

DISCRIMINATION AND SCIENCE

By

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Pelo kwa teng
ke phuti.

Only a person can know
their own heart.

(Don't judge by appearances.)

Setswana proverb



Trigger warning: This chapter includes references to racism and gender-based violence.





WHAT DOES DISCRIMINATION HAVE TO DO WITH SCIENCE?

Have you ever been discriminated against based on your skin tone, gender, nationality, socio-economic status, sexual orientation, mental health, physical disability, learning disability, appearance, accent, religion, political affiliation or age?

Most of us have experienced discrimination in some way. And all of us have discriminated against others, either consciously or unconsciously.

But does discrimination have anything to do with science? Yes! Discrimination damages science, because humanity misses out on some potentially brilliant scientists when some people are excluded because of discrimination. The best science arises from collaboration between diverse people who bring together different perspectives and critique.

So, what should you, as a budding scientist, know about discrimination on your journey to becoming an excellent scientist? Racism, sexism and other 'isms' might affect your science career. Your own unconscious bias might affect other scientists and shape the science that you do.

This chapter describes scientific research into these aspects and ends with some practical advice for dealing with discrimination. As you read this chapter, keep in mind that discrimination is a complex, sensitive topic, about which much more can be said than we have space for here. We will focus primarily on race and gender, but these are not the only areas of discrimination and our focus should not detract from the impact of other forms of discrimination.





WHAT CAUSES DISCRIMINATION?

Discrimination is based on stereotypes that arise from our natural human tendency to organise the world into categories that we can easily understand. Let's unpack what this means. When we were babies, we learnt to make sense of our surroundings by classifying things into categories, such as 'food' and 'toys'. This classification helped us interact appropriately with different things, eating food and playing with toys, although sometimes we played with our food and tried eating our toys.

In science, classification systems allow us to make predictions about how things might behave. This is very useful for scientists as we try to make sense of our complex world. However, our classification systems have limitations. For example, glass appears solid but does not have the crystal structure of a solid. Light can be classified as both particle and wave. Some animals look and behave the same but don't belong to the same species; other animals look very different but belong to the same species. Classification systems are simplifications of complex reality; they are not as tidy as school makes them appear. Differences exist on a spectrum rather than the neat categories that we are taught to see as natural.

As children, we were taught to classify people into categories, such as children and adults. This social classification helped us interact appropriately with people of different ages. We were also taught stereotypes about different social categories; for example, maybe you were told 'boys are



better at math' or 'girls are better at art'. Many stereotypes are based on superficial things, such as what a person looks like or how someone speaks. Once we form a stereotype, it becomes difficult to see people as different from that stereotype. These stereotypes, which arise from organising our complex world into categories, are the basis for discrimination.

Discrimination is the unjust distinction between, and prejudicial treatment of, people, especially on the grounds of ethnicity, gender and disability.

Unconscious bias

Unconscious bias happens when we are consciously against discrimination, but negative stereotypes still affect us subconsciously. As a result, we make assumptions and judge people based on these stereotypes; for example, we may find aggressive behaviour more acceptable in men than women. Everyone makes assumptions about others based on unconscious biases, but greater awareness of our unconscious bias helps us treat people more equally.

Bias (conscious or unconscious) is a preference for or against a certain group of people.

Unconscious bias is not the same thing as conscious discrimination. Conscious racism (or homophobia, sexism, tribalism, xenophobia, etc.) is when we treat people differently with full knowledge of our bias against them. Unconscious bias is when we are unaware of our biased behaviour.

Here are some kinds of bias that you may be unconscious about. **Ableism** advantages people who are able-bodied. Our society is inherently ableist because our buildings and transport systems are built primarily with able-bodied people in mind. **Affinity bias** is a preference for people who are similar to us. **Beauty bias** is favouring people whom we find visually appealing. These biases are not consciously against anyone, but nonetheless disadvantage some people by preferring others.

Types of discrimination

Term	Discriminates against
Homophobia	LGBTIQ+ people
Sexism	Women
Tribalism	Other tribes or ethnic groups
Xenophobia	Other nationalities
Misogynoir	Black women
Disablism	People with disabilities

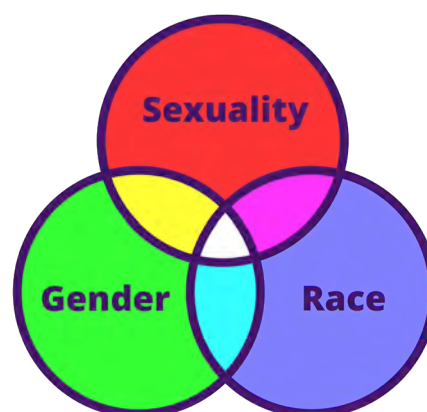


Intersectionality and positionality

Each person navigates the world holding some privilege based on certain aspects of their identity, whilst simultaneously experiencing marginalisation based on other aspects of their identity. For example, a heterosexual Black man is considered privileged based on his gender and sexuality, but will probably have to deal with the negative impacts of racism. Similarly, a queer White woman might be privileged based on her race, but will likely encounter sexism, patriarchy and homophobia. Black women, and Black queer women in particular, face the worst form of discrimination in our society, known as **misogynoir**. The combination of different social categories in an individual person is called **intersectionality**.

