 program 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 National Review article "The Folly of Woke Math",`https://www.nationalreview.com/2021/09/the-folly-of-woke-math/`." Inspired in part by these Californian initiatives, the Governor of Oregon Kate Brown has signed a bill[14] that exempts high school students of the need to pass proficiency tests in reading, writing and math before they graduate. Proficiency tests are being attacked as racist in most other states of the Union. "To increase equity some school districts eliminate Honors classes" is the title of a recent article in WSJ. Some schools even go so far as to refuse to notify students who won National Merit awards, all in the name of racial equity, see `https://www.standingforfreedom.com/2023/01/more-virginia-schools-discovered-hiding-national-merit-awards-from-high-achieving-stu`

Though intended, supposedly, to reduce the academic performance gap for minorities, they mostly have the opposite effect. Kids in well to-do educated families have the resources to avoid these woke educational programs 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 [Card1] "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". See also the March 6 2023 article by R. Henderson in Free Press. Other studies, see [Frey], find that the SAT, ASVAB, and the ACT tests are all highly correlated with IQ.

4 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 Nov 7, 2022 Free Press 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".

In her articles "The Peril of Politicizing Science" (Phys. Chem. Lett. 2021)" and "From Russia with Love: Science and Ideology, Then and Now"(Heterodox STEM 2022), the chemist Anna Krylov compares her experiences as a chemistry professor at USC in 2021 with her experiences as a student in Soviet Union concerning:

"(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."

It is interesting to note, and a challenge to explain why[15], that the most egregious attacks on objective, established, science (so far) occur in Biology, Medicine and Psychology (e.g. Joseph Forgas" Combatting Woke tyranny:can science be saved?, Spectator Australia Feb 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[16], veritable political litmus tests which require applicants for positions at universities and research institutions (including the National Science Foundation[17] (NSF) and the National Institutes of Health (NIH) (see Kenin M. Spivak, "The New Loyalty Oaths," National Review, Nov. 13, 2021) 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." In its most recent [OSTP] 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". Who knows what measures these government bureaucrats are now preparing to adopt in order to combat this invisible, yet omnipresent, alleged discrimination.

Illustrious US academic institutions such as the National Academies of Sciences and 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[18] ("Advancing Antiracism, Diversity and Equity Inclusion in STEMM Organizations"`https://nap.nationalacademies.org/catalog/26803/advancing-antiracism-diversity-equity-and-inc` 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". The selection criteria for choosing the members of these illustrious societies are more and more skewed towards DEI considerations. A recent study published in the Proceedings of the National Academy of Sciences (NAS), see [Card2], 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. The paper also finds that "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 (see for example "The Woke Virus Has Landed Deep in the Heart of Texas" by Aaron Sibarium `https://freebeacon.com/campus/the-woke-virus-has-landed-deep-in-the-heart-of-texas/`). An important reason are the mandates put in place by the federal government. According to John Sailer `https://www.city-journal.org/dei-in-the-heart-of-texas`.) "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 re-

quires all grant applicants to submit an "equitable research" plan that explains how their work will "promote DEI and accessibility." Accusations of systemic racism can be found in many, once highly prestigious publications, Science[19], Nature[20] and Scientific American[21].

Though 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 "anti-racist" statements such as "objective facts are a tool of white supremacy". 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[22] which prompted the apology was described in the AMS report "Task Force on Understanding and Documenting the Historical Role of the AMS in Racial Discrimination".

The same AMS, on the other hand, has no reticence to give voice on its website (see Inclusion Exclusion blog posted June 7 2017) 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[23] 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".

In another AMS blog `https://blogs.ams.org/blogonmathblogs/author/vanessa/`) one can read opinions such as: "precision and accuracy" is a form of white supremacy. So is the insistence that right or wrong answers has anything to do with objectivity. These statements are still on the website and no apologies have been issued.

Professors of mathematics at prestigious universities make inflammatory, overtly racist, statements[24], ignored only because they are anti-white. 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 court's decision (`https://www.otffeo.on.ca/en/news/ontario-court-declares-that-the-ontario-math-proficiency-test-is-unconstitutiona`
to declare mathematics proficiency tests for would-be math teachers as "anti-constitutional".

