

The Scholar

Issue 12+13
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thebrilliantclub.org

*Outwitted by an octopus?
Complex cognition across
the tree of life*

+
*Academic essays on
planning the future smart city
and printing 3D body parts
from Brilliant Club scholars*

Bumper edition



This issue

Contents



3

Updates

Introduction and welcome to The Scholar.

4

Guest Article

Guest article from Paul Gardner, Senior Lecturer, School of Psychology and Neuroscience at the University of St Andrews.



5

STEM Articles

This term, we hear from scholars in the science, technology, engineering and maths disciplines on subjects including climate change, tackling prostate cancer and assistive reproductive technology for genetic disorders.

36

Arts and Humanities Articles

The Arts and Humanities articles in this edition explore subjects including the Free Will Defence, fantastical figures in medieval French literature and Hip Hop as political resistance.

53

Social Sciences Articles

Our Social Science scholars look at the arguments for equal media coverage of men's and women's sport, the psychology of human behaviour and how anti-social behaviour affects us.

Updates

Introduction from The Brilliant Club

Welcome to the latest edition of The Scholar!

We are delighted to be celebrating the incredible work of pupils who have taken part in The Scholars Programme and Uni Pathways from schools across the UK. In this edition, you will find 30 outstanding assignments with course titles ranging from 'Can we 3D print human body parts?' to 'Guilty or innocent? How do juries decide?'

This edition of The Scholar features some of the most impressive articles ever produced by pupils who have taken part in The Scholars Programme and Uni Pathways. The university-style learning that pupils are exposed to on our programmes is designed to provide pupils with the freedom to develop their own ideas and approaches. Not only will this help pupils who go on to study at university, but we believe these are crucial skills to develop in the adult world. The development of independent study skills and support with critical thinking provides young people with a platform to share their ideas. We hope it will empower these young people to engage in debates that shape our world, whether they concern media coverage of women in sport or combating climate change with renewable energy.

The Brilliant Club is passionate about exposing pupils on our programmes to these important aspects of university. We hope that these projects encourage pupils to dig a little deeper into subjects that matter to them and to seek opportunities to make unique contributions to their fields. In doing so, pupils can change their own lives by enriching them with opportunities for learning and being inspired by the topics they cover.

This year, we had a record number of nominations for The Scholar, so we would like to say a huge congratulations to the pupils published in this edition and to the pupils who completed The Scholars Programme and Uni Pathways. All the pupils who graduate from the programmes should be very proud of themselves!



The map above shows the locations of all pupils featured.

On Page 4, we are delighted to have a guest article from Paul Gardner, Senior Lecturer, School of Psychology and Neuroscience at the University of St Andrews. We would like to say a massive thank you to Paul for taking the time to write his interesting insight into Fundamental Attribution Error.

If you are a teacher who would like to find out how your school can get involved with The Scholars Programme, we would love to hear from you! Please get in touch via this email address: tspschools@thebrilliantclub.org.

Guest Article

The Fundamental Attribution Error

Paul Gardner, Senior Lecturer
School of Psychology and Neuroscience
University of St Andrews

I have learned many important things in life but two stick out in particular. Firstly, when I was five, I learned how to read. Secondly, at 25, I learned not to believe everything I read. Now, at 55, both of those skills I use every day and whether that is checking the football scores or reading a review of my favourite band, they are really useful. They are part of my cognitive toolkit, which also contains some things that get in the way but are difficult to get rid of.

Here is an 'experiment' you can try in class. Let's say you have eighteen people (or any multiple of three). Divide them into six groups of three and ask them all to write 10 general knowledge questions each – no conferring! Clearly, they must know the right answer to the questions they have set.

Now, nominate one person as the Quiz Show Compere, one as the Contestant, and the third as the Audience (if you have people left over call them the Audience). The Compere asks the Contestant their ten questions and keeps a score of how many they get right, revealing the score at the very end.

When all the groups are finished, ask each of the Audience members to rate the general knowledge from 0 to 100 (where 50 is average) for both their Compere and Contestant. In most cases, the Compere gets a higher rating than the Contestant even though we all know the Compere set the questions and obviously already knows the answers!

This is an example of the Fundamental Attribution Error. We have attributed a particular set of characteristics, in this case greater general knowledge (or maybe worse intelligence!), even though the set-up was always in the Compere's favour. To demonstrate that this judgement is wrong, we could use the Audience's ten questions to test the Compere and Contestant, and I bet they score about the same as each other. I know quite a lot about my field of research, but when I watch University Challenge, I am lucky if I get three right!

Let's look at another attribution mistake we might make. I ask somebody I 'like' to come and see a movie with me on Friday, but they say no. As a response, I could think (a) I'll just ask somebody else because they must be busy; or (b) I must be boring and ugly, and I'll never ask anyone to the movies again.

If we analyse this second attribution, we should ask ourselves four questions:

- Is it useful for me to think this way?
- Is it realistic?
- Would a scientist follow the logic of the argument?
- Would I say this to a good friend: "They turned you down because you are ugly and boring"?

I'm hoping your answer is 'No' to all four questions, and if you wouldn't say it to a friend then you really shouldn't be saying it to yourself either, because it's not true.

These are just two of many psychological biases, but they are very far-reaching. We make judgements a lot of the time by making (social) comparisons and we don't always do this wisely. We might think that someone is smarter or whatever but that doesn't mean we aren't smart.

Yes, I could learn more or I could eat more fruit and vegetables and do some exercise, but I don't need to beat myself up about it. On the other hand, 93% of American drivers think they are better than the average driver and 90% of teachers think they are above average teachers. These have to be nonsense too!

So, I don't believe everything I read, and I don't believe anything that I am told just because someone important tells me to. There are lots of uncertainties, and a lot of fake news, but I can put together a better cognitive toolkit by spending time and effort with people who understand how important these tools are. This is what being a Scholar is all about, and it is what The Brilliant Club will teach you, too.

Paul Gardner, Senior Lecturer



STEM



Innate and adaptive immunity act in cooperative and interdependent ways to protect humans and other vertebrates that possess them

1. Discuss the collaboration of these two forms of immunity in protecting humans from infections caused by microbes
2. Is the immune system always protective?

Year S3

Pupil: **I. Eldhose**
School: **Braidhurst High School, North Lanarkshire**
Supervised by: **Dr S. Amanfo**
Tutor University: **The University of Edinburgh**
Course Title: **Infections, the immune system and when things go wrong**

The immune system has an extraordinary defence mechanism in how it works to protect the body from occupying pathogenic microorganisms. The immune system defends the body from microorganisms. This includes viruses (influenza), fungi (microscopic yeast), bacteria (*Escherichia coli*), parasites (protozoa), and foreign proteins. Survival of the body stands in control of the immune system which is a vital source. The immune system develops a response automatically or over time against microbes. It has the ability of producing a huge range of molecules and cells which are efficient to detect and destroy unwanted pathogens [1].

There are two segments to the immune system, the innate and adaptive system. The innate system is present from birth and has a non-specific mechanism with the capability to develop a response in hours. It includes both physical/anatomical and chemical barriers. The adaptive system has a specific defence mechanism which advances through age. The two main cellular components include of T-lymphocytes (T cells) and B-lymphocytes (B cells). A huge advantage of the adaptive system is that it can develop memory which is a very helpful source in destroying microbes during a second encounter with the same microbe. However, during primary response, a reaction can take days to develop. This differs towards a repeated infection which develops a faster response due to possession of immunological memory.

Anatomical barriers of the innate system consist of mucous membranes, skin and the digestive tract. They act as a barrier of entrance against invading pathogens [2]. Mucus produced in the nostrils traps respiratory viruses such as influenza. It is helped by cilia which beats the mucus upwards where it can be expelled from the body. The skin prevents growth and replication of pathogens by the aid of normal flora found on it [3]. Entry through the digestive tract is prevented by saliva which contains lysozymes and the acidic pH of the stomach which kills the microbes [2].

An inflammatory response occurs when tissues become infected or damaged. When an inflammatory response is activated, mast cells secrete a chemical called

histamine. This dilutes the blood vessels which allows an increased blood flow to the infection or damaged tissue [4].

The Human Immunodeficiency Virus (HIV) attacks the CD4 cells (T cells) in our immune system. HIV can enter the body through injections with contaminated needles, blood transfusion, sexual intercourse and body fluids such as semen, breast milk and vaginal fluids [5]. Entry can be prevented through vaginal fluids as they contain mucous membranes formed at the endocervix and ectocervix [6]. The endocervix is coated with columnar epithelium where mucus is released, trapping microbes and protecting the body from further infection. The ectocervix is lined with non-keratinized, multi-layered squamous epithelium. They develop a wet lining that is efficient enough to avoid common infection [6][7]. However, if HIV successfully enters the system, the symptoms can vary from fevers, headaches, rashes to weight loss, memory issues, and breathing difficulties [8]. Although, symptoms may not show as it will only appear if there are large quantities of the virus in the body. HIV can lead to several opportunistic infections and cancers such as lymphoma, Kaposi's Sarcoma and tuberculosis [9].

After the pathogen successfully enters, the final part of the innate system is activated. The Pathogen Associated Molecular Pattern (PAMP) are found on the surface of microbes. They are recognised by Pattern Recognition Receptors (PRRs), they detect a specific group of PAMPs, resulting in a response developed against it. There are several types of PRRs, one being a TLR (Toll Like Receptors). Activation of a TLR results in signal in pathways against the pathogen, recruiting MYD88 and adaptors such as TIRAP and TRIF which strengthen the response developed. NF-KB contributes in the procedure of inflammatory and immune response by controlling a huge variety of genes [10]. Activation of two key pathways of signalling occurs which is the noncanonical and canonical. Both signalling pathways are essential for controlling inflammatory and immune response. During the process of the PRRs, the NF-KB canonical pathway is frequently used as signalling towards the activations of pro-inflammatory cytokines [10].

HIV is found to have the PAMP of ssRNA, this is a type of viral nucleic acid that activates TLR7/8. They recruit MYD88, with no additional adaptor required. The NF-KB canonical signalling pathway results in secretion of pro-inflammatory cytokines of IFN- alpha and IL-12p70 [11]. Cytokines join to specific receptors generating a signal [1]. Infected cells and leukocytes such as monocytes/macrophages and plasmacytoid dendritic cells (PDC's) secrete IFN- alpha after they detect the mechanisms of a pathogen through the process of PRRs. B cells and Eosinophils control and enhance production of IFN-alpha through PDC's. IFN- gamma also plays a major role by heightening IFN-alpha production through macrophages [12] [13] IL-12p70 is secreted through antigen-presenting cells (APC's), which consists of macrophages, dendritic cells and B cells [1]. Activation of cytokines lead to a huge range of interactions between cells. Both cytokines of IFN-alpha and IL-12p70 interact with the immune cells of macrophages and T helper cells resulting in activation of other immune [1]. For example, IL-12 leads to activation of T cytotoxic cells and Natural Killer cells. It also activates TH1 which has the responsibility for cell mediated functions such as activation of IgE antibody production, delayed-type hypersensitivity and T cytotoxic cells. [1]. IFN alpha cytokines can strengthen the function of T cells, increase antibody production and block viral replication. [1] [14]

The complement system is made up of plasma proteins. They improve the phagocytic cells and the ability of antibodies to eliminate and resolve issues on damaged tissues and microbes found in the body. It has four functions: immune clearance, lysis of cells such as bacteria and viruses, generating responses for inflammation and promoting phagocytosis through opsonization [1]. The complement system is excellent in how it releases a cascade of reactions against pathogens.

The adaptive system is activated when the innate system has finished its job or has been unsuccessful in eliminating the pathogen. Cellular components of the adaptive system include the T-lymphocytes (T cells) and B-lymphocytes (B cells). T cells mature in the thymus while B cells mature in the bone marrow. T cells function to produce T helper and T cytotoxic cells. B cells produce antibodies (immunoglobulin) which is known to neutralise unwanted microbes [13]. When antibodies act on the antigen this leads to destruction. However, this does not apply for the T helper cells (Th) and T cytotoxic (Tc). They need the assistance of MHC class I/II. Tc cells recognise microbes processed by APCs. This results in stimulation of Cytotoxic T lymphocytes (CTLs) which detect and destroy cells which have been infected or damaged. T-helper cells recognise microbes processed by APCs via MHC-class II. Activation of T helper cells leads to production of cytokines, they enhance the stimulation of Tc cells, B cells and other cells such as macrophages [15]

Lymphocytes are specific and complementary in shape to only be activated towards a certain type of antigen. For this reason, a process called clonal selection is initiated. This is when the lymphocytes multiply by cell division producing huge numbers of identical/cloned lymphocytes which allows the body to develop a stronger response to act on the antigen [4].

When the adaptive system initially encounters a virus, the response is not the strongest. This is known as primary response. This results in low production of antibodies and a longer response time. However, the advantage is it has immunological memory. This means that upon exposure to a repeated infection, the adaptive system will develop a stronger, faster and heightened response than before.

Assuming, that the pathogen has been cleared, negative feedback is activated at the end of the process to stop the response. This also assists the body to maintain homeostasis. Homeostasis is when the body returns to normal set point after succeeding in clearing an infection, regardless of adjustments [16]. The negative feedback mechanism is shown to have an important role in discontinuing the response [17]. However, there may be times where a malfunction occurs, leading to no activation of negative feedback. This can cause major issues. Excessive immune response will activate, leading to a continuation of responses even though the pathogen has already been eliminated.

The end result involves elimination of the pathogen, following in activation of negative feedback, returning the body back to its set point. The collaboration between both parts of the immune system is very important as both work together to develop efficient responses, with the innate system transmitting essential information to the adaptive system. This reassures the adaptive system, allowing it to analyse the infection to develop a specific and strong response. However, in some cases all is not resolved. For example, in most cases of HIV, the immune system fails to succeed in destroying the virus which then further develops into AIDS. This is because HIV manipulates the body by attacking one of the main

cellular components of the immune system which is the CD4 cells (T cells).

The immune system works to the fullest ability to destroy pathogens. However, in some cases the immune system can fail such as in hypersensitivity reactions, immunodeficiency and autoimmunity. The immune system tends to fail in its normal function.

Hypersensitivity is a reaction which involves inflammatory responses. These reactions result in tissue damage or death [1]. Type I is IgE-mediated hypersensitivity. This is an IgE regulatory defect occurring when diagnosed with the abnormality called atopy. This activates unnecessary IgE production, resulting in allergies like asthma, eczema and hay fever [1]. Type II is antibody-mediated which occurs when antibodies develop a response against antigens found on cell surfaces, destroying them in the process. Type III is immune complex mediated which occurs when reactions between antibodies and antigens develop huge amounts of immune complexes. Type IV is delayed-type hypersensitivity. This generates from sensitized TDTH cells, producing cytokines and activating macrophages. The macrophages cause tissue damage by releasing lytic enzymes in the procedure [1].

Immunodeficiency is a disorder, disrupting the defence mechanisms against microbes. This results from a defect or absence of a main component of the immune system [1] [18]. This occurs in either the innate or adaptive system. There are two types of immunodeficiency: congenital and acquired. Congenital immunodeficiency disorder can be inherited or present at birth. This can be due to genetic defects such as complement deficiency. Acquired immunodeficiency disorder is due to environmental factors, exposure of body fluids, chemotherapy and malnutrition [18]. Immunodeficiency can be dangerous, putting survival at risk.

Defects develop an altered response in which a component cannot function properly. An example of this is the reduction of complement proteins – this causes a defect in phagocytosis activation, opsonization of bacteria and membrane attack complex. Another example is reduction of T cells, which results in macrophages and B cells not fully becoming activated.

Autoimmunity is when the immune system fails to function, directly attacking the body's own tissues and organs in the process [19]. In an autoimmune organ specific disease, the response is directly targeted at a specific organ of the body. Examples include hashimoto's thyroiditis (thyroid) and insulin-dependent diabetes mellitus (pancreas). A Systemic autoimmune disease is when a wide variety of organs, tissues and cells are affected [1]. This triggers a huge defect in the immune regulatory mechanism. This also leads to the T cells and B cells becoming hyperactive. Examples of this type of disease are multiple sclerosis and scleroderma [1].

In conclusion, regardless of the times the immune system fails, it continues to fight against invading microbes, which in most cases is successful. The innate and adaptive system play crucial roles in defence. With the innate system consisting of anatomical barriers, chemical barriers and PRRs and the adaptive system having T cells and B cells, this develops several responses to fight infection. Therefore, the immune system is remarkable in its ability to fight and protect the body.

Tutor comment:

I. is a very passionate student and I thoroughly enjoyed her contributions and questions during discussions in class. Her essay is very original and applied all the scientific writing skills we discussed including accurate referencing of the ideas of others. She received an overall mark of 90% for her work, which means she is already performing to a good standard at A-levels. I am pleased that she intends to pursue a career in STEM and I wish her the very best in all her future endeavours.

References

- [1] Richard A. Goldsby, Thomas J. Kindt and Barbara A. Osborne, (1999), Kuby Immunology (book) pages 3, 303, 310, 307, 329, 397, 412, 415, 419, 499, 501
- [2] Alan R. Tunkel, Warren Alpert, "Defences Against Infection" (online) <https://www.msmanuals.com/en-gb/home/infections/biology-of-infectious-disease/defences-against-infection> [2 December 2018]
- [3] "Barriers and Defences of Innate Immune Response" (online) <https://opentextbc.ca/anatomyandphysiology/chapter/21-2-barrier-defenses-and-the-innate-immune-response/> [30 December 2018]
- [4] R. Watson (2017) Human Biology Class Notes Immunology, Braidhurst High School (booklet) pgs. 2.6 [1 December 2018]
- [5] "Causes, HIV and AIDS" (online) <https://www.nhs.uk/conditions/hiv-and-aids/causes/> [August 2018]
- [6] "Function of Cervix" (online) <https://www.eurocytology.eu/en/course/932> [3 December 18]
- [7] "Cervix" (online) <http://www.pathologyoutlines.com/topic/cervixnormalhistology.html> [3 December 2018]
- [8] Kirsteen Cherney 'A Timeline of HIV Symptoms' <https://www.healthline.com/health/hiv-aids/hiv-symptoms-timeline> [4 August 2018]
- [9] "HIV/AIDS" (online) <https://www.mayoclinic.org/diseases-conditions/hiv-aids/symptoms-causes/syc-20373524> [4 August 2018]
- [10] Ting Liu1, Lingyun Zhang Donghyun Joo and Shao-Cong Sun (article), "NF-KB Signalling in Inflammation", Citation: Signal Transduction and Targeted Therapy, 14 July 2018
- [11] David J. Dowling "Recent Advances in the Discovery and Delivery of TLR7/8 Agonists as Vaccine Adjuvant" (online) <http://www.immunohorizons.org/content/2/6/185#sec-11> [14 November 2018]
- [12] Cantel K, Pirhonen J "IFN-Gamma enhances production of IFN-alpha in human macrophages not monocytes" (online) <https://www.ncbi.nlm.nih.gov/pubmed/8807500> [4 January 2019]
- [13] Skrzeczyńska-Moncznik, Zabejgło K, Bosowski JP, Osiecka O, Kapinska-Mrowiecka M, Kwitniewski M, Majewski P, Dubin A, Cichy J "Eosinophils Regulate Interferon Alpha Production in Plasmacytoid Dendritic Cells Stimulated with Components of Neutrophil Extracellular Traps" (online) <https://www.ncbi.nlm.nih.gov/pubmed/28186428> [4 January 2019]
- [14] "Interferon Alpha" (online) <http://www.aidsmap.com/Interferon-alpha/page/1731638/> [1 December 2018]
- [15] Seth Amanfo "The Scholars Programme, Infections, the immune system and when things go wrong" (book)
- [16] "Homeostasis" (online) <https://kids.britannica.com/scholars/article/homeostasis/40879> [4 December 2018]
- [17] Anisur Rahman1, Abhinav Tiwari, Jatini Narula and Timothy Hicking (article) "Importance of Feedback and Feedforward Loops to Adaptive Immune Response" Modelling Citation CPT Pharmacometrics Syst. Pharmacol, 30 July 2018
- [18] Ba Carey "Immunodeficiency Disorders" (online) <https://www.healthline.com/health/immunodeficiency-disorders> [5 December 2018]
- [19] Daniel Murel, "Autoimmune Diseases: Types, Symptoms, Causes and More" (online) <https://www.healthline.com/health/autoimmune-disorders> [5 December 2018]



Transport in London, is it fair?

Year 7, Key Stage 3

Pupil: **F. Onyeso**

School: **St Ignatius College, Enfield**

Supervised by: **Dr T. Alaje**

Tutor University: **Newcastle University**

Course Title: **Transport in London, is it fair?**

Mayor Sadiq Khan
City Hall
The Queen's Walk
London
SE1 2AA

Dear Mayor Sadiq Khan,

I am writing to you regarding the major issue London is facing in the form of air pollution and specifically the problems it causes for the younger residents of London. Recent research had revealed high levels of emissions "are responsible for more than 9,500 premature deaths each year," in the capital alone (Vaughan, 2015). Newer research conducted by Kings College London yielded even more worrying results, stating that "air pollution

could cause 36,000 deaths a year" across the UK if left unchecked (Kings College London, 2018), which is a very concerning increase from 2015's total of approximately 29,000 deaths. The scale at which emissions are produced leaves the streets of London doused in harmful gases and particles that could damage a person's health, leading to hospitalisation or possibly even death. One might argue children suffer from the effects of air pollution more than adults. Queen Mary University of London led a study in 2018 which proved that children residing in London's polluted areas show poor lung capacity, "putting them at risk of lifelong breathing disorders." It affects the children of London permanently, despite the fact that they are the least responsible for air pollution, hence they will be inheriting the problems adults leave behind.

Air pollution is the presence of any substances in the air that reduces air quality (Oxfordreference.com, n.d.). One of the most dangerous substances found in the air is sulphur dioxide. This corrosive gas is a contributor to asthma and chronic bronchitis. It is released into the atmosphere mainly via industrial combustion and energy production. Certain nitrogen oxides are the result of the reaction of nitrogen and oxygen in fire, but can be caused by nature (e.g. lightning). Due to the nature of its production, it is mainly caused by energy generation and vehicle emissions. Ozone (O₃), the poisonous gas which is created when oxygen meets electrical discharges or ultraviolet lights, does not have a direct source. It is formed in the atmosphere and is highly reactive. Ozone, unlike the other pollutants listed here, is not a gas; it made up of solid and liquid particles which may be found in our atmosphere. Any matter measuring less than PM_{2.5} in diameter (particle matter units) is classed as fine particle matter. It is primarily produced via domestic wood/coal burning and industrial combustion. All of the pollutants here are highly regulated by the EU. In 2018, Britain broke the annual legal limit of nitrogen dioxide emissions within a month. While this is an improvement on previous years, where the limit has been broken within a week into January, it is still unacceptable and can lead to further environmental damages as well as health issues for the public.



The effects that pollution has on children can sometimes be irreparable, especially if the children are involved in outdoor activities such as sports. The constant exposure to pollutants when a child stays outside for prolonged periods of time could 'restrict lung development' (QMUL, 2018). Children with asthma are particularly at risk due to faster breathing rates, increasing the potential damage pollution could cause. A new study led by the Alzheimer's Society shows that these pollutants, particularly PM_{2.5} can enter the bloodstream and may be a cause of neurological diseases such as Alzheimer's and Dementia later on in life. Younger children in prams and buggies are the worst off, as they are put on the level of exhaust pipes. But even before children are born,

they are exposed to air pollution through their mothers, which may cause premature birth and an underweight child when born. Dr Roberta McKean-Cowdin, of the Department of Preventive Medicine, Keck University of Medicine, conducted research on the effects of air pollution in 2018. The investigation was centred on how the brain, in particular, was affected. Dr McKean-Cowden's findings led her to believe that "traffic related air pollutants is associated with an increased risk of childhood brain tumours." This worrying finding should spur us on to intensify action for the reduction of air pollution.

