MIND THE GAP

Addressing Physical,

Knowledge &

Societal Gaps

From the Editors

Gaps between atoms in buttons: potentially the downfall of Napoleon's army. The class system in modern British society: economic and social gaps. Black holes: the largest physical gap known. The gaps between both the letters and the words in this very sentence.

In the creation of this publication, we wished to draw attention to the myriad gaps that exist in the world around us. So often gaps go unnoticed, as we become preoccupied with other issues, and in order to mind the gap, we must first be aware of its existence. These gaps need not be typical, or indeed obvious. They could be physical, societal, or intellectual, taking any shape or form.

In creating the publication, we wanted to ensure that what we were writing about, what our focus was, was relevant and impactful, and there is nothing more impactful than the gaps that appear in this collection of articles. We hope that you will take time to think about the gaps that you have discovered here, and that you will be aware of your role in minding them, and, if relevant, closing them.

The Stevens Academic Scholars have each chosen a 'gap' to write about that they are both passionate about, and interested in, and we hope that you enjoy reading the publication just as much as we have enjoyed putting it together.

We would like to extend our thanks to Ms. Edwards for her support throughout the process since without her help, our roles would have been more difficult. We would also like to thank the Stevens Academic Scholars who contributed to the publication, without whose articles we would not have this journal.

Mind the Gap and thank you for reading the Academic Scholars' Publication.

Alice, Amelia, Beatrice, Chloe and Yolanda.

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Societal Gaps

Bridging the gap between female models, mannequins, and all body sizes - Maddy (J)

There is a large gap in the modelling and mannequin market: the representation of more diverse body types, not only bodies conforming with the contemporaneous 'ultra- thin' ideal. This ideal applies mostly to the female body and is shown in many different ways through our society, often without going unnoticed. These body standards are known to put people at risk of developing eating disorders in their lives, especially those of young females. Mannequin sizes aid this ideal, yet their size is not something that many people consciously consider; some research into this issue has been completed by various organisations, but little has been acted upon so far.

> "100% of the female mannequins measured in Liverpool and London in chain stored were severely underweight."

A study carried out in the 13th edition of the Journal of Eating Disorders showed that 100% of the female mannequins measured in Liverpool and London in chain stores were severely underweight (Robinson, 2017). On the other hand, the male mannequins were of a much more average size with only 8% showing an underweight male, yet they had other ideals to adhere to, such as extremely muscular chests or very broad shoulders. But a discrepancy remained as to the percentage of healthy and 'underweight' male and female mannequins. For the female mannequins, their size, respective to their height and supposed age, showed what would be medically considered an underweight woman.

Similarly, in 1992 an article published by the British Medical Journal examined whether a female mannequin could even menstruate.[1]The test was carried out on six different mannequins from three countries. To evidence their findings, data from obstetrician E. Baker was used, suggesting that women need at least 17% of their body weight to be fat in order to menstruate and at least 22% of their body weight as fat to have regular cycles (Rintala, 1992). The results concluded that these mannequins could not menstruate. This is an issue that needs to be addressed as it is giving unconscious, unrealistic and dangerous body ideals to all people who see these figures. It is taught to children in primary school that in order to be classified as a 'living' organism we must perform certain functions. One of these is the ability to

reproduce. The use of mannequins in stores is surely to show the potential buyer what the clothes might look on a person before they buy the item. How can these figures that are so normalised be, according to primary school, not even a living organism?

In addition, models that we see can have an impact on our ideals of how we think we should look. Many clothes companies show their clothes online worn by equally underweight models. As humans, it is our instinct to copy one another; it is the way in which children learn to speak, by imitating their parents. Why then should that be any different when we see a model on the internet? Don't we also want to copy them? Even if we do not consciously *want* to look like them, societal pressure may entail that we feel we *should* look like them. So, are we buying the clothes because we like them, or buying them in order to look like the model that is wearing them? Of course, this is not always the case, and many brands have tried to diversify the sizes of models, but the majority of clothing websites today reflect the reality of body ideals to a disproportionate level.

By making both mannequin and model sizes more diverse it would have positive impacts by allowing all sizes to be shown, which would lessen the assumption currently given out by the fashion industry that to look good, you must be a certain size. There is no wrong size or body because everyone is different, so we must close the gap between models, mannequins, and all body sizes.

Image from MappingIgnorance
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Reducing the gap between the number of men and women in governments – Yolanda (I)

As of January 2021, only 25% of all national parliamentarians are women. Just ten countries have a woman Head of State, thirteen countries have a woman Head of Government and finally at the current rate, gender equality in the highest positions of power will not be reached for another 130 years.

As the figures above show, women are significantly underrepresented in governments across the world which is extremely harmful given governments are making decisions for the whole population, and women make up 50% of this population. An example of the danger of this underrepresentation can be seen through the UK's reaction to Covid-19. In the current cabinet, women make up 27% so it is unsurprising that the government's response to the pandemic does little to protect women, especially at a time when women need protecting. The 'Counting Dead Women' project estimated that the number of women being killed by a partner or ex-partner had doubled and Refuge reported an eightfold increase in calls to its helpline in a day. Furthermore, women are more likely to work in sectors that have been shut down by coronavirus than men. These figures show how important it is to have equal representation; women must be in the room to have the conversations and raise the issues that the everyday woman is facing, otherwise these issues get dismissed without a second thought.

It is also important to note the success of current female leaders. Females provide a different type of leadership which is especially effective in a crisis. They act with empathy and compassion and bring something different to the table. As a result, female-led countries have had fewer Covid-related deaths. The success of Jacinda Ardern and Angela Merkel is proof of the power of female leaders.

So, the question is: how can we get even more women into politics and positions of power?

Rwanda ranks first in terms of women's representation in national legislature. This is because in 2003, the country adopted a new constitution that reserves 30% of parliamentary seats for women. Furthermore, political parties must ensure that women hold at least 30% of elected positions. However, these quotas raise a new question: is it democratic? Shouldn't the best people for the job be elected?

Therefore, whilst this can be a good approach in some countries, it wouldn't be in others.

Georgia is another example of the nation making a conscious effort to level the playing field; political parties that include at least 30% of each gender on their electoral list receive a 30% supplement from the state budget. In Ireland, parties lose 50% of their state funding if their candidate pool includes less than 30% of either gender. This is an extremely effective method, given funding and financial backing is so important in a political campaign - now, more than ever - and given that politics (particularly in the US) is so influenced by financial backing, something which can set women back. For this reason, policies such as those in Georgia and Ireland are essential in making sure women are getting the support that they need.

Putting the finances and statistics aside, there are many social difficulties which we need to help women overcome. Familial constraints are a big reason as to why women can't go into politics. But even with issues such as these, there are many ways in which we can overcome them. For example, Victoria Donda Pérez, an MP in Argentina, went viral after breastfeeding during a parliamentary hearing. Allowing new mothers to bring their children to work or providing care services for them would certainly increase the number of women wanting to get involved in politics. Even something as simple as encouraging men to take up more familial responsibility would provide women with an ability to pursue their career.

Therefore, it is evident that we can easily overcome the barriers which are preventing equal representation; there are so many examples of countries making a real effort to aid women and these examples prove that it is possible for all nations to increase the amount of female representation. All it takes is a concentrated effort and a recognition of how vital it is that the government represents the country that it is acting for. Now the government in the UK needs to take a look at other nations that are out-doing us when it comes to female representation and act accordingly. The ideas and solutions are all out there; it is just a matter of implementing them.

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How can we bridge the generation gap? – Sophia (M)

Firstly, what is a generation gap?

"The difference in attitude or behaviour between young and older people, that causes a lack of understanding." This means that there is a difference in our opinions, beliefs, and values, from generation to generation, as a result of factors such as upbringing, the society that surrounded us whilst growing up, and current affairs. These factors exist constantly throughout our lives, helping to shape our thoughts, opinions, values, social norms, and our perception of the world.

> "Accepting and respecting differences between people of different ages is so important."

I want to talk about ways that we can bridge these gaps between generations. Initially, we must gain perspective. We need to open our eyes up to the fact that people of different generations exist together every day. In reality, everyone is going to have their different opinions and beliefs. This is something that needs to be accepted; perhaps it just requires looking at something from someone else's point of view, to understand why they may think differently to you, or why they may act or behave differently to you.

This leads me onto my next point: learning from different generations. If there is a clash between generations, then one of the best things to do is to talk about why things are seen so differently, in order to gain an understanding and to then accept that even though you don't agree with some things that others have said or done, frequently, this is due to the way in which people have been brought up, and each generation grows up in a vastly different social and political environment.

An example of significant events that can affect certain generations is the Silent Generation – people who were born between 1928-1945, and lived the earlier years of their lives amidst the Second World War. This no doubt shaped a person's thoughts and perspectives on life in a certain way. Another example is 'Generation Alpha', the youngest generation currently living on the planet. Those in this generation were born between 2011-2021, and they are, of course, growing up in the middle of a global pandemic.

There is so much that people across all generations can learn from each other's generations. Nowadays, people say that the older generations have much to learn from the younger generations, especially in terms of technology, because of this new and modern world that we are living in. But this is not at all the only way in which

generations should be learning from each other. Younger generations have so much to learn from older generations, too. It isn't all one way.