5 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, see [JHU], that, just as some people are born with a talent for music, art or athletics, there is a strong inborn talent for mathematics. 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[25]. Here are some of the main takeaways from various studies such as [Knopik], [Petril] and [Geary]: 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 shared environment diminishes sharply after adolescence. In addition, according to [Petril], "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.

But the g-factor is not destiny and human creativity is in no way reduced to mathematical proficiency. Human flourishing depends on a myriad of 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]. Yet enforcing RED, when its basic premise seems to be fundamentally wrong, is not going to make things any better[26]. 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.

6 Is RED's assumption justified in connection to 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 2023 NSF report "Diversity and STEM" women represent 35% of people employed in all STEM occupations and 25% of the skilled technical workforce. Despite an enormous increase in efforts to increase women participation, the report finds that "between 2011 and 2023 the proportion of the STEM workforce that were women increased by no more than 3 percentage" .

The report also shows that the distribution of women in various fields is highly uneven. Thus women represent 61% of social and related scientists[27], 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 the US universities as well as the majority of the top leadership positions in the US universities `https://www.city-journal.org/the-great-feminization-of-the-american-university`.

At the top level of my own profession, mathematics, women represent less than 10% of tenured professors, and less then 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 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 occupy now top leadership positions at AMS, NSF, NAS, AAAS, and universities, far more than their proportion in the field. In addition, special prizes[28] and prestigious lectures[29] were created that are restricted to women mathematicians.

Partly, due of these extraordinary measures[30], 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 shows, there are still large disparities. Part of this disparity may be due to a persistent cultural bias; it may still be that in some cultural environments girls are still discouraged to study 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 2017 Google memo "Google's ideological echo chamber: How bias clouds our thinking about diversity and inclusion". The claims made in the memo, concerning possible variations in mathematical talent between sexes, were analyzed recently in the very comprehensive review [Steven]. See also [Benbow],[Baye], [Hyde-Mertz], [Johnson][31], [Reilly], [Williams][32] and [Wai][33] for other thoughtful and up-to-date reviews. Figure 1 below is reproduced from [Hyde-Mertz]. Here are the main takeaways from these sources[34]:

1. Men and women differ, on average, in the kinds of occupations that interest them.
2. There are consistent sex differences favoring 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 Fig 1 below. They appear to be largest at the highest levels of mathematical reasoning. There are many more males with a profile of higher math 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 math, 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 math, perceived usefulness of math, confidence, expectations, encouragement etc.) are unsupported by numerous studies conducted over many years.

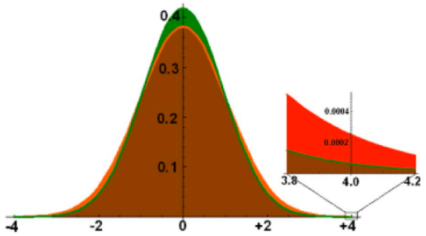

Fig. 1. Theoretical normal distributions for males (orange line) and females (green line) when their means are identical and the M:F VR = 1.2. The schematic on the right shows a blowup of the distributions in the region from 3.8 to 4.2 standard deviations above the mean. Brown, area of overlap of the 2 distributions; green and orange, areas unique to females and males, respectively.

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" like psychology, sociology, political sciences, biology and fewer in the "harder" ones like math, physics, engineering? The claim made by some feminists and their supporters is that the 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[35]? 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, that must be cured by any price.

The push towards equity=parity hurts not only would-be young men who necessarily would have to be rejected in favor of less qualified women, but also those 10-30% women mathematicians who, though professionally on a par with most qualified men, see their credentials questioned as if their success is not due to their talent and hard work but for unfair preferences based on their sex[36]. This leads to more biases and with it demands for even more favorable treatment, in a vicious circle.

7 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[37]. But what about environmental factors? How important are they? It is fair to say that these factors are less and less important as it concerns 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 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 a an obsessively controlling Asian tiger mom, and those educated by single mothers[38] on welfare[39]? Are there no differences of outcomes[40] 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] (see also the classic study of [Hart-Risley]) around 25% of caregivers never read to their children.