While we appreciate the effort exerted into the diminution of air pollution, children in London are still the least responsible, yet they suffer the brunt of air pollution the most. To further help these children, I suggest an outright ban of the sale of petrol and diesel vehicles in London, preferably achieved within the next two years. I suggest accelerating the plans to expand the Ultra-Low Emissions Zone, and the Low Emissions Zone. I also recommend expediting the introduction of charging hired vehicles (such as black cabs and Ubers) the fee required to use the roads assigned to the Central Congestion Zone, which is due to come into action in April this year. The LEZ has not been as effective as it could be, due to the fact that many companies are willing to pay the fine in order to pollute the city. I advocate an amendment to the conditions of the LEZ and ULEZ; instead of stating that cars which produce over a certain amount of emissions must pay a fine to enter through the zone, I propose that cars like these are simply not permitted to enter, and if they must, they must purchase a license (renewable every 48 hours with a maximum of ten renewals) with an unreasonably (almost extortionately) high fee (this fee should increase by 30% with every renewal), thus deterring them from doing so. The few monies received via these fines may be invested into researching cleaner forms of transport and how to enhance them, it could also be used to start a campaign appealing to the conscience of major delivery companies. By making them feel responsible for the damage they create, it may make them change their ways; boycotts of certain companies like these will also assist the campaign.

In addition, I recommend expanding the ULEZ at a quicker rate. While growing the Ultra-Low Emissions Zone to the outer regions of London such as Enfield is unrealistic (as it would render multiple major highways useless, such as the A10 and M25), promoting the production of electric and hydrogen-fuelled vehicles will certainly help decrease harmful fumes and substances in the atmosphere. Even so, the ULEZ is only a temporary fix; as it still permits the emissions to be released into our air, polluting our city and affecting our children and residents. In order to encourage the sale of zero-emission transportation, I suggest that an installation of multiple charging and hydrogen fuel stations be considered, it would also be an intelligent idea to invest in the production of such vehicles. To minimize the production of pollutants whilst creating cleaner cars, I also petition for the United Kingdom as a whole to turn to cleaner forms of energy production, such as hydropower and wind power, as they are renewable sources of energy. Although, in this case, 'what City Hall can do is a drop of water in the ocean' compared to the funds at the disposal of the UK parliament. Yet I do believe that an outright ban on petrol and diesel vehicles in the councils of Westminster, The City, North Lambeth, North Southwark and Tower Hamlets is within the power of City Hall. To compensate for the banning of most vehicles (zero-emissions vehicles exempted), bicycles should be made readily available to rent at an extremely low price and public transport should have fares abolished for students and cut down for those who wish to travel with TFL over a long period of time (e.g. those who purchase a weekly travel pass for

three consecutive weeks get the fourth month heavily discount). The few funds received from the revised ULEZ could also help support TFL in the absence of fares. This will contribute massively to the reduction of nitrogen oxides fumes and particulate matter in the air.

It is important to focus the attention on corporations, particularly those who are based on delivery services, it is vital that the government invests in cutting pollution caused by private companies, be it through new legislation or other means. Whilst there are methods to force companies to take action in reducing emissions, it is important that they see the error of their ways by polluting the environment. By sending letters like these to such organisations, placing an emphasis on how children are effected; it certainly will move at least some hearts within the institutions. By getting the public to group together in one big campaign, the united people will be triumphant; as there is strength in numbers.

In conclusion, air pollution affects the children of London; the most innocent of the city's residents. The air pollutants such as nitrogen oxides, sulphur dioxide, particulate matter and ozone are the primary polluting substances found in our atmosphere and they are produced by processes from industrial combustion to transportation emissions. The rules and regulations on such substances are there to assist us in our quest to conquer air pollution. I also believe that there is much to be done to help improve air quality in London, primarily, but also throughout the whole UK. For example, improvements to the Low Emission Zone and Ultra-Low Emission Zone conditions, turning to hydropower and the sale electric/hydrogen-fuelled cars as well conducting research into how to better electrically and hydrogen powered vehicles. I wish you all the best in your endeavour to make London the greatest it can be.

Yours Sincerely,
F. Onyeso

References

- Alzheimer's Society. (2019). Air pollution and dementia. [Online] Available at: <https://www.alzheimers.org.uk/about-dementia/risk-factors-and-prevention/air-pollution-and-dementia> [Accessed 31 Jan. 2019].
- Carrington, D. (2018). London reaches legal air pollution limit just one month into the new year. [Online] the Guardian. Available at: <https://www.theguardian.com/uk-news/2018/jan/30/london-reaches-legal-air-pollution-limit-just-one-month-into-the-new-year> [Accessed 31 Jan. 2019].
- Kcl.ac.uk. (2018). UK air pollution could cause 36,000 deaths a year. [Online] Available at: <https://www.kcl.ac.uk/news/news-article.aspx?id=41ef9e911-5796-4344-948b-8d7c0045bdfc> [Accessed 30 Jan. 2019].
- McKean-Cowdin, R. (2018). Brain Tumors and Traffic-Related Air Pollution, PM2.5 and NO2. [ebook] Los Angeles: Department of Preventative Medicine, Keck School of Medicine, University of Southern California, p.1. Available at: <http://www.childhoodcancer2018.org.uk/speakers/mckean-cowdin-cc2018-abstract.pdf> [Accessed 3 Feb. 2019].
- Oxfordreference.com. (n.d.). Air pollution - Oxford Reference. [Online] Available at: <http://www.oxfordreference.com/view/10.1093/oi/authority.20110810104326671> [Accessed 17 Jan. 2019].
- Qmul.ac.uk. (2018). SMD - Study of 2,000 children suggests London air pollution is restricting lung development - Queen Mary University of London. [Online] Available at: <https://www.qmul.ac.uk/media/news/2018/smd/study-of-2000-children-suggests-london-air-pollution-is-restricting-lung-development.html> [Accessed 30 Jan. 2019].
- Vaughan, A. (2015). Nearly 9,500 people die each year in London because of air pollution - study. [Online] the Guardian. Available at: <https://www.theguardian.com/environment/2015/jul/15/nearly-9500-people-die-each-year-in-london-because-of-air-pollution-study> [Accessed 30 Jan. 2019].

Tutor comment:

The tutorial was designed to take a closer look at the problem of air pollution in London. Focus was on the role of vehicles and the impact on children's health. The final assignment was a letter to the Mayor of London with suggestions on what can be done to remedy the situation. F. is a very focused and ambitious pupil who displayed an uncommon commitment all through the tutorials. The effort he puts into all the tutorial assignments was always evident.



Climate change and sustainability

Year 9, Key Stage 3

Pupil: **R. Azhar**

School: **Harris Academy Battersea, Wandsworth**

Supervised by: **Dr E. Gholami**

Tutor University: **The University of Liverpool**

Course Title: **How to make our school more sustainable**

Sustainability and climate change have been described in several dimensions by many scholars and how that has been affecting climate change. UNESCO (2002) describes sustainability (under what is now known as 'Bruntland Report') as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. According to McKeown (2002), sustainable development is thought to have three components: environment, social and economy, and the well-being of these three areas are intertwined, not separated. UNESCO would also have arguments supporting McKeown as they "promote international development that is socially desirable, economically, culturally appropriate and ecologically sustainable" (Johnston, 2004). The Great Law of the Hau de no sau nee (Six Nations Iroquois Confederation) says that in every deliberation we must consider the impact on the seventh generation (Ratcliffe, 1994).

In London, it has been constantly proven that human activity has impacted the environment over the centuries. Human Impacts would include changes to biophysical environments/ecosystems and natural resources. This will also cause changes including global warming, mass extinction – caused by ecological collapse. In addition to this, having the need to modify the environment in order to have it compatible to fit the needs for today's society which is causing severe affects which prevail to increase as human overpopulation continues. We have been able to confirm this from using the Earth's orbiting satellite to be able to understand the fact that over the past 400,000 years, the limit of carbon dioxide levels has been 280 parts per million, but after 1950 and the industrial revolution, carbon emissions have exponentially increased to 394 parts per million.

Buildings are a large part of sustainability in this sense that we use it 24 hours a day and so, especially depending on climate, the materials used in such buildings leave mass amount of carbon footprint. "A sustainable building would be an establishment with high efficiency in the use on energy, water and materials and reduced impacts on health and the environment through better design, construction, operation, maintenance and removal throughout its lifecycle" (Cassidy, 2019). The type of building which is made has different carbon footprints. "A carbon footprint is the total amount of CO2 and other greenhouse gases, emitted over the full life cycle of a process or product. It is expressed as grams of CO2 equivalent per kilowatt hour of generation (gCO2eq/

kWh), which accounts for the different global warming effects of other greenhouse gases." (Parliamentary Office of Science and Technology). Many different things can be used to make sustainable buildings such as slate. Slate is sustainable as it is environmentally friendly in all stages of its life span, allowing this resource to be the best natural choice for making a sustainable building. There are many reasons for why slate is sustainable for a building and why it is a good idea to use it for making such structures. One positive of using slate is that it is reusable and recyclable. This is as slate can easily be dismantled to be used for any other reasons then can be recycled at the end of its useful life. Another reason for why slate is useful is that it has no chemical emissions as during its production process, it does not need any artificial materials, furnaces or chemical products, which allows slate to be a great alternative for any project. Furthermore, slate is also durable meaning that it can last for over 100 years, making it the most resistant material for roofing and can benefit greatly as it does not need to be replaced after every 10 years or so (Centre, 2017). Though slate has not been used as a material in our school, it is something used by many people across the globe and moves across to being a very sustainable material.

Our school, in many areas of or building, have used double glazing. Double glazing is otherwise known as insulating glass and consists of two or three glass window panes separated by a vacuum or gas filled space to reduce heat loss though the glass windows of the building. The space filled by gas traps in the heat and allows it to stay in and keep the cold air out. There are many positives to double glazing over single glazing such as: better insulation; keeps noise out; reduction in the amount of condensation; and heightens security (Ransome-Crocker, 2018). Good insulation would mean that there will be fewer draughts and cheaper heating bills. By less noise, it means that at the glass is quite thick so you will hear less noise – this will be useful our school is built on a main road and so it will allow the students to concentrate on their work rather than hearing constant traffic from outside the window, which can be distracting. By heightening security, it means that double glazed windows are more difficult to break though over single glazing. This is very beneficial in school as it ensures extra protection for the students and it also will stop thieves into breaking into the school at night to steal the technology. Therefore, double-glazing is very beneficial and also very sustainable, especially regarding the lack of heat loss.

When built, our school used passive design in its building. A passive design is one in which form, fabric, and systems of a building are arranged and integrated to maximise the benefits of ambient sources and sinks of energy for heating, lighting and cooling in order to reduce consumption of conventional fuels and the emissions of greenhouse gasses. The basic rules for the building are to acknowledge the following: building location; shape and orientation; and treatment of fabric. Architects would also take in the fact that the sun 'rises in the east and dies in the west', so, for social sustainability, offices and other work spaces/schools would have main working rooms located in the east so it

is easier and more comfortable to work – rather than to constantly have the sun in your eyes. Architects will also place heating directly under the windows so that when it comes though, it will lift up the heat and make the room warm. However, some designs were not made as suitable to the building as planned. For example, Grenfell Tower suffered tragically after from a fire mainly due to that the government decided to use a cladding material which was a lot cheaper but could ‘light up like a matchstick’. According to BBC News (2018), “the cladding used on Grenfell was Reynobond PE, aluminium panels containing a plastic filling, that were popular in cost-conscious council refurbishment schemes. While zinc cladding was initially considered when the tower was refurbished in 2015, Reynobond PE was a cheaper option, saving nearly £300,000”. If the council decided to use Zinc instead of Reynobond PE, it would have ultimately made a bigger difference as Zinc is much more fire resistant and thus been the more sustainable and safer choice.

There are many strategies that can help the world become more sustainable. Though some may be costly to administer, some may not, and money should not be the reason why we cannot make our world more sustainable. There are many eco-cities around the world which have proven that this is not hard to achieve. One of the biggest eco-cities includes Singapore. With a population of more than five million people, Singapore is often recognized as one of the most forward-thinking green cities in Asia. The city-state has developed a Sustainable Development Blueprint, which outlines sustainable goals leading up to 2030. The targets include improving energy efficiency by 35 percent, ensuring 80 percent of its buildings are certified green, and having 80 percent of households are within a 10-minute walk to a train station (Climate Reality Project. 2017).

In conclusion, over the past few tutorials on sustainability, I have learnt a great deal regarding many issues surrounding lack of sustainability and so much more. Sustainability is overall the preservation of resources and the earth itself for future generations. Many countries regard ‘generations’ as the up-coming 7 generations so that they are able to still use materials and energy resources that we use today. This course can lead into us finding out why countries will not or may not be able to become sustainable. This course could also increase our knowledge in how this push for sustainability was created and so much more.

References

5 sustainable cities making a difference for the planet. (2017, 03 10). Retrieved 03 11, 2019, from Climate Reality Project: <https://www.climate realityproject.org/blog/live-sustainable-cities-making-difference-planet>
BBC News. (2018, 05 5). Retrieved 03 11, 2019, from <https://www.bbc.co.uk/news/uk-43558186>
Cassidy. (2019). Sustainable Building. In Lecture by E.Gholami, How to make our school more sustainable (p. 20). London.
Centre, T.B. (2017, 03 03). What Makes Slate Great Building Material? Retrieved 02 25, 2019, from The Building Centre : <https://www.buildingcentre.co.uk/news/what-makes-slate-a-great-sustainable-building-material>
Johnston. (2004). 3mfuture. Retrieved 02 25, 2019, from Definitions of Sustainable Development: http://www.3mfuture.com/sustainability/definition_sustainable_development.htm
McKeown. (2002). 3mfuture. Retrieved 02 25, 2019, from Definitions of Sustainable Development: http://www.3mfuture.com/sustainability/definition_sustainable_development.htm
Ransome-Croker, L. (2018). Double glazing: your questions answered. Retrieved 03 11, 2019, from www.which.co.uk:https://www.which.co.uk/reviews/double-glazing/article/how-to-buy-double-glazing/double-glazing-your-questions-answered
Ratcliffe, D. (1994, 10 20). Ratical. Retrieved 02 25, 2019, from The Hau de no sau nee Address to the Western World: https://ratical.org/many_worlds/6Nations/6nations1.html
UNESCO. (2002, 06 01). What is sustainable development? Retrieved 02 25, 2019, from What Is

Sustainability: http://www.3mfuture.com/articles_sd/UNESCO%20-%20what%20is%20sustainable%20development.htm

Tutor comment:

I thoroughly enjoyed R.'s input in discussions during The Brilliant Club Tutorials. She is a very keen pupil who was deeply engaged in the critical analysis on implementing strategies to improve sustainability in school. Every assignment was evidence of R.'s impressive comprehensive writing skills and depth of understanding of the complexities of sustainability. Her top mark of 71 out of 100 in her final assignment is a testament to her invaluable role through the course. She is a worthy and excellent candidate for any undergraduate course.



Is advanced cognition unique to humans, and what relevance does this have for a wider society?

Year 9, Key Stage 4

Pupil: R. Beckerleg
School: St Ives School, Cornwall
Supervised by: R. Hooper
Tutor University: University of Exeter
Course Title: Outwitted by an octopus? Complex cognition across the tree of life

In the duration of this essay, I will be evaluating the following question: "Is advanced cognition unique to humans and what relevance does this have for wider society?" I shall be arguing my point of view and will provide evidence to aid my answers. In this essay, I will argue that advanced cognition is not solely unique to human beings alone. To support my perspective on the aforementioned question, I shall be using examples from cognitive tests and evidence of convergent evolution. Firstly, I will be providing a short definition of what cognition is: cognition can be described as the intelligence that animals collect to better understand their surroundings. Furthermore, I will be exploring the fact that I believe that this question holds relevance for wider society.

To begin, I will establish a better detailed definition of cognition and what it truly is. Cognition is the mechanisms animals use to accumulate and maintain knowledge of their environments. It is a process that allows animals to gather and collect information that supports them to better adapt to their surroundings and, hence, be able to survive more effectively in their habitats. In addition, there is not just one kind of cognitive ability; there are many different types that support different situations and conditions. If there was only one ability, all species showing signs and understanding of cognition (including us - humans) would struggle to acquire the intelligence that may be required to understand how to survive in their environments. Some examples of cognitive abilities include: spatial cognition, theory of mind and tool-use. These three cognitive abilities are very important for the species to understand its environment. For example, spatial cognition is the use of specific information - that has been gathered by the species - that allows it to determine where they are, how to acquire resources and how to find their way back home. They could collect

any intelligence which enables them to be compatible with their surroundings: where food and water sources are, if there are any predators or threats in the area and, finally, if they are even in a suitable location fit for their needs.

Secondly, in order for us - as human beings - to see and understand that cognition can be found in other species in contrast to ourselves, there need to be a number of methods and tests that can be run to grasp that knowledge. Cognition is tricky to test for as we cannot actually see it and so, it cannot be directly measured. Just as there are many different types of cognition, there are many ways that we can approach the issue of exploring the inner workings and mental capacities of non-human animals. New tests have been introduced and analysed to detect signs of cognition. For instance, dogs have been found to be skillful at social cognitive tasks; nevertheless, they haven't shown efficient skill or understanding of the test for mirror self-recognition. However, Dr. Cazzolla Gatti proposed a new test to shed light on the different ways that can be used to check for self-recognition and self-cognition [1]. This new test was applied to 32 domestic dogs supervised and managed by the leading researcher; Dr. Alexandra Horowitz. This study confirmed previous thoughts on the topic - proposed and conveyed through this sniff test. Furthermore, it shows that, "Dogs distinguish between the olfactory 'image' of themselves when modified: investigating their own odour for longer when it had an additional odour accompanying it than when it did not." This new approach to animal cognition and its methods of testing clarified that dogs do, in fact, have the ability of self-cognition. Additionally, as we delve into the minds and mechanisms of these animals, we can discover that cognitive abilities can be found across a wide range of species beside humans. Recent theories and research have depicted birds (such as corvids and parrots) as having a similar mental capacity and ability as those of apes. Birds brains do not have the same structure as that of mammals. For starters, their brains are much smaller. Secondly, mammals' cognitive skills are controlled by the multi-layered cerebral cortex, which ceases to exist in birds. In disregard to these facts, however, birds are capable of the same cognitive performances as apes. To better understand how this could be, Orun Gunturkun and his colleagues analysed a number of neuro-anatomic studies [2]. Their overall conclusion: both animal groups have very different brain structures and, yet under closer examination, some similarities have become clear. Singular modules of the brain, for instance, are wired in a similar way. Moreover, both animal groups have a prefrontal brain structure which controls similar executive functions. Taking all these factors into consideration, I believe that this conveys that advanced cognition is not truly unique to humans. If these species are showing signs and understanding that is in a way similar to our own, then we are not the only animals to portray complex cognition and the abilities ensued.

Thirdly, cognition - like all things - has evolved with time. It has not just evolved once but a number of times across the tree of life. It can be argued that cognition was pressured into evolving through a number of forces and variables. Such precedents include: social and ecological variables. When a species lives in a complicated, numerous social

group a lot of information has to be processed and inferred to deduct individual's actions and their true intentions. This includes the origins of said actions; is it innocuous or offensive? In order to do so, the species requires an advanced quality and quantity of cognition. Having to compete and interact with other individuals that are part of your social group would be extremely hard: what would be the right way to act and how should one react with another? The social intelligence hypothesis is thought to be a leading cause of why and how advanced cognition has evolved. Secondly, ecological variables have generated stress on cognition. It would be important for organisms to acknowledge weather situations and how they would be affected.

Furthermore, unpredictable food sources are an ecological variable and while that places stress on the organisms need to eat, it also highlights the fact that they may need to fight in order to survive off that unreliable source. Friction could occur between different species because of that one factor. The ecological intelligence hypothesis illustrates how natural forces can provoke selection pressure on cognition. When faced with pressures that affect an organism's ability to survive and reproduce in their environments, certain cognitive abilities may be more favourable in these situations than others. This can be linked to the idea of evolution by natural selection - where a heritable trait is passed down through a species that is more sufficient to particular conditions in contrast to a different trait and eventually the species would evolve to survive more effectively. Alternatively, not only has cognition evolved; it has evolved convergently through the tree of life. Evidence of this is the fact that some species of birds - corvids and parrots - have been known to show the same advanced cognitive abilities as is found in apes despite the fact that they are evolutionary distant. This links to the aforementioned matter that some singular modules in both species' brains are similar. This highlights the case that cognition has evolved convergently; certain species that are evolutionary distant have come to share some of the same skills. Furthermore, the same can be said for octopi, as they show some cognitive abilities akin to those of some mammals (apes and monkeys, for example). All these factors lead to the suggestion that cognition has evolved multiple times independently across the tree of life and, therefore, has evolved convergently.

Finally, in this paragraph I will be arguing my perspective of why this question and its many possible answers does hold importance and relevance for wider society. Questions such as these and others requiring similar thoughts and research can have interesting influences and effects on the way we - as human beings - view the natural world and the animals that inhabit this world beside us. As was discussed in the paragraph prior, cognition has evolved convergently, along with different species and as a result it can change the way that society views animals and even the way we see ourselves. By acknowledging the evidence that we are not the only species to show signs of advanced cognitive abilities, we could see that other animals do not differ from us to large extents. For example, we have a high justification of fairness and how we should all be treated equally. Experiments and tests show that other animals, too, show this same validation of equality.

Brosnan and de Waal completed a test that illustrates how capuchin monkeys have a concept of fairness [3]. One monkey was offered cucumber as a reward for passing a rock to the person enacting the experiment. However, the second monkey was offered a grape in return for handing over a rock. The first monkey then saw that the other monkey had received a grape and in hopes of also getting a grape, handed another rock to the human. Again, they got cucumber. Knowing that they were not earning the same as the second monkey for doing the same amount of work, they spurned the cucumber and threw it back; therefore, rejecting inequity. This shows that non-human animals have similar concepts and justifications as ourselves; consequently altering the way we think of ourselves as a possibly superior species and proving that these animals are just as complex and well adapted as us. Furthermore, this could change the mindset some people adopt when thinking of the safety of wildlife and conservation. Understanding that all animals have been evolving for the same amount of time and that we are not the only species to have adopted advanced cognition could convince some members of society that animals are more intelligent than we might first think. As a result, more people may start to think about what could be done to help animal welfare. This change in attitudes could therefore save many species that are vulnerable or endangered.

Alternatively, such awareness of this topic could cause confusion for members of society. Viewpoints such as the scala naturae (otherwise known as The Great Chain of Being) are common misconceptions that people may still obtain. This logic perceived by Aristotle connotes how we may see ourselves as the most powerful and prominent species on this world, with only angels and gods being of a higher standard to ourselves. Furthermore, by assuming this idea it could influence us to believe that we are also the most important species; everything else is below us and consisting of a less evolved state - resulting in the opinions that those animals are of less importance to ourselves. The fact that we are not the only species to have advanced cognition and that we are not the most evolved animals may come as a revelation to many people in wider society. Societal implications ensued could include confusion, uncertainty and possibly panic. Humanity's place in the world might become indistinct and people may begin to wonder what the future holds and whether we have a dignified, distinguishable reservation there.

In this essay, I portrayed my thoughts and perspectives on the previously mentioned question. Firstly, cognition was defined to a fuller state and different types of cognitive abilities were noted and explored. Secondly, I delved into how cognition can be tested and how we can see it in other animals, compared to ourselves. In the fourth paragraph, the evolution of cognition was examined, along with some of the pressures that applied stress, therefore, causing it to evolve. Finally, in paragraph five, I assessed the effects that advanced cognition in non-human animals could cause in a broader society. In conclusion, after assessing the factors in this essay, I believe that advanced cognition is not unique to humans and that this is a relevant issue for wider society.

Bibliography

[1] Roberto Cazzola Gatti. 2016. The Sniff Test of Self Recognition. sciencedaily.com
[2] Onur Gunturkun. 2016. Cognition Without Cortex. sciencedaily.com
[3] Sarah F. Brosnan and Frans B. M. de Waal. 2003. Monkeys Reject Unequal Pay. nature.com to humans and that this is a relevant issue for wider society.

Tutor comment:

It was a wonderful experience working with St Ives School, and R. was an outstanding student. She had to miss some tutorials, but she independently caught up with everything that was taught by using the Virtual Learning Environment. R. wrote a phenomenal final essay, which explored the definition of cognition, the leading theories as to why cognitive capabilities have evolved independently across the tree of life, and how research into the cognitive capabilities of non-human animals may have societal implications. Her essay was thorough, engaging and imaginative, and an absolute pleasure to read. R. would be an asset to any sixth form, college or undergraduate course, and I wish her every success in the future!



Paracetamol: A household drug

Year 9, Key Stage 4

Pupil: A. Parish
School: Harris Girls' Academy Bromley, Beckenham
Supervised by: Dr K. Xu
Tutor University: University of Nottingham
Course Title: Paracetamol: Friend or foe

The purpose of this essay is to explain the uses, administration and the chemical structure of paracetamol, along with the possible metabolic pathways and how to ensure a safe and effective dosage is given to a patient. I have examined multiple sources for this piece of work to explore what has led to paracetamol being the most popular painkiller world-wide.