Learning from other generations is one way in which generations can develop a mutual respect. This mutual respect is one of the key elements to bridging the gap between generations.

In conclusion, I think that it is an important thing to be able to bridge generation gaps. There seems to be some stigma between generations, around how others that weren't born, and didn't grow up at the same time as they did, don't have the "right" attitudes to key areas in their lives, such as work or family. Some people believe that others should not behave as they do, adhering to the different societal norms that each generation would have followed whilst growing up. Accepting differences between people of different ages (and all people in general), and then respecting those differences, is so important, and is how we can start taking steps to bridge the generation gaps.

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Can we ever close the gender pay gap in sport? – Izzy (J)

Naomi Osaka. Serena Williams. Each year, Forbes releases a list of the 50 highest paid athletes from around the world. On the list for 2021, only these two women made the cut. Only two years previously, Williams made history as the first woman to break into the top 100.

Their position in the charts leans heavily on the fact that the prize funds in the women's tennis tournaments match the prize money of their male counterparts. Billie Jean King has been the woman behind the movement, who began campaigning following her win in the Italian Open, 1970 where she only received $600 compared to the men's winner, Nastase, who walked away with over five times the amount: $3500. It wasn't until she threatened to boycott the 1973 US open that the organisers finally agreed on equal prizes. Another 34 years later, Wimbledon finally offered

the same winnings in both tournaments. King's journey to reach this point shines a light on the difficulty of making changes in the sports industry; despite her struggle being almost five decades before, little has really changed.

"In 2019, Serena Williams made history as the first woman to break into the top 100 of the Forbes highest paid athletes list."

Whilst tennis seems to be the one sport that is most progressive on the gender pay gap front, many other sports have attempted to follow suit offering equal prize money. A 2021 survey completed by the BBC showed that out of the 37 sports that offered prize money only three did not offer the same amount at any of their main events. Football has always been known for its large payouts, yet it is one sport where the gap between the men's and women's tournaments remains stark. The 2019 Women's World Cup saw the US national team receive a mere $4 million compared to Frances's men's team receiving $38 million the year before in the same tournament. When asked about the disparity, an FA spokesperson said that the funds "are determined by the amounts of money generated through commercial revenue, including national and international broadcast rights".

This raises the most prevalent issue in closing the gender pay gap: the fact that women's sport currently does not receive the same amount of support as the men's does. One of the main causes of this is lack of coverage of the games. Although over 40% of athletes are female, on average their screen time is less than 4% of all sports coverage globally, which occasionally rises for large events such as the Olympics or the World Cup. Unfortunately, these figures are unsurprising, but do not reflect the public's desire to watch women's sport. A 2019 study showed that 60% of the respondents felt that there was not enough coverage of women's sport and even when it was shown, fixtures had not been advertised enough.

The underrepresentation also has a drastic effect on young women's approach to sport. One third of teen girls drop out of sports by their late teens compared to the rate of teenage boys which is only one in ten between the ages of 16-18. As more and more women drop out of sport due to lack of confidence, women's sport has overall lower participation and a smaller following. This feeds into one of the most common excuses for the pay divide: that the men's matches are just better to watch. It is ignorant to pretend that biologically, men cannot be faster and stronger; however, the women's game can be equally as skillful if given the same resources and coaches. It was not until January 2019 that the England women's rugby team received full time contracts, yet these women saw a significant drop in their wages from what they had been earning outside the game. How can we expect the skill level in the women's game to match the men's when many must work a part-time job alongside training?

Overall, women's sport is stuck in a rut. To improve the game, we need to increase the exposure female athletes are getting. In order to do this, the funding needs to increase, but the funding only increases from advertising in more women's games, which need more exposure. It seems to be a vicious cycle with no clear solution. Maybe what we need is more players like Billie Jean King to take a stand in order to cause global change.

Billie Jean King Slams U.S. Open Umpire for Sexist 'Abuse of Power'. [online] Advocate.com. Available at: <https://www.advocate.com/sports/2018/9/10/billie-jean-king-slams-us-open-umpire-sexist-abuse-power> [Accessed 12 September 2021].

Closing the gap – The fall of South African Apartheid – Alex (G)

Following the end of the Great Depression and the Second World War, South Africa was facing increasing economic troubles. This persuaded the government to increase its laws on segregation, and eventually, in 1984, the Afrikaner National Party won the election using the slogan "Apartheid" which means "apartness." The purpose of this party was to divide the white minority from the non-white majority and further segregate the non-white population to reduce their political power. Many laws were put in place to suppress the black population, such as prohibiting the marriage between white and black people. Furthermore, one of the most terrible aspects of Apartheid was the seizing of land owned by black families who were then deposited into *Bantustans* (regions of South Africa designated for black people) where they would be plunged into poverty.

Opposition to Apartheid eventually manifested itself in many ways ranging from peaceful protests to armed resistance. One of the leading Anti-Apartheid groups was the African National Congress (ANC). However, unsurprisingly, these groups faced a significant backlash and eventually, in 1960, a group of anti-Apartheid activists were fired on in Sharpeville. At least 67 black people were killed and over 180 wounded. Following this, the ANC decided that peaceful demonstrations would be to no avail. However, by 1961, most of the leaders of the resistance had been imprisoned or executed. Finally, in 1963, Nelson Mandela, a founder of the "Spear of the Nation" (the military offshoot of the ANC), was incarcerated until 1990. His arrest helped the anti-Apartheid effort to gain support internationally.

By 1976, after increasingly violent actions and further economic troubles, the illusion that Apartheid was working began to collapse, and international attention bore down on South Africa. In 1973, the United Nations General Assembly denounced South Africa, and in 1976 the UN Security Council voted to impose a mandatory embargo on the sale of weapons to South Africa. Nine years later, both the UK and the US imposed economic sanctions on the country. Now facing growing international scorn, the president of South Africa, Pieter Botha, and his government, began to repeal segregation laws, such as the ban on interracial marriage. These reforms were wholly ineffective as they were happening too slowly, and Botha was forced to step down in favour of F.W. de Klerk. Immediately, de Klerk's government began to strip away the segregation laws which had formed the basis of South African Apartheid. In 1994, following this, he freed Nelson Mandela and helped to create a new constitution to give rights to the black community. After the 1994 elections, a coalition government was formed with a non-white majority, which brought about the end of the Apartheid system.

After becoming president of South Africa, Nelson Mandela, aided by his first deputy, F.W. de Klerk, set about national and international reconciliation, even hosting the Rugby World Cup in 1995. However, the main issues facing this new government were the economic issues which had been created by the Apartheid system and they created the Reconstruction and Development Programme (RDP). This programme set its sights on reducing poverty in the nation and rectifying the extreme lack of social services across the country. Through the RDP, the government was able to fund the creation of housing, jobs and basic healthcare.

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The gap between activism and actions: too little and too far – Beatrice (J)

Too Little: Where are we not doing enough?

Activism itself is not performative. By its very nature, it is a powerful and important means for social change. Unfortunately, activism on social media can be futile when the activism begins and ends there. Social media forces us to be the individual starring in the five-star performance of our own creation. This lends itself to performative activism very easily.

What is performative activism? Essentially, a façade – activism in order to receive the social approval that accompanies social media activism. It adheres to a moral economy that equates likes and positive comments with the moral value of our actions. Whilst these symbolic actions may have sincere intentions, it is often that these actions do not result in progress. Ask the question of yourself and of others: are these actions being replicated offline and if not, why not? Performative activism and progress are not mutually exclusive. With every social cause or need for activism, there comes an opportunity for exploitation and activists can potentially capitalise on this. It is important to hold ourselves to higher standards with our activism, because as we continue to be performative, we also allow large corporations and influential groups to similarly exhibit this behaviour.

To add to the complexity of the situation, reviewing performative activism, as done here, can be performative in itself, if we – the critics – do nothing to change the status quo. Simply enacting performative activism (or activism of any kind for that matter) does not make you exempt from being called out.

Too Far: where are we doing too much?

White saviour complex: a phenomenon wherein a white person 'helps' people of colour by offering them the opportunity to be guided into mainstream (usually Western) ideals, dictating that they are incapable of helping themselves.

Gap year: a year taken out of school, typically between school and university, which when including a 'voluntourism' trip, can easily contribute to white saviour complex. 'Voluntourism' suggests that the world is nothing but a problem that can be solved by some enthusiasm, and a couple of weeks of picking up litter from a tropical beach or playing football with some local children. However, there is more to doing good work than the initial promise that we would 'make a difference', because it is often in conflict with the fundamental human principle of 'do no harm'. Repeatedly, this type of work is far more rewarding for the 'volunteer' than for the community that they

were attempting to support. Ironically, it contributes to the larger systems that produce the inequality and poverty that was being targeted. White saviour complex leads to the construction of an idealised altruistic self, who is valued for their contributions to society, reinforcing racist power dynamics. These big emotional experiences then validate and intensify the privilege that was already used to be able to go on these trips. If we are going to interfere in the lives of other people and their communities, then a little due diligence is a minimum requirement.