Our identity in relation to the power dynamics in the structures of society is referred to as our **positionality**. We should be aware of how our identities position us in society. Then we can use our privileged-as-well-as-marginalised experience to ensure that we don't contribute to the further discrimination of people, but instead help to remedy injustice.

Intersectionality



Positionality assessment

Pick your privilege	✓
race	
gender	
nationality	
sexual orientation	
socioeconomic status	
learning (dis)ability	
physical (dis)ability	
political affiliation	
mental health	
appearance	
religion	
accent	
age	

People identify themselves in different ways. For example, I am a South African by birth, but also culturally Indian. I identify as a heterosexual cisgender woman. I trained as a scientist, but now work in academic development. Each of these components are part of my identity; where they intersect is what makes me a unique individual.

Dr Riashna Sithaldeen



RACE IS A SOCIAL CONSTRUCT

There are many types of discrimination, but those that have a particular impact on science (especially in the South African context) are based on race and gender. Let's spend some time thinking about these two socially constructed classification systems and how this kind of categorisation is problematic for humanity and science. We start with race.

Biologists, geneticists and anthropologists agree that race is not a biological reality. Race may seem biologically real because it's based on physical features that we've been socialised into seeing as significant. However, there is no gene or cluster of genes common to all Black people or all White people; in fact, there is more genetic diversity within any race group than between race groups. There is also no scientific evidence of measurable difference in genetically-determined behaviour or academic skill between different race groups. Yet, as with all living organisms, different populations may slowly adapt to local conditions. For example, people in a sunny climate need skin that provides protection from harmful UV radiation, whereas people in a cloudy climate need skin that optimises occasional sunshine.

Let's imagine a world where racial categories were based on height, with Tall people presumed to be superior to Short people, or Short people believed to be smarter than Tall people. What would the cut-off height be for this classification system: 1.5 m or 1.6 m? The cut-off would be completely arbitrary,

Tyla, a Grammy Award-winning artist, faced backlash in 2024 from Black Americans for identifying as Coloured. (In the USA, 'coloured' is an offensive term for Black Americans, but 'people of colour' is not.) [2]



Tyla
@Tyllaaaaaaa

13 June 2024

Yoh guys

Never denied my blackness, idk where that came from... I'm mixed with black/Zulu, irish, Mauritian/Indian and Coloured. In Southa I would be classified as a Coloured woman and other places I would be classified as a black woman. Race is classified differently in different parts of the world.



There is only one race to which we all belong, and that is the human race.

Specialist perspective

Professor Rebecca Ackermann

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Although the concept of race is totally false in the biological sense, it is very real in the historical, social and economic sense. Put simply, race affects every aspect of how we experience the world. Historically, under South Africa's apartheid system, racial classification was used to legalise discrimination and oppression, and to segregate communities. People classified as White received better educational and job opportunities.

Socially, segregation limited opportunities for cross-cultural exchange. When cultures have close contact, they enrich each other; for example, District Six in Cape Town and Sophiatown in Johannesburg had vibrant inter-racial cultures (until they were bulldozed by the apartheid government in the 1950s and 1970s respectively). Segregation may lead to the development of distinct identities within segregated groups. Physical separation also inhibits understanding and empathy towards other groups, perpetuating stereotypes and prejudice. Many people still experience racism on a daily basis, even though racial discrimination is now illegal in South Africa,

Some academics consider capitalism in South Africa to be an extension of colonialism, apartheid and racism.

Economically, income correlates with race because of centuries of racial discrimination. Most White South Africans continue to benefit from the inequality established in apartheid. South Africa currently has the highest income inequality in the world [3], with the richest 10% holding at least 90% of all wealth, and White South Africans having a disproportionate share of this wealth. As a result, any discussion about socio-economic class or affordability in South Africa cannot be separated from the impacts of colonialism, apartheid and racism.



A consequence of this inequality is the so-called 'achievement gap', for example in South African higher education, White students, on average, perform better than Black students [4]. This achievement gap is not because of differences in inherent ability or intelligence, but because of the difference in access to resources and opportunities. The strongest predictors internationally of academic achievement are parental income, parental education and the quality of one's schooling. White South African students, on average, have more highly educated, wealthier parents and access to better schools than most Black South African students. Hence, it is not surprising that we see a racialised achievement gap. If we treat people differently, giving more resources and opportunities to one group over the other, the privileged group will do better than the group that has been discriminated against. The achievement gap is exacerbated (worsened) when Black students experience financial challenges at university that White students don't.