A brief history of paracetamol

Paracetamol was first synthesized in 1878 by American chemist Harmon Northrop Morse. However, it was not until 1883 that it was introduced to medical use under the name Antifebrin. Understandably, due to the lack of knowledge surrounding the safety dosage it was found to have very toxic side effects. In 1893 German physician Joseph Von Mering published a paper on the clinical findings of paracetamol with phenacetin. In this paper he stated that paracetamol was the active metabolite in phenacetin. Mering's claims remained unchallenged for over half a century [1].

In 1947 American researchers David Lester and Leon Greenberg decided to analyse the metabolism of paracetamol and acetanilide. The two found strong evidence that paracetamol was the major metabolite in human blood. Another paper published in 1949 by Bernard Brodie, Julius Axelrod and Fredrick Finn backed this theory, also proving it with more specific and advanced methods and further confirmed that phenacetin was metabolised into paracetamol [2].

First marketed with prescription as Trigaesic in 1950, this was a mixture of caffeine, aspirin and paracetamol [1]. However, it was removed from shelves, as in 1951 reports

showed that three people who were prescribed the drug, had developed a blood disease called Agranulocytosis. After a while the disease was disproven to have any link to the ingestion of paracetamol. In 1953 paracetamol was re-marketed under the trade name Panadol, again this was available by prescription only.

In 1956, 500mg tablets went on sale in the UK under the name Panadol. Paracetamol has been available over-the-counter since 1959 and is now the most commonly used drug worldwide.

Common usage and known side effects

Paracetamol is the first line of treatment recommended for most pain and pyrexia, i.e. fever [3]. Mostly used in households to relieve mild pain such as toothache, headaches, sprains and menstrual pain and to reduce temperature from colds or flu. It plays an important role in multimodal analgesia; this is because it has very little chemical interaction with other drugs. Multimodal analgesia is pain management using combinations of pain relief medications to relieve a patient's pain. The drug is considered to have an excellent safety profile, except in extreme overdose cases, which are exceptionally rare [4].

Due to the large difference in the bioavailability this makes the onset and duration of pain relief very unpredictable. Oral bioavailability is the percentage of a drug molecule available to serve its purpose [3]. Oral and rectal administration of paracetamol can relieve pain within 40 minutes, and maximum effect takes place in about 1 hour. The bioavailability difference between oral and rectal administration is 63%-89% for oral and 24%-98% for rectal [4].

However, due to the introduction of intravenous (I.V.) administration, doctors are now able to overcome this issue of the reduced bioavailability. As a result, it has secured a place with every anaesthetic and pain relief management plan. The effect of pain relief after the introduction of I.V. occurs within 5 minutes, peaking between 40-60 minutes and lasts approximately 4-6 hours [4]. However, due to the increased bioavailability due to the direct administration into the bloodstream the amount of paracetamol needed may decrease, failure to decrease the amount administered correctly can cause overdose or paracetamol induced liver toxicity. Drugs have many different formulations, a few of these are outlined in the table below.

Route Of Administration	Drug Formulation	Site of Absorption
Oral	Tablet, Capsule	G.I. tract
Rectal	Suppository	Bloodstream
Inhalation	Inhaler	Lung
Topical	Cream, Patch	Skin
Parental	Liquid	Vein

Table 1. The routes of administration, drug formulation and the sites of absorption of paracetamol [5].

Most of these can be used as a drug formulation for paracetamol, however, inhalation is not used due to the problems it can cause for asthmatics [6]. It can cause analgesic-induced bronchospasms. Bronchospasms are the tightening of the chest and airway, restricting the oxygen supply to the lungs. However, paracetamol is regarded as the safest and most effective pain reliever for both analgesic tolerant and intolerant asthmatics.

Paracetamol is generally well understood and unreactive when it encounters other medications [6]. However, the side effects of paracetamol alone are rare but can include; allergic reactions such as rashes and swelling, flushing, low blood pressure, increased heart rate (mostly common in hospitals e.g. I.V. administration), blood disorders, such as thrombocytopenia (which is the low number of platelet cells) and finally liver and kidney damage due to excess amounts of the metabolite. This can be fatal in cases of overdose. Patients who suffer from these side effects should immediately report it to their doctors and can use the yellow card scheme to seek help and advice on how to appropriately approach the situation.

An overdose on paracetamol can be extremely dangerous, the symptoms of these include; nausea, feeling light-headed, unusual abdominal pains, drowsiness, comatose states and seizures. Nonetheless symptoms of an overdose, commonly don't appear immediately after consumption, effects tend to begin to show 2-3 days after consumption. It is most common for children to overdose on paracetamol accidentally as parents are unaware of the correct dosage for their child [4].

How to ensure safe and effective dosage

There are four compartments responsible for paracetamol distribution, namely plasma, interstitial fluid, intercellular fluid and fat. This is shown in Figure 1.

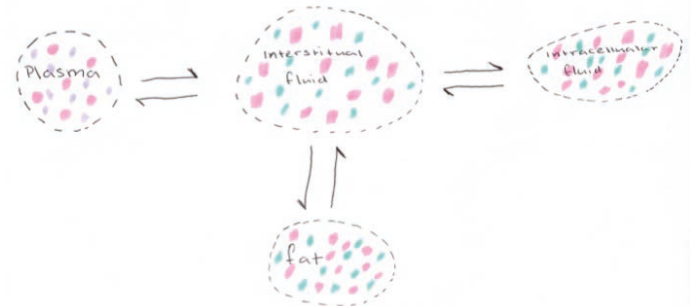


Figure 1. The four body compartments involved in paracetamol distribution.

The purple dots in Figure 1 represent plasma protein, this is found in the blood vessels. The most common plasma protein is albumin (Figure 2).



Figure 2. A simulated molecular model of albumin protein.

The pink dots in Figure 1 are drug molecules and the blue dots are drug binding proteins as shown in Figure 2. The way that this is distributed is shown below in Figure 3.

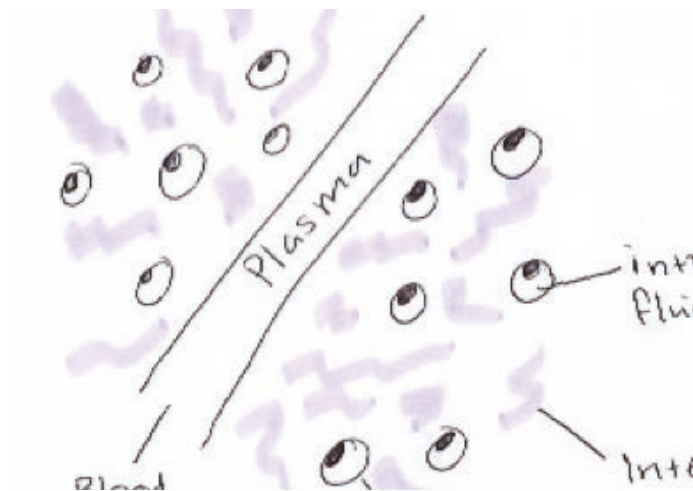


Figure 3. Schematic diagram to show how a drug is taken to the place of pain, the purple lines show the movement of the drug molecules.

The hepatic first pass is the removal of the drug through the liver, before distribution. The liver does this to detox/remove a foreign substance to protect us. Only approximately 68% of the initial drug reaches the source of pain [7]. This is because it is diluted/metabolised by the hepatic first pass [8].

Once paracetamol is distributed there is a ratio of the amount of drug being absorbed over the body mass of patient (Figure 4). The equation for finding the right dosage of paracetamol to be prescribed to a patient is shown in Equation 1:

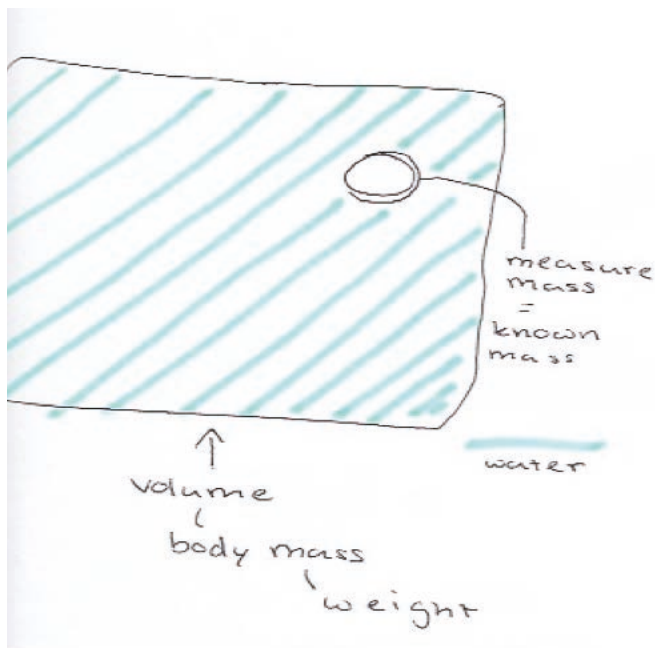


Figure 4. Demonstration of the ratio of drug over total body mass. Dosage = Concentration of drug needed / volume of distribution Equation 1.

Chemical structure

The chemical structure of paracetamol is built out of a benzene ring, a hydroxyl group and an amine functional group. A functional group is a group of atoms which are responsible for specific characteristics of particular compounds [9].

The first part of the paracetamol chemical build up is a benzene ring, as shown in Figure 5.

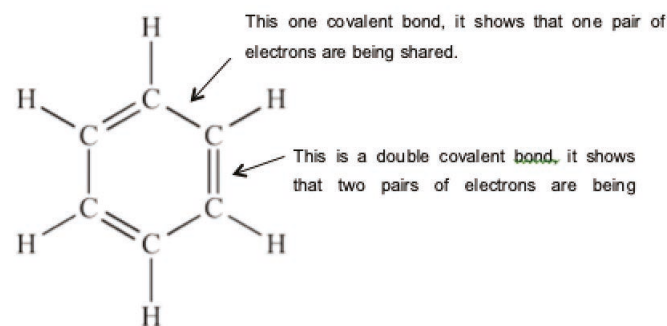


Figure 5. Molecular structure of a benzene ring.

Paracetamol is constructed by a benzene ring core, this is made up out of six carbon atoms, the carbon atoms are connected by covalent bonds. A carbon atom needs four covalent bonds to be stable. This is because it has four valent electrons. A carbon atom is situated at ends of atoms.

The next part of the structure of paracetamol is a hydroxyl group. For the hydroxyl group to be placed on the benzene ring you need to substitute a hydrogen atom for it. A hydroxyl group is shown below in Figure 6.

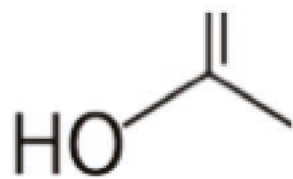


Figure 6. Molecular structure of a hydroxyl group.

A hydroxyl group is a pair of atoms that are most commonly found in organic compounds, such as sugars and alcohols [4]. Hydroxyl groups are composed of one hydrogen atom and one oxygen atom, meaning it is soluble in water. The chemical formula of a hydroxyl group is written as either [-HO] or [-OH]. The '-' represents the carbon to which it is bonded.

The final part of the chemical structure of paracetamol is an amine functional group. Which is shown below in Figure 7.

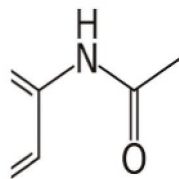


Figure 7. Molecular structure of an amide group.

The amine group, is a functional group. It is found in many different drugs, it is made up of a carbonyl group bonded to a nitrogen, or any other compound.

The metabolism of paracetamol

The metabolism of paracetamol is still unknown, even after 100 years we do not know the exact mechanisms of action. There has been evidence put forward that suggests, that a number of different central mechanisms are used in the process of metabolising paracetamol,

such as effects on prostaglandin production and cannabinoid pathways [6]. However, it is extremely likely that it is a combination of some interrelated pathways, that are involved.

One theory suggests that it effects the production of prostaglandins. Paracetamol has been proven to not reduce inflammation of tissue, unlike non-steroidal anti-inflammatory drugs (NSAIDs), which act on the enzymes COX1 and 2. Paracetamol however is believed to act on a detached form of the COX1 variant, believed at first to be COX3. COX3 is thought to be active predominately in the central nervous system rather than the injured tissue. This explains the lack of reduced inflammation. However, it still gives high amounts of pain relief and fever reduction properties [4].

The other theory is that paracetamol effects the endocannabinoid system. This system responds to cannabis (hence the name endocannabinoid), however this system is also responsible for mood, memory, appetite and pain sensations. In the endocannabinoid system there are special receptors that respond to pain. They are called nociceptors and they protect us by responding to potentially dangerous stimuli. For example, burns or a needle pierce. Once they have found a source of pain, they send signals to the brain to stop us from educing further harm [7].

It is common for most injuries to get hot and swollen, the body does this to protect itself from receiving further injuries. By swelling the body immobilises the joint therefore preventing more injury. The heat is a result of increased blood flow to the injury, allowing more healing immune cells to reach the source of pain. Another thing that damaged cells release is arachidonic acid. The two previously mentioned enzymes, COX1 and COX2, react with this and create prostaglandins, and other chemicals responsible for swelling, heat and pain [6]. These two enzymes are the target for NSAIDs, like aspirin and ibuprofen. Paracetamol is not a NSAID, there have been many ideas but nothing conclusive has yet been found about how paracetamol reduces pain. In 2002, scientists in the UK discovered another COX enzyme and named it COX3. COX3 is normally found in the brain and is more sensitive to paracetamol than any other drug. However, this only seemed to be true in tests with other animals [7].

Leading on from the COX enzymes, there is a theory that paracetamol works differently on the enzymes than other painkillers [6]. COX enzymes have two active sites as seen in Figure 8.

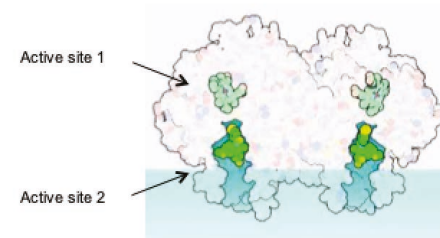


Figure 8. The simulated structure of a COX enzyme which two active sites shown by the arrows.

COX enzymes have two active sites, one which binds with arachidonic acid; the intake of aspirin or ibuprofen prevents the arachidonic acid from binding with this active site, therefore preventing pain. There is a second active site, pyrethroid site, which leads to the production of a tyrosine radical. Chemists believe that this is the active site that paracetamol may bind with, therefore preventing the body from making this tyrosine radical relieving pain [7].

Paracetamol activates two ion channels in the brain and spinal cord. These channels also respond to certain cannabinoids'; however, researchers caution that these channels can actually trigger pain instead of relieving it. Therefore, it seems odd that it would reduce pain [7].

Another study published in the European journal of Pharmacology showed by that blocking cannabinoid receptors type 1, it prevents paracetamol from leaving the enzymes in mice. Some other ideas have also been thought of such as it works with serotonin receptors [7].

Conclusion

Paracetamol is one of the most popular painkillers worldwide. It is very effective at relieving mild pain and reducing fevers, this is because of its excellent analgesic (a drug to relieve pain) and antipyretic properties. Paracetamol is known as a simple analgesic and antipyretic drug. However, there are several known side effects which rarely occur, but which can be fatal particularly in cases of overdose. The metabolic pathways for paracetamol are still under high speculation, as we are still unaware of how it reduced pain unlike ibuprofen and aspirin.

References

- [1]. Prescott, L. F. (2000). Paracetamol: past, present, and future. *American Journal of Therapeutics*, 7(2), pp. 143-147.
- [2]. The Acetaminophen Molecule - Tylenol n.d., accessed 01 March 2019, <https://www.worldofmolecules.com/drugs/tylenol.htm>
- [3]. Paracetamol n.d., accessed 01 March 2019, <https://nhs.uk/conditions/paracetamol/>
- [4]. Sharma, C. V. and Mehta, V. (2014). Paracetamol: mechanisms and updates. *Continuing Education in Anaesthesia Critical Care & Pain*, 14(4), pp. 153-158.
- [5]. The New Zealand Data Sheet n.d., accessed 01 March 2019, <https://medsafe.govt.nz/profs/Datasheet/p/paracetamolAFTinf.pdf>
- [6]. Paracetamol: does it cause asthma? n.d., accessed 01 March 2019, <https://www.nhs.uk/news/medication/paracetamol-does-it-cause-asthma/>
- [7]. Brown, T., Dronsfield, A., and Ellis, P. (2005). Pain relief: from coal tar to paracetamol. *Education in Chemistry*, [online] Available at: <https://eic.rsc.org/feature/pain-relief-from-coal-tar-to-paracetamol/2020140.article>
- [8]. The New Zealand Data Sheet n.d., accessed 01 March 2019, <https://medsafe.govt.nz/profs/Datasheet/p/paracetamolAFTinf.pdf>
- [9]. McMurry, J. E. (2007). *Organic chemistry*, 7th international ed. Brooks and Cole.

Tutor comment:

It was an absolute joy to work with A. in the Uni Pathways project on Pharmaceutical science. I was particularly impressed with her enthusiasm in science, her outstanding level of engagement with the theory knowledge, her comprehensive dissertation writing skills, and constant generosity in sharing ideas when contributing to tutorial discussions. A. would be an invaluable presence to any undergraduate programme, and I have no doubt that she will achieve something great in the future. wish her every success in the future!



Hybrid photovoltaic – Fuel cell systems for power generation

Year 10, Key Stage 4

Pupil: **B. Beaver**
School: **Co-op Academy Swinton, Manchester**
Supervised by: **C. Ogonnaya, AFHEA**
Tutor University: **The University of Manchester**
Course Title: **Combating climate change with renewable energy**

1.0 Introduction 1.1 Renewable energy

Renewable energy in mechanical engineering is “energy produced by wind, sun, and other sources that will never run out” (HarperCollins, 2018). This is important for the future due to the fact that current energy resources such as oil, and natural gas, will be fully depleted by 2042, and coal will be depleted by 2112 (Shafiee & Topal, 2008). Considering this, we must find a way to generate all of our electrical energy in entirely renewable ways, or we risk not being able to generate power at all. This essay will explore one of many potential methods for renewable energy generation, which uses photovoltaic cells, and proton exchange membrane fuel cells powered by Hydrogen from electrolysed water. The use of this system will also help decrease the release of carbon dioxide, which is a major cause of global warming via the greenhouse effect.

1.2 Climate change

Climate change is caused by the trapping of heat in the Earth’s atmosphere due to large amounts of “greenhouse gases”, including CFCs, and CO₂. This has caused the Earth’s average temperature to rise by 0.85°C since 1900, however 0.55°C of this has been since 1970 (Romm, 2018). This rise in temperature, seen since the industrial revolution, could be fatal for this planet and its inhabitants if it is not minimised. The change in heat also caused a rise in sea levels due to melting ice caps, which will flood and destroy coastal areas if it rises too much. Obviously, we need a solution, which can be found in renewable energy sources such as the Hybrid Photovoltaic — Fuel Cell System.

2.0 Description of hybrid photovoltaic — fuel cell system

The Hybrid Photovoltaic — Fuel Cell System uses photovoltaic cells along with a PEM fuel cell for constant, reliable, and clean power generation.

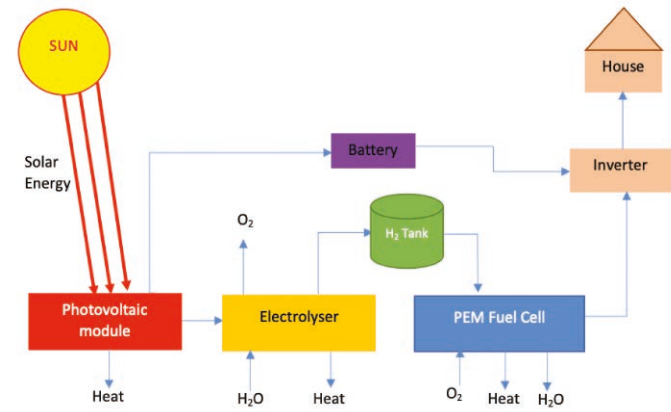


Fig 1. Block Diagram of Hybrid Photovoltaic — Fuel Cell System (Ogonnaya, 2018)

This works by using the excess power from the photovoltaic module to electrolyse water into Hydrogen, which is stored for use in a proton exchange membrane fuel cell and can be seen in figure 1.

A proton exchange membrane fuel cell splits diatomic Hydrogen into 2 ionised Hydrogen atoms at the anode, using their electrons to power electrical devices (seen in eq. 2 below). The Hydrogen nucleus (essentially just a proton) passes through the semi-permeable membrane to the cathode, where it is recombined with its electrons and oxygen into water (Nguyen & White, 1993). When used in conjunction with the Electrolyser, which splits water into its Hydrogen and Oxygen (this can be seen in eq. 1 below) components, it can supply a constant generation of electrical energy to the consumer no matter the time of day, unlike a photovoltaic cell whose voltage varies with light intensity, and only works during the daytime and not at night. This is advantageous due to the fact that heating systems and air conditioning systems require constant power, which would normally require large and costly batteries, which many people in rural locations may not be able to afford.



Many energy conversions also take place, these can be seen below in figure 2 along with the components and their efficiencies.

Component	Energy Conversion	Efficiency (%)
Photovoltaic Module	Solar to Electrical	10-15
Electrolyser	Electrical to Chemical	50-60
Battery	Electrical to Chemical	80-95
Fuel Cell	Chemical to Electrical	40-60
Inverter	Electrical (DC) to Electrical (AC)	80-90
Hydrogen Tank	Chemical to Chemical (Storage)	90-98

Table 1: Components and their efficiencies (Ogonnaya, 2018)

3.0 Merits and demerits

3.1 Merits of the hybrid photovoltaic – fuel cell system

The Hybrid Photovoltaic – Fuel Cell System has a large number of merits, which will be discussed in detail in this essay. The advantages of this system far outnumber its shortcomings.

Firstly, the Hybrid Photovoltaic – Fuel Cell System emits no products that are harmful to the environment (it only discharges Water, or H₂O and Oxygen, or O₂), which means the generation system is considered to have zero emissions. This also means that it helps in reducing Carbon Dioxide (CO₂) levels in the atmosphere, and therefore reducing Global Heating and Climate Change (Ogonnaya, 2018).

Secondly, it is powered exclusively by solar radiation, which is the prime mover, and is abundant across the entire globe, even in rural areas where there is no connection to the national grid or other energy transmission systems. This is very advantageous in low income developing countries and newly industrialised countries, where widespread power generation is extremely lacking compared to high income developing countries and highly industrialised countries. This also helps to reduce poverty in the areas where it is installed, as the only cost is maintenance of the system,

providing jobs, and also aids in areas such as Sub Saharan Africa, where water supplies are often lacking, as the system produces only water., the system is completely noiseless when operating, meaning that when operating the system, you will not disturb your neighbours and your own sleep. This is advantageous as your relationship with your neighbours will be a positive one due to the lack of disruptions to the both of you. Not only will you have a happier life due to having good relationships with people, you will also help reduce climate change and global heating as the system has zero emissions, which benefits the whole earth, as well as the impact on the community.

It helps combat climate change and global warming due to its renewability, sustainability, and zero emissions. This is positive for the entire planet for many generations, as your children and their children will have a planet to live on that is not polluted, and has good relationships between groups of people. Not only will it benefit you, but everyone on the planet, for years and years to come.

3.2 Demerits of the hybrid photovoltaic – fuel cell system

This system does, however, have a few small and relatively insignificant drawbacks, especially compared to the large amount of advantages the system has to offer. Also, a lot of these issues will be reduced with time and innovation.