To help you find the middle ground, and close the gap: Further Resources:

Learn about doing more:
'She's Beautiful When She's Angry': A documentary about the activists who fought for gender equality and feminism in the 1960s and 1970s.
'How to Change the World': A documentary that tells the story of a group of activists who initially sought to stop Nixon's nuclear bomb tests in Alaska and ended up founding Greenpeace.
'Such a Fun Age' (Kiley Reid): A fictional novel which tackles the messy dynamics of the privilege that accompanies race, class, and gender.

Learn about doing less:
'The Sustainable Travel Handbook' (Lonely Planet): Providing realistic and practical advice to ethical and responsible traveling, both with race and the environment.
*'Ours to Explore: Privilege, Power and the Paradox of Voluntourism' (*Pippa Biddle): The book prompted by the Twitter-written essay (@1stwrldwhtgirl – a good place to start), examining the relationship between privilege and voluntourism.
'New Colonialists of Africa? - Tackling the White Saviour Complex in Contemporary Voluntourism' (Jude Cowen): An essay that explores the nature of white saviour complex and how it interacts with voluntourism, and the problems that this relationship causes.

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How is modern British society influenced by the class system? – Isabel (I)

With George Orwell describing Britain as 'the most class-ridden society under the sun', (Great British Mag 2019), it must come as no surprise that Britain is, to this day, yet to be set free from the constraints of a hierarchical social structure. Although aspects such as class mobility (the ability to move between classes) may have relaxed in contrast to even 50 years ago, to what extent does the class system still impact us all in modern life, and how can we finally close this gap between the classes?

"At the moment, 76% of the country's wealth is held by the top 3 wealth deciles in the UK."

Wealth, occupation, and education are the factors which play a role in creating an identity regarding social class (Robson 2016). Although many argue that there has always been a hierarchical societal system since the beginning of time (Great British Mag 2019), the introduction of the middle-class post-industrial revolution as factory workers became factory owners, produced the class construct that still shackles British society to this day. Although Victorian society was influenced to a much greater extent by this system (essentially, if an individual was born into a certain class that is where they remained for life), we must consider how this class system still impacts society today.

With the gap between the richest and poorest in society increasing over the past ten years (UK Gov 2021), British class is a concept which divides our modern population. At the moment, 76% of the country's wealth is held by the top three wealth deciles in the UK, highlighting the clear wealth distribution issue currently facing the UK (UK Gov 2019).

One average investment banker receives as much pay per year as eleven average care workers (even after everyone has paid tax)

As shown in the above drawing by Ella Furness (Furness 2012), the difference between the classes is one of great significance. With the rigidity of social mobility in the UK, the opportunity for someone of a lower class to reach success is a task requiring much greater endeavour than for someone from a higher class (it is much harder to become an

investment banker coming from a family of care workers than it is to become an investment banker from a family of investment bankers). Although our modern working class may not be subjected to working endless hours in a factory like the Victorians, they are still facing exploitative power from the higher classes, as although they are the ones creating the wealth, they are still only receiving a marginal proportion of it.

But how do we close this gap? This is when we must look towards economic inequality, perhaps one of the greatest factors hindering class mobility. In 2010, the Organisation for Economic Cooperation and Development discovered that Britain is ranked very low in comparison to other countries for certain measures of social mobility, meaning that the likelihood of a child attaining high level success later in life is hugely influenced by their parents' wealth (Robson 2016). Although class mobility may have improved over the years, it is still much harder to move classes than it is in other countries, with it taking almost 10 generations for individuals at opposite ends of the class spectrum to reach the middle (Robson 2016). As for a solution, this can only come from government initiative. We need fairer and more equal opportunities, especially regarding education, to help dissolve the rigidity of class mobility and help close the gap between the classes.

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What causes a generation gap? – Freddie (H)

A generation gap, defined by Oxford Languages, is 'a difference of attitudes between people of different generations, leading to a lack of understanding' and differences between beliefs, politics, or values. There are several indications of a generation gap. Some indications are a change in language such as usage of slang, change in natural Instincts; for example, levels of fear reached in certain situations or a difference in decision making such as acting in emergencies. I am going to be exploring the causes of these generation gaps and provide real life examples of where these gaps may be widening.

One main cause of a generation gap is the rapidly changing environment that we live in. This includes certain factors such as technology or circulating trends, and I will focus on both. On the well-known app, TikTok, 62% of users in the US are below the age of 29. TikTok is currently the most downloaded app on the Apple store, with each user spending on average 52 minutes a day on the app. When you are scrolling through TikTok, you are watching people doing certain activities such as dancing, exercising, or running a business to entertain their audience. This audience, predominantly consisting of younger age groups are watching these trends and behaviours quite often, and in turn, are being influenced by them. An example would be TikToks about people on their weight loss journey, inspiring others to start a fitness programme. The more time people are spending on these apps, the more likely they are to be influenced by other people on them.

What causes a generation gap? – Freddie (H)

Another reason for a generation gap may be a lack of interaction between different age groups. This may be caused by parents spending more time at work, or children reluctant to leave their room. This lack of interaction is limiting possible behaviour changes based on the behaviour of other generations. For example, if the parents are spending lots of time at work, the children may become bored and take up a new hobby that they discovered on TikTok. The parents wouldn't have any exposure to this hobby that their child has taken up since they are spending less time together, meaning that this hobby only becomes more common amongst the child's generation.

> "As a society, we are always trying to close the generation gap."

A third factor causing a generation gap is the environment that you grow up in. How you live as a child has a huge influence on the rest of your life. I have always grown up only knowing a world with computers and phones everywhere, but my parents were different. They grew up without any of these devices and had to find another way to entertain themselves. This caused them to be entertained more easily than my generation, who spend lots of time entertained online, making it easier to get bored elsewhere.

As a society, we are always trying to close the generation gap. This is important since it is easier to work with other generations if you understand them better, but the generation gap is limiting understanding between us. I believe that if we can manage to close this generation gap as much as possible, we can go on to do great things.

Health Sense of Self. 2016. *A Generation Gap, is it unavoidable? https://healthysenseofself.com/generation-gap-not-unavoidable/ [Accessed on 15 September 2021].*

To what extent is absolute opportunistic equality possible and desirable? – Ollie (G)

By the standards of the 21st century, it remains apparent: several societal gaps must be closed and inequalities must be reduced, yet one must contemplate how far this process should go before the outcome is detrimental to society. Equal opportunity is the notion that everyone ought to be able to compete on equal terms, on a "level playing field" with an equal attempt at empowerment. This concept distinguishes itself from equality of outcome, advocates of which endeavour to ensure disadvantaged people are making gains. Equality of outcome refers to overseeing results instead of foundations, whereas the idea of opportunistic equality is to remove all prejudices established by one's identity or circumstance.

By living in a society with completely equal opportunities, we lead the way to justifying inequalities of outcome, as they only arise from an array of efforts and talents. It is in our human nature to want to support those less fortunate than ourselves. What is driving the wealthy elite to aid those struggling if both have been given the same opportunities in life? This raises several issues, including how we determine which inequalities of outcome are a result of social circumstances, arbitrary talents or one's determination and perseverance. A decent society should try to achieve a reasonable and rising standard of living for all where deprivation is a concept of the past. In a world with completely equal opportunities, we may reduce various injustices including racial and sexual inequalities. However, we also pave the way to widening other gaps. In this scenario, the only thing dividing the population is talent, intellectual ability, and fortitude. Society would so differently reward people with varying intelligence despite comparable efforts. This challenges the subject of whether talents are genetic; how can we claim that a culture is impartial if the primary way to determine our place in society is through hereditary talents? Rewarding those who win the 'birth lottery' contradicts the initial reasoning behind wanting more equal opportunities.

A world that is entirely known, in which everything has been planned and mastered, would be monotonous. It is the uncontrollable aspects of society that provide us with the aspiration to overcome, triumph or exploit. Parts of society that cannot be regulated will, however, also lead to uncontrollable inequalities of opportunity. There is no way to prevent natural disasters that widen the opportunity gap. We all encounter an assortment of challenges in life, over which we have very little control, including health, life expectancy, crime, and genetics. There is no way to completely offer the same chances for everyone, due to the arbitrary inconsistencies in the world, which are not the fault of humanity.