In summary, while race is socially constructed and not biologically real, its impact on people is very real. Although race was created by people using arbitrary criteria, centuries of race-based discrimination have significant consequences for people's lives today. Zukhanye Mack and Nelson (not his real name) describe the harsh reality of the UCT experience for many Black students.

Looking this harsh reality in the face can be tough. The injustice of it all may bring up emotions of pain, anger, guilt or other feelings. These responses are appropriate, even though they may feel unpleasant. We encourage you to take a moment to check in with your feelings. Write down some thoughts about how you are feeling right now.



Being Black@UCT

Zukhanye Mack

Biochemistry student



As a final-year BSc student, I find myself constantly navigating the complexities of being a Black student in an institution historically dominated by White privilege. UCT is transforming, but the remnants of its past are still palpable.

Growing up in Cape Town's townships and attending former Model C schools, I thought I had a grasp on integrating into predominantly White spaces. However, UCT presented a unique challenge. Here, the divide between the privileged and the underprivileged is stark, particularly in a field like science, where resources and support can significantly impact one's academic journey. Being Black at UCT means being constantly visible. Cultural ignorance from peers is a daily reality, and while there are smiles and friendly gestures, they often feel superficial. The pressure to adapt, to fit in, is immense. It requires a constant balancing act of maintaining one's identity while conforming to an environment that wasn't designed for us.

UCT hosts numerous pro-Black societies and clubs. These spaces are crucial for support and community-building among Black students. Yet, the perception from many White students is that these clubs exist solely to help Black students fit in, rather than being spaces of empowerment and cultural celebration. Interestingly, it's rare to see White students join these 'Black' societies, while Black students often find themselves in 'White' societies, further highlighting the cultural divide.

Being Black at UCT is a constant reminder that our presence here is seen as a privilege, one that comes with an unspoken obligation to prove



ourselves constantly. We are not just students; we are symbols of progress and transformation, bearing the weight of our community's hopes and expectations. Despite these challenges, there is strength in our presence. The resilience of black students at UCT is a testament to our determination and desire for change. We are paving the way for future generations, challenging the status quo, and pushing the boundaries of what it means to be a Black student at a historically White university.

Being Black@UCT

Nelson



Every year at UCT, there is a reminder that being Black equates to being underprivileged. Demographically, Black students are the majority, but they also face the majority of issues at UCT. There is no-one who tells you, but the system highlights to you that, while you are cognitively eligible to be here, financially you are not.

Every year since I joined UCT in 2020, there have been protests at the beginning of the year. These protests were about student housing and fee blocks – issues that are mostly experienced by Black students. When these protests take place, it is often mostly Black students who participate because housing issues and fee blocks directly affect their ability to study and thrive at UCT. All students have a right to protest, but it is usually Black students that need to protest to fight for their futures. During these protests, other races make it seem like you are destabilising learning processes at UCT or you are being barbaric and backward. Does this mean that impoverished Black students do not deserve to be at UCT simply because financially they can't afford it?





GENDER IS A SOCIAL CONSTRUCT

Like race, gender is a social construct. But what is gender, actually? When you were born, you were assigned a biological sex (male or female) on the basis of your external genitalia. This sex assignment resulted in your family assuming your gender (boy or girl), which affected how those around you treated you and how you were brought up. It probably affected the clothes and toys you were given and the household chores you were expected to do. This gender-based classification system determined the behaviours and roles expected of us within our families, communities and society as a whole. You may have been told 'boys don't cry' or 'that's not ladylike', or encountered stereotypes of men needing to be strong, and women being nurturing and gentle. Ultimately, how society treats you, based on your assigned sex at birth, affects what type of person you think you need to be.