One of these issues is the low efficiency of the photovoltaic module and proton exchange membrane fuel cell, which causes a low power output to the consumer when compared to modern fossil fuel based energy generation systems. For example, if we use the numbers from figure 2 (above), along with the general formula for efficiency, we can calculate the limits for the efficiency as follows:

$$\eta_{\text{overall}} = \eta_{\text{pv}} * \eta_{\text{electrolyser}} * \eta_{\text{battery}} * \eta_{\text{fuel cell}} * \eta_{\text{inverter}} * \eta_{\text{H2 tank}}$$

Upper Limit – $0.15 * 0.6 * 0.95 * 0.6 * 0.9 * 0.98 = 0.045247 = 4.5247\%$
Lower Limit – $0.1 * 0.5 * 0.8 * 0.4 * 0.8 * 0.9 = 0.01152 = 1.152\%$

As you can see, these two efficiencies are many times smaller than current fossil fuel or nuclear powered energy generation methods can achieve. In 2017, the average efficiency of a combined cycle gas turbine station was 48.7%, the average efficiency of a coal fired station was 34.9%, and the average efficiency of a nuclear powered station was 40.0% (BEIS (HM Government), 2018). If we find the average efficiency of all of these stations, which is 41.2%, we can see that even the most optimised components would have an efficiency which is almost ten times lower than what we currently get from the burning of fossil fuels or nuclear fission powered generation. This is an issue with renewables as a whole, as they are new technology and are still being developed. However, these methods of generation are being improved constantly, and by the time the system is in widespread use across the globe, the efficiency will be increased to more acceptable standards in line with traditional generation stations, improving cost to the consumer and reducing worldwide poverty.

Secondly, the system is currently costly to initially build due to the high manufacturing costs of photovoltaic cells and fuel cells, as they are not mass manufactured as there is a low demand. Again, as the system becomes widespread, these issues will be reduced as the components of the Hybrid Photovoltaic – Fuel Cell System become mass manufactured with better manufacturing methods and reduced costs. This benefits everyone, as the global economy will improve with global access to cheap electricity, and again added job production with higher requirements in manufacturing.

Another problem is the lack of solar radiation due to solar energy, which means for half of the day the system relies on battery power and the proton exchange membrane fuel cell for all of the generation. If energy use is too high during the night, then the system could stop functioning due to a lack of Hydrogen. This will be reduced, however, when the efficiency of the proton exchange membrane fuel cell is increased, or a new technology is discovered, which happens all of the time in mechanical engineering.

Finally, some of the parts in the fuel cell are not durable, such as the proton exchange membrane, which drives up cost. However, with new innovations in manufacturing technique the cost of these membranes could be decreased while the durability increases. Again, this is a problem that time will solve.

4.0 Summary

In summary, this innovative system that is being developed has an intrinsic worth to the planet and is extremely practical for the future. With increasing innovations in mechanical engineering and constantly decreasing cost, this system will surely be in widespread use in the future. Its benefits to the environment and Earth as a whole, as well as the local ecosystem, are irrefutable, including its complete lack of harmful emissions and its contribution to the reduction of global heating and climate change.

Another indirect advantage is the increase in economy of developing populations and regions with job production for maintenance of the components of the system, and the educational training in STEM areas also helping to boost the economy and further drive innovation in engineering to reduce costs in manufacturing and optimisation of the system’s components, thus revealing it to be an extremely beneficial form of energy production on many levels.

References

BEIS (HM Government), 2018. Digest of United Kingdom Energy Statistics (DUKES) 2018: dataset. [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/736142/DUKES_2018_dataset.xls [Accessed 16 December 2018].
HarperCollins, 2018. Renewable Energy Definition and Meaning | Collins Online Dictionary. [Online] Available at: <https://www.collinsdictionary.com/dictionary/english/renewable-energy> [Accessed 13 December 2018].
Nguyen, T. V. & White, R. E., 1993. A Water and Heat Management Model for ProtonExchange-Membrane. Journal of the Electrochemical Society, pp. 2178-2186.
Ogonnaya, C., 2018. Combating Climate Change through Renewable Energy. London: The Brilliant Club.
Romm, J., 2018. Climate Change: What Everyone Needs to Know., 2nd ed. Oxford: Oxford University Press.
Shafiee, S. & Topal, E., 2008. When will fossil fuel reserves be diminished?. [Online] Available at: <https://doi.org/10.1016/j.enpol.2008.08.016> [Accessed 13 December 2018].

Tutor comment:

B.'s article is well articulated and outstanding. He learned so quickly that the quality of his work would still be rated excellent at undergraduate level. He also contributed in class work and supported his peers to understand the activities during team-based exercises. I am truly happy to have worked with B. I wish him the very best in his future studies and career.



How can 3D printing be used to replicate human tissue?

Year 10, Key Stage 4

Pupil: E. Daniel

School: Steyning Grammar School, West Sussex

Supervised by: E. Hodder

Tutor University: University of Brighton

Course Title: Can we 3D print human body parts?

The purpose of this paper is to explore the process of ossification and the development of the three-dimensional (3D) printing of prosthetics, whilst focussing on the particular field of 3D printing of bone and its cells. This field of research is becoming increasingly vital to human survival rates due to the high incidences of cancer within the population (Jones, 2019), which is creating an impetus to develop the technology to be able to 3D print tissues.

Bone is one of the two primary supporting connective tissues in the human body, the other being cartilage. One of the key functions of bone is to provide structure to the body and to protect soft tissues, such as tendons, ligaments, muscles, and nerves. Because of the collagen fibres within bone tissue's extracellular matrix (ECM), bone is impervious to being bent, compressed or stretched and can resist tensile stress (Paxton, 2019). The ECM of bone is secreted by osteoblasts. These cells line the surface of bone and develop from osteoprogenitor cells (the proclaimed 'stem cells' of bone) (Paxton, 2019). The matrix deposited by osteoblasts soon becomes calcified and traps osteoblasts in the organic matrix, where they gradually become osteocytes (cells that maintain bone tissue) (Paxton, 2019). Bone is a hard tissue due to the process of calcification, which is the accumulation of calcium salts in a body tissue and is, therefore, able to withstand immense pressure.

Naturally, ossification (the formation of bone) occurs in two ways: intramembranous ossification and endochondral ossification (Paxton, 2019). Both intramembranous and endochondral ossification start with the formation of mesenchymal condensations. During endochondral ossification, these 'condensations' form a cartilage matrix, whereas, during intramembranous ossification, the mesenchymal condensations differentiate directly into osteoblasts (Provot and Kronenberg, 2013). Intramembranous ossification is where a bone is formed by the direct replacement of mesenchyme, which is a somewhat organised embryonic tissue that can

ultimately develop into skeletal and connective tissues. This process is involved in the formation of the flat bones of the skull, the mandible and the clavicle (Douglas, 2011). Endochondral ossification is where cartilage is systematically replaced by bone to form the growing skeleton (Douglas, 2011). This action is the mechanism responsible for the formation of all long bones of the axial skeleton, for example, vertebrae and ribs, and the appendicular skeleton, such as limbs (Maes and Kronenburg, 2016). However, although bone has an inherent capacity for regeneration and repair, in some cases, it is necessary to artificially replace bone.

For example, presently, a major Australian research project is working to radically advance the way physicians surgically treat bone tumours. This research involves the use of 3D implants and robotic surgery to remove the tumour and print a replica of the missing bone. In this work, specialised imaging is used to scan the bone and plan the surgery. The acquired dimensional data from the scan is then interpreted to guide robotic-assisted surgery and remove the tumour. Following this operation, another scan is performed on the removed diseased bone in order to 3D print an implant to precisely fit the space left vacant in the bone (Giggacher, 2017). This protocol of 3D printing for bone repair is proving to be a revolutionary, with evidence suggesting incidences of reduced reliance on limb amputation and thus is effectively decreasing the long-term impacts of bone cancer (Giggacher, 2017). The success of this research will greatly benefit society due to the increased likelihood of contracting cancer within the population (from one in three chance to one in two (Jones, 2019)). This has been attributed to the increase in life expectancy (having increased by approximately 6 years since the year 2000), which has resulted in an ageing population and therefore a larger number of people being susceptible to the disease (Jones, 2019).

The process of printing structures such as bone can be a time consuming task due to the complex procedure for printing live cells. Firstly, the cells need to be printed under compatible conditions for live cells. However, for standard additive manufacturing methods, such as Fused Filament Fabrication (FFF), the printing process relies on using plastic filaments and high melting temperatures which would be unsuitable for the cells. Therefore, whilst printing with cells, one should endeavour to use printers designed for cell inclusion such as the Bioscaffolder 3.1. (Gesim, Germany). This 3D printer model is an example of a bioprinter, of which the first one was created in 2003 by Thomas Boland (Boland and Wilson, 2003).

In order for the cells to be printed, they must first be isolated and grown to a high cell density. This is done by the process of isolating individual living cells from a tissue for the generation of 'primary cell cultures.' Next, a bioink paste is prepared and the cells are collected via centrifugation (a separation process which implements the action of centripetal forces to promote accelerated settling of particles in a solid-liquid mixture) and counted using a haemocytometer to discern the cell number to be added per gram of material. The cells are subsequently re-suspended in growth medium (a substance designed

to support the growth of micro-organisms). There are many growth medium supplements which can be employed during cell culture, such as vascular endothelial growth factor (VEGF), fibroblast growth factors (FGFs) and bone morphogenic proteins (BMPs), which are important in bone tissue engineering. VEGF is an angiogenic protein which regulates endothelial cell proliferation. Angiogenesis is the formation of new blood vessels, a process which involves the migration, growth and differentiation of endothelial cells that line the inner wall of blood vessels (NCI, 2018). Whereas, FGFs are a group of proteins essential for the FGF signalling pathway that provokes angiogenesis through endothelial and osteoblast cell proliferation (Bilezikian, 2008). BMPs, however, induce ossification through osteoprogenitors and mesenchymal stem cell (MSC) differentiation to osteoblasts or via binding to collagen (Tarafder, 2012), (Phillippi, 2008), (Bose, Vahabzadeh and Bandyopadhyay, 2013).

Once the cells in the solution have been counted, a defined volume of the cell mixture is pipetted into the pre-prepared bioink paste, often a hydrogel, to be loaded into a cartridge with a plunger placed on top and a tip (with a determined internal diameter) tightened to the bottom. The cartridge containing the material and cells is then loaded into the 3D printer and attached to a gas line (often nitrogen due to its near inert state and its high abundance, which renders it less expensive than other applicable gases - like noble gases). Once ready, the gas will exert pressure and slowly force the hydrogel out through the tip. After attaching the gas line, a digital file is generated by the software or a file is uploaded. The printer's software interface has many print parameters that can be adjusted to the user's preference. For example, the amount of pressure exerted onto each cartridge, the height of the structure and the size of the pores/distance of strands of the material scaffold. The pores are essential for cell growth, and nutrient and oxygen delivery. However, low mechanical strength is a major challenge in porous scaffolds (Bose, Vahabzadeh and Bandyopadhyay, 2013). The effects of which can be combatted by decreasing the pore size and volume.

An alternative example to tackle the known porosity related strength issue was evidenced by Tarafder et al. who used an effective densification approach achieved using microwave sintering (sintering is when the density of a material is increased by melting, which forms bridges between particles (collinsdictionary.com) compared to conventional heating. The effects of this sintering approach demonstrated an improvement to the mechanical properties of 3D-printed TCP (tricalcium phosphate) scaffolds (Tarafder, 2012). However, sintering cannot be achieved on cell-laden scaffolds without damage to cells due to the high temperatures required to form the bridges between particles. Researchers have also encountered another problem concerning getting sufficient oxygen to cells within 3D scaffolds, to produce clinically applicable tissues and organs. One potential strategy that has been investigated to overcome this limitation was to use an oxygen releasing scaffold (Kim et al., 2019). Currently, this method is proving to be highly successful and compatible with the surrounding cells, as

it is prolonging the survival of the cells within the scaffold. This procedure works by preparing hollow microparticles that are loaded with an emulsion of an oxygen carrier known as perfluorooctane for the timely supply of oxygen to surrounding cells (Kim et al., 2019).

After tweaking the scaffold design using the software interface, the printing starts and, layer by layer, a structure is printed. Immediately following the print process, the deposited bioink is commonly cross-linked. Crosslinking is a treatment used to set and harden materials. Crosslinking can be performed via a variety of methods including the use of a change to temperature or pH or via the addition of ionic compounds, the process used is dependent on the material type. Usually, hydrogel materials are used for cell printing because they are biodegradable, injectable, and printable. Additionally, the water content of hydrogels mimics that of the natural extracellular matrix (bone's extracellular matrix is 25% water (Paxton, 2019)). Hydrogels are water-swollen polymeric materials that can be synthetic or natural. The problem with using naturally sourced hydrogels from animals, such as collagen, is that the body may reject the materials due to immune rejection.

Immunerejection can cause many problems in biomaterial implantation. Rejection occurs when the new material triggers the host's immune system, and subsequently causes a mass infiltration of lymphocytes (white blood cells), called the foreign body reaction. This response can cause fibrosis and is where connective tissue thickens and encapsulates the implant, rendering it unreachable for blood supply and nutrient exchange. However, a negative immune response can be combatted by the careful selection of biomaterials as well as the use of a patient's cells within the scaffolds to limit the chance of rejection. For example, CaP ceramics (calcium phosphate ceramics) are widely used in bone tissue engineering due to their excellent compatibility as well as bioactivity (the effect of an agent on a living tissue or organism), osteoconductivity (the ability to grow 'bony tissue' into the structure of an implant or graft (medical-dictionary.thefreedictionary.com) and similarity in composition to bone (Bose, Vahabzadeh and Bandyopadhyay, 2013).

In summary, because of the steadily increasing population risk of contracting cancer, the development of 3D printing bone and other tissues is progressively becoming an issue of importance for human survival and continued health into old age. However, despite the necessity for the success of 3D printed tissues and organs, many challenges within this field remain to be overcome. Such is highlighted in the quotation by Dr Anthony Atala, a professor and director for the Wake Forest Institute of Regenerative Medicine, who stated that "One of the biggest challenges in bioprinting so far has been getting printed tissue to survive long enough to form blood vessels and nerves and otherwise fully integrate with the body in which it is implanted". Whilst there is evidence to indicate that a solution to the problems highlighted within this paper are nearing a conclusion, it is clear that challenges remain. Despite this, the issues that have arisen within 3D printing body parts thus far should not undermine the continuing success that these studies have demonstrated.

References

Bleizkian J.P. Principles of Bone Biology, Elsevier Inc. (2008), p. 3
Boland,T, Cris.W, Wilson,JR, Cell and Organ Printing 1: Protein and Cell Printers (2003), The anatomical record part A, Department of Bioengineering, Clemson University, Clemson, South Carolina, 272: 2, p. 491-496
Bose,S, Vahabzadeh,S, Bandyopadhyay,A, Bone tissue engineering using 3D printing, <https://www.sciencedirect.com/science/article/pii/S136970211300401X> (December 2013) [02/03/2019]
Collins Dictionary <https://www.collinsdictionary.com/dictionary/english/sintering> [03/03/2019]
Douglas,J, in Diagnosis and Management of Lameness in the Horse (Second Edition), 2011
Endochondral Ossification, Pathogenesis of Osteochondrosis [02/03/2019]
Ho Yong Kim, So Young Kim, Hye-Young Lee, Jin Ho Lee, Gyu-Jin Rho, Hyeon-Jeong Lee, Hee-Chun Lee, June-Ho Byun, and Se Heang Oh, Oxygen-Releasing Microparticles for Cell Survival and Differentiation Ability under Hypoxia for Effective Bone Regeneration, Biomacromolecules 2019 20 (2), p.1087-1097
Giggocher,J, Australian Government, RMIT University in Melbourne, the University Of Technology Sydney (UTS), St Vincent's Hospital Melbourne, Stryker, Just-in-time 3D implants set to transform tumour surgery, <https://www.rmit.edu.au/news/all-news/2017/oct/just-in-time-3d-implants-set-to-transform-tumour-surgery-30/10/2017> [02/03/2019]
Jones,G, <https://scienceblog.cancerresearchuk.org/20Jones,2019/02/04/why-are-cancer-rates-increasing/> [03/03/2019]
Maes,C, Kronenberg,H, in Endocrinology: Adult and Pediatric (Seventh Edition), 2016 Endochondral Ossification, Volume I
Medical dictionary, Osteoconduction, Gale Encyclopaedia of Medicine, (2008), <https://medical-dictionary.thefreedictionary.com/osteoconduction>, [22/03/2019]
National cancer institute (NCI), <https://www.cancer.gov/about-cancer/treatment/types/immunotherapy/angiogenesis-inhibitors-fact-sheet> [02/04/2018] [03/03/2019]
Paxton,S, The Histology Guide, Cartilage, Bone and Ossification: Bone, <https://www.histology.leeds.ac.uk/bone/bone.php> [27/02/19]
Paxton,S, Histology Guide © Faculty of Biological Sciences, University of Leeds, Bone: Types of cell found in bone, https://www.histology.leeds.ac.uk/bone/bone_cell_types.php [27/02/2019]
Philippi,L,A, Stem Cells, 26 (2008), p.127-13
Provot,S, Kronenberg,H, in Osteoporosis (Fourth Edition), 2013 Intramembranous Bone Formation, Development of the Skeleton [02/03/2019]
Tarafder,S, et al., J. Tissue Eng. Regen. Med., 7 (2012), p. 631-641

the ability to execute five-hundred individual functions³. The liver carries up to 10% of a human being's blood volume at any given time, bringing the average adult liver to a weight of around 1.4kgs, thus making the liver the largest internal organ within the human body³⁻⁴.

The liver is well-known for detoxifying drugs, alcohol, and other harmful substances from the gut as well as controlling blood sugar levels³. Nutrient-rich blood cells are transported from the heart and intestine to the liver to deliver carbohydrates, fats and vitamins that help the liver to produce blood plasma proteins, cholesterol and vitamin D that are essential for daily bodily function⁴. Any old or spent blood cells are eliminated by the liver in order to store vitamin A and produce bile – a digestive fluid stored in the gallbladder³.

The liver also produces multiple hormones as well as coagulation factors that control blood thickness in order to reduce blood clotting which may lead to cardiac arrest or a cerebrovascular accident³⁻⁵.

With the liver playing such an important role in the daily maintenance of the human body, it is crucial that we find out how to preserve it in order to live a healthy life. The aim of this study is to discover a viable cell therapy for CLD that will suit the current needs of the National Health Service (NHS) and its patients.

Breakdown of the hepatic lobule

The liver is made up of four lobes; the right lobe, left lobe, Quadrate lobe, and the Caudate lobe⁶. These sectors are made up of thousands of small lobules that are key in the liver's operation. Hepatic lobules are made up of: Hepatocytes - which are the main cells in bile production⁷; Endothelial cells - which act as a barrier between the blood and the rest of the body's tissue⁸; Kupffer cells - also known as resident macrophages of the liver; and Hepatic Stellate Cells (HSCs) - where the liver stores vitamin A.

The combination of all these cells and the roles they undergo demonstrate the significance of the liver's daily operation within the human body.

Chronic liver disease & immune response

CLD arises as a result of repeated damage to the liver which triggers the inflammation process of the immune system. The most common causes of liver damage include; toxin abuse (e.g. alcohol or drugs), excessive fat intake – which may lead to the development of various other health problems such as diabetes, high blood pressure, and kidney disease⁹ –,genetic diseases, biological agents (such as hepatitis B), and physical trauma¹⁰. Repeated exposure to these eventually leads to the liver becoming unable to regenerate as efficiently, leaving signs of fibrosis - a deposition of scar tissue in place of dead hepatocytes and around nearby blood vessels⁹⁻¹¹.

The latest stage of CLD is called cirrhosis, this is the process in which fibrosis is too widespread to revert, increasing the chances of tumours and/ or hepatic cancer.

Inflammation

When damage is discovered in the liver, the human body establishes a localised defensive response called inflammation¹¹. Inflammation can be identified when a damaged area begins to swell and rise in temperature, as well as releasing cellular fluid in order to kill heat sensitive bacteria or viruses¹²⁻¹³.

Inflammation is measured through biopsies, imaging techniques, and blood tests, and can also be characterised by symptoms such as; reddening and/ or loss of function of the affected area¹³.

Blood tests to measure alanine aminotransferase (ALT) and aspartate aminotransferase (AST) enzyme levels within the damaged liver indicate whether or not a liver is damaged. These tests may also reveal indications of muscle damage located elsewhere within the body¹⁴

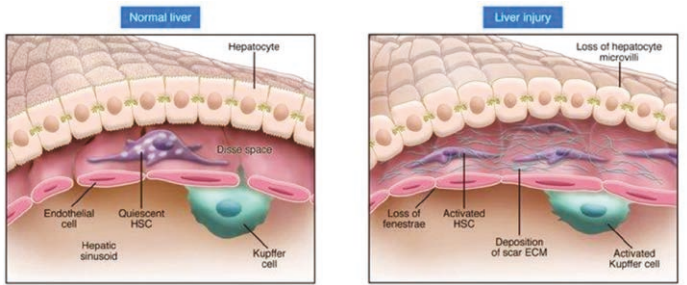


Figure 1: Cellular changes among chronic liver inflammation – The following diagram of the liver lobule presents the activation of resident Kupffer cells as a result of hepatocyte damage, releasing factors that send quiescent HSCs into an activated state in order to release vitamin A and provoke fibrotic tissue production. The presence of fibrotic tissue leads to loss of endothelial fenestrae and microvilli in hepatocytes. This change in cell structure may induce loss of organ function. Image source: Iredale J.P., J Clin Invest. 2007;117(3):539-548.Yin, C., 2015. Yin Lab - Hepatic Stellate Cells.

Inflammation holds a vital role in the resolution of CLD as it is an early sign of fibrosis. Chronic liver damage can be identified through biopsies as liver tissue may show several signs of this process, helping doctors to assist in the recovery of CLD patients during the early stages. (Figure 1)

Macrophages

Haematopoietic immune cells of the body called macrophages are a key component in the resolution of liver damage (Figure 2).

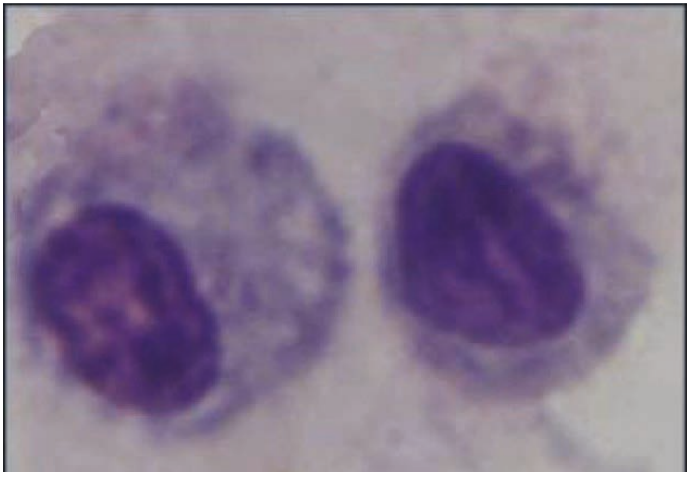


Figure 2: Alveolar macrophages stained with Wright-Giemsa. [Image source: Saldana J.I. – 2009 – Macrophages (British Society for immunology)– Figure 1 [Online]]

Infiltrating macrophages mature from circulating monocytes and hold the function to change their cellular properties according to their exposed environment¹⁵⁻¹⁶. Their role is to **migrate** to the affected area, **phagocytose** (eat and decompose) any dead cells and bacteria within an organ, and **secrete** (reproduce and discharge) cytokines and growth factors which assist hepatocyte proliferation.

Once infiltrating macrophages phagocytose dead cells, they are adjusted to a pro-restorative state in order to promote cell healing.

Kupffer cells – also known as resident macrophages of the liver - are relatively immobile compared to infiltrating macrophages¹⁷. They phagocytose microorganisms, cellular debris and other harmful bacteria that may translocate from the blood and gut to the liver where they may cause sepsis – a potentially life-threatening condition¹⁷⁻¹⁸.

Cellular communication in the resolution of liver injury

Once infiltrating macrophages phagocytose dead tissue, it is digested into tiny pieces and translocated on molecules to the macrophage surface where they can be recognised by lymphocytes such as B and T cells¹⁸.

T cells assist infiltrating macrophages to kill bacteria and viruses, whereas B cells help to produce antibodies in order to neutralise them¹⁸⁻¹⁹. For the liver lobule to return to a healthy condition, activated HSCs must either encounter cell death or revert to a quiescent state as hepatocytes proliferate to substitute for the dead cell(s).

If macrophages were alone in the resolution process, not much would get done. It is the communication between cells that make the process possible. Monocytes, B & T cells, hepatocytes, and HSCs all communicate well with macrophages in order for them to do their job and execute the repair of damaged tissue. (Figure 3)

Implanting more of these extremely intellectual cells into a chronically damaged liver could possibly speed up the resolution process and aid reversal of liver damage, leaving the implantation of infiltrating macrophages as a viable cell therapy for CLD²⁰⁻²¹.