Absolute equality of opportunity ensures not only adequate opportunities but equivalent ones. However, most major inequalities cannot be suitably addressed by governments. Anything we do would have to be regulated accordingly and our choices

would become a matter of public policy. Inheritance would be distributed amongst communities and any methods used by parents to give their children an advantage would no longer be feasible, including private schools and many extra-curricular activities. We would enter an almost totalitarian form of government caused by intervention in our private lives.
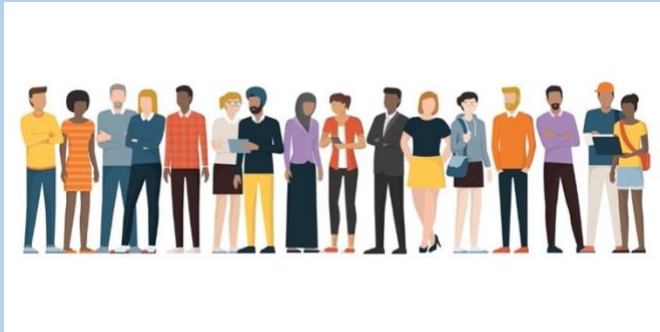
As we progress into a more inclusive and equal world, often our actions do not result in a revised mindset. No society can claim to offer equal opportunities without a willingness for people to adapt their mentality, and remove any preconceived notions. With the absence of this, any conscious efforts to improve equality is made somewhat redundant, without simultaneously inciting a change in our subconscious and internally accepting everyone. As a society, we must be more accepting of differences and with this, diversity and equality will follow. Currently, as many people and companies aim to improve their DEI (Diversity, equity, and inclusion), their approach is often the reverse – by improving their diversity on paper and then assuming that their acceptance has also progressed. In the case of employment, companies should be able to hire those most suited for a role whether they fulfil humanity's 'diversity checkbox' ideals or not. Of course, what must be removed is those applicants being disadvantaged due to a lack of acceptance by anyone. Companies should not be motivated to hire diverse employees to tick a box, but should adapt their mindset, then diversity and equality of outcome will follow equality of opportunity.

In a completely just society, one should be willing to enter it in any place, and as any person, without the fear of being disadvantaged by preconceived notions. If we can achieve this as a society, then I would argue that our role to ensure opportunistic equality to an achievable and desirable extent is complete. There will always be people who achieve greater economic and social success for as long as we don't live in a communist state. A society will always have a hierarchy and the assignment of places on this hierarchy will always be determined by some competitive process. In our quest for greater equality, we must ensure this competitive process is not influenced by circumstances of birth, other uncontrollable factors, or any forms of prejudice. Undoubtedly, whatever we aim for as the result of our changes, we still have a fair way to go to get a "fair go".

Ensuring real diversity and inclusion in athletics. (No date)
https://www.athleticdirectoru.com/articles/ensuring-real-diversity-and-inclusion-in-college-athletics/
(Accessed 11 October 2021)

Closing the gap between benevolence and evil – Darryl (F)

People in modern society often believe that they are incapable of evil, relegating such vile acts to a small sect of sociopaths that take pleasure in their profound immorality. The infamous Adolf Hitler, Charles Manson or Osama Bin Laden are notable examples. These characters are often described by the media as 'animalistically cruel', owing to their sadistic torture, persecution, or genocide; however, this would be an inaccurate statement. As Dostoyevsky once wrote: "People sometimes speak of the animalistic cruelty of man, but that is terribly unjust and offensive to animals." Animals could never conceive of the evil that humankind can inflict upon itself. Such barbarity and cruelty seem to be limited to the human domain. This begs the question: why? But more specifically, what motivates people to commit such egregious atrocities?

A more realistic yet sobering conclusion is that the potential for evil remains dormant within every human being. In 'The Better Angels of Our Nature: A History of Violence and Humanity', Stephen Pinker examines human nature and our capacity for violence. Pinker suggests several key ideas which may support this contention. Firstly, perpetrators often attempt to diffuse the responsibility of their actions by blaming their superiors or subordinates. A notable example of this tactic was employed during the Nuremburg Trials, wherein accused war criminals would espouse the clichéd defence: "I was only following orders." Ironically, the generals who issued the orders often found solace in the knowledge that they themselves did not personally carry out these atrocities. This results in a cyclical paradox in which neither party is to blame, which is quite clearly absurd. Hanna Arendt, a political theorist, coined the term 'The Banality of Evil' to describe this phenomenon. She claims that such acts are not necessarily perpetrated by evil people, but rather committed in dutiful service to their superiors.

In addition to this, violence and evil are considerably easier to carry out given a fair quantity of physical distancing. This disengagement mechanism allows individuals to commit acts they would otherwise be incapable of. It is significantly easier to pull a trigger than beat someone bare fisted, and easier still to press a button in an isolated control room. In an attempt to depose the despotic regime of imperialist Japan during World War II, the US military dropped two atomic bombs on the cities of Hiroshima and Nagasaki. This ultimately led to the deaths of 200,000 Japanese civilians, but additionally helped to bring the war to a quick and decisive conclusion. However, this action has since been

scrutinised as unnecessary and unscrupulous. Paul Tibbets, the pilot of Enola Gay (the plane that dropped the atomic bombs), has since maintained that the atrocity was necessary as "it ultimately saved lives". Despite this, it is doubtful that Tibbets would have maintained his position if the civilians in question were massacred by him individually with a flamethrower or firearm.

By justifying their actions using these disengagement mechanisms, perpetrators of evil can often delude themselves into believing their actions are morally justifiable or even righteous. Such is the case with terrorists and hate groups that weaponize their ideology for the purposes of bringing about societal change. This may help explain the centuries of endemic warfare that have plagued humanity since the dawn of civilisation.

One possible explanation is capitalism and the ubiquity of trade and commerce. Despite the recent opprobrium capitalism has faced in light of several social issues, it is undeniable that it has served an important role in reducing the presence of war and violence. Under capitalism, war has become increasingly internecine as it harms trade relations between nations and consumes both resources and money. In pre-industrial eras, war was seen as an opportunity to increase wealth and resources through plunder and ruination. However, were the US to invade China today and effectively level the nation's military, the invading army would be surprised to find little in the way of natural resources and crops. In fact, this action would irrevocably damage trade with China and China's allies. This would have detrimental implications for the US economy, as its biggest trading partner would be eradicated. Mutual self-interest and gentle commerce eliminate any incentive to attack as it would be exceedingly advantageous to both nations to trade peacefully.

In conclusion, capitalism has certainly aided in the creation of a more peaceful and prosperous society. Rapid industrialisation and the specialization of industry has allowed goods and services to become increasingly affordable, encouraging global trade and commercialisation. Committing evil through means of violence is becoming increasingly undesirable and difficult. It seems that World War III may be forever relegated to the minds of fearmongering news networks and doomsday preppers. While it may be inaccurate to suggest that all are born evil it is pertinent to discuss the mechanisms by which evil can arise, for recognising these issues is the first step in building a society free from the clutches of fear and selfish desire. While evil may never be truly eradicated, it is essential that we act altruistically to be good, for that is what it means to be human.

Reuters, 2021. *The atomic bombing of Hiroshima and Nagasaki*. [image] Available at: <https://s2.reutersmedia.net/resources/r/?m=02&d=20200806&t=2&i=1528524886&w=780&fh=&fw=&ll=&=&sq=&r=2020-08-06T001810Z_35957_MRPRC2Z1I9AY6GK_RTRMADP_0_WW2-ANNIVERSARY-HIROSHIMA-NAGASAKI> [Accessed 13 September 2021].

Universities' perspective on the gender pay gap – Veronique (K)

It is well established that there is a gender pay gap and although it is being reduced, the gap's rate of reduction is too slow. Universities and educational institutions have an obligation to pave the way to reduce this gap as they inspire the future workforce generation to achieve equal pay and more broadly, equality.

One of the universities stating what they have done to close the gap is the University of Cambridge. A paper from the University of Cambridge[1] reports that they have reduced their gap by 0.1% in a year. Although this is an improvement, it is a slow one. Cambridge suggests that one of the factors why the gap is still large (around 11.5% in Cambridge) is because more men more than women obtain the senior roles which pay more. In order to tackle this problem, Cambridge has introduced funding to help women jumpstart their careers after maternity leave. Another solution is introducing a workshop to give advice and coach women how to gain promotions. They have also installed guidelines to ensure a diversity of candidates. For example, one of these guidelines is to actively search for more women and minorities to interview at the very first stage of employee selection. Statistics show that these factors seem to be helping Cambridge reduce their gender pay gap as now women have a higher chance of being successful when applying for promotion and with the proportion of female professors increasing from 18.6% to 23.1% in four years.

"It may take around 60 years to eradicate the gender pay gap."

In other universities such as Wharton School of the University of Pennsylvania, they have been focusing on highlighting why a gender pay gap still exists in order to tackle the problem from its core. Research from UPenn[2] suggests that companies that are more transparent with their gender pay gap reports tend to be closing their gap more, and even in some companies the women are making more than the men now. Therefore, UPenn says that transparency is the primary solution.

Another potential solution from Wharton is to train all their employees in how to negotiate their pay and how to request promotions. This

ensures that each person knows how to request in a more effective way which means people will be promoted more on their skill, talent, and hard work than if they can effectively request it. Professor Janice Madden from Wharton investigated the gap among stockbrokers. She found that women are placed into inferior accounts which means they earn lower pay and receive fewer opportunities for advancement. Madden suggests that people are making decisions about pay and promotions using unwritten criteria, by appointing on their 'gut instinct', which leads to prejudice without meaning to.

This research finding about transparency has been supported by a number of other universities such as: Columbia Business School, INSEAD, University of Copenhagen, University of North Carolina and Cornell College of Business.[3] Some people suggest it will take around 60 years to eradicate the gender pay gap yet work from universities such as these will help to close it sooner. What these universities, and other places of employment, continue to put into place to combat the gender pay gap on a small scale remains to be seen but it is progress towards the larger-scale consequences that will follow as we pave the way towards equal pay.