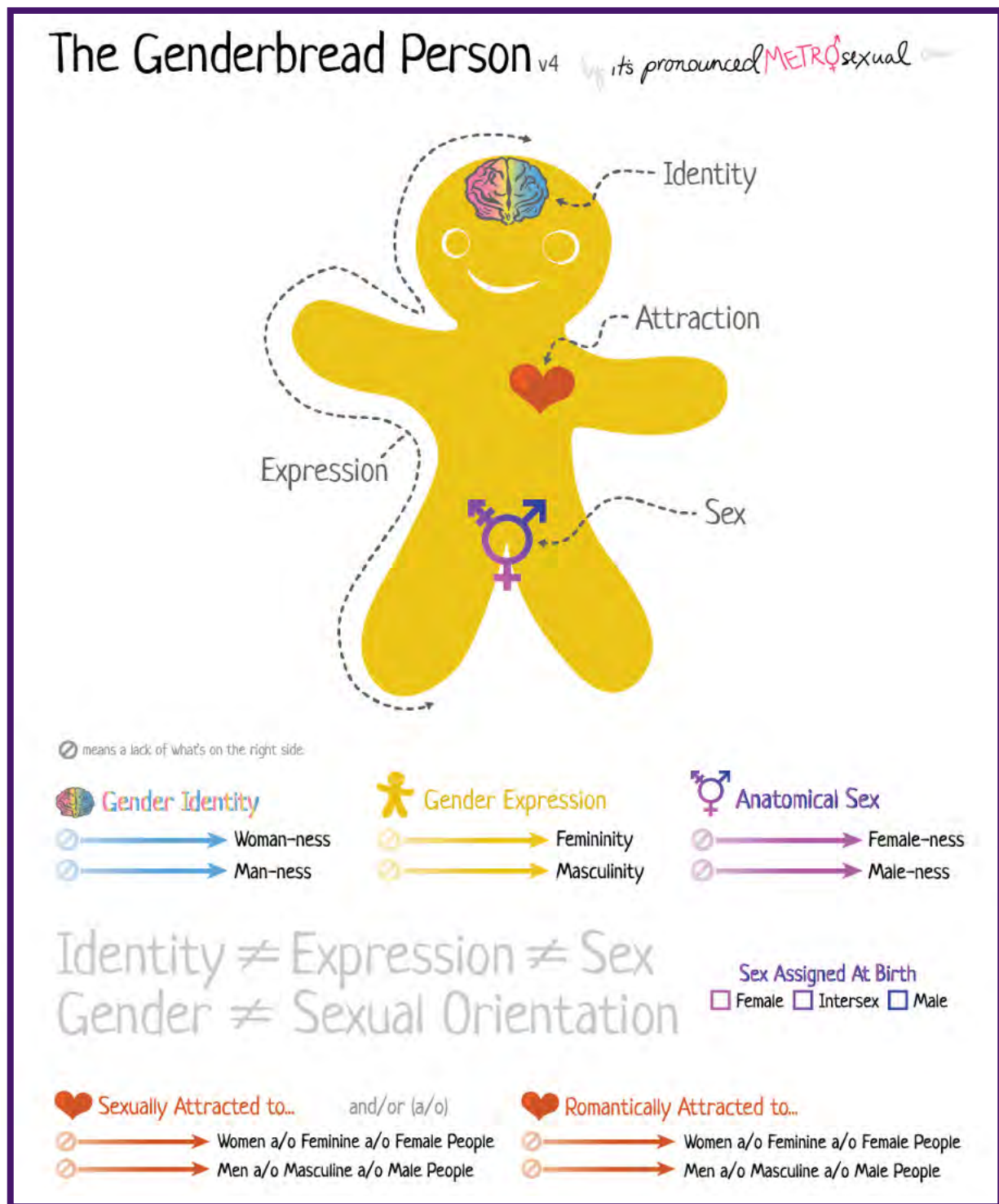
It's important to realise that these roles and expectations do not in fact have anything at all to do with your anatomy, but are instead socially constructed. Different cultures have different norms; for example, men in the Middle East are expected to grow beards and wear long kurtas that resemble dresses. Similarly, Scottish men traditionally wore skirts; while Chinese peasant women traditionally wore trousers. These cultural norms change over time.

Although gender-based norms are culturally defined, most of us see our gender as a core aspect of our identity and how we interact with the world. We identify as woman, man or non-binary. We behave in ways that are considered by society to be feminine, masculine or gender-neutral. Our sexual and romantic attractions are usually gender-based.



The Genderbread Person graphic illustrates these different aspects of our gender and shows that there are many more than two ways to be a human being [5]. It also points out that biological sex is not only male or female, but can also be intersex (i.e. having both female and male characteristics).

Figure 1: The genderbread person (Source: [Sam Kellerman](#))





Like race, gender has very real implications for how people are treated. In South Africa, gender-based discrimination is at the root of the gender-based violence that is so pervasive in our country. Across the world, there is discrimination and violence towards people who are not heterosexual and cisgender. Transgender people are most at risk of discrimination, ostracisation and even violent crime simply because of their gender. There is also discrimination based on an over-simplified understanding of biological sex as being either male or female. This binary classification system results in the marginalisation of people who are intersex or who don't appear as typically male or female. Mohammed Kajee explains the complexity of biological sex below.

We remember **Uyinene Mrwetyana**, a UCT student who was raped and murdered in 2019 by an employee of the Claremont post office when she went to collect a parcel.

Transgender means that a person's gender identity differs from their socially-assumed gender. Cisgender means that a person's gender identity aligns with the socially-assumed gender they have grown up with.

Biological sex is complex and beautifully diverse

Mohammed Kajee
Biology PhD student



Since the early 1900s, scientists have been learning more and more about the diversity of human biological sex [6]. Whether a foetus develops as male, female or intersex is determined by three key elements: (i) the Y and X chromosomes; (ii) sex-determining genes; and (iii) hormones. For the majority of people, these elements result in the development of a typical male or female individual [7]. In these instances, a biological male is someone who has XY sex chromosomes, an external penis and testes, and develops secondary male characteristics at puberty. Likewise, a female is someone who has XX sex chromosomes, a vagina and ovaries, and who develops secondary female characteristics at puberty. However, this is not always this case. Here are some of the most common mechanisms that give rise to the diversity in biological sex in humans.