However, disadvantages of this procedure may include; a lack of healthy hepatocytes in the diseased liver, leaving it unable to regenerate, circulating monocytes entering

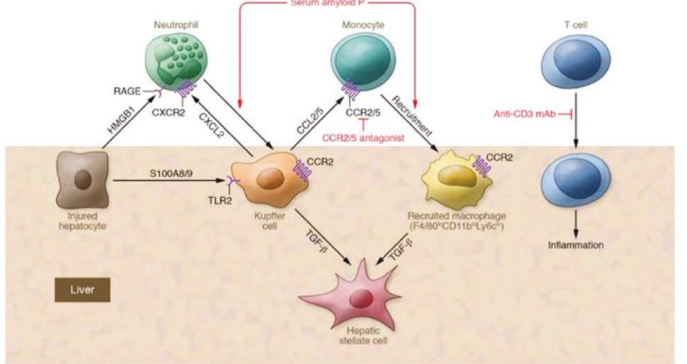


Figure 3: Cellular communication in the resolution of liver injury [Image source: Koyama Y., Brenner D.A. – 2017 – Liver inflammation and fibrosis – Figure 2]

Therapeutic implantations for the resolution of liver injury

Current research into viable cell therapies for chronic liver damage is based on autologous/allogeneic cell transplantation or bioartificial support systems in order to reverse liver damage. These therapies may also be used to maintain the liver whilst a patient is waiting for a suitable OLT²².

Primary Hepatocyte Transplantation

Studies taken out on clinical models have shown that replacing dead hepatocytes with healthy reengineered hepatocytes using a direct implantation procedure via the splenic or portal veins have shown encouraging results of liver regeneration²²⁻²³.

The implantation of bioartificial hepatocytes may show promising results as; it is easier for macrophages to focus on regenerating other dead cells, speeding up the resolution process. Unfortunately, this therapy has shown several downsides too such as; hepatocytes lacking the ability to migrate to the damaged area, leaving a high margin for human error, and bleeding of the portal vein during percutaneous infusion of these cells²⁴; a high demand for expensive biomaterials to transport these cells, and hepatocytes losing the ability to proliferate after alteration and encountering cell death shortly after infusion²⁵ Therefore, the risks may outweigh the few benefits of this treatment.

Hepatic Organoid Implantation

Recent research has led to the possible implanting of stem-cell derived bioengineered minilivers called organoids. Organoids are developed through the allogeneic biopsy of a healthy liver lobule. Stem cells are extracted via the bile ducts of the lobule where they are grown using the organoid culture method²⁶. The organoid is then injected into the hepatic bloodstream where its progenitor-like properties induce hepatocyte growth and reduce liver damage²⁶⁻²⁷. Although hepatic organoids have shown very promising results on rodent models, slow production speed limits this procedure to rodent models for the time being, and due to this new procedure being rather invasive, it can only be performed once within a human's lifespan²⁷⁻²⁸. (For more information on the pros and cons of organoid technology, see Table 1)

Application	Pros	Cons
Fundamental research	Studies in <ul style="list-style-type: none">Stem cell biologyCell-cell interactionCell-ECM interaction studies (in coculture)	Studies in cell biology of fully mature hepatocytes or cholangiocytes, because of the low differentiation potential.
Disease modeling	<ul style="list-style-type: none">Cell banking possibilityPatient-derived cells with low invasive techniques	Disease models with fully mature epithelial cells will require improved organoid differentiation.
Precision and personalized medicine	<ul style="list-style-type: none">Patient-specific cell culture systemsPotential for genome editing	Selective procedures for corrected clones are needed.
Drug screening and toxicology	<ul style="list-style-type: none">Suitable for long-term testing	Mature hepatocytes require improved differentiation methods.
Transplantation	<ul style="list-style-type: none">No risk for teratomaPotential for gene correction and autologous transplantation	<ul style="list-style-type: none">Low differentiation potentialNew protein expression upon gene correction requiring immunosuppression

Abbreviation: ECM, extracellular matrix.

Table 1: Pros and cons of organoid technology
[Table source: Nantasanti S. et al – 2015 – Concise Review: Organoids Are a Powerful Tool for the Study of Liver Disease and Personalized Treatment Design in Humans and Animals]

Human Monocyte Derived Macrophage Transplantation

In 2015, several scientists at the University of Edinburgh executed murine experiments in order to investigate the possible use of Human Monocyte-Derived Macrophages (HMDMs) as cell therapy for alcoholic/ drug-induced liver cirrhosis²⁹. Human monocytes from a healthy donor were isolated and matured into macrophages over a seven-day period using a Good Manufacturing Practice-compatible technique and were signalled as fully developed macrophages once there was an absence of monocyte markers and a presence of macrophage markers³⁰. HMDMs were then infused in mice models of toxin-induced liver fibrosis²⁹. Results of the experiment show markers of a significant increase in liver regeneration from fibrosis measured with Sirius red staining of the collagen³⁰. Implanting healthy HMDMs into clinical models of CLD has shown reduced markers of fibrosis and an increase in liver regeneration. These factors may contribute to the recovery of patients suffering from the effects of toxin-induced cirrhosis as the mice models mentioned show similar biological properties to human beings, once again indicating that HMDM implantation is a viable cell therapy for CLD. With bioartificial support devices being a foreign substance to the human body, immunosuppression is necessary in order to prevent immune cells from attacking the transplanted cells³¹. However, immunosuppression also comes with a high risk of infection and malignancy, which may worsen liver damage³².

Concluding remarks

The aim of this study was to discover a viable cell therapy for CLD that will suit the current needs of the NHS and its patients. It is key to have an ethical understanding of the normal functions of the liver, and how its specialised cells are involved in the reversal of liver damage in order to develop an effective cell therapy for chronic liver fibrosis. Cell therapy holds a dual function within the resolution of chronic liver damage. It can be used to stimulate the regenerationof damaged cells, preventing disease progression and thus preventing the need for organ transplantation.

In some cases, cell therapy can also be used as a pathway to OLT by maintaining the liver until a suitable organ donation is made available²². Whilst the implantation of primary hepatocytes and hepatic organoids show signs of reduced fibrosis, they are both unable to migrate to the afflicted area of the liver, thus more precision is necessary in order to transport these cells to the liver, leaving patients vulnerable to human error and bleeding of the portal vein during the percutaneous cell infusion²⁴. Hepatic organoids may be promising in the future, but the slow speed at which they grow limits this treatment to rodent models for the time being²⁷.

Circulating monocyte-derived macrophages possess the ability to migrate to the damaged area, thus making the translocation of cells easier and cheaper for medical practitioners to administer³³, and safer for recipients of this treatment. The transplantation of circulating monocyte-derived macrophages would make a viable cell therapy for CLD as it is; faster, more efficient, and cost-effective compared to other experimental treatments.

The next stage of this research would be to enter a clinical phase in order to identify the risks and precautions required in order to begin the first series of clinical trials on human beings. If successful, then this treatment may be able to move on to commercial use, potentially improving the quality of the life for many patients suffering from the adverse effects of CLD.

Bibliography

1 Campana L. – 2018 – Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
2 NHS Blood and Transplant – 2016 – Annual report on liver transplantation – Executive Summary
3 Campana L. -2018- Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde – 4 Bryce E. – 2014 – What does the liver do? [TEdEd Video Lesson] [Online]
5 U.S. Department of Health and Human Services - National Heart, Lung and Blood Institute – 2018 Treatment – Goals of Treatment [Online]
6 Hansen J.T. – 2014 – Netter's Anatomy Coloring Book, 2nd Edition – Chapter 8, Plate 8-9
7 Innerbody – 2013 – Liver – Anatomy and Function of the Human Liver - Lobules [Online]
8 Lanza – 2017 – Endothelial Cells and Functions – Functions of Endothelial Cells [Online]
9 NHS – 2018 – Non-alcoholic fatty liver disease (NAFLD) [Online]
10 Campana L. - 2018- Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
11 Campana L. - 2018- Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
12 Bryce E. – 2018 – How does your immune system work? [TEdEd Video Lesson] [Online]
13 Campana L. - 2018 - Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
14 British Liver Trust – 2007 – Liver Function Tests [Online]
15 Campana L. - 2018 - Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
16 Ramachandran P., Iredale J.P. – 2012 – Liver Fibrosis: a bidirectional model of fibrogenesis and resolution –
17 Campana L. – Message to Bryan Formosa – 22:02 GMT, 19 November 2018 – Brightside Mentoring VLE
18 Campana L. - 2018- Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
19 FuseSchool – Global Education – 2018 – What are Antibodies | Biology for All | FuseSchool
20 Campana L. - 2018 - Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
21 Jung Y. K., Yim H.J. – 2018 – Reversal of liver cirrhosis: current evidence and expectations. –
EXPERIMENTAL EVIDENCE OF THE REGRESSION OF FIBROSIS
22 Nicolas C. et al – 2017 – Cell therapy in Chronic Liver Disease - Key Points
23 Nicolas C. et al – 2017 – Cell therapy in Chronic Liver Disease – Cell Therapy
24 Soltys A.K. et al – 2010 – Barriers to the successful treatment of liver disease by hepatocyte transplantation –
Box 1 Key Messages
25 Kim Y., Uygun B.E. – 2014 – Regenerative medicine applications in organ transplantation – Liver regeneration
26 Hubrecht Institute – 2015 – Clevers group: Lever organoids [YouTube Video] [Online]
27 Campana L. – Message to Bryan Formosa – 23:20 GMT, 02 December 2018 – Brightside Mentoring VLE
28 Campana L. – Message to Bryan Formosa – 17:01 GMT, 27 December 2018 – Brightside Mentoring VLE
29 Moore J.K. et al – 2015 – Cytotherapy – Phenotypic and functional characterization of macrophages with therapeutic potential generated from human cirrhotic monocytes in a cohort study – Abstract –
30 Moore J.K. et al – 2015 – Cytotherapy – Phenotypic and functional characterization of macrophages with therapeutic potential generated from human cirrhotic monocytes in a cohort study – Results –
31 Campana L. – 2018 – Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde
32 Dhaliwal R. – 2014 – Organ transplantation heart & lung transplant – Complications of immunosuppression
33 Campana L. – 2018 – Inflammation and liver disease: the strange case of Dr Jekyll and Mr Hyde

Tutor comment:
I have thoroughly enjoyed my time at Cardinal Newman High School. The pupils were incredibly engaged with the course and eager to learn. B. has shown an outstanding proactive attitude since the beginning of the course: he contributed to the group discussion regularly, in a positive and respectful manner. His passion for the English language was evident in every homework assigned: his command of the grammar and his ability to master the required technical language were second to none. B. also provided the group discussion with insightful comments, which are credit to his well-developed critical thinking skills. B. performed to an excellent standard at A-level, and he will surely be able to enrich any undergraduate programme in the future.



How will a Circular Economy and Bioeconomics contribute towards the sustainability of society?

Year 10, Key Stage 4

Pupil: **E. Sinclair**
School: **Haverfordwest VC High School, Pembrokeshire**
Supervised by: **A. Hindle**
Tutor University: **Aberystwyth University**
Course Title: **Interdependence: Nurturing nature so nature can nurture us**

Introduction

Creating a circular economy and using biotechnology will help society become more sustainable. It will reduce waste and help us use natural resources more effectively. By further integrating natural resources into the economy and using them in new and creative ways, such as in biotechnology, we can strive towards a circular economy which produces little waste [1]. Fundamentally, to improve sustainability we ought to consider how ecosystems work and implement an economic model based on the way ecosystems function [2].

Circular economy

A circular economy is a different economic model from the linear economy which society operates on currently. A linear economy consists of using natural resources in production, using products and then discarding them, whereas a circular economy maximises use of products and recycles those that become obsolete. The diagram below shows the difference between the two economic models.



Fig. 1: Linear Economy and Circular Economy [3]

The circular economy places emphasis on reducing consumption, reusing products and recycling as much as possible. It also focusses on the Triple Bottom Line approach to sustainability.

Implementing a circular economy will help minimise waste, as everything is reused or recycled. In an ecosystem, all elements are constantly being reused, as nothing is truly wasted. In a circular economy, the reuse of waste is an essential principle. One way of reusing waste is industrial symbiosis. Industrial symbiosis involves the utilization of waste from one company or sector in another company

or sector. This enables companies to use resources effectively as, instead of exploiting new resources, they reuse waste. The first functioning example of industrial symbiosis is the Kalundborg Symbiosis, in Denmark, which initially began reusing waste water in a symbiotic way [4]. This industrial symbiosis in the Kalundborg Symbiosis has resulted in bottom line savings of 24 million euros and annual savings of 635000 tons of carbon dioxide demonstrating the benefits of employing aspects of a circular economy [5]. By reducing the carbon dioxide produced by the global population, we could mitigate global warming as carbon dioxide contributes hugely towards it [6]. Climate change will have huge ramifications for future generations, depriving them of land and resources as sea levels continue to rise, amongst other things [7]. This goes against the Brundtland Commission's definition of sustainability, which defines sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [8].

Nevertheless, industrial symbiosis would have serious legal implications as a lot of waste is toxic, dangerous, or requires careful disposal [9]. To prevent waste from being misused or handled irresponsibly, regulations around industrial symbiosis would have to be established. Furthermore, some waste from products is biodegradable and some is non-biodegradable, meaning that it will not decompose over time and consequently cannot simply be returned to nature. For instance, plastic is not biodegradable, so does not decompose and can be a danger to many animals and plants [10]. Products such as polystyrene cups are non-biodegradable, whereas paper cups are, so a circular economy would maximise the use of biodegradable materials in products to decrease the amount of environmentally harmful waste being produced.

Biotechnology would aid the development of a circular economy as it can be used to create biodegradable products. Biopolymers are one example of this [11]. They would replace plastic and would be biodegradable, so therefore would not damage the environment. Another alternative to non-biodegradable materials is solid wool, which is a versatile material that can be used to make furniture, for example, but is compostable. One of the principles of a circular economy is to use more biodegradable materials in manufacturing to lessen the effect on the environment.

In a circular economy, non-biodegradable waste would be reused or recycled to maximise the resources we have but also to prevent damage to the environment. The disposal of waste in landfills causes many problems: rotting waste may produce methane gas, which results in the greenhouse effect and consequently climate change, and pollution can be caused through the production of leachate. Due to the vast amounts of waste being produced, space for landfills is quickly running out. However, incinerating waste is also problematic as it can produce toxic substances, such as dioxins, or gases that cause acid rain.

By reusing or recycling non-biodegradable materials, these problems can be ameliorated [12].

The reparation of broken or obsolete products is also fundamental to a circular economy, as it helps to reduce waste as well. However, one of the main problems with a linear economy is planned obsolescence [13], which originates in the designing and manufacturing of a product. Planned obsolescence occurs when manufacturers design a product to break after a certain period of time, thus encouraging consumers to purchase a replacement product instead of repairing it. Consequently, durability is disregarded in favour of economic gain, violating the Triple Bottom Line approach to business which is vital to create a sustainable society.

One way of dealing with planned obsolescence is to effectuate a leasing economy [14]. A leasing economy where products are rented out to consumers would encourage manufacturers to design sustainable products, placing more importance on durability than on encouraging consumers to buy more and so use up resources. The customer would be buying a service as opposed to a good. As an example of this, Michelin offer durable tyres for rent; consequently, the company is incentivised to make the tyres long-lasting as that is most beneficial for their profits.

In addition, a key aspect of a circular economy is using renewable energy which can reduce carbon dioxide emissions drastically. Renewable energy is one of the most effective ways of dealing with climate change, as they are an alternative to fossil fuels. Fossil fuels are quickly depleting and when burned, produce greenhouse gases. The externalities of fossil fuels include pollution and the emission of carbon dioxide, which is the most significant cause of global warming as 72% of the total emitted greenhouse gases is carbon dioxide.

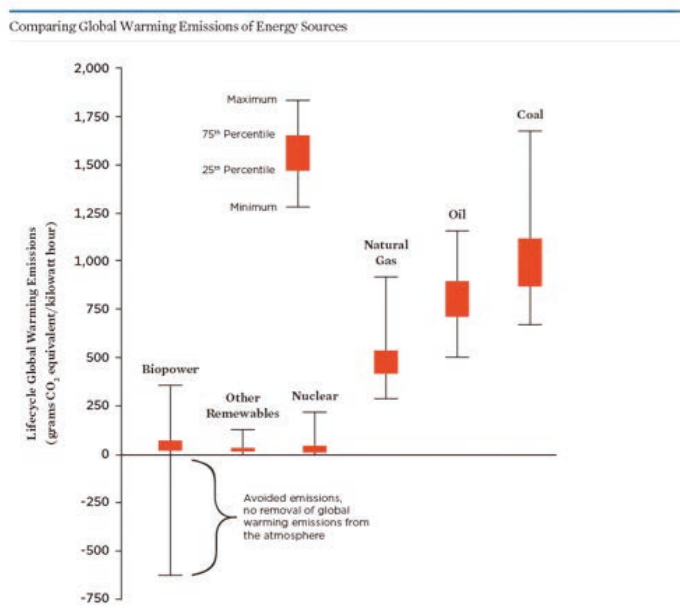


Fig. 2: Lifecycle Global Warming Emissions [15]

Moreover, as fossil fuels are being depleted rapidly and will run out soon, we will need to utilise renewable energy to create a sustainable economy as other fuels such as coal or oil will be unavailable. One of the advantages of renewable energy is that the energy can be replenished naturally and reliably, as resources like the wind or the sun will be there constantly. [16]

Eco-design is also one of the principles of a circular economy. By considering the environmental impact of a product, manufacturers and designers can minimise the negative effects our economy has on the environment. A life cycle assessment of a product can help determine a product's environmental impact; for this, a holistic approach is necessary [17]. A life cycle assessment can help designers and manufacturers become more aware of the environmental, social, and economic impact a product has, and can aid them in making decisions regarding design and manufacture.

Overall, the most significant difference between a linear economy and a circular economy is the treatment of waste. In a linear economy, waste is discarded, whereas in a circular economy, it becomes a resource. It could be argued that this is one of the most significant ways to minimise environmental impact and to use resources efficiently.

Bioeconomics

Bioeconomics – considering the environmental impact the economy has and using environmental resources effectively- is integral to a sustainable economy and can support the shift from a linear economy to a circular economy. Ecological economists argue that the economy is part of the environment [18] instead of the environment being part of the economy. Bioeconomics denotes economic activities based on biotechnology; considering how we use biotechnology is essential to creating a sustainable economy.

Biofuels are an example of how bioeconomics can create a more sustainable society. According to Brent Erickson, the executive vice president for the industrial and environmental section at BIO, "biofuels could play a big part in our low-carbon future", as biofuels such as biodiesel are carbon neutral [19]. Biochemicals are another example of biotechnology that limits environmental impact: these are chemicals that are found in nature and are less toxic than their artificial counterparts.

Biotechnology uses biodegradable, renewable resources that minimise environmental impact. By replacing plastics with biopolymers, we could prevent the pollution that plastic causes and use less space for landfill. Using biodegradable products could reduce landfill mass by as much as 30%. This would help us protect our resources as less waste would be sent to landfill. Landfills have many harmful side effects, as discussed above. Biodegradability is an intrinsic part of production in a circular economy.

On top of this, biodegradable products come from natural materials like corn and potato starch. These can be replenished annually, so are renewable, unlike the finite supply of oil, for example.

Due to the renewable, often biodegradable aspects of biotechnology, as well as its ability to limit pollution and the release of carbon dioxide, biotechnology and the bioeconomics it enables will help establish a more sustainable economy. Coupled with a circular economy, bioeconomics would minimise environmental impact and create a more sustainable society.

Conclusion

The principles of a circular economy include using waste as a resource through processes such as industrial symbiosis and using biodegradable materials. Biotechnology can facilitate the change to a circular economy, providing the technology required for more sustainable, eco-friendly products. In conclusion, bioeconomics and a circular economy would interact synergistically to contribute towards the sustainability of society.

References

Adam Hindle, 2018 Interdependence: Nurturing nature so nature can nurture us What is Circular Economy? <https://www.activesustainability.com/sustainable-development/what-is-circular-economy/> [14/12/2018]
Materials Management and the Circular Economy <https://nerc.org/news-and-updates/blog/nerc-blog/2015/05/12/materials-management-and-the-circular-economy> [16/12/2018]
Kalundborg Symbiosis: Effective Industrial Symbiosis <https://www.ellenmacarthurfoundation.org/case-studies/effective-industrial-symbiosis> [15/12/2018]
Systems Make It Possible, People Make It Happen <http://www.symbiosis.dk/en/systems-make-it-possible-people-make-it-happen/> [16/12/2018]
Time for Change: CO2- the major cause of global warming <https://timeforchange.org/CO2-cause-of-global-warming> [16/12/2018]
Effects of Climate Change <https://www.climateandweather.net/global-warming/effects-of-climate-change.html> [16/12/2018]
"What is Sustainability?" by the University of Alberta (24/11/2018)
Toxic Waste <https://www.nationalgeographic.com/environment/global-warming/toxic-waste/> [16/12/2018]
The Positive Impact of Biodegradable Products on Our Eco-system <http://savannahnaturehouse.com/the-positive-impact-of-biodegradable-products.php> [16/12/2018]
About Biopolymers <http://www.o2.org/ideas/cases/biopolymers.html> [16/12/2018]
Environmental Impacts <https://www.greenchoices.org/green-living/waste-recycling/environmental-impacts> [16/12/2018]
Here's the truth about the planned obsolescence of tech <http://www.bbc.com/future/story/20160612-heres-the-truth-about-the-planned-obsolescence-of-tech> [16/12/2018]
Judith Merkle and Eric Lowitt, Leasing Could provide the route to a circular and self-supporting economy <https://www.theguardian.com/sustainable-business/leasing-route-circular-economy> [15/12/2016]
The Hidden Costs of Fossil Fuels https://www.ucsusa.org/clean-energy/coal-and-other-fossil-fuels/hidden-cost-of-fossils#.XBY9J_Z2vRN [16/12/2018]
What is Sustainable Energy? <https://www.conserve-energy-future.com/IsRenewableEnergySustainable.php> [16/12/2018]
Life Cycle Sustainability Assessment <https://www.lifecycleinitiative.org/starting-lifecycle-thinking/life-cycle-approaches/life-cycle-sustainability-assessment/> [16/12/2018]
Herman Daly, Joshua Farley Ecological Economics: Principles and Applications (2003)
Biotechnology: Toward a Sustainable Future <https://www.bio.org/articles/biotechnology-toward-sustainable-future> [16/12/2018]

Tutor comment:

E. is an extremely bright and diligent student, and it shows in his work. His research, synthesis, analysis and language skills far exceed the average for his age group, furthermore he demonstrated a strong comprehension of the subject matter within the course, which is broad, complex and demanding. The results speak for themselves, not only did he achieve a 1st, he did so with a score of 89 out of 100, the argument could be made that his work is beyond A-level quality.



The biological and psychological factors contributing to the development and maintenance of anorexia nervosa

Year 12, Key Stage 5

Pupil: Y. Amirouch
School: Swakeleys School for Girls, Hillingdon
Supervised by: M. Leslie
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Course Title: Mind vs. body: Eating disorders and the brain

Introduction

Anorexia Nervosa (AN) is an eating disorder (ED) characterised by a reduced energy intake which prevents a person from maintaining a normal body weight (Hebebrand et al., 2004). The weight loss is induced by the patient, and tends to stem from fears of gaining weight (Casper et al., 1979); although it has multiple causes. There are a wide range of symptoms of anorexia, both psychological and biological, due the way diet affects the human body and the complex nature of the brain. Some of the effects of starvation, which have also been seen in anorexia patients, include weight loss, hair loss, dizziness, reduced cold tolerance, irritability, introversion and lack of motivation and concentration (Keys et al., 1950). As a result, AN has detrimental effects on families, creating an anxious, stressful atmosphere (Whitney et al., 2005) and negative impacts on wider society. In addition Anorexia Nervosa has high mortality rates, considerably higher than all other types of psychiatric disorder (Harris & Barraclough, 1998) with one of the primary causes of death being suicide (Birmingham et al., 2005). As a result, AN is a crucial area of study.

In this essay I will discuss the biological and psychological factors contributing to maintenance and development of Anorexia Nervosa. I will consider first how genetics can predispose someone to developing an eating disorder: how certain inherited characteristics can impact appetite. Next, I will discuss how starvation affects the body and how this creates a vicious cycle; allowing people with AN to maintain their disorder. I will then look at the psychological side of AN, taking into consideration the impact of the media, close friends and family, and the internal beliefs and distortions AN patients suffer from.