Getty Images, 2021. *This Company Wants to Help You Close Your Gender Pay Gap*. [image] Available at: <https://img-cdn.inc.com/image/upload/w_1920,h_1080,c_fill/images/panoramic/GettyImages-1045270600_448917_em5p4b.jpg> [Accessed 13 September 2021].

Knowledge Gaps

To sleep or to study? A gap in our understanding – Amelia (J)

To sleep or to study? That is the question. We are told sleep is something we don't get enough of, something the teenage brain requires more of, something we should prioritise over Netflix or excessive studying. Yet there is a gap in this logic as often sleep either becomes less important in our distraction-heavy lives or is forced to become so by a shortage of hours in the day. So, if there is an exam tomorrow, should you sleep or should you study?

Sleep is a psychological and biological imperative. Whilst we sleep the brain performs countless functions for its mental and physical health. Consequently, our ability to function is impaired by continuous sleep deprivation: attention, memory and mood are all severely affected. Drastic physical changes can include high blood pressure, diabetes and weight gain.

What happens to our bodies during sleep?

Memory consolidation occurs most effectively between neurons when we sleep. The hippocampus area of the brain 'replays' new experiences and sensory inputs from the day, converting some memories into long-term memory. Therefore, levels of memory retention are higher the more you sleep. Whilst sleeping we also create adenosine triphosphate (ATP) which is used as energy in brain cells for respiration – a basic life function – meaning that if not enough is produced, brain activity changes.[1] The endocrine system is also affected whilst we sleep, as adenosine (as derived from the degradation of ATP) and melatonin are hormones released as waste products from our metabolism which, accumulating, increase drowsiness and send us into the light sleep period during which DNA is repaired. Drinking coffee when we are tired, therefore, works in reverse. Caffeine blocks the adenosine receptors thereby inhibiting the drowsiness that adenosine would cause.

Effects of sleep loss

Overly-tired people are more prone to being forgetful, stressed, inattentive, ill and overweight. These traits can primarily be explained by inconsistencies in the endocrine system. The hormone cortisol regulates memory function when we are tired as it provides a short-term increase in energy levels and alertness, which is ideal until we

release too much of it that we become stressed – which can occur when we remain awake for long periods of time. Additionally, when sleep-deprived, our T-cell levels – needed for immunity and fighting pathogens – decrease simultaneously as cytokine levels increase, whereby the mixture of fewer infection-fighting cells and more inflammatory proteins make us more exposed to illnesses like colds and flu.[2] Another physical change prompted by a lack of sleep is counter-intuitive: we would think that by remaining awake we are exerting more energy as our brain and body remain active, meaning that the natural result would be more calories burned and potential weight loss. The reality is not that simple. Ordinarily, when we sleep our leptin levels are high and our ghrelin levels are low – as the leptin hormone signals that we are full and ghrelin triggers appetite – as we know we have sufficient energy whilst sleeping and so do not need to eat. Therefore, when we stay awake our levels of ghrelin are too high and leptin levels remain low so our appetite is triggered – particularly for sugary and fatty foods – meaning our blood sugar levels are constantly changing and the food consumed is deposited as fat. We are, in fact, becoming unhealthier by staying awake more.[3]

Studying, though, as we all know, is paramount at school. The benefits of studying (or whatever activity we substitute for sleep), are self-explanatory. Yet, what with the hormone imbalances occurring in the body and cognitive functions decreased, is it worth staying awake late into the night or waking early in the morning, regardless of whether the purpose is work? Sometimes, it is unavoidable, and the effects of losing some sleep will hardly be noticeable. It is when the hours of sleep-loss accumulate in a sustained, disrupted sleep pattern that the long-term detrimental effects occur. Daily sleep-loss should not be normalised. It is in fact a myth that after a week of compromised sleep it can be made up by sleeping longer at the weekend. Overall, sleep does more good than half-hearted revision, a rushed essay, or one more episode.

Vandergriendt, C. and Weatherspoon, D., 2020. *How to Avoid Sleepiness While Studying: 9 Ways to Stay Awake*. [online] Healthline. Available at: <https://www.healthline.com/health/how-to-avoid-sleepiness-while-studying> [Accessed 12 September 2021].

Gaps in science: proof for the existence of God or merely a lack of knowledge? – Maryam (I)

Knowledge gaps in science have been a recurrent problem for human civilization since the evolution of abstract thought, or metacognition, in the modern *Homo sapiens* roughly 40,000 years ago. Metacognition has allowed humans to question, research, and explain physical phenomena in the world around, and beyond, us. It goes without saying that curiosity and research have always been accompanied by a myriad knowledge gaps that we humans have consistently strived to fill through a multitude of concepts, including religion and the concept of God. The term "God of the Gaps" is a perfect representation of this mindset: it assumes that scientific gaps are indicators of God's existence, when they might merely be an ignorance fallacy, and something that science hasn't yet explained acceptably. Subsequently, while a theologist and believer like Robert Harris might state that "it cannot be concluded that [science] can explain all phenomena" (Wikipedia, 2021), despite its many marvels, scientists might purely view these gaps as open research questions.

Despite some Christians' belief in the 'God of the Gaps' argument, and the fact that anything currently unexplained by science falls within the realm of divine intervention, the theory has one major shortcoming: it doesn't take into consideration the fact that science is constantly evolving. A prime example of this would be the historic clash between science and religion after Charles Darwin's *'On the Origin of Species'*. Darwin's book introduced the concept of evolution through the processes of adaptation and natural selection, pinpointing that man evolved over a long period of time from his ape-like ancestors. These statements caused an uproar in the Christian community, which, prior to the 1859 book, believed that humans were created on the Sixth day (rather than over millennia) and that God had created the perfect environment prior to human creation (rather than humans gradually adapting to it). However, over the following century, enough evidence accumulated to further support Darwin's theory, including fossil records, and technological advances allowing us to observe life forms at a genetic level, leading to the gradual acceptance of the theory over its preceding Genesis stories. Yet, religion feels intuitively true to humans since it fills the 'god-shaped hole' in our brains, soothing our feelings of existential insecurity and lack of knowledge; replacing these religious tendencies with rational thought and explanation – the same way that Darwin's theory replaced many former religious

beliefs – might allow us to look at the current scientific gaps and their potential discoveries more logically, steering us clear of the 'God of the Gaps' concept.

Notwithstanding the popularity and plausibility of Neo-Darwinism, the 'God of the Gaps' theory can indeed be supported too. When nature and the human body are examined closely enough, it is practically impossible to ignore their intelligent design and symmetry. Fine-tuning of the universe, or how all the laws of physics are perfectly and delicately balanced, is a prime example of this argument. As Newton observed the motion of planets around the Sun in the late 17th century, he was able to calculate and predict their orbits with great precision despite the gravitational interactions between the separate planets (BioLogos 2021). Now, scientists know that these gravitational perturbations average out to zero, meaning that planetary motion is very stable and doesn't deteriorate over time. A similar balance can be seen in the human body, where the heart pumps blood around the body autonomously, and our eye works in tandem with our brain to allow us to not only see the world around us, but also perceive it. Hence, it would be fallacious to accredit the perfect uniformity of the universe and its laws, and the baffling complexity of the human body, to random chance and evolutionary 'trial-and-error', rather than justifying it through a Grand Creator. After all, even the computer had a designer, so it would be absurd to declare that a human – with a brain that equates roughly 82,000 computer processors – didn't.

Where science and religion clash, a hotly debated topic arises, with enough evidence to support either side of the argument. Unlike the preceding knowledge gaps, most of the current scientific dilemmas – like the origins of the universe and life – are much more abstract, and hence complex to explore. Although most religions might accredit these concepts to God, it might be a mere lack of knowledge where further research will shine light on the truth. Similarly, however, it seems impossible to disregard the numerous pointers to God, like the fine-tuning of the universe and life, that science can't simply prove or disprove. It is also worth noting that – at the end of the day – both religion and science are the products of our endless imaginations, or that science and God might end up co-existing. However, having looked at both sides of the debate, one question remains: once all the scientific puzzles are solved, will we put our full trust in science, or will we find out who the ultimate Creator is?

En.wikipedia.org. 2021. *God of the gaps - Wikipedia*. [online] Available at: <https://en.wikipedia.org/wiki/God_of_the_gaps> [Accessed 17 July 2021].
BioLogos. 2021. *Are gaps in scientific knowledge evidence for God? - Common-questions*. [online] Available at: <https://biologos.org/common-questions/are-gaps-in-scientific-knowledge-evidence-for-god/> [Accessed 20 July 2021].

How has the internet reduced the knowledge gap? – Ben (E)

Over the past few decades, the way we acquire information has changed dramatically. The tightly constrained pieces of information from written transcripts and academic books have now been supplemented by the internet, significantly increasing the amount and variety of information at our disposal. Today, knowledge that may have taken an age to discover in the past can be accessed in a few seconds after some clicks of a button. The internet has reduced the knowledge gap by making learning more accessible for everyone. As the internet collates several sources into one page, people can now discover the same information without having to own a particular product (as it was in the past) such as books, though the ability to purchase a computer is essential. Fundamentally, the gap has reduced because the internet has made the distribution of knowledge worldwide more even by decreasing the importance of socioeconomic status.