8 Do the measures advanced by DEI help the people they are intended to help?

It could be that, though 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 in these fields. In the case of women, who do 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 from diverse classrooms. This may be true in humanities, social sciences, and law schools, where the skill 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[41] (exposure to less prepared students) can help more advanced "majority" students to achieve better results. Gaps in mathematical education are debilitating in advanced math courses and it is hardly surprising that many bright black kids, who may have dreamt of becoming physicists, computer scientists, chemists or engineers, get 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 higher 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 [Ardiciano3]), 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".

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 [Ardiciano1] and [Ardiciano2], both based on a 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 `https://www.theatlantic.com/national/archive/2012/10/the-painful-truth-about-affirmative-action/263122/`.

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.

9 Do DEI policies improve racial harmony on the US campuses?

Though 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 their May 5, 2016 WSJ essay article "Hard Truths About Race on Campus" Jonathan Haidt and Lee Jussim draw attention to the fact that affirmative action can help to improve racial harmony if it helps well-prepared minority students attend top universities; however, these policies are detrimental to racial harmony if they involve different admissions standards for applicants of different races[42].

"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".

In their Heterodox May 12, 2016, follow-up article ("The amazing 1969 prophecy that racial preferences would cause the exact grievances of protesters today") they point 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.

"To add to the puzzle, [they write] 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 Intercollegiate Studies Institute, indicating schools that are not recommended for conservative students.) What is going on?" A simple resolution of the puzzle, they find, is "the hypothesis that the anti-racist policies these schools pursue give rise, indirectly, to experiences of marginalization[43]. They also point 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 `https://www.nationalaffairs.com/storage/app/uploads/public/58e/1a4/ae3/58e1a4ae36717528770103.pdf`.

10 Conclusions

Though RED is intellectually incoherent and contradicted by a myriad of stubborn facts, Wokism=SJ as a movement (a religious-type movement as described by some, e.g. [Sowell]) 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 provenly wrong remedies such as:

1. Dumbed-down admissions, grading, graduation requirements.
2. The abandonment of testing (as racist) in favor of fuzzy holistic evaluations.
3. Reliance on quotas to inflate the number of minority students, independent on their level of preparedness. Thus a black kid has 4 times more chances to be admitted to Harvard or UNC than an Asian kid with equal credentials, see [Ardiciano1].
4. Encourages, in the name of anti-racism, a divisive culture focused on grievances and resentments.
5. Exaggerated expectation of gender parity in all STEM disciplines.
6. Celebrates identities (except whites= oppressor class) rather than individuals and, all in the name of anti-racism, it elevates race as an essential category by which people are to be judged. It even pushes for segregation of dorms, graduations, or even special black-only events (see for example the documentaries concerning events at the Evergreen college `https://newdiscourses.com/2020/01/teaching-to-transgress-rage-a`

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[44], 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.

Notes

1. In his well-known January 17, 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."

2. According to American Council of Trustees and Alumni, "How Colleges Spend Money," 2020, much of the growth in administrative bloat at universities has come from the excessive growth of DEI bureaucracies.

3. 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.

4. This happening not only in math but also in reading, see "Why 65 Percent of Fourth Graders Can't Really Read" in Free Press 2023. Both in math and in reading an important explanation for the sorry state of the US education is wrong pedagogical methods, with little understanding of content, developed in schools of education.

5. Sons and daughters of people deemed to belong to the wrong class were often denied entrance to universities. In the latest stages of Soviet Union this principle was mostly ignored, replaced instead by a crude scheme which discriminated against Jews and other ethnic minorities, see [Shifman].

6. 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 (1913-43) 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."

7. It is interesting to remark that Capitalism, in so far 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 also 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.

8. According to Lee Jussim "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, see https://heterodoxacademy.org/blog/diversity-related-training-what-is-it-good-for/.

9. The claim that mathematics is socially constructed is ridiculous on its face. The theorem of Pythagoras proved more that 2500 years ago is still valid today, for both man and women, black and whites, on any place of the Earth. Algebra and Calculus are at least as much studied in China, Japan, Vietnam, and S. Korea as in the US or Europe. It is even assumed that mathematical universality is the key for communication with extraterrestrial civilizations, using primary mathematical objects such as primes.