Biology

A study (Lucas, et al., 1991) into trends in the incidence of AN over 50 years showed that the rates of younger people (10-19) who had the disorder were much more likely to fluctuate over five year time periods, whereas older suffers (20-59, who had the condition for longer) had fairly constant rates. This allowed the researchers to come to the conclusion that the development of the disorder in teenage girls, who tended to have a milder

form of AN and were more vulnerable to social pressures, is quite strongly linked to idealised body image and societal-expectations, whereas in the more severe, long-term cases biology must be a more prevalent cause. The authors also make a point that both forms of anorexia must be at least somewhat due to biology as most people are not able to maintain such a weight loss, evident from the low prevalence of AN in general. The study was only conducted in one specific area of America so it cannot be known if the results show patterns exclusive to Rochester, Minn. (where it was conducted). It also only used medical records, which were heavily scrutinized, but may lack some cases that went undetected (especially in the earliest records when EDs were less recognised). Similarly, it is insufficient to say this is evidence enough for a biological cause of AN: some form of mechanism must be provided to support this theory.

It is probable that EDs can be inherited: some suggest up to 80% is due to genetics (Patel et al., 2002) and people with AN tend to be more likely to have a relative with AN (Holland et al., 1984), although it's difficult to differentiate between genetic and environmental causes. Some studies have found that certain genes are linked to appetite (Cecil et al., 2008 & Dougkas et al., 2013). The FTO gene in particular has been show to contribute to the feeling of fullness and the A allele is associated with increased food intake. This could explain why for some people it's easier to develop the disorder than most people: if you already have a low appetite it is easier to justify eating less and after you have restricted your food intake you're less inclined to crave nourishment. It could be argued that this is insufficient evidence: both studies look at the gene in relation to over-eating and didn't consider how it could cause under-eating. There are also other genes which have possible links to susceptibility of AN, the markers in the uncoupling proteins 2 and 3 (UCP-2 and UCP-3) are potential candidates as they have been seen to be present in people with AN (Campbell et al., 1999).and they have a linkage to resting metabolic rate (Ricquier & Bouillaud, 2000). However, more evidence is required to prove a definite link and there are multiple other candidate genes such as the 5HT2A receptor gene and the 5HT transporter gene (Jacobi et al., 2004 & Vink et al., 2001). An important limitation of all studies claiming linkage between a gene and a psychiatric disorder is that due to the complexity of the human genome, similarities and differences between populations' genetics, random mutations, the interaction of genes and the effect of nurture, it is difficult to conclude that one gene or set of genes caused the disorder without high uncertainty.

During the Minnesota Starvation Experiment (Keys et al., 1950) many symptoms were recorded most of which apply to AN, however, there are many limitations. The first is that the group was exclusively male, contrasting the primarily female population of AN sufferers. This suggests some of the effects recorded may not be present in the majority of suffers, whereas some effects that most suffers have didn't occur, e.g. amenorrhoea is a typical symptom (Dally & Sargant, 1966) and could not be recorded due to the nature of the study. It could also be noted that the sample size was fairly small, so the data may not represent all populations accurately and since the experiment was

done over a short period of time, the effects of starvation over years could not observed, making it less useful when trying to understand the most severe, long-term cases of AN. Also due to the technology of the time there was no opportunity for the detailed neuroimaging we have today, so we cannot understand the neuroscience of starvation fully without repeating the test which is unlikely to happen due to its questionable ethics. One of the impacts that does seem to apply to AN was obsessive behaviours and food rituals. This has been seen in modern AN patients: many of which have strict eating regimes partially caused by hormonal disturbances in the brain, creating a cycle of maladaptive brain function, causing restriction, causing malnourishment, reinforcing the hormonal changes (Kaye, W. 2008). This is an example of a biological maintenance factor and shows how once begun, the cycle is difficult to stop.

Psychology

Psychology plays an equally big role to the development of AN as biology does and the two are often interlinked. AN has been on the rise (Latzer & Gaber, 1998) and is most prevalent in women, with rates around eight times higher than in men (Pawluck & Gorey, 1998). One suggestion is that constant exposure to media that is increasingly focusing on body image has lead to lowered self-esteem by placing too much value on body image (Hamilton & Waller, 1993) resulting in some using extreme measures to achieve the media's ideals. A study (Yamamiya et al., 2005) found after viewing images of "thin-and-beautiful" women, participants had a more negative perception of their own body, but after multiple images the effect was lessened, suggesting they had gotten used to the ideals presented. The study also noted that young girls- who perhaps had more internalised societal-expectations- were affected more than older participants. As a result we could conclude that a girl's expectations of beauty are based upon the media, she then may base her actions off of these ideals causing heightened weight concerns. A limitation is that the study was only done in the short term so doesn't provide conclusive evidence for the media's effects over longer time-periods. A similar study (Hamilton & Waller, 1993) found that women with AN evaluate their size as larger than it is, to a greater extent than healthy controls, and were more inclined to over-estimate size after seeing pictures of "thin-and-beautiful" women, suggesting suffers value their weight higher than the average person and perceive themselves differently to reality. Which is confirmed when considering that AN sufferers are perfectionists: they value the opinion of others and are concerned over making mistakes more than healthy people (Halmi et al., 2000), a study (Bruch, 1962) claimed "The first symptom is a disturbance in body image of delusional proportions" and one the diagnostic criteria of AN is "Disturbance in the way in which one's body weight or shape is experienced" (American Psychiatric Association, 2013) and the evidence above would suggest that these disturbances are caused by the psychological implications of long-term exposure to unhealthy beauty standards from the media.

On the other hand, not everyone exposed to the media

will develop AN. from this we can conclude there must be other psychological factors involved, one of which is families. Family related reasons are often stated as a cause of AN (Tozzi et al., 2003), for example: growing up in a hostile environment or suffering trauma at a young age. Parents with EDs can pass their concerns about weight onto their children (Dare et al., 1990). From this perspective, restricting intake is a form of control – something a person with AN may have been denied previously. Part of the reason why people with AN want this control is their incapability to process emotions. A study (Racine & Wildes, 2013), where people with AN answered questions to assess their emotional regulation, found that patients tend to have difficulty with emotional awareness, understanding and acceptance. Not understanding the appropriate way to deal with emotions could lead some people to seek control in something they can understand. The lack of emotions then provided by anorexia comforts them. However, this conclusion may need more evidence since it's not completely clear whether the emotional dysregulation was a cause or a result of AN. Similarly, the study notes when you adjust for anxiety and depression, the only significant dysregulation is of emotional awareness, however it could be asked if the depression and anxiety are effects of AN? especially since the two are often seen together (Casper, 1998). What is sure is struggling with emotions is a cause of AN and is why both mind and body must be treated.

Families also play a significant role in the recovery of patients with AN; in particular, earlier, shorter cases find family therapy very effective, more so than individual therapy (Dare et al., 1990). The cognitive-interpersonal maintenance model (Treasure & Schmidt, 2013) suggests that unhelpful responses from close others, leads to isolation and a fear of social interaction, pushing the patient deeper into their anorexia, causing more negative responses in a vicious cycle. When researchers (Whitney et al., 2005) have looked into the implications of AN on families it has been found that there is a profound emotional effect, which can manifest in many different ways, with common themes of hope, guilt, patient-blame, over-protectiveness and love. This shows how complex the impact is and why someone with AN might want to avoid contact with others as a result. Despite this the study is limited by the fact it was taken from parent's accounts which may be biased and since there were only 20 cases reported on and all were from parents of daughters with severe AN, trends in the responses to less severe cases might not have been identified. One criticism of this theory is that since, for certain patients, family therapy isn't significantly effective (typically longer cases) then the importance of close others is not always relevant, however the model discussed also states other causes and some maybe more significant than others depending on the specific case. Similarly, the experiment comparing family therapy and individual therapy found that sometimes parents or relatives would make critical comments that had a negative effect, explaining the drop-outs and failures; perhaps after a long period of time families became more hostile due to lack of progress. It should also be noted that the study says

older patients were less responsive to both therapies, meaning it's important to make improvements through studying them.

Conclusion

Anorexia is a serious problem and should be treated with much gravity. It's caused by a multitude of factors: from genetic predisposition, to growing up in a culture that places too much value on appearance or in a situation which leaves you vulnerable to mental illness. It becomes the patient's worst enemy once they develop it, creating cycles of maintenance, AN patients create rigorous food rituals because of hormonal dysregulation which causes them to lose more weight and tighten their regimes in a similar way to how hostile responses from close others only pushes patients further away from recovery. You must remember that AN is an extremely complex disorder and due to its nature, there is no one cure. As a result, the development and maintenance of AN is an especially important topic and must be studied further to improve current treatment, so doctors can help patients survive this terrible disease.

References

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.

Birmingham, C. L., Su, J., Hlynsky, J. A., Goldner, E. M., & Gao, M. (2005). The mortality rate from anorexia nervosa. *International Journal of Eating Disorders*, 38(2), 143-146.

Bruch, H. (1962). Perceptual and conceptual disturbances in anorexia nervosa. *Psychosomatic medicine*, 24(2), 187-194.

Campbell, D. A., Sundaramurthy, D., Gordon, D., Markham, A. F., & Pletl, L. F. (1999). Association between a marker in the UCP-2/UCP-3 gene cluster and genetic susceptibility to anorexia nervosa. *Molecular psychiatry*, 4(1), 68.

Casper, R. C. (1998). Depression and eating disorders. *Depression and anxiety*, 8(51), 96-104.

Casper, R. C., CHATTERTON JR, R. T., & Davis, J. M. (1979). Alterations in serum cortisol and its binding characteristics in anorexia nervosa. *The Journal of Clinical Endocrinology & Metabolism*, 49(3), 406-411

Cecil, J. E., Tavendale, R., Watt, P., Hetherington, M. M., & Palmer, C. N. (2008). An obesity-associated FTO gene variant and increased energy intake in children. *New England Journal of Medicine*, 359(24), 2558-2566.

Daily, P., & Sargant, W. (1966). Treatment and outcome of anorexia nervosa. *British Medical Journal*, 2(5517), 793.

Dare, C., Esler, I., Russell, G. F., & Szmulker, G. I. (1990). The clinical and theoretical impact of a controlled trial of family therapy in anorexia nervosa. *Journal of Marital and Family Therapy*, 16(1), 39-57.

Dougkas, A., Yaacobi, P., Givens, D. I., Reynolds, C. K., & Minihane, A. M. (2013). The impact of obesity-related SNP on appetite and energy intake. *British Journal of Nutrition*, 110(6), 1151-1156.

Halmi, K. A., Sunday, S. R., Strober, M., Kaplan, A., Woodside, D. B., Fichter, M., ... & Kaye, W. H. (2000). Perfectionism in anorexia nervosa: variation by clinical subtype, obsessiveness, and pathological eating behavior. *American Journal of Psychiatry*, 157(11), 1799-1805.

Hamilton, K., & Waller, G. (1993). Media influences on body size estimation in anorexia and bulimia: An experimental study. *The British Journal of Psychiatry*, 162(6), 837-840.

Harris EC, Barraclough B (1998) Excess mortality of mental disorder. *Br J Psychiatry* 173: 11–53.

Hebebrand, J., Casper, R., Treasure, J., & Schweiger, U. (2004). The need to revise the diagnostic criteria for anorexia nervosa. *Journal of Neural Transmission*, 111(7), 827-840.

Holland, A. J., Hall, A., Murray, R., Russell, G. F. M., & Crisp, A. H. (1984). Anorexia nervosa: a study of 34 twin pairs and one set of triplets. *The British Journal of Psychiatry*, 145(4), 414-419.

Jacobi, C., Hayward, C., de Zwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders: application of risk terminology and suggestions for a general taxonomy. *Psychological bulletin*, 130(1), 19.

Kaye, W. (2008). Neurobiology of anorexia and bulimia nervosa. *Physiology & behavior*, 94(1), 121-135.

Keys, A., Brozek, J., Henschel, A., Mickelsen, O. & Taylor, H. L. (1950) *The Biology of Human Starvation* H-I University of Minnesota Press Minneapolis, MN.

Latzer, Y., & Gaber, L. B. (1998). Pathological conflict avoidance in anorexia nervosa: Family perspectives. *Contemporary Family Therapy*, 20(4), 539-551.

Lucas, A. R., Beard, C. M., O'Fallon, W. M., & Kurland, L. T. (1991). 50-year trends in the incidence of anorexia nervosa in Rochester, Minn.: a population-based study. *Am J Psychiatry*, 148(7), 917-22.

Patel, P., Wheatcroft, R., Park, R. J., & Stein, A. (2002). The children of mothers with eating disorders. *Clinical child and family psychology review*, 5(1), 1-19.

Pawluck, D. E., & Gorey, K. M. (1998). Secular trends in the incidence of anorexia nervosa: Integrative review of population-based studies. *International Journal of Eating Disorders*, 23(4), 347-352.

Racine, S. E., & Wildes, J. E. (2013). Emotion dysregulation and symptoms of anorexia nervosa: The unique roles of lack of emotional awareness and impulse control difficulties when upset. *International Journal of Eating Disorders*, 46(7), 713-720.

Ricquier, D., & BOUILLAUD, F. (2000). The uncoupling protein homologues: UCP1, UCP2, UCP3, STUCP and ATUCP. *Biochemical Journal*, 345(2), 161-179.

Tozzi, F., Sullivan, P. F., Fear, J. L., McKenzie, J., & Bulik, C. M. (2003). Causes and recovery in anorexia nervosa: The patient's perspective. *International Journal of Eating Disorders*, 33(2), 143-154.

Treasure, J., & Schmidt, U. (2013). The cognitive-interpersonal maintenance model of anorexia nervosa revisited: a summary of the evidence for cognitive, socio-emotional and interpersonal predisposing and perpetuating factors. *Journal of eating disorders*, 1(1), 13.

Vink, T., Hinney, A., van Elburg, A., Van Gozen, S. H. M., Sandkuyl, L. A., Sinke, R. J., ... & Adan, R. A. H. (2001). Association between an agouti-related protein gene polymorphism and anorexia nervosa. *Molecular psychiatry*, 6(3), 325.

Whitney, J., Murray, J., Gavan, K., Todd, G., Whitaker, W., & Treasure, J. (2005). Experience of caring for someone with anorexia nervosa: Qualitative study. *The British journal of psychiatry*, 187(5), 444-449.

Yamamiya, Y., Cash, T. F., Melnyk, S. E., Posavac, H. D., & Posavac, S. S. (2005). Women's exposure to thin-and-beautiful media images: Body image effects of media-ideal internalization and impact-reduction interventions. *Body image*, 2(1), 74-80.

Tutor comment:

Y. is an exceptional student, whose thoughtful questions and original insights contributed greatly to each tutorial. Her critical thinking skills and dedication to conducting wide research are on full display in this essay discussing risk and maintenance factors for anorexia nervosa. I have no doubt that Y. will go on to do great things at university and beyond!



The inheritance of X-linked genetic disorders and how they are overcome with assistive reproductive technology

Year 12, Key Stage 5

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Course Title: **Assisted reproductive technologies: Changing your fate?**

Among the great discoveries of the 20th century was the role of DNA and genetic inheritance, including the inheritance of diseases which were previously unexplainable. A genetic disease is any disease that is caused by an abnormality in an individual's genome, the entire genetic material of a person, inherited from their parents or because of environmental factors, which can cause mutations of pre-existing genes. The abnormality can be as trivial as a substitution mutation (a single base change) or because of the addition or deletion of an entire chromosome. There are about 6,000 different known genetic disorders in the world [1]. The disease severity ranges from minor, to catastrophic and significantly life shortening. They can be divided into 5 major groups; Single-gene inheritance (when mutations occur in the DNA of a single gene) , multifactorial disorders (caused by a combination of genetics and environmental factors like diet, toxins, chemicals and lifestyle), chromosomal changes (due to non-disjunction in cell division which can cause entire chromosomes to be added or deleted), mitochondrial diseases (when mutations in the mitochondrial DNA impair the ability of mitochondria to make proteins, use oxygen, and produce energy [2]) and epigenetic disorders (caused by abnormal silencing or activation of genes due to environmental factors). Single- gene inheritance can be further categorised into autosomal dominant (inheriting only one mutated gene, an example being Huntington's disease), autosomal recessive (inheriting two copies [one from each parent], an example being Cystic Fibrosis) and x-linked conditions. X-linked inheritance means that the mutation occurs on the X chromosome. These types of disorders often have a more severe impact for males due to their sex chromosomes. As females have two X chromosomes and males have one X and one Y chromosome, if there is a genetic change on the X

chromosome a female may only have mild symptoms or no symptoms at all, whereas males, who have the recessive allele, must be affected because they only carry one copy of the X chromosome and therefore have no back up gene to be expressed if it is defective. Examples of X-linked disorders include colour blindness, hunter syndrome and muscular dystrophy. The mutations accountable for these diseases can be classified as hereditary or somatic [3]. Hereditary mutations, also called germline mutations, are present in the parent's egg or sperm cells therefore occur in virtually every cell in the body. Somatic mutations can occur at any point in life and are present only in certain cells. They are caused by environmental factors such as ultraviolet radiation, toxins or errors made as DNA copies itself during cell division. Most disease-causing mutations are uncommon in the general population and many mutations don't have any noticeable effect on the phenotype of an organism, perhaps if the mutation occurred in a protein-coding region, but ends up not affecting the amino acid sequence of the protein.

Once a genetic disorder has been identified, while it cannot be cured, there are many treatments and interventions available that can help ease symptoms. But arguably, a more favourable option is to use the technology available to overcome a genetic disorder before conception. Assistive Reproductive Technology (ART) refers to the medical procedures used to address infertility and circumvent genetic disorders. There is now a wide array of treatments available for men and women including: In Vitro fertilisation (IVF) and intracytoplasmic sperm injection (ICSI), surrogacy, gamete donation, artificial insemination and pro-nuclear transfer for mitochondrial replacement. The world's first in-vitro fertilization baby was born in 1978 in the UK. Since then, 8 million babies have been born worldwide as a result of ART [4]. Although ART has given hope to millions of couples, it has also introduced countless ethical, legal, and religious challenges.

Hunter syndrome, also called mucopolysaccharidosis II or MPS II [5], is an example of a chronic, progressive, metabolic genetic condition that affects 1 in 100,000 to 150,000 male births [6]. The cause of Hunter syndrome is due to a mutation on the iduronate-2-sulphatase (IDS) gene located on the X chromosome [7]. A male can inherit this abnormal gene in one of two ways. His mother is often a carrier and passes it directly to him or during egg and sperm formation, a mutation can develop in the IDS gene on his X chromosome. Females can carry a defective copy of the IDS gene and remain unaffected.

Inside the cells of the body, the deficiency or absence of the enzyme iduronate-2-sulfatase (I2S) due to the genetic defect, results in the harmful accumulation of glycosaminoglycan's (GAGs) in cells, specifically inside the lysosomes. Lysosomes are compartments in the cell that digest and recycle different types of molecules [8]. The build-up of massive amounts of these harmful substances eventually causes permanent, progressive damage affecting appearance, mental development,



Figure 1. A series of photographs showing the progression of the characteristic facial features of Hunter syndrome. The ages of the boy from left to right are 6 months and 5, 9, and 30 years.

Not all people with Hunter syndrome are affected by the disease in exactly the same way, and the rate of symptom progression varies widely from patient to patient. Symptoms aren't present at birth, but often emerge around ages 2 to 4 [9]. The earliest visible features of Hunter syndrome are unusual facial features - full lips, large rounded cheeks, a broad nose, and an enlarged tongue (see figure 2A). Additionally, narrowing of the airway causes frequent upper respiratory infections and short pauses in breathing during sleep (sleep apnoea). An enlarged liver and spleen (hepatosplenomegaly) are also common, as well as umbilical hernias or inguinal hernias. Carpal tunnel syndrome commonly occurs in children with this disorder and is characterized by numbness, tingling, and weakness in the hands and fingers, along with a curved appearance (see figure 2B). Individuals with this condition have joint deformities that significantly affect mobility and regular growth (see figure 2C) which is often responsible for their short stature. People with a severe form of Hunter syndrome experience a decline in intellectual function and a more rapid progression of the disease. They begin to lose basic functional skills between the ages of 6 and 8. The life expectancy of these individuals is 10 to 20 years [10].

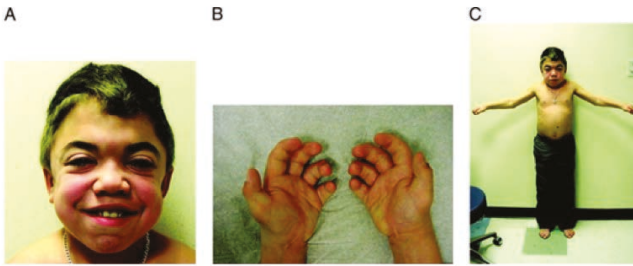


Figure 2. Photographs of a Fourteen-year-old boy with Hunter syndrome.

Assistive Reproductive technology is used as an infertility treatment for couples and as a way to reduce the chance of a child inheriting a genetic disease or abnormality. The factors leading to infertility in women could include conditions such as polycystic ovary syndrome (caused by a hormone imbalance), if a women's ovaries stop working early or endometriosis (which causes adhesions that can stop the egg from moving down the fallopian tubes), means that they fail to ovulate and therefore struggle to conceive. In addition, lifestyle choices can have an effect on fertility. Studies have shown that smoking, alcohol and being significantly overweight or underweight, reduce the chance of a successful pregnancy. Other factors include age and timing. A woman is most fertile in her early twenties (fertility quickly declines after 40 years old) and 14 days before her period. Male infertility could be due to abnormal semen (low sperm count or decreased sperm mobility), injury to the testicles as well as lifestyle

choices, like smoking, which reduces the amount of sperm produced. Additionally, if parents-to-be are concerned about passing on a genetic condition to their children due to known carrier status or a family history of a genetic condition, they may want to pursue a method of ART.

There are a wide array of treatments available e.g. donor conception (sperm, eggs or embryos). Egg donation is a process where an egg, or oocyte, is removed from a fertile woman in a minor procedure and donated to another woman in order to help her conceive. This is generally given to women who cannot use their own eggs for various reasons, aforementioned, as well as ovarian failure, to avoid genetic defects or if they have experienced several miscarriages. Sperm donation is a procedure in which a man donates semen. It is then injected into a woman's reproductive organs or used to fertilize mature eggs in a lab (IVF). It is used if the male partner produces low quality sperm, none at all or if they want to avoid the chance of passing a genetic disorder to their children. The other option is embryo donation which often occurs when embryos created during another couples IVF treatment are not needed. Embryo donation would be suitable when both members of the couple cannot become parents with their own gametes. In 2012, over 55% of transfers involving fresh embryos from donor eggs resulted in a live birth [11].

Alternatively, a couple/person could choose to use surrogacy. This is a form of ART where a woman, the surrogate, agrees to carry and give birth to a child on behalf of another person or couple (the intended parents). This method is surrounded by many legal and ethical complexities. It is the only option for some to conceive; especially those who have had gametes stored before cancer treatment, sterilisation, or multiple IVF cycles.

However, the most common method of ART is In Vitro Fertilisation (IVF), again appropriate to overcome infertility or as a first step of a method to prevent passing a potential genetic disorder to an individual's child. Firstly, a women's egg supply is boosted with the FSH hormone to increase the number of eggs produced by the ovaries. Then the eggs are collected using a needle that is guided into the ovaries using ultrasound. The man's sperm is collected and used to fertilise the eggs in a lab for embryos to develop. Most commonly, only one of the most suitable embryos is transferred into the uterus of the women, but multiple can be transferred. The final steps are verifying the pregnancy with ultrasound at around 6 weeks and then the live birth.

In order to overcome Hunter syndrome specifically, IVF could be used in conjunction with Preimplantation Genetic Diagnosis (PGD). The reasons for being carried out include; having a child already with Hunter syndrome, a strong family history of the disease or if the parents have been diagnosed themselves as either having Hunter syndrome or being carriers. The process of PGD starts on day 5/6 of development (embryos are at the blastocyst stage), a few cells that would eventually become the placenta are removed from the outer layer of the embryo (see figure 3) [12].

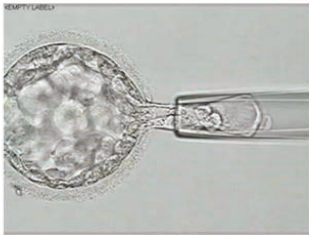


Figure 3. A photograph showing a 5 day old embryo undergoing a trophectoderm biopsy.