The internet has removed barriers that in the past prevented access to information which, in turn, has made our current world more conducive to obtaining knowledge, resulting in a decreased knowledge gap. As I mentioned, one reason for this is because the hierarchical pyramid of socioeconomic status has become less important. Studies from the US have discovered that the more that the internet has been used to discover information, the more its cost has decreased. People from all over the world, no matter their economic position (whether they live in a low-income country, newly industrialised country or a high income country), can now access the same information, which was not possible prior to the introduction of the internet.

Furthermore, the internet has provided new ways to acquire knowledge. Comprising video sites, blogs, journal articles, academic writing, online discussion groups and question and answer websites, the internet is tailored to mostly everyone's tastes. In this sense, it has catered for all different types of learners, such as visual, aural and reading. In line with this, it has acted as a platform that has spread new information. For instance, the internet has increased political awareness amongst the youthful population around the world. Websites specifically designed for the young present political news that is more like Instagram than another dull and predictable article

from The Telegraph. Specific informal language is used to engage the reader on these websites, whilst continuing to inform them. Surveys from the UK illustrate that this has been very successful as it has mobilised groups or influencers which, in the past, have been politically inactive, such as the young. Therefore, the internet has also helped increase interest in particular areas, which one individual may not have discovered from reading the same genre of books in their local library. One prevalent example of this is the Climate Change movement, which has been spearheaded by teenage activist Greta Thunberg on several social media platforms, mobilising thousands of young people all over the world. All of this has helped reduce another prominent knowledge gap, one which exists between the older members of the population and the young.

Therefore, it has been proven that the internet has made it easier to access information. Additionally, it can be used to inform groups that are unaware and of a differing socioeconomic status, thus reducing the knowledge gap. However, the development of the internet has come at a cost. Another knowledge gap has emerged: the digital divide, which explains the gap between people who do and do not have access to new forms of information technology, as opposed to (as it was in the past) the gap between the literate and the illiterate. In addition to this, geopolitical constraints have led to bans on the access to specific information in some countries, with the Russian firewall being the most prominent. Both of these factors have only acted to further widen the knowledge gap and waste the true potential of the internet. There is no doubt that the internet is a valuable tool for spreading knowledge; however, this is only the case if people are allowed to use it to its full extent.

The Hungry JPEG. 2021. https://thehungryjpeg.com/product/3553893-abstract-network-vector-concept-with-world-globe-internet-and-global [Accessed on 15 September 2021].

Why does the Kalenjin Tribe produce so many elite runners? – Ike (G)

On the 29th of September 2013, Kenya's Wilson Kipsang smashed the Marathon World Record with a time of 2 hours, 3 minutes, and 23 seconds, crushing the previous world record by over fifteen seconds (it has since been broken again). What was arguably more astonishing, however, was the fact that those men who came second, third, fourth, and fifth, as well as those who came first, second and fourth in the women's race, were all Kenyan, specifically from the Kalenjin tribe, who make up a mere 12% of Kenya's population, but account for many of Kenya's elite runners. Still today, the current world record holder (2018) is Eliud Kipchoge who is also from the Kalenjin tribe and retained his gold medal at the Tokyo Olympics.

A study by David Epstein (2014) found that there were "17 American men in history who have run under 2:10 in the marathon"; 32 Kalenjin did it in October of 2011. There have been many suggested explanations for the dominance of the Kalenjin tribe, but the most widely accepted ones have to do with their natural physique, the altitude at which they live, and their diet. The Kalenjin tribe typically have thin ankles and calves, which are common to tribes who live near the equator. This is particularly important in long-distance running due to the leg acting like a pendulum, meaning that the less weight that is further from the centre of gravity (the body), the easier it is to lift and swing them – an essential movement in running. This is supported by a study conducted where 8lb of weight were placed on the waists of half the runners in the study and 4lb were placed on each of the ankles of the other half of the runners. Results found that those runners with weights on their ankles performed significantly worse than their counterparts, due to the increased amount of energy being expended every stride.

Another biological factor was investigated by Holden (2004) who found that lactate, which is produced by oxygen-deprived muscles and causes athletes to tire, builds up more slowly in the Kalenjin people's blood, allowing them to gain up to 10% more distance than their European counterparts with the same oxygen intake. They also have a higher concentration of an enzyme that stimulates lactate turnover, resulting in lower lactate production, which can subsequently convert oxygen into energy more efficiently than other runners. Scientists L. Kravitz and R. Robergs (1995)

explain that "The maximal ability of skeletal muscle to utilize oxygen will depend on the proportion of slow twitch muscle fibres in the working muscle, as well as the endurance training nature of the muscle. Slow twitch muscle has a higher capacity to consume oxygen than fast twitch muscle." The scientists also stated that most slow twitch fibres develop during infancy, which suggests that genetics contribute a large amount to the domination of the Kalenjin runners in long-distance races.

High altitudes also play a significant role in the success of the Kalenjin. Unlike their Massai counterparts, who live at low altitudes, the Kalenjin live at altitudes of up to 7000 feet above sea-level. This means that the oxygen levels are much lower, forcing the Kalenjin peoples' bodies to adapt and make up for the lack of oxygen, by increasing the number of red blood cells in their blood, allowing them to carry more oxygen. As a result, when running at lower altitudes, the Kalenjin get a natural boost to the performance of their muscles, by up to 2%. Although this might seem like a minuscule improvement, international competitive sport is a measure of small gains and this can be the difference between barely getting selected for the team and winning a medal.

The diet of the Kalenjin tribe also explains their success. Eberle (2000) notes, "The Kalenjin diet is very basic: small amounts of roasted meat, cooked greens and other vegetables, fruit, eggs, milk and their favourite — ugali...made from white corn flour, water, and salt". Ugali provides a food high in carbohydrates yet little fat, providing the athletes with a plentiful supply of energy during their race, yet contributing little to their mass. Furthermore, the Kalenjin tribe only eat twice a day and refrain from eating sweets and other fatty foods, instead choosing to eat fruit, vegetables and milk (the latter of which has been suggested to contribute to their stronger and longer femur bones in their legs, helping them to increase their stride length).

This combination of biological factors provides the Kalenjin with specific advantages for long-distance running, providing the best natural physique, enzyme production, red blood cell levels and diet to tackle marathons.

Hitij, M., 2021. *The former marathon world record holder and 20 others were caught in a Kenyan nightclub after hours*. [image] Available at: <https://hips.hearstapps.com/hmg-prod.s3.amazonaws.com/images/wilson-kipsang-of-kenya-celebrates-after-finishing-third-news-photo-1586206158.jpg?crop=0.633xw:0.949xh;0.182xw,0.0102xh&resize=980:*> [Accessed 13 September 2021].

The gap between what feminism truly means and how it is interpreted (in the UK) – Lara (K)

Feminism is received in many different ways due to the different interpretations surrounding it. I aim to close that disconnect and gap by explaining what modern day feminism truly is. The Merriam-Webster dictionary defines feminism as 'the belief in and advocacy of the political, economic and social equality of the sexes'; however, in modern day society the interpretation has often been warped into either female superiority or a disregard for men's issues. I will discuss two reasons for this; firstly, the origins of the feminist movement and secondly, how prevalent each of the three primary types of feminism are.

> "It should be understood that at its core, feminism is equality."

While the first organised movement for feminism in Britain was in the 1850s, women received the right to vote on the same terms as men in 1928. This came at a time when the divide between opportunities of the sexes was drastic, therefore feminism focused on the rights of women. Now in 2021, since the Equality Act passed in 2010, prohibiting discrimination in the workplace, women have the same legal rights as men, which is why the question, 'what is the need for feminism now?' is often posed. I believe this is the cause of the misinterpretation of feminism equalling female superiority. If legally we are all the same, what could feminism be fighting for if not women getting more than men? To refocus on the definition, while, theoretically, politically and economically the genders are equal, socially there is a major disconnect. Everyone currently faces gender-specific issues which, left untreated and unacknowledged, will only emphasise gender inequality. This is what modern-day feminism focuses on. However, since it was introduced at a time when it was necessary to focus only on women, many people do not identify as feminists because of the connotations that it only concentrate on women's issues, instead of what it currently stands for, or what it *should* stand for, which, put simply, is gender equality.

The three main types of feminism in society are cultural, liberal and radical. Cultural feminism, introduced in the 1970s, focuses on the 'ideology of a 'female nature' or 'female essence' that attempts to revalidate undervalued female attributes' (Alcoff, 1998), and is the only branch which emphasises the cultural differences of the genders. Put simply, it takes aspects of women which are often deemed, 'unattractive' or 'undesirable' and instead reframes them in a positive light. Liberal or mainstream feminism primarily focuses on political and legal reform and women's historical secondary status which 'is based on unequal opportunities and segregation of men' (Baehr, 2021). This often transitions into 'equity feminism' which focuses on removing oppressive laws, or focuses on the non-political feminism, which helps

educate how to utilise freedom and develop strategies which allow for success. The form of feminism which is often misinterpreted and is highly present in the media, however, is radical feminism. 'Radical' is often misconceived as 'extreme', when in this case it means focusing on the route of the issue, which for gender inequality is 'the patriarchy'. Generally, because of the distrust of the patriarchal system, radical feminists are less likely to trust the political system to benefit their cause, so will instead focus on 'culture change that undermines the patriarchy and associated hierarchal structures' (Lewis, 2020). However, often this approach becomes extremist and blames men as individuals instead of the conceptual intention of blaming the system of patriarchy. This is generally seen as the cause of gender-specific issues, such as the lack of awareness of men's mental health or as a major contributor towards domestic abuse. Because of the way this branch of feminism can be interpreted, it makes modern-day feminism seem accusatory instead of intent on making society equal for all.