10. 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.

11. 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 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." See`https://equitymathed.wordpress.com/a-mirror-of-prof-algebra-geometry-perpetuate-white-privilege/`. Consider also statements made by Louis A Levya, professor of mathematics education at Vanderbilt university. In his peer reviewed article (Journal of Urban Mathematics Education) "A Framework for Understanding Whiteness in Mathematics Education" 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." Professor Levya has recently delivered an invited address at the 2023 Joint Mathematics Meeting, the most important yearly gathering of mathematicians in US, with the title "Undergraduate Mathematics Education as a White, CIS heteropatriarchal 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 of Urban Mathematics Education) that both "meritocracy" and "color-blindness" are ideological precepts that hold back racial minorities from succeeding in math classes.

12. 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 math 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.

13. 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 favor of data science. These points, articulated by the Stanford education professor Jo Boaler in her articles "The importance and emergence of K-12 data science" (Tanya LaMar and Jo Boaler, July 21, 2021) and "New Data Science Standards Are Needed for a Data-Filled World. Here's What We Propose" (Jo Boaler and Rob Gould, Oct. 11 2021) were debunked by the Stanford mathematician Brian Conrad in his " Public comments on the CMF". See also "Stanford Prof. Debunks Research Behind New California K-12 Math Standards" WSJ, May 3 2022. Concerning Jo Boaler it is instructive to see how the Stanford professor has been able to monetize her

dedication to SJ in mathematics education, see https://stanfordreview.org/boaler-professor/ .

14. See https://www.oregonlive.com/politics/2021/08/gov-kate-brown-signed-a-law-to-allow-oregon-students
html. Supporters of the bill say the old proficiency tests where 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 then all other groups including those deemed "Whites".

15. 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 which cannot be explained by biases alone.

16. The American Enterprise Institute reported in 2021 that 19% of postings on leading university job boards require diversity statements. The number is a lot higher for universities ranked in the top 100, by the U.S. News & World Report. See James D. Paul and Robert Maranto, "Other Than Merit: The Prevalence of Diversity, Equity, and Inclusion Statements in University Hiring," American Enterprise Institute, November 2021.

17. Research proposals in Mathematics with excellent review on intellectual merit can be rejected due to a weak review on " 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". The proposal was rejected.

18. See a summary of it in and a summary of it by Ryan Quinn "Fighting Racism in STEMM", Inside Higher Ed https://www.insidehighered.com/news/2023/02/15/national-academies-release-antiracism-dei-recommen

19. J. Mervis, Can U.S. Physics Overcome its Record of Exclusion? Science 375 950 (2022). Mervis, The Toll of White Privilege, Science 375 952 (2022). J. Mervis, Fix the System, not the Students, Science 375 956 (2022).

20. The the Nature editorial "Science Must Overcome Its Racist Legacy" announce four special issues dedicated to systemic racism in science. The first issue appeared in 2022, Nature 610 issue 7932. See also M. Nobles, C. Womack, A. Wonkham, E. Wathuti, Science Must Overcome Its Racist Legacy: Nature's Guest Editors Speak, Nature 606 225 (2022). See also Nature 30 November 2022, "Beyond anything I could have imagined': graduate students speak out about racism".

21. In her article " Modern Mathematics confronts its White, Patriarchal Past" Rachael Crowell accuses the mathematics community of racism and sexism. The article also contains the bizarre accusation that,

besides Alan Turing the list of LGBTQ+ mathematicians becomes "pretty, pretty dry."

22. 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 skill gap.

23. 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...".

24. According to Chad Topaz, Professor of Mathematics at the well known liberal arts college Williams (tuition $61,450 per year!), founder of the Institute for the Quantitative study of Inclusion, Diversity and Equity QSIDE, the field of mathematics is "informed by white supremacy". To combat this he has created a blacklist which identifies and shames mathematicians, see public.tableau.com/app/profile/institute.for.the.quantitative.study.of.inclusion.diversity.and./viz/shared/HYSKD2ZQR views.

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

26. 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 math education programs 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 it. 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.

27. 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).