The cells are then tested in a lab for all 24 chromosomes (all 22 autosomal chromosomes and the X and Y chromosomes) for abnormalities [13], the specific gene for the genetic condition and gender. The embryos can be screened with 95% reliability for the specific condition [14]. The identification of the gender is particularly important for X-linked conditions as they frequently occur in males. As Hunter syndrome is an X- linked recessive condition there are a number of cases with different outcomes for the genotype of potential children. The first case is if the mother is a carrier of the defective gene (father unaffected) causing Hunter syndrome. None of the daughters will be affected, with a 50% chance of a daughter being a carrier, and 50% of the sons will be affected, the other 50% of sons unaffected (see figure 4). The second case is if the father has the condition (mother unaffected). This would lead to all daughters carrying the condition and all sons having the condition (see figure 5).

Therefore, depending on the genotypes of the parents, the gender selected will vary. The next stage of PGD is removing the embryo's that have been detected to have an abnormality from the IVF process and implanting the healthy embryos into the mother which are then allowed to go to term. A PGD test can be designed for almost any genetic disease as long as prior testing on the individual has identified the genetic/molecular cause of their condition. [15]

When a couple is at risk of passing a genetic condition to a child, the use of PGD and IVF as a method to have a child without the disease gives rise to ethical conflict. Currently in the UK it is the Human Fertilisation and Embryology Authority (HEFA) that oversees and regulates the use of gametes and embryos in fertility treatment and research [16]. The IVF process inevitably creates multiple embryos. It is agreed that it would be unethical to transfer them all into the woman. This is because multiple births are the single greatest risk of fertility treatments for the mother and her babies. Therefore campaigns have been created to tackle the high multiple birth rate following IVF (one in four births were multiple births in 2007, 20 times higher than natural conception) [17].

However, what happens to unused embryos brings its own challenges. The Roman Catholic Church teaches that embryos have the right to be respected as a person from the moment of conception (Roman Catholic Catechism 2378 [18]). Therefore they hold beliefs against what happens to embryos that aren't implanted into the mother which could be thawing and discarding, donating to research or indefinite storage. However, the remaining embryos could be donated to other couples for the purpose of uterine transfer.

A scientific view for the remaining embryos would be supporting an option like donating remaining embryos as this would allow the method to be advanced and success rates to improve.

Other concerns with this method of ART are financial. The cost of IVF in the UK is around £5,000 per cycle of treatment [19] and often a couple will go through multiple cycles before it is successful. Approximately 25% of all IVF cycles performed are funded by the National Health Service [20]. The remaining cases are performed in private clinics, reducing the financial strain on the NHS. Additionally, there are ethical challenges surrounding the children born through IVF. Research has shown they are more likely to have health problems than if they were conceived naturally. This is because children born via IVF often have smaller birth weights, increasing the risk of heart disease and other unforeseen problems in the future. The PGD process to overcome X-linked disorders raises the question whether gender selection is ethical in any circumstance.

There are three main motivators for gender selection; medical reasons as mentioned, family balancing reasons, and gender preference because of cultural or economic bias. The scientific view is to support the technology we have available to prevent children being born with severe conditions, thereby preventing a lifetime of suffering and premature death. Some would argue not doing so is equivalent to letting a child die of an infection when effective antibiotics are available. Its use for other reasons (like purely for the preference of the parents or especially for nonpathological traits [such as intelligence or athleticism]) would not be considered acceptable practice as it could skew the gender proportions and increase discrimination and prejudice. However, there are religious objections

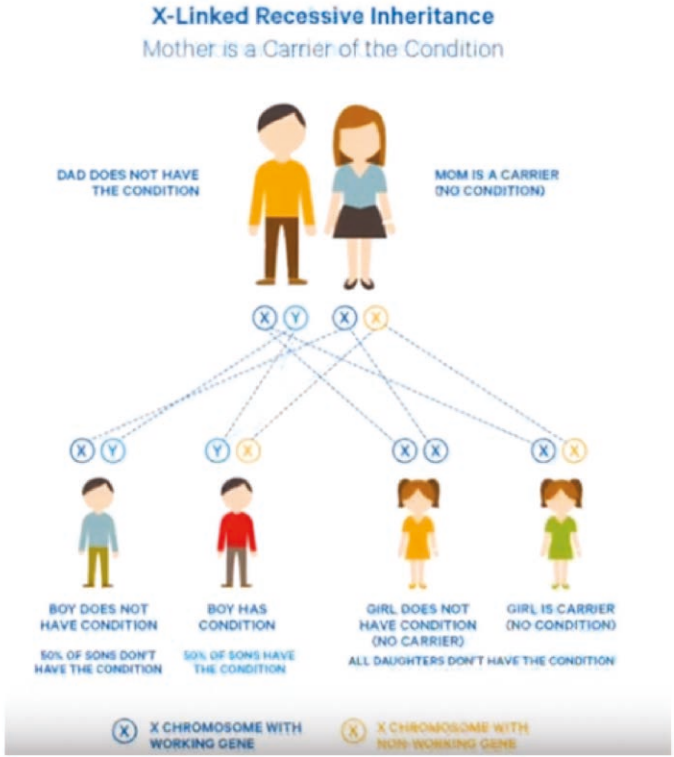


Figure 4 A genetic diagram showing the alleles of the parents and children with in x-linked recessive inheritance when the mother is a carrier of a genetic condition.

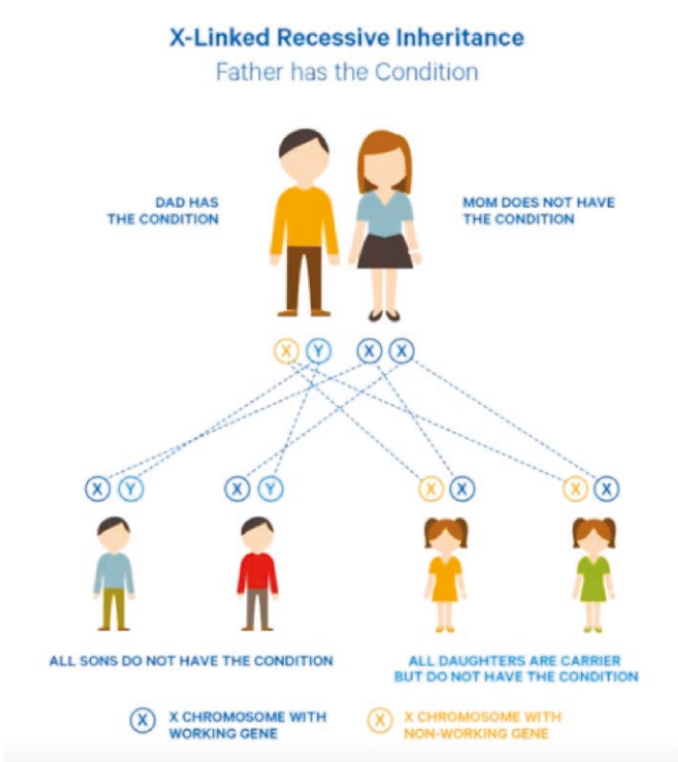


Figure 5 A genetic diagram showing the alleles of the parents and children with in x-linked recessive inheritance when the father has a genetic condition.

The prospect of detecting any genetic disease in an embryo, which can then be used as grounds to discard the embryo for implantation, raises issues surrounding the devaluation of having a disability. Additionally, how do we decide on the level of severity of a disease that justifies the deselection of an embryo? The encouragement of reducing the amount of disabled people in society would send a negative and potential harmful message to disabled people themselves. Additionally, in March 2018 at the University of North Carolina's (UNC) Clinical and Translational Research Centre (CTRC) a treatment for Hunter syndrome was being developed – gene therapy that enables the liver of a Hunter syndrome patient to produce a lifelong and stable supply of the lacking enzyme [21]. This breakthrough shows that in the future, a diagnosis of Hunter syndrome should not be considered a basis to deselect or abort an embryo. This could be applicable to many other genetic conditions.

To conclude, with the correct restrictions for ART I believe it is a principled method to overcome genetic disorders and infertility. The current conditions for the use of this technology, especially with new regulations surrounding multiple implantations of embryos, appear to be overall beneficial for hopeful parents, children born as a result and the NHS. For me, it is still incredibly important that the care towards monitoring and regulating this practice in the future, as technology develops further, remains constant. I hold the scientific belief that an embryo does not have equal value to human life and would certainly use IVF and PGD treatment if it was deemed most suitable.

References
[1] Liat Ben-Senior '10 Most Common Genetic Diseases', <<https://www.jabroots.com/trending/infographics/8833/10-common-genetic-diseases>>
[2] <<https://www.mda.org/disease/mitochondrial-myopathies/causes-inheritance>>

[3] "What is a gene mutation and how do mutations occur?", <<https://ghr.nlm.nih.gov/primer/mutationsanddisorders/genemutation>>
[4] <<https://edition.cnn.com/2018/07/03/health/worldwide-ivf-babies-born-study/index.html>>
[5] Nayana Ambardekar, <<https://www.webmd.com/children/hunter-syndrome-mps-ii#1>>
[6] <https://en.wikipedia.org/wiki/Hunter_syndrome>
[7] Peining Li, Amy B Bellows, Jerry N Thompson, "Molecular basis of iduronate-2-sulphatase gene mutations in patients with mucopolysaccharidosis type II (Hunter syndrome)", <<https://img.bmj.com/content/36/1/21>>
[8] <<https://ghr.nlm.nih.gov/condition/mucopolysaccharidosis-type-ii#genes>>
[9] <<https://www.mayoclinic.org/diseases-conditions/hunter-syndrome/symptoms-causes/syc-20350704>>
[10] <<https://ghr.nlm.nih.gov/condition/mucopolysaccharidosis-type-ii#>>
[11] Jayne Leonard, 'How does the egg donation process work?', <<https://www.medicalnewstoday.com/articles/314750.php>>
[12] <<https://uscfertility.org/ivi/how-does-pgd-work/>>
[13] <<https://www.givf.com/geneticservices/pgdtestoptions.shtml>>
[14] Invicta Genetics, <<https://www.youtube.com/watch?v=BzA1TiUAGQc>>
[15] <<https://www.givf.com/geneticservices/pgdtestoptions.shtml>>
[16] <<https://www.gov.uk/government/organisations/human-fertilisation-and-embryology-authority>>
[17] 'Our campaign to reduce multiple births', <<https://www.hfea.gov.uk/about-us/our-campaign-to-reduce-multiple-births/>>
[18] Catechism of the Catholic Church, <http://www.vatican.va/archive/ccc_css/archive/catechism/p3s2c2a6.htm>
[19] 'IVF costs in the UK', <<https://www.mumsnet.com/conception/ivf-costs>>
[20] William L Ledger, Dilly Anumba, Neil Marlow, Christine M Thomas, Edward CF Wilson, 'The costs to the NHS of multiple births after IVF treatment in the UK', <<https://obgyn.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1471-0528.2005.00790.x>>
[21] Mathew Shanley, 'UNC Paediatrics Delivers Gene Therapy to Hunter Syndrome Patient', <<https://www.aredr.com/news/unc-delivers-sb-913>>

prostate-specific antigen (PSA), which is produced during transcription of genes. Therefore, high levels of PSA could indicate an over-active AR signalling pathway, and thus, prostate cancer. However, elevated levels of PSA do not always indicate cancer as they can be a result of an enlarged prostate gland or prostatitis (WebMD, 2018). Another procedure is a digital rectal exam: the doctor examines the gland for abnormalities that may indicate tumour growths. However, prostate cancer can only be confirmed through a biopsy, where a tissue sample is taken from the patient and the histology is examined, and a Gleason score is calculated (Prostate Cancer UK, 2018).

There are several risk factors: there is a higher risk in older men, men of African ethnicity, men with family members with prostate cancer, genetic mutations i.e. in the BRCA1 and BRAC2 tumour suppressor genes, and men occupationally working with pesticides. However, there is no clear link to preventable factors (Cancer Research UK, 2018).

Prostate cancer refers to uncontrolled, malignant cell division in the prostate: a walnut-sized gland located under the bladder and above the penis. It secretes a fluid essential to the makeup of sperm and contains PSA (Ashford, 2010). The prostate and its cells rely on androgens to function. Androgenic hormones activate the androgen receptor (AR) found in the cytoplasm, which regulates the expression of genes that are crucial for the development of male sexual phenotypes. Androgens such as testosterone from the testes or the adrenal gland, reaches the prostate gland and is converted to dihydrotestosterone (DHT) by the enzyme 5 α -reductase. This metabolite state has a higher affinity to the androgen receptor and binds to it in the cytoplasm (Pienta & Bradley, 2006). The receptor then translocates to the nucleus and binds to androgen response elements (AREs) in the promoter region. Transcription of genes ensues resulting in cell growth and differentiation, as well as the transcription of PSA. However, deregulation of the AR signalling pathway can lead to an over-expression of the genes associated with cell growth and differentiation, which can result in cancer due to unrestrained cell division. Cancer occurs in the luminal cells of the gland and is stimulated by androgens.

In general, carcinogenesis can be defined by several key hallmarks that contribute to the formation of neoplasms (Hanahan & Weinberg, 2011). Over-activation of oncogenes and the inactivation of tumour suppressor genes are related. Proto-oncogenes are growth proteins with cancerous potential and are activated due to mutations, gene amplifications, or chromosome rearrangements (Pierotti, et al., 2003). As a result, there is uncontrolled growth without tumour suppressor genes to regulate cell division. In a healthy cell, there are barriers to the rate of proliferation of cells: senescence and programmed cell death through apoptosis. However, cancerous cells can evade apoptosis and even attain lifetime, limitless replication as they are able to "maintain telomeric DNA at lengths sufficient to avoid triggering senescence or apoptosis" (Hanahan & Weinberg, 2011). In order to sustain themselves, tumours require a steady supply of nutrients, like healthy cells, and form Inflammation enables many of the other hallmarks and contributes to their progress. Although, inflammation is

neovasculature through angiogenesis. The 'angiogenic switch' is activated constantly in tumours to support the neoplastic growths, in contrast with a healthy system, wherein it is only activated during wound healing and the female reproductive cycle for example (Hanahan & Folkman, 1996).

Inflammation enables many of the other hallmarks and contributes to their progress. Although, inflammation is necessary to the immune system to repair damaged tissue and heal wounds, in cancerous regions it is upregulated. Immune cells appear transiently in the wound region, but in neoplasms, they are enduring in sites of inflammation, releasing cytokines that aid angiogenesis (Grivennikov, et al., 2010) (Karin, et al., 2006). As a result, it is possible to classify tumours as unhealed lesions due to the chronic inflammation present, which is usually a response to a wound.

Finally, cell invasion and metastasis are characteristics of cancers. Though cell migration is a normal function in the biological and pathological processes, deregulation leads to abnormal migrations (J.Vazquez-Mellado, et al., 2017) and cancerous cells use this mechanism to translocate to another site and develop a secondary tumour. This deregulation is often a result of an altered extracellular matrix (ECM) leading to the promotion of metastasis (Lu, et al., 2012).

Cancerous epithelial cells from the primary tumour undergo a change in their morphology, lose their cell-to-cell adhesion due to the loss of the molecule E-cadherin, and become elongated mesenchymal cells; which can now invade extraneous tissue (Hanahan & Weinberg, 2011). These cells then intravasate into the circulatory or lymphatic system and migrate to another site, illustrating that angiogenesis promotes metastasis. In fact, tumour cells secrete factors that deregulate the ECM and promote angiogenesis (Lu, et al., 2012). The circulating tumour cells (CTCs) then revert back to epithelial cells through a MET transition and regain proliferation properties; though they can lay dormant for years before developing into a tumour.

There are several sub-types of prostate cancer classified by progress compared to the primary site. Localised prostate cancer is when cancer has not left the gland and there is slow or no growth. When cancer has advanced to the surrounding microenvironment e.g. lymph nodes, bladder, then it is locally advanced. As cancer develops into later stages, the cells can metastasise, forming secondary tumours. A rare form of prostate cancer can occur in the neuroendocrine cells as opposed to in the luminal cells. Neuroendocrine carcinoma only accounts for 5% of prostate cancer cases (Virtual Medical Centre, 2018). The most common sites of metastasis are the lymph nodes, bones, liver, and lungs (WebMD, 2017). Depending on the progress of prostate cancer and the patient's viability, different treatments are considered (Prostate Cancer UK, 2018).

Localised prostate cancer can be monitored with active surveillance, which requires routine checks, i.e. biopsies. As localised cancer is slow-growing and contained within the region, this is ideal if the patient wants to defer treatment and side effects. Watchful waiting is a less intrusive method of monitoring; it does not involve any testing or treatment

that may be debilitating to patients who have other medical conditions, and therefore cannot complete treatment. Both options will only progress to surgery or therapy if cancer shows adverse symptoms (Makarov, 2017).

Radical prostatectomy is a surgical operation for localised cancer to remove the whole gland including the prostate cells within. For low-risk localised cancer, surgery, active surveillance, and radiotherapy all have the same chances that the patient will live 10 or more years. External beam radiotherapy is ideal for localised or locally-advanced prostate cancer. High energy X-rays are directed at cells in the local area to damage them and prevent the growth of cancer. Although healthy cells recover, healthy tissue is damaged as well which leads to side-effects. If cancer spreads to nearby lymph nodes, treatment can weaken the immune system. Permanent seed brachytherapy may be conducted along with radiotherapy if biopsies show a Gleason score of ≤ 6 , and it is localised T1-T2a cancer. Small radioactive seeds are inserted into the gland, where the low-dose radiation emitted destroys the cancer cells (Prostate Cancer UK, 2018).

Advanced prostate cancer is metastatic in nature, and so cannot be cured, only controlled. Chemotherapy uses anti-cancer drugs to slow growth and control cancer as it targets the rapid proliferation of cells. It can improve pain and other symptoms but can have side-effects such as hair loss and potentially fatal infections.

As prostate cancer is dependent on androgens, implementing an anti-androgen hormone treatment could prevent tumour growth. Testosterone is conducive to the growth of cancer cells as it dictates prostate growth. There are two ways to block androgenic stimulation: block the source of production or block the androgens reaching the tumour.

As androgens are mainly produced by the testes, surgical castration can be an option. Another option is the use of luteinising hormone-releasing hormones (LHRH) agonists and antagonists, in the form of injections or implants, which will regulate a naturally-occurring negative feedback loop. The hypothalamus releases gonadotropin-releasing hormone (GnRH) which causes the pituitary gland to release luteinising hormones and follicle stimulating hormones. These, in turn, stimulate the testes/ovaries to release hormones such as testosterone and oestrogen. If the levels of hormones are too high, this will feedback to the hypothalamus, which will stop the production of GnRH; and vice versa. The LHRH agonist binds to the LHRH receptor in the pituitary gland and causes a temporary surge in LH levels – and thus a 'flare' in testosterone levels – which can cause adverse reactions in the patients; for which LHRH antagonists can be used.

On the other hand, drugs can be used to prevent the testosterone from reaching the prostate gland. 1st line therapy includes taking daily pills (flutamide/bicalutamide) that are antiandrogens (Perlmutter & neovasculature through angiogenesis. The 'angiogenic switch' is activated constantly in tumours to support the neoplastic growths, in contrast with a healthy system, wherein it is only activated during wound healing and the female reproductive cycle for example (Hanahan & Folkman, 1996).

Tutor comment:

It was an absolute pleasure working with G. during The Brilliant Club Scholar's Programme. She was a consistently outstanding student throughout the course, and she was quick to pick up complex ideas about epigenetic regulation of gene expression. G.'s essay showed a level of sophisticated thinking and used wider research to substantiate the writing. The essay was a great example of how genetic abnormalities in X-linked genes can cause congenital disorders. G. dealt with the sensitive issues surrounding assisted reproductive technologies and was able to critically evaluate the ethical, religious and moral viewpoints of families in these situations. I have no doubt that G. will continue to excel in university.



How does prostate cancer become resistant to current treatment?

Year 12, Key Stage 5

Pupil: P. Pemmasami
School: Whitchurch High School, Cardiff
Supervised by: S. Koushyar
Tutor University: Cardiff University
Course Title: Can we tackle treatment resistant prostate cancer?

With an increasing incidence rate, prostate cancer is the second most common cancer for men around the world. In the UK alone, it is the most common cancer for men, with around 47,700 new diagnoses and 11,500 deaths every year (Cancer Research UK, 2018). Although curable if detected early, prognosis deteriorates as cancer progresses; with the five-year survival rate for metastatic prostate cancer patients being only 29% (American Cancer Society, 2017).

Around 130 men are diagnosed every day with prostate cancer (Cancer Research UK, 2018). One procedure to diagnose prostate cancer is to perform a blood test. The indicator is the prostate cancer biomarker: the enzyme

necessary to the immune system to repair damaged tissue and heal wounds, in cancerous regions it is upregulated. Immune cells appear transiently in the wound region, but in neoplasms, they are enduring in sites of inflammation, releasing cytokines that aid angiogenesis (Grivennikov, et al., 2010) (Karin, et al., 2006). As a result, it is possible to classify tumours as unhealed lesions due to the chronic inflammation present, which is usually a response to a wound.

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surveillance, and radiotherapy all have the same chances that the patient will live 10 or more years. External beam radiotherapy is ideal for localised or locally-advanced prostate cancer. High energy X-rays are directed at cells in the local area to damage them and prevent the growth of cancer. Although healthy cells recover, healthy tissue is damaged as well which leads to side-effects. If cancer spreads to nearby lymph nodes, treatment can weaken the immune system. Permanent seed brachytherapy may be conducted along with radiotherapy if biopsies show a Gleason score of ≤6, and it is localised T1-T2a cancer. Small radioactive seeds are inserted into the gland, where the low-dose radiation emitted destroys the cancer cells (Prostate Cancer UK, 2018).

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On the other hand, drugs can be used to prevent the testosterone from reaching the prostate gland. 1st line therapy includes taking daily pills (flutamide/bicalutamide) that are antiandrogens (Perlmutter & Lepor, 2007) which inhibit the translocation of the AR receptor to the nucleus, instead holding it in an inactive state in the cytoplasm. Abiraterone acetate (second-line therapy) stops testosterone production differently to other therapies and is used in castrate-resistant prostate cancer that is unresponsive to other hormone therapies (Prostate Cancer UK, 2018). Male characteristics may be affected by hormone therapy i.e. erection problems, strength loss.

Despite the androgen-deprived microenvironment, cancers can develop resistance to hormone therapies and cause a relapse. Castration-resistant prostate cancer

does not need testosterone to grow (National Cancer Institute, 2018) and therefore, is not responsive to castration treatment – both surgical and chemical.

Resistance can arise due to multiple mechanisms that allow a tumour to survive in a nutrient-deprived environment. They can develop various signalling pathways and supporting mechanisms include amplifications or mutations in the AR gene, change in co-activator and co-repressor expression, non-specific ligand binding to the androgen receptor, and mutations in tumour-suppressor genes or oncogenes (Pienta & Bradley, 2006). This illustrates that the AR signalling pathway can be activated non-specifically i.e. with a non-androgenic hormone. (Pienta & Bradley, 2006) also suggests that the cancer is not entirely independent of androgen but has become sensitized to low levels of androgen and can use that effectively to its benefit.

Another such mechanism is a change in repressor expression e.g. a change in prohibitin expression in the prostate cancer cell. Prohibitin is a pleiotropic protein that is found in mammalian cells (Koushyar, et al., 2017). It is found in the mitochondria, plasma membrane, and in the nucleus. It acts as a receptor and activates signalling pathways within the cells when found in the plasma membrane. If found in the mitochondria, it increases the stability of the mitochondria membrane by forming ring-like structures. In the nucleus, it has a tumour suppressor role; it stops certain genes from functioning and therefore cell growth is inhibited. Prohibitin is very important to mammals: if genetically deleted from an embryo, the embryo would die as they are crucial to the mitochondrial role in development (Sanz, et al., 2003).