There is an important link which joins together all the different types of feminism; it isn't about blame or superiority of any gender, but the precise opposite. At its crux, it focuses on issues which target specific genders and should be a term which connotes unity. In essence, regardless of which branch of feminism one chooses to follow, it should be understood that at its core, feminism is equality.

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Scientific / Physical Gaps

Closing the gaps: the chemical changes which altered the course of history – Chloe (K)

In 1812, when Napoleon assembled his army of 600,000 troops to invade Russia and fight in the Battle of Maloyaroslavets, he did not expect only 10,000 to make it out of the country alive. This huge loss was not due to the superiority of the Russian military, but because of the cruel Russian winter which the French troops were unable to endure; but why was Napoleon's army so disproportionally affected? Why did the greatest army in the world crumble as the Arctic winds swept over the nation? The answer is buttons.

Tin, a relatively hard and ductile metal, seemed a safe choice for the material from which the buttons on the coats of Napoleon's troops should be made. However, the mysterious allotropic changes which tin undergoes at low temperatures were unknown, an ignorance which led to the demise of 95% of the mighty Napoleonic army. In standard conditions, tin is in the form of β-tin where it has both metallic structure and bonding producing its durability, but, at the deadly temperatures of the Russian winter, it might have been in the form of α-tin, a state which can only be achieved in the presence of germanium (or when it is below -30℃). This structural change – called nucleation – causes the orbitals to hybridise and there to be covalent bonding within the now diamond cubic structure. The once-reliable metallic buttons holding the coats of the soldiers shut disintegrated into a brittle dust exposing gaps in their protection against the cold, making them more susceptible to diseases such as pneumonia and the flu. Despite winning the Battle of Maloyaroslavets, Napoleon was never able to recover from his losses before his defeat in the Battle of Waterloo in 1815.

This phenomenon, known as 'tin pest', was also one which has disastrous impacts on Scott's expedition to Antarctica and ruined his goal of being the first to reach the South Pole in 1910. The tin soldering on the cans which held the kerosene required for heat and cooking had crumbled away in the same way that the buttons of the

> "The smallest chemical changes have been able to alter the course of history in some way."

troops had, due to the extremely low temperatures experienced in the Antarctic. This caused all their fuel to leak out and the crew were unable to return to camp, with many dying of frostbite and starvation. The brittle property of α-tin was not the only factor of tin pest which caused problems for the explorer; the non-metallic allotrope has a volume 25% greater than that of β-tin. As the tin slowly underwent the allotropic change, areas of the soldering stretched out revealing gaps in the containers where the kerosene escaped.

'Tin pest' is still prevalent today as the use of lead in alloys has been restricted due to the hazards it poses to health, meaning that materials with a higher percentage of tin have to be used. Electrical equipment used in cold environments is also affected as the pure β-tin used to coat wires no longer conducts electricity if converted to α-tin. This shows that although our knowledge of the issue has grown, we are still far away from finding a solution.

There is little solid evidence to support either of these stories, with some even dismissing them as 'urban myths' and others conceding that although the nucleation of tin played a role in the outcome of both incidents, it was not the singular cause of the death of Napoleon's troops or Scott's failed expedition. However, the fact that the smallest chemical changes have been able to alter the course of history in some way due to the gaps they have created is undeniable.

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The gap between drivers and cyclists, and how to reduce it – Alex (C)

The conflict between motorists and cyclists is dangerous, harmful and needless, causing countless problems – the main and most obvious being a reduced attraction to cycling for many people, because of the associated risks. This, in turn, leads to fewer bikes, leading to poor cycling infrastructure (such as a lack of segregated bike lanes), auto-dependency and consequently environmental problems. Luckily, though, there are solutions to the problem.

As alluded to, segregated bike lanes are an underutilised option, proven to significantly reduce potential contact between drivers and cyclists. The Netherlands is a great example: the combination of bike lanes and exclusive bike zones culminate in approximately 1/3 of the Dutch population cycling as their main mode of transport. By contrast, less than 3% of Brits consider cycling their main mode of transport. Although the decreased risk of direct contact between cars and bikes reduces the extent of detestation from drivers towards cyclists in the Netherlands, there are certain people who, quite simply, dislike any cyclist, and it is these people who disproportionately caused the 229 cycling-related casualties recorded in the Netherlands during 2020. In the UK, a similar trend is apparent, but to an even greater extent.

"40% of cycling related deaths resulted from overtaking."

The first problem fundamentally relates to hierarchy, whereby drivers feel they have superiority over cyclists due to the price, speed, and comfort of their vehicle (in comparison to bicycles). This is worsened by the numerical inferiority of cyclists (with the exceptions of Denmark and the Netherlands), leading to motorists seeing cyclists as "others" and the road as "theirs", resulting in them discriminating against them. This then creates a classist environment on the roads, in which cars frequently treat cyclists badly for little reason other than this unfounded belief in road hierarchy.

Moreover, it is not only drivers with a hatred of cycling that cause problems, there are also the ignorant – those that have never experienced what a close pass feels like when out cycling. In fact, 40% of cycling-related deaths result from overtaking, whereby drivers are, quite simply, unaware of the width of their vehicle or not paying full attention. To combat this, drivers should be fined or punished more severely for failing to pass cyclists at an appropriate distance. When driving above 30 mph, drivers must pass leaving at least a two metre gap, something many drivers fail to do.

Even though bikes cause under 1% of road-related casualties and cars over 85%, there is some degree of fairness behind anti-cycling sentiment. Firstly, because certain cyclists are reckless, many car drivers fear cyclists, as they know the physical dominance of their vehicle in relation to the bike and don't want to be responsible for a casualty. There are also other (perhaps less dangerous) reasons which understandably frustrate car owners, with one of the main ones being cyclists taking up unnecessarily large portions of the road, whilst travelling slowly. Another widespread annoyance is cyclists' lack of obedience to the Highway Code, such as jumping red lights and ignoring stop signs. Although many drivers feel cyclists are hazardously lawless (some indeed are), a 2019 study in Denmark suggested that drivers are thirteen times more likely to break the law than cyclists where there are bike lanes. Clearly, this contradicts many drivers' perceptions of cyclists.

The tension between drivers and cyclists is extremely unproductive and costs countless lives. The hierarchical systems that many drivers adhere to is arguably the most significant problem in the UK, but ignorance and lack of attention are clearly also important. However, there is some positive news, such as the new alteration to the Highway Code, whereby drivers must yield to pedestrians and cyclists. With laws like this, both driving and cycling can become safer, although fundamental shifts in the attitudes of drivers towards cyclists still need to occur for profound change to take place.

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Black holes: The largest gaps in the universe – Patrik (H)

There are gaps everywhere. In every corner of the world there are gaps waiting to be closed and they come in every shape and form. At a school like ours, mental gaps might be the most common kind of gap waiting to be closed – a gap in your learning or understanding, closed by practice and hard work. If we look to the world we see, physical gaps are all around and like the others, they open and close whilst you are reading this: ravines, the oceans separating continents, the ozone layer, cracks in a pavement or a building – I'm sure there are plenty that come to mind. Societal gaps are a sort of gap that are not as simple or easy to close; these kinds of gaps are

generally well-established – gender pay gaps, cultural gaps and wealth inequality highlight a few. There are many distinct types of gaps, found in many different places, and they can all be closed whether it be individually, or by working together.
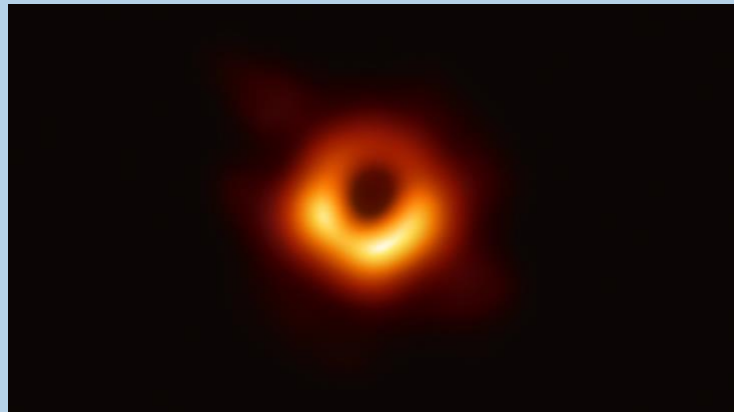
That is why I have decided to briefly mention the one gap that cannot be closed, at least in humanity's lifetime: black holes. This scientific gap is not only the single gap that will stand the true test of time, it also holds the title for the single biggest gap anywhere. To put it into perspective, here are some gaps we can relate to, the numbers that come with them, compared with the numbers associated with the largest gaps in the universe (black holes in bold):