28. Such as 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 3 Maryam Mirzakhani New Frontiers Prizes for women mathematicians who have earned PhDs in the previous two years. Among the most recent prizes at JMM2023: 6 prizes for women only were presented by the Association for Women in Mathematics.

29. 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.

30. 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.

31. A comprehensive study of the variability hypothesis, "which posits that general intelligence may be more biologically variable in males than in females".

32. From the abstract:" It is a well-known and widely lamented fact that men outnumber women in a number of fields in STEM (science, technology, engineering and math). The most discussed explanations for the gender gaps are discrimination and socialization, and the most common policy prescriptions target those ostensible causes. However, a great deal of evidence in the behavioral sciences suggests that discrimination and socialization are only part of the story. The purpose of this paper is to highlight other aspects of the story: aspects that are commonly overlooked or downplayed. More precisely, the paper has two main aims. The first is to examine the evidence that factors other than workplace discrimination contribute to the gender gaps in STEM. These include relatively large average sex differences in career and lifestyle preferences, and relatively small average differences in cognitive aptitudes – some favoring males, others favoring females – which are associated with progressively larger differences the further above the average one looks. The second aim is to examine the evidence suggesting that these sex differences are not purely a product of social factors but also have a substantial biological (i.e. inherited) component. A more complete picture of the causes of the unequal sex ratios in STEM may productively inform policy discussions". The paper also 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. According to Ceci et al. (2014), 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 (Funk & Parker, 2018; HESA, 2018).

33. From the abstract of the paper: Sex differences in cognitive ability level and cognitive ability pattern or tilt (e.g., math >verbal) have been linked to educational and occupational outcomes in STEM and other fields. The present study examines cognitive ability tilt across the last 35 years in 2,053,265 academically talented students in the U.S. (SAT, ACT, EXPLORE) and 7119 students in India (ASSET) who were in the top 5% of cognitive ability, populations that largely feed high level STEM and other occupations. Across all measures and samples, sex differences in ability tilt were uncovered, favoring males for math > verbal and favoring females for verbal >math. As ability tilt increased, sex differences in ability tilt appeared to increase. Additionally, sex differences in tilt increased as ability selectivity increased. Broadly, sex differences in ability tilt remained fairly stable over time, were consistent across most measures, and replicated across the U.S. and India. 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 or humanities careers.

34. I thank Lee Justin and Marco del Judice for the bibliography. They have also pointed out to a paper https://onlinelibrary.wiley.com/doi/full/10.1111/brv.12818 which reaches different. Conclusions (A meta- analysis of sex differences in animal personality: no evidence for the greater male variability hypothesis) as well as to a subsequent paper https://psyarxiv.com/6ua8r by M. Del Jiudice and S. Gangested which criticizes its methodology.

35. Paradoxically, less emphasize on enforcing equality may even help bring more women in the STEM disciplines. Thus, according to research published in [Stoet] (see also "The paradox of working in the world's most equal countries": https://www.sciencedaily.com/releases/2018/02/180214150132.htm) 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.

36. 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 men mathematicians) are more than eager to hire weak 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 honors 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 a 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 when many women feel hostility of the "profession" and lack of the sense of belonging despite the huge promotion, prompting some to argue that this warrants even more favorable treatment... the answer to this bad spiral is not more promotion but 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.

37. This, of course does not prevent the women who enter the pool to be as capable as the larger number of men in the pool, see the conclusion of [Steven]. Efforts to bring more women in mathematics and more broadly in STEM are commendable and important as long as they do not sacrifice merit to enforce parity.

38. According to the census bureau only 38.7% of children below the age 18 leave in two parents families. The number for White Americans is 74.3 and is over 85% for Asian Americans

39. Approximately 49% of Blacks and 36.2% Hispanics leave on welfare

40. 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 which simplistic causation. For example "children with a family history of dyslexia have a 45% chance of dyslexia despite adequate instruction and practice", see[Hart]. According to [Bergen] "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".

41. If diversity is necessary for a better STEM education, why do people from strongly homogenous cultures (Taiwan, China, Japan, S. Korea) do so well in STEM?

42. "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".

43. The also 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." for black students".

44. 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, `https://www.tabletmag.com/sections/news/articles/the-vanishing/`

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