Specialist
perspective



Chromosomal diversity: In school, you were taught that all babies have two sex chromosomes, either XX or XY. However, some people have three sex chromosomes, in various combinations, such as XYX, XYY or XXX. which can result in a variety of sex characteristics.

Gene-level diversity: Scientists have discovered many genes involved in determining how sex characteristics develop. For example, the SRY gene, usually located on the Y chromosome, signals the gonads to develop into testes and ultimately into a male child [6]. However, in some cases, this gene is moved around (during meiosis), which results in a Y chromosome that doesn't have the code for 'maleness' and an X chromosome that does; thus an XY person develops as a typical female [8]. Similarly, if an individual has extra copies of genes that promote the development of ovaries, this can result in the development of typically female genitals, despite having XY chromosomes. If another key ovarian gene (RSPO1) does not switch on, XX people develop an ovotestis, which has both ovarian and testicular characteristics [6].

Hormonal diversity: If a person with XY chromosomes and a typical SRY gene does not produce the two main sex determining hormones (anti-Müllerian hormone and testosterone), then they may not develop typical male genitalia. Similarly, if a person's cells do not respond to these hormones, then typical external characteristics may not develop [9]. There are numerous other ways in which hormones can affect the way that people develop and whether they present as male, female or intersex.

Chromosomal, genetic, and hormonal diversity are just some of the most apparent examples demonstrating how biological sex develops through a complex network of interacting factors. As scientists continue to study these topics, our understanding of the mechanisms affecting biological sex will improve.

You might be finding all of this quite startling! Perhaps you feel as though everything you've ever been told about biological sex, gender and your role in society is being questioned. If you're wondering why we've been socialised into seeing gender as binary when gender is diverse, read Jes Graham's piece below.

Jes Graham

Many cultures around the world have been negatively impacted by the binary view of gender brought by colonialism. The fact that gender is constructed differently by different cultures tells us it is not a 'scientific fact' or 'truth' of nature. Some cultures have more than two genders, but the bulldozing European colonisers did not want to allow other cultures and other ways of life to flourish. The colonisers wanted to dominate through violence (whether physical or through controlling knowledge) and by twisting colonised people to live by their rules, beliefs and ideology. There is a painful history behind gender not being seen as a social construct. The dominating colonising powers used binary gender as an ideological state apparatus to control indigenous cultures.

Respecting people's pronouns shows that you respect them and their gender identity.



RACISM AND SEXISM IN SCIENCE

Now that we've explored how the socially constructed categories of race and gender impact people in different ways, we consider specifically how discrimination affects scientists. We will focus on racism and sexism, although other kinds of discrimination also impact scientists. While we address racism and sexism separately, we recognise that intersectionality is at work here: racism and sexism intersect with each other and with other kinds of discrimination, such as homophobia and disablism. Even when discrimination arises unintentionally from unconscious bias, it can affect people's careers dramatically.

Racism in science

Racism in higher education impacts many students and university staff across South Africa. It impacts science differently across different institutions and across different disciplines. Racist influences are still found in scientific discourse, even in the social sciences. It is important for all of us, as scientists, to collectively fight against racism wherever we find it. This collective movement to create a more equitable institutional environment is at the centre of UCT's *Vision 2030* transformation goals.

Racism in science should not be confused with 'scientific racism'. Scientific racism is the false belief that empirical evidence exists to justify racism; in particular, that there is evidence that some races are naturally superior to others. This belief is based on pseudoscience, i.e. statements that are claimed to be scientific and factual



but are not. Because races are not actually biologically discrete entities, it follows that any 'science' that makes claims about different capabilities in these groups is invalid. Scientific racism was commonly practiced from the 1600s through to the end of the Second World War, but was formally denounced in 1950 by UNESCO's anti-racist statement, *The Race Question* [10]. Today, scientific racism is discredited by scientists, but it is still found on racist websites, social media and in some academic literature.

Sexism in science

Scientific research shows that we develop stereotypes through exposure to bias in the media and our communities. In one study, when five-year-olds drew a scientist, about half of their drawings featured a woman [11]. However, when these same children were 10 years old, the percentage of woman scientist drawings dropped to 25%, and continued to decline as the children grew older, regardless of whether the study participants were boys or girls. A Harvard University study on unconscious bias reveals that both women and men strongly associate the word 'male' with STEM (science, technology, engineering and math) subjects; while 'female' is associated with words related to family and the humanities [12]. This bias affects how STEM subjects are taught; for example, when Australian teachers planned science lessons for individual students, they included less scientific information in their lessons for girls [13]. When girls outperform boys at maths and science, teachers often attribute this to girls being more hardworking than boys, rather than girls' ability [14].