The gap between your eyes and this article: ≈ 0.00045km
The gap between Faulkner's and H House: ≈ 0.08km
The gap between the Blackburn Science Centre and Faulkner's: ≈ 0.36km
The gap between Bradfield and Reading: ≈ 11km
The gap between London and Paris: ≈ 344km
The gap between London and New York: ≈ 5,570km
The gap between the Earth and the Moon: ≈ 384,400km
The gap between the edges of the Sun: ≈ 1.392 million km
The gap between the edges of Sagittarius A *: ≈ 23.6 million km
The gap between the Sun and Neptune: ≈ 9.09 billion km
The gap between the edges of Cygnus A's black hole: ≈ 14.7 billion km

The biggest gap in the universe is between the edges of the largest known black hole, TON 618:

≈ 207 trillion km
460 trillion times bigger than the gap between your eyes and this article

Incredibly, the 'gap' TON 618, weighs 66 billion times the weight of our sun. This gap in space is so large that it would take light a whole week to reach the centre of it, with eleven of our solar systems fitting inside it side by side. There is a way black holes can theoretically close, and that is through a process called 'Hawking Radiation', which says that black holes slowly emit particles, and hence shrink. Black holes evaporate, and so, to close this gap, this black hole would have to evaporate 66 billion times the weight of our sun, particle by particle. Possible, impossible goal. To make the numbers even more mind-blowing, when we look at TON 618, we see what it looked like ten billion years ago, so it is most likely bigger than our calculated values, meaning it would take even longer to close. If we could help close it by walking the entire distance diameter, it would take us roughly 2.76 x 1014 seconds to do so, or roughly 8,751,903 years, assuming it takes us eight minutes to walk from Faulkner's to the Science Centre. This would mean, to close the biggest gap in the known universe, we would have to walk from Faulkner's to Science 575 billion times.

"There are gaps everywhere. In every corner of the world there are gaps waiting to be closed."

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The gaps in 'The Complete Marbles' – Alice (K)

On April 8th 1820, on the Agean Island of Milos, where some French navy ships had previously anchored, a peasant named Yorgos Kentrotas found himself searching for stones in the ground to reinforce some walls around his fields. Olivier Voutier, a young navy officer on the island, stumbled across Kentrotas mistakenly uncovering the grand marble torso of a beautiful woman.

This was the moment that the pinnacle of Western feminine beauty was discovered and quite literally set in a 6 ft 6 carved block of stone. She is now known as the *Venus de Milo* or due to her discovery in Greece, Aphrodite of Melos, attributed to the sculptor Alexandros of Antioch between 130 and 100 BC. Her classical idealisation conveys her divinity through perfection in human form, leaving viewers starstruck at what has been called "the visual epitome of female beauty", due to her semi-nude and seductive stance and toned, unblemished body.

Venus de Milo by Alexandros of Antioch, c.125 BC

Despite this, the ancient goddess of love has no arms. Voutier described in a letter afterwards that "It had no arms, the nose and the knot of the hair were broken, it was horribly dirtied. Nevertheless, at first glance, one recognizes a remarkable piece." Her beauty was instantly clear but the *Venus de Milo* is not just an archetype of femininity; if she were to come to life, she would be an embodiment of a disabled yet divine female. However, the viewer chooses to ignore this, not wanting to associate something so beautiful with disability.

Marc Quinn's 'Alison Lapper Pregnant' sculpted in 2000, was originally part of his 'Complete Marbles' exhibition and later put on the 4th plinth in Trafalgar. It displays the English artist, Alison Lapper MBE. Lapper was born in 1965 with phocomelia, meaning she was born with no arms and shortened legs. Quinn was influenced by the *Venus de Milo* for his portrait of Lapper as two representations of femininity – one through a toned and divine bodily idealisation and one through pregnancy, but their similarities through disability conform them. In contrast to the reception of the *Venus de Milo*, Lapper's placement on the 4th plinth was called a 'monstrosity' by one member of the public,

Alison Lapper (8 Months) by Marc Quinn, 2000

whilst another said, "I'm sure there's a place for a disabled statue but I don't think it's appropriate in Trafalgar Square."

The comparison of these sculptures highlights the fact that while the notion of an incomplete body is something that is celebrated and acceptable within the context of art history, it is not always so in real life. To some people, both sculptures could be classed as lacking something or showing physical gaps, specifically due to their absence of arms. To others, Alison Lapper is wholly complete as she is. However, it is evident that globally, there is still a huge gap between ability and disability which results in vast discrimination. For example, on average in the UK, non-disabled female employees earn £1.53 hourly more than disabled female employees whilst 53% of disabled people are employed compared to 82% of non-disabled people.

"The notion of an incomplete body is celebrated within the context of art history but not always in real life."

Marc Quinn created his sculpture of Lapper because, in his words, "The sculpture celebrates in a very public way the beauty of a different body and makes us question the narrow binds of acceptability into which the social normal tends to push us". Quinn's sculptures raise questions about the viewer's thoughts on disability. We admire accidentally broken and disabled ancient sculptures, but many would be shocked and disgusted by the portrayal of disabled people in a marble sculpture. Making this gap so visible is what allows us to bridge it.

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Why do we experience gaps in our memory? – Bella (J)

Have you ever walked into a room and completely forgotten why you entered? Or no matter how hard you try to remember something, it just keeps slipping out of your mind? Have you questioned what makes us forget things and how we can remember them? What is memory? Why do we experience gaps within our memory?

The brain is the most complex organ of the body, comprising a multitude of parts, each with a specific task to enable us to function. Memory is not confined to a specific part of the brain but is rather spread across different regions and components working in conjunction with one another. The main regions of the brain involved with memory include: the amygdala, the hippocampus, the cerebellum, and the prefrontal cortex.

Scientists divide memory into three main categories, constructed upon the length of time that the memories last. Short-term memories (also known as immediate memories) last milliseconds up to perhaps 30 seconds, and are so short-lived they are not truly considered a memory. Working memories are also rather short, lasting up to a minute, and hold information for enough time for it to be useful; for instance, recalling the page of a book whilst you turn it. It could be argued that you have more 'gaps' in short term memory as there are multiple ways you forget them and thus they are not converted to long term memory. Long term memories can last from an hour to many years, and are used to account facts, observations, and the stories of our lives.

Memories are formed through associations. The first stage of creating a memory is encoding, where information is received and processed. Our brains use physical and chemical stimuli to connect our senses, our impressions, and the situation into a relationship in the prefrontal lobe. The importance of our senses and feelings are not to be underestimated, as they contribute to the whole process of forming memories and the significance of them.

The abstract relationships formed are dependent on reinforcement, which can come in two main forms: repetition and emotional arousal, which is effectively a result of attention. Reinforcement is so pivotal in creating memories as it triggers the movement of memories into the storage phase. From immediate to working memory, the insignificant features of a situation will be lost as this is vital for effective storage. Further reinforcement converts working memory into long-term memory and is known as consolidation, the final stage of retrieval, and the most critical relationships in the occasion are joined together in the hippocampus.

Memories are thought to be stored across the cerebral cortex; however, the true location of memory accommodation is unknown. The amygdala and cerebellum are involved in supporting the creation and storage of explicit memory (recalling previously learned information that requires effort to be retained, and fades with the lack of recall) and implicit memory (unconscious and effortless that may last a lifetime without the need of further practice).

Psychologists believe there are two main causes why we forget information: the information is stored in your memory, but it is inaccessible to you at the time when you need to remember it, or the physical traces of the memory actually disappear, and it simply becomes permanently unavailable. There are three ways in which you can forget things in your short-term memory and the first is decay. This occurs when information is not rehearsed, and thus the traces of the memory are lost. The second is displacement, where older memories fade due to newer ones being created. Finally, there is interference, where things that are similar between new and old memories could distort each other. With long term memory, information can also be forgotten through the process of decay, but they do last a much longer time.

There are also influences that can instigate forgetfulness that are part of our everyday lifestyle. One of the most significant factors perhaps, and also one of the most underestimated, is lack of sleep. The brain can generate an approximate of 23 watts of power, which is why it is vital for it to have an adequate rest in the form of sleep. Sleeping helps the consolidation, retrieval, and storage of long-term memories, and is therefore of great importance. Your mental health likewise affects your ability to retain information, as if you are depressed, stressed, or anxious, you become unfocused, and it can prevent the retrieval of old memories and stop the creation of new ones. Chemicals such as alcohol, recreational and pharmaceutical drugs, and smoking can increase your forgetfulness as well, as they interfere with short-term memory and can cause sedation and confusion.

In conclusion, our minds are fascinating and astonishing, with the ability to memorise things from milliseconds to a whole lifetime. Unfortunately, not all memories created will be transferred into storage in the brain, but there are ways in which we can improve what and how much we can recall and remember.

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Cover image found at: https://pavelkuchar.com/2019/08/15/on-the-epistemological-break-in-economics/