An over-activation of the AR signalling pathway can lead to prostate cancer. However, PHB is a co-repressor that binds to the AR receptor, recruiting other proteins to hold the AR receptor in an inactive state in the cytoplasm, unable to reach the nucleus; effectively stopping the signalling pathway. A mutation to PHB can affect its tumour-suppressor function. As evidenced by (Koushyar, et al., 2017), there is a direct link between PHB expression and the AR signalling pathway. When one is expressed/activated, the other is inhibited. If there is a change in this co-repressor's expression, it can lead to over-activation of the signalling pathway – leading to an increase in the transcription of genes associated with cell growth. PHB also represses the E2F promoter from its transcription functions by recruiting chromatin-condensing proteins (Koushyar, et al., 2017). Furthermore, (Koushyar, et al., 2017) illustrates that the expression of PHB inhibits the migration of cancerous cells, thus dissuading potential metastasis.

In conclusion, a carcinoma in the prostate gland, whilst initially dependent on androgen stimulation to grow, can develop its own mechanisms to survive in an androgen-deprived microenvironment. As a result, the cancer becomes resistant to hormone therapies that target the androgen supply that it initially relied on. Mechanisms include sensitivity to low levels of androgenic hormones, change in the coactivator or corepressor expression – thus leading to abnormal regulation of gene expression -, mutations in cancer-promoting oncogenes and tumour suppressor genes, and the activation of signalling pathways

through non-specific ligand binding. A combination of these mechanisms renders any androgen deprivation treatments ineffective. Though the treatment may have initially worked, the cancer is able to adapt to a hostile environment, enabling resistance and leading to an unfortunate relapse in the patient.

Bibliography

- American Cancer Society, 2017. Survival Rates for Prostate Cancer. [Online] Available at: <https://www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/survival-rates.html> [Accessed 12 December 2018].
- Ashford, M., 2010. What Does The Prostate Gland Do?. [Online] Available at: <https://www.livescience.com/32751-what-does-the-prostate-gland-do.html> [Accessed 12 December 2018].
- Cancer Research UK, 2018. Prostate cancer risk. [Online] Available at: <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/prostate-cancer/risk-factors> [Accessed 12 December 2018].
- Cancer Research UK, 2018. Prostate cancer statistics. [Online] Available at: <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/prostate-cancer> [Accessed 12 December 2018].
- Grivennikov, S., Greten, F. & Karin, M., 2010. Immunity, Inflammation, and cancer. *Cell*, 140(1), pp. 883-899.
- Hanahan, D. & Folkman, J., 1996. Patterns and emerging mechanisms of the angiogenic switch during tumorigenesis. *Cell*, 86(1), pp. 353-364.
- Hanahan, D. & Weinberg, R. A., 2011. Hallmarks of Cancer: The Next Generation. *Cell*, 144(5), pp. 646-674.
- J.Vazquez-Mellado, M., VictorMonjaras-Embriz & LeticiaRocha-Zavaleta, 2017. Chapter Fourteen - Erythropoietin, Stem Cell Factor, and Cancer Cell Migration. *Vitamins and Hormones*, 105(1), pp. 273-296.
- Karin, M., Lawrence, T. & Nizet, V., 2006. Innate immunity gone awry: linking microbial infections to chronic inflammation and cancer. *Cell*, 124(1), pp. 823-835.
- Koushyar, S. et al., 2017. The prohibitin-repressive interaction with E2F1 is rapidly inhibited by androgen signaling in prostate cancer cells. *Oncogenesis*, 6(1), p. e333.
- Koushyar, S., G.Jiang, W. & Dart, D. A., 2015. Unveiling the potential of prohibitin in cancer. *Cancer Letters*, 369(2), pp. 316-322.
- Lu, P., Weaver, V. M. & Werb, Z., 2012. The extracellular matrix: A dynamic niche in cancer progression. *Journal of Cell Biology*, 196(4), p. 395.
- Makarov, D., 2017. What's the Difference between Active Surveillance and Watchful Waiting when Treating Prostate Cancer?. [Online] Available at: <https://www.urologyhealth.org/patient-magazine/magazine-archives/2017/winter-2017/ask-the-experts-whats-the-difference-between-active-surveillance-and-watchful-waiting-when-treating-prostate-cancer> [Accessed 12 December 2018].
- Msaouel, P., Diamanti, E., Tzanela, M. & Koutsilieris, M., 2007. Luteinising hormone-releasing hormone antagonists in prostate cancer therapy.. *Expert Opinion on Emerging Drug*, 12(2), pp. 285-299.
- National Cancer Institute, 2018. NCI Dictionary of Cancer Terms. [Online] Available at: <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/castrate-resistant-prostate-cancer> [Accessed 12 December 2018].
- Perlmutter, M. A. & Lepor, H., 2007. Androgen Deprivation Therapy in the Treatment of Advanced Prostate Cancer. *Reviews in Urology*, 9(1), pp. S3-S8.
- Pienta, K. J. & Bradley, D., 2006. Mechanisms Underlying the Development of Androgen-Independent Prostate Cancer. *Clinical Cancer Research*, 12(6), pp. 1665-1671.
- Pierotti, M. A., Sozzi, G. & Croce, C. M., 2003. *Holland-Frei Cancer Medicine*. 6th ed. Hamilton: BC Decker.
- Prostate Cancer UK, 2018. Abiraterone. [Online] Available at: <https://prostatecanceruk.org/prostate-information/treatments/abiraterone> [Accessed 12 December 2018].
- Prostate Cancer UK, 2018. Choosing a treatment. [Online] Available at: <https://prostatecanceruk.org/prostate-information/treatments/choosing-a-treatment> [Accessed 12 December 2018].
- Prostate Cancer UK, 2018. Prostate Biopsy. [Online] Available at: <https://prostatecanceruk.org/prostate-information/prostate-tests/prostate-biopsy> [Accessed 12 December 2018].
- Prostate Cancer UK, 2018. Treatments. [Online] Available at: <https://prostatecanceruk.org/prostate-information/treatments> [Accessed 12 December 2018].
- Sanz, M. A. et al., 2003. Home Current Issue Papers in Press Editors' Picks Minireviews. *Journal of Biological Chemistry*, 278(34), pp. 32091-32099.
- Virtual Medical Centre, 2018. Prostate cancer: Neuroendocrine carcinoms. [Online] Available at: <https://www.mymvc.com/diseases/prostate-cancer-neuroendocrine-carcinoma-of-the-prostate/> [Accessed 12 December 2018].
- WebMD, 2017. What Is Metastatic Prostate Cancer?. [Online] Available at: <https://www.webmd.com/prostate-cancer/metastatic-prostate-cancer#1> [Accessed 12 December 2018].
- WebMD, 2018. Diagnosis & Tests. [Online] Available at: <https://www.webmd.com/prostate-cancer/guide/prostate-cancer-diagnosis-tests> [Accessed 12 December 2018].

Tutor comment:

P. was an excellent student and a pleasure to teach. Her final assignment is outstanding and written in a coherent scientific manner that is well beyond her years, achieving a first-class mark. P. will be an excellent university student and will continue to achieve high class work.

Arts and Humanities



How can the oral history of Hip Hop help us to interpret Hip Hop dance theatre as a form of political resistance?

Year 9, Key Stage 3

Pupil: **G. Cicero**

School: **Cantonian High School, Cardiff**

Supervised by: **G. Connell**

Tutor University: **University of Surrey**

Course Title: **'Y'all don't hear me though: Hip Hop as political resistance'**

Hip Hop has grown rapidly as a collection of art forms in the last few decades. Hip Hop continually develops and changes as time goes by; the definition of Hip Hop today is vastly different from the original definition that was conceived upon the creation of the movement. This is due to certain art forms that comprise Hip Hop gaining exposure and being globalised, which has left Hip Hop's other art forms behind and out of the limelight. A large proportion of the art forms that Hip Hop consists of have stayed underground whereas others have been pushed into the view of the public.

A misconception common amongst laypeople is that Hip Hop is another name for the music genre 'rap'.

Rap or Hip Hop is evidently one of the most popular music genres today; it has its roots in spoken word poetry however the likes of The Sugarhill Gang helped to shape Hip Hop during their time in the charts in the late 1970's. Nowadays, Rap music can be split into multiple subgenres from violent, gang-led 'Drill' popular in Chicago and London, spearheaded by rappers like Chief Keef and 67, to alternative Hip Hop, with artists like Kanye West, Tyler the Creator, MF DOOM and Earl Sweatshirt putting their own unique spin on Hip Hop music. Hip Hop is a genre of music that bonds MC-ing (rapping) and DJ-ing however as previously mentioned, Hip Hop is a social-political movement made up of five pillars (Reference).

The five pillars of Hip-Hop are as follows: MC-ing, DJ-ing, breakdance, graffiti and consciousness/knowledge. These are the pillars or elements of Hip Hop that were outlined by DJ Afrika Bambaataa, the leader of the Universal Zulu Nation in the Bronx in the early 1970s. Afrika Bambaataa did coin the five pillars of Hip Hop but nonetheless, he isn't credited with creating Hip Hop on the whole. The Father of Hip Hop is said by many to be Jamaican DJ Kool Herc. In August 1973, he had a series of parties at 1520 Sedgwick Avenue in West Bronx, New York and on one night, history was made. It is reported that by using two copies of the same record, two turntables and a mixer, DJ Kool Herc played an extended drum break which caused the crowd to go wild (the crowd became very noisy and excited). People were seen B-Boying (an athletic form of street dance consisting

of acrobatic moves done both on the floor and whilst the dancer is stood up; it is more commonly referred to as breakdancing by laypeople) whilst DJ Kool Herc's friend, Coke La Roc, was talking or more appropriately 'toasting' over the beat to get the crowd hyped. This spawned MC-ing, one of the pillars of Hip Hop that now has evolved into rapping which exploded in popularity thanks to artists on the East Coast like Mos Def, Talib Kweli, A Tribe Called Quest and Nas in the 1990s.

The Universal Zulu Nation's motto 'Peace, love, unity and having fun' describes what Hip Hop was about. Hip Hop was a way for reformed gang members to unite and bond over art forms they all loved. Hip Hop is also used as political resistance predominantly in rap lyrics but also in dance performances and theatre as well. The best example of an artist utilising rap lyrics as a form of political resistance is Jo-Vaughn Virginie Scott, a 24-year-old rapper more frequently known as Joey Bada\$\$\$. His song 'Land of the Free' from his 2017 studio album 'ALL-AMERIKKAN BADA\$\$\$' was highly praised as Joey truly opens up about his views on slavery and the inauguration of Donald Trump as US president. In the first verse he says "Sorry America, but I will not be your soldier, Obama just wasn't enough, I need some more closure, And Donald Trump is not equipped to take this country over, Let's face facts 'cause we know what's the real motives."

When explaining these lyrics Joey talks about how even though Barack Obama becoming president was a good thing for black people, it caused a lot them to forget and turn their back on the history of slavery and racism in America all because there was now a black president. He goes into detail about how having Barack Obama as president wasn't enough for him; he stated that Obama being voted into the white house gave him hope but it did not resolve any of the problems that he faces as a Caribbean black man living in America. I personally believe that Joey expressed his views well and managed to achieve what he intended to do with the verse; he gave a clear and convincing argument as to why Barack Obama becoming president of America in 2009 did not resolve many of the problems that the Black community was facing at the time such as racism and police brutality.

It is not only rappers who channel their political views into their art forms but also Hip-Hop dance performers. Various dance styles carry messages or are intended to express a certain point or the dancer's feeling towards something. The Hip Hop dance style 'Turf' originated in the San Francisco Bay Area and often is used by the dancer to express their opinions. It is incredible how dance performers can convey their political views with dancing. Some of performers have even gone as far as to devise a complete solo show about a political issue or view; the best example of this is 'The Letter' by Jonzi D, a British dancer and director who has been supporting the Hip Hop community for a prolonged period of his life. The show is about Jonzi D trying to determine if, as a man with an Afro-Caribbean heritage, it is morally correct to accept an MBE and become a member of the same British Empire that invaded and colonised most African countries towards the end of the 19th century. Jonzi displays a myriad of different opinions from multifarious characters which make his dilemma considerably more difficult to solve.

The trailer for 'The Letter' begins with Jonzi D sat down and opening, then reading the letter offering an MBE prior to putting it down. While reading the letter Jonzi performs a dance move in which his feet shuffle to the left side of his body, to the right and back to the left while he is seated. I strongly believe that in this brief moment in the trailer, Jonzi is showing that even when he initially was reading the letter, his mind was going back and forth about whether or not to accept the MBE, hence why his legs kept moving side to side. It is as if Jonzi was viewing the situation from two different perspectives and he constantly changes his mind, so he is switching side or perspective. I think that this is an effective way of showing that even initially, Jonzi D did not know how to feel about being offered an MBE. Next, he puts the letter down and debates in his head about whether or not he believes an MBE is a good thing or a bad thing. His thoughts are narrated in this part of the trailer, he thinks "You have to look deep into your soul and ask yourself, how do you feel about an MBE?". This means that his conscience was telling him that that he must truly decide what his opinion about the offer is. In the video, the word 'You' is slightly emphasised showing that his conscience is telling him to only take into account what he thinks about an MBE and not the opinion of others.

The next two shots of the video consist of Jonzi D impersonating those who had just heard the news that Jonzi had been offered an MBE. The second person he impersonates says "Is it true, you're gonna meet the Queen?". From the way they start off the question saying 'Is it true' I can conclude that there was most likely a rumour spreading around about Jonzi D's MBE offer before he went public about it and the person wanted to ask Jonzi if there was any truth behind the rumour. After this shot, we see Jonzi seated in the dark. He is sitting with his legs crossed which indicates the debate of whether to accept or reject the MBE is still 'crossing' his mind. I believe that him sitting with his legs crossed also alludes to the MBE award itself which is a cross shaped medal. In this shot he also does a dance move in which he moves his hands in a wave fashion from right to left and back again. In my opinion, this movement symbolises Jonzi's mind going from one side of his debate about the MBE to the other and references the slave trade. I feel as if the wave movement is referring to slaves being sailed across the ocean during the rise of the British Empire. During the 18th century, British boats would sail to the west coast of Africa and trade their cargo for captured African slaves who would then be sailed to the Americas to work as slaves. The slave triangle made up of Britain, west Africa and America. One reason that Jonzi does not want to accept the MBE offer is that he does not want to be a member of the British Empire since he would be submitting to the same empire that enslaved his ancestors hundreds of years ago. Also, in this scene Jonzi says that the acceptance of the MBE would be excellent for street dance while sat in the dark with his hands in front of his head. He then moves his face into the light to say, "oops I'm sorry, Hip Hop." I believe that Jonzi is trying to illustrate how people think of street dance as just one part of Hip Hop; they believe that street is just a small section of a bigger picture, hence why Jonzi's hands form some kind of picture frame or represent a canvas while he says 'Hip Hop'.

In the next scene, Jonzi mimics a woman embracing him and heavily congratulating him. Again, in this scene we are able to observe both sides of Jonzi's conundrum about whether to accept or reject the MBE award. While impersonating the lady, Jonzi outstretches his arms to offer out a hug; this motion used to invite some to hug you is the same motion you would do in order to receive or accept an object, in this scenario, an MBE. After this, the character pushes out their hands in a playful manner while expressing how she would like to see Jonzi on the BBC. This motion represents Jonzi rejecting or shunning the MBE as he pushes it away from himself. Later in the trailer, Jonzi performs another impression. This time of an African man. The man talks about how Jonzi needs to stop fighting and that the Black Revolution is over. He says, "it's alright now, Mandela is free!".

He is obviously referring to the release of Nelson Mandela, a former South African president, from prison after spending over 10,000 days there. Mandela was freed on Sunday, 11th February 1990 after his long sentence in prison for conspiring to overthrow the state. It's clear in this scene that Jonzi shares the same opinion as aforementioned Rap artist, Joey Bada\$\$\$. They both talk about how members of the African and Caribbean community will overlook hundreds of years of injustice that both them and their ancestors have received whether it be the slave trade, racism or police brutality just because one significant thing has happened for the good of their communities. Joey talked about how Black people in America thought the inauguration of Barack Obama would solve all the problems suffered and Jonzi D showed how black people that black people didn't experience problems ever since Nelson Mandela was freed.

To conclude, Jonzi D's hip hop dance theatre show 'The Letter' displayed his thoughts about the British Empire amongst other things. Jonzi, like many other hip hop dancers or rappers, utilised Hip Hop as a form of political resistance. Even though people such as author M.K Asante believe that hip hop has died, I believe that hip hop has a good future ahead of it especially if artists continue to use their respective art forms as political resistance.

Bibliography

- [1] Shannon Randall, 'The Five Elements Of Hip Hop' <http://www.shannonrandallcreative.com/stories-shannon-randall/2017/4/27/the-five-elements-of-hip-hop/Shannon+Randall>, [March 12th, 2019]
- [2] Rebecca Laurence, '40 Years On From The Party Where Hip Hop Was Born', <http://www.bbc.com/culture/story/20130809-the-party-where-hip-hop-was-born> [March 12th, 2019]
- [3] Joey Bada\$\$, 'Land Of The Free', <https://genius.com/11200638> [March 12th, 2019]
- [4] Christina Lee, 'Turf in the Bay: A Local Dance Craze Becomes a Community's Voice', <https://daily.bandcamp.com/2016/07/18/turf-in-the-bay-feature/> [13th March 2019]
- [5] 'Jonzi D', <https://www.breakinconvention.com/jonzi-d> [March 13, 2019]
- [6] 'The slave trade- a historical background', <http://www.bluk/learning/histcitizen/campaignforabolition/abolitionbackground/abolitionintro.html>, [26th March 2019]
- [7] Brand South Africa Reporter, 'Remembering Nelson Mandela's first steps of freedom', <https://www.brandsouthafrica.com/people-culture/mandela/mandela-release-100215>, [27th March, 2019]

Tutor comment:

Tutor comment: G. was a joy to teach - incredibly passionate about the subject and so engaged in the course. He generated some outstanding creative homework tasks during the course, including a rap which I'd love to see at number 1 in the charts! His essay was outstanding, and I was impressed by the high level of analysis he applied to Hip Hop's politics and to an interpretation of a particular Hip Hop dance theatre work. I wish him all the best in the future. I know he'll go very far.



How successful is the Free Will Defence in solving the problem of evil?

Year 9, Key Stage 3

Pupil: W. Lake
School: West Somerset College, Somerset
Supervised by: C. Marsden
Tutor University: University of Exeter
Course Title: Martin Luther and the problem of evil

The Problem of Evil is an argument that has engaged philosopher's minds for many years and caused them to spend their lives trying to end this weighty debate. It is a problem for the theists, uninclined to stop believing in God's three values - that he is omnipotent, omniscient and omnibenevolent, even though evil obviously still exists in the world. This theodicy runs deep into the roots of philosophy. There are many theodicies used to explain and dispel the co-existence of God and evil in the world, one of which is the Free Will Defence. Although, it exonerates God in certain aspects it is challenged by other theories. This essay aims to unpick the successfulness of the Free Will Defence and sharing my views on why I believe it only partially solves the Problem of Evil.

To summarise the Problem of Evil, it's the contradiction that comes with believing that God is omniscient (all knowing), omnipotent (all powerful) and benevolent (all loving). When a theist believes in all three of these qualities belonging to God, it creates a problem because evil shouldn't be able to exist. It can be viewed as an inconsistent triad; consisting of three propositions of which at most two can be true - when one of God's qualities is taken away evil can exist. As an example, if we took away God being omnipotent then we would be able to say, yes, God is benevolent and omniscient however, he just doesn't have the power to stop evil. David Hume, an atheist, argued that only three possibilities exist; God is not omnipotent, God is not benevolent, evil doesn't exist. We know that evil does exist and if God also exists, he is either not powerful or malicious, contradicting the traditional portrayal of God. Therefore, Hume concluded that God does not exist. However, Hume's theory is open to debate because he failed to fully acknowledge the possibility that God could have another reason to allow evil to exist.

Consider the two types of evil: moral evil and natural evil. Natural evils refer to those caused by disasters, such as earthquakes, and are seen to further challenge the benevolence and omnipotence of God. A moral evil, however, is one resulting from the direct result of a human's actions, causing pain or suffering to someone. Murder and war are both examples of moral evils.

God might have a 'morally sufficient reason' to allow evil, one that would allow evil if it were to benefit in some way. As a result of this response, unjustified evils (those that no-good being would allow to happen or there is no

good reason for it to happen) shouldn't exist. An article published by William Rowe, a professor of philosophy, it tells the story of a deer caught in a forest fire and left to suffer for 4 or 5 days. This raises the argument that if there really was a God, then why did this happen? There are no ways to justify this action as we cannot put it under either human free will or having a morally sufficient reason in some way.

Alternatively, the 'Free Will Defence' states that humans have been given free will by God and can therefore make choices; in doing something evil, abusing the free will given to them by God, it is solely the fault of humans that evil exists. This, therefore, exonerates God, saying that he isn't the reason that evil exists in the world. Consider the example of a person who instead of intervening to prevent a violent crime allows it to happen, citing the allowance of free will as a defence. This seems a poor excuse for a human, so it could also be considered a weak defence for God. Modern theists use the Free Will Defence to say that God, being benevolent, gave humans free will as he didn't want them to be slaves to his thinking. However, the obvious argument to this is, if God is omnipotent and benevolent then he would give humans free will but erase evil thoughts from their minds (this is what J.L. Mackie referred to as moral perfection in 1955). This once again shows that God and evil struggle to coexist. Logically, as argued by Alvin Plantinga in 1977, just as God cannot make square circles, he cannot give people both free will and moral perfection.

Of course, does free will even exist? Free will was questioned by Martin Luther (a seminal figure in the protestant Reformation) many centuries before in 1525. The issue at the time was whether or not humans are free to choose good from evil after the Fall of Man. His criticism was that by having free will it undermined God's omnipotence. Luther was a very firm believer in God and thought that God hadn't given humans free will because it would mean he was not all powerful. John Locke (an English philosopher and physician) quoted "Suppose that a sleeping man is placed in a locked room. On awakening, he decides to stay where is, he does not know that the door is locked. This is a real decision taken by him, it is freely made and he might have chosen to leave; but in reality he has no choice and it is only his ignorance of his true situation which made him think otherwise." This again suggests that we are not really free. Like a robot, our actions are predetermined; we are programmed to do certain things.

We should consider the approach of Existentialism. Existentialism is the belief of existence before essence, that at the point of birth, humans have no meaning. Existentialists believe that we have to discover our own essence in the world – determining our own development through acts of the will. Jean Paul Satre who is one of the best-known existentialists said, "We are condemned to be free". Satre believed that humans lived in a world with an abundance of free will.

Satre also said "that as there are no guidelines for people's actions; each person is forced to design their own moral code and invent a morality to live by".

However, theists would argue that a holy book or bible provides a guideline of morality. What this means is that existentialists believe that humans aren't born with a purpose in life and God doesn't have your life planned out for you but not all existentialists are atheists. The theists who follow existentialism believe that God exists and created the world and people, but he did this without any particular purpose in mind. This philosophy supports the Free Will Defence; Existentialism also exonerates God as it moves the source of evil to humans. However, like the Free Will Defence, God's benevolence is still questioned as surely an all loving being who is also omnipotent would do something about the obvious existence of evil in the world.

There is a further, more simplistic view that there is another higher power tempting people to sin; the Devil. People are given two choices to follow: God (for good purposes) and the Devil (for evil). The Devil is a being, sent down to Hell by God and is mentioned most memorably in the Bible as the serpent who coaxed Eve to eat the apple. As a result of this the Devil is believed to shape shift, luring people into a false sense of security. The Bible talks about an ongoing battle with God and the Devil, Heaven and Hell. Could it be that the very existence of evil provides the definition for good? That, in fact, good cannot exist without its direct opposite. The very foundation of religion is overcoming the struggle against evil – why else provide a moral code to live by? This is an argument supported by blind faith, by those who unquestioningly follow God, recognise that evil exists but do not believe that it undermines Him but in fact, provides Him with a purpose.

All things considered the Problem of Evil, in my opinion, cannot be easily solved by the Free Will Defence. Many philosophers have explored this pool of mystery but never reached the bottom. The Free Will Defence is, as we have already looked at, the theory that God gave us the power to think for ourselves, to make choices and in turn, allow evil to exist as true free will must consist of the capacity to choose anything, whether it is good or evil. Taking this theory and coupling it with the presence of evil we can assume many people have abused that right given to them by God. However, if there was a God powerful enough to give humans free will then they are also powerful enough to alter it.

The world has been in existence for millennia, but it has not changed morally. There has always been pain and suffering; the only difference? The victims. It's hard to see how any deity would look down at His creation with a sense of pride or satisfaction. A God who is omnibenevolent would surely do something to improve the state of the world he had created and destroy evil. Though without evil, good wouldn't knowingly