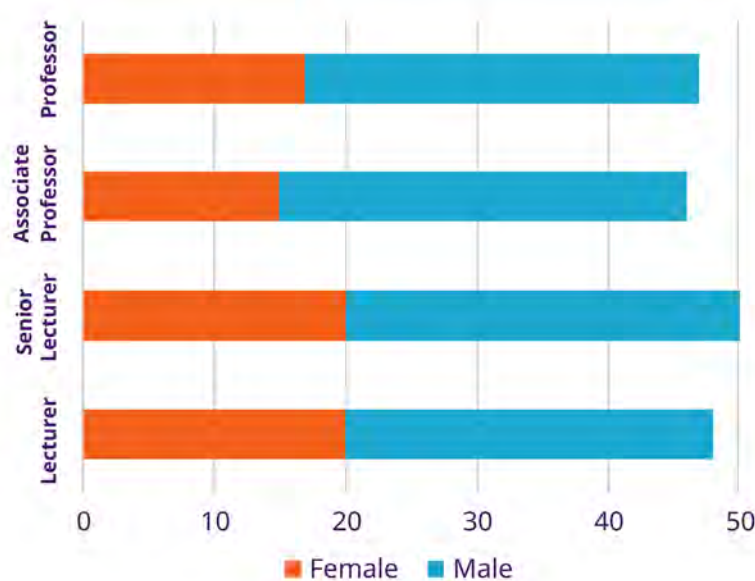
A USA study [15] demonstrates how men are often given more opportunities for professional development than women.



A total of 127 professors (in physics, chemistry and biology) were asked to evaluate an application from a PhD student for a lab manager position. All the professors were given the same application; for half, the application had the name 'John', whereas the other half had 'Jennifer'. The professors rated the 'man' as significantly more competent and hireable than the (identical) 'woman', and recommended a 14 % higher starting salary and more career mentoring. Surprisingly, the gender of the professors did not affect their responses: men and women were equally likely to exhibit bias against the woman student; even women who have faced many challenges and discrimination to reach their current position (i.e. a professorship) can exhibit bias against other women in their field.

This bias contributes to women being underrepresented in science faculties across the world, particularly at professorial level. Figure 2 illustrates the numbers of academics at each level (from lecturer to professor) in UCT's Science Faculty.

Figure 2: UCT Science Faculty academics (2023)





There are many factors contributing to this situation, including:

- The fact that women were excluded from universities for most of history, as this table shows.
- Ongoing sexism (both conscious and unconscious), as illustrated by the study described above, means that men get better opportunities, on average.
- Ongoing sexism means that women are often under-recognised for their contributions. For example, Jocelyn Bell's supervisor was given the Nobel Prize for her groundbreaking work in astronomy. (Overall, women have received less than 4% of the Nobel Prizes in Science [16]).
- Academics are evaluated on their cumulative contribution to scientific knowledge, as measured by published research. Research is time and labour intensive. People with fewer family responsibilities have more time for research. This means that men are likely to meet the requirements for promotion sooner than women with children, because society traditionally expects mothers to contribute more time to child-rearing than fathers.
- Since women are in the minority, and, on average, have lower higher rank in universities, they are disadvantaged by workplace power dynamics and may suffer retaliation if they speak up against unfair practices. Power dynamics are exacerbated if racism and homophobia are also at play, making it more difficult for black women and particularly black queer women.

Dates of institutional origin and women's admission

University	Started in	Women admitted from
Al-Qarawiyyin (Morocco)	859	1940s
Oxford University (UK)	1096	1879
Cambridge University (UK)	1209	1881
Harvard University (USA)	1636	1940s
UCT	1829	1887

It was because of the efforts of Paul Daniel (PD) Hahn, a professor in chemistry, that women were first admitted to UCT.



Under-representation makes women especially vulnerable to sexual harassment in the workplace. The #MeToo movement highlighted the fact that women working in STEM experience extremely high levels of sexual harassment. In 2018, the USA's National Academies of Sciences, Engineering and Medicine published a report on the extent of sexual harassment across STEM fields [17]. The research found that women in STEM endure the highest rate of sexual harassment of any profession outside the military. Nearly 50% of women working in STEM fields and 58% of STEM women in academia report experiencing sexual harassment, whereas 16% of men report sexual harassment. Added to this, retaliation is experienced by 90% of women who report sexual misconduct. Sexual harassment includes requests or hints for sexual favours in exchange for career advancement, as well as any kind of unwelcome sexual advances, gestures, jokes or comments that create a hostile or offensive work environment.

In summary, universities were originally for men only, and women have had the odds stacked against them ever since they were first admitted: they get fewer opportunities and less recognition; they often have to balance their work with home responsibilities; and a toxic workplace environment can lead to them abandoning a career in science. We shouldn't be surprised by the resulting under-representation of women in science, but we can hope for a future where all are able to participate equally in science.



Stereotype threat

In the present, the reality is that there are stereotypes about who is good at science. These lead to 'stereotype threat'. If there's a negative stereotype about people like you, then you may try to prove the stereotype wrong and do extra well. However, in actively fighting the stereotype, you use some of your working memory, and so have less capacity to perform well. When you perform a task under stereotype threat, you are likely to underperform.

What can you do about stereotype threat? Knowing about its existence helps. You can also reduce the effects by reminding yourself of some truths:

- Stereotypes are just social constructs intended to advantage some at the cost of others.
- Under-representation in science is a reflection of our society, not biological differences in ability.
- You have multiple identities. (It helps to focus on your 'scientist' identity, rather than other social categories.)
- The BSc degree is a TOUGH degree: university maths and science are hard for everyone.
- You are a unique and TOUGH person — you have made it this far!
- Initial talent doesn't count as much as sustained hard work. Your ability now is just your starting point (this is a 'growth' mindset).

You are not personally responsible for proving that people from your social category can do science. You are only responsible for yourself and your learning.



WHAT SHOULD YOU DO ABOUT DISCRIMINATION?

This chapter has shown that, although race and gender are ‘just’ social constructs, they have a big impact on our lives. The question now is, what will you do? There are two sides to the coin when it comes to discrimination. On the one side, there are the ways in which you are discriminated against. On the other side, there are the ways in which you impact other people as a result of your explicit or unconscious biases. It’s your responsibility to work on both sides of the coin. On the one side, be aware of the ways in which other people’s bias affects you and what you can do about it. On the other side, become more aware of your own bias and how it affects others. Both sides will always be a work in progress – this is a lifelong journey, but it’s a journey that you’ve already started on by digging into this chapter. We end this chapter with some practical ways to work on both sides of the coin.



How to approach your unconscious bias

There are many steps that you, as young scientists, can take to identify your own biases. This process of self-exploration will be useful as you navigate your academic careers, make friends, find a lover, and build a professional scientific network. Here are some guidelines for overcoming bias in your own life:



1. Focus on seeing people as unique individuals and try to spend time considering them on a more personal and individual level.
2. Work on consciously changing your stereotypes. If you do recognise that your response to a person might be rooted in bias or stereotype, make an effort to consciously adjust your response.
3. Adjust your perspective; try seeing things from another person's point of view. How would you respond if you were in their position?

A hero is someone who is not only a degree-holder, but also someone who knows how to be kind and treat people well. Someone who is inclusive (does not exclude people in anything). Someone who knows themselves and does not allow anyone to decide who they are and how they are supposed to be. Someone who helps people in any way but can also help themselves.

Emihle Kwetana

Confronting discrimination

UCT has a zero-tolerance approach to any form of discrimination, harassment, sexual violence and behaviour that demeans others [19]. You have a right to speak up when lecturers, tutors or demonstrators or other staff say things or behave in ways that reinforce stereotypes, even (or especially!) if they do so for the sake of humour. It can be hard for your peers to speak up when they are being discriminated against, so look out for your fellow students. You have a right to speak up when you see bias raising its ugly head, even if it's not looking at you. You can start by saying 'I felt uncomfortable when ...'. Remember that your class reps are there to channel complaints to your lecturers. If you don't get a satisfactory response, move up the UCT hierarchy (lecturer, HOD, Dean) until you do. UCT's Office for Inclusivity and Change or the UCT Ombud can also provide support. UCT's *Vision 2030* calls on us to 'unleash human potential to create a fair and just society'.

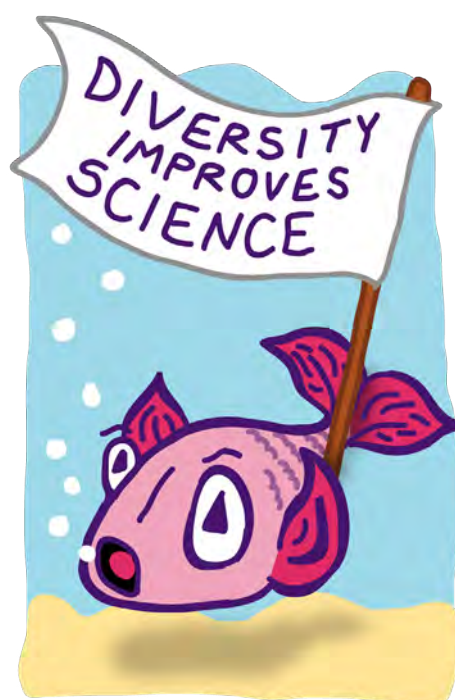


It can be tricky to stand up against discrimination in social settings because we're socialised into 'keeping the peace'. But laughing at sexist jokes contributes to rape culture, making gender-based violence seem socially acceptable. Speaking up may benefit the people who come after you and find themselves in the same situation. At the same time, you should be aware of the risk of speaking up and take steps to protect yourself – which may mean NOT speaking up. Do what you can with the power you have: choose your battles and don't feel guilty if you don't speak up.

HOPE FOR THE FUTURE

We noted near the start of this chapter that the best science arises from collaboration between diverse people who bring together different perspectives and critique. Better representation in STEM will improve the quality of scientific ideas, the questions that we explore, the methodologies used and the interpretations of our findings. While there is still much to be done in order to achieve true equality in STEM, there has been some progress; though the rate of transformation differs in different disciplines and at different institutions.

It's encouraging to realise that, while science has a discrimination problem, science itself can help us better understand and solve the problem. On the one hand, we've seen how scientists have investigated the nature and extent of discrimination in science. Their studies reveal under-representation in various disciplines and quantify the effect of this discrimination and harassment on





their careers. In fact, many social scientists have been studying systems of power, bias and discrimination for more than a century. These studies are a starting point to address these issues and will lead the way towards a fairer system. At the very least, studies that quantify evidence for discrimination allow people to have their lived experience, pain and suffering acknowledged and documented. In this way, modern science (which is colonial in origin) can be used to defeat systems of discrimination that grew out of colonialism.

On the other hand, science is an important tool that can be used to dispel myths around biological sex, gender, race and other aspects of diversity. The reality is that human beings are a complicated species with wonderful diversity in our physical make-up. Understanding this diversity, and the mechanisms that contribute to it, can help us to accept and embrace our differences. Together, we can create a more inclusive world where people are respected and treated equally, regardless of their chromosomes and genes.

As scientists, it is important that we: (1) don't let discriminatory misinformation impact our self-esteem and how we view ourselves; and (2) work to ensure that we tear down structures of oppression from our past and build a future that is more inclusive and just. One of the most powerful tools at your disposal is to educate yourself about how systems of power and culture impact different people. If you found this chapter interesting, you may want to consider taking (as an elective in your BSc) one of the humanities courses that dive deeper into these subjects. As you navigate this journey for yourself, remember that together we have the power to make change, step by step.

Ukugqitna kwizivunguvungu
kukuvrila kwilanga. [After the
storm passes, there comes a ray
of sunshine]

My mother said this to me. Itustwa upua kulomhlaba siphila kuwo ingxaki ziyosoloko zikhona kodwa akhonto ingadluliyo. (This world we live in there will always have problems, but it will all pass.) This has been helpful ever since I arrived at varsity, where you face multiple life challenges. I always comfort myself by telling myself that after every storm there is a ray of sunshine coming. And my sunshine is going to be my success from my degree and making my whole family proud.

Bathabile Ndzendze



READ/WATCH MORE

Videos

These short YouTube videos are well worth watching :

- **The UCT Accents video** illustrates how we discriminate based on people's accents (3 minutes).
- **Blue eyes/Brown eyes** shows a USA teacher's grade 3 lesson from 1970, where she discriminates against children on the basis of the colour of their eyes, in order to teach them about discrimination (6 minutes).

Some excellent movies show the effects of discrimination on scientists and students: *Picture a scientist*; *Promising young woman*; *Hidden figures*.

XXY is a movie that portrays an intersex teenager.

Gender diversity

If you are interested in learning more about the diversity of biological sex, check out this **graphic** created by researchers at the University of Oklahoma.

LBGTIQ+ support: **Triangle Project**

4 Seymour St, Observatory, Cape Town.
Helpline 0217126699 (1 pm – 9 pm).

Terminology in other languages: if you'd like a better understanding of some of the terms and concepts discussed here, in English, isiXhosa or Afrikaans, take a look at the Tshisimani **Pocket Queerpedia** glossary.



Unconscious bias

If you are interested in figuring out your unconscious bias, Harvard University's **Project Implicit** test helps you identify bias based on social categories such as race, gender, sexuality and classism.

More information about unconscious bias can be found in the **resource** developed by UCT's Office for Inclusivity and Change, in partnership with UCT's Organisational Psychology Department.

Discrimination at UCT, then and now

Here are some articles that may interest you:

- UCT stood against apartheid, but had some **racist classroom policies** during apartheid.
- PD Hahn's contribution to women in science is noted in **this article** on UCT's beginnings.
- Dr Nomakwezi Mzilikazi (Deputy Vice-Chancellor for Research at Rhodes University and Honorary President of the Zoological Society of Southern Africa) wrote an **article** in response to the **paper** by UCT's Prof. Nicoli Nattrass that received attention in the media for its racist assumptions. Both articles were published in the *South African Journal of Science* in 2020.

The history of women in science

Overview of the contribution of women to science across history

Extraordinary women from the golden age of Muslim civilisation

Further study

Humanities courses can be found in the **humanities handbook** at UCT handbooks

'Towards a Decolonised Science in South Africa' (AGE1005L): Watch this **trailer video** (4 minutes) about this Science Faculty course that runs during the mid-year break.



Advance release version (August 2024)

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How to cite this resource

Kajee, M. et al. 2024. Discrimination and science. In Taylor, D., Kajee, M., Moosa, N. & Mnisi, T. eds. *Science is tough (but so are you!)*. Advance release version. Cape Town: Science Faculty, University of Cape Town. <https://doi.org/10.25375/uct.26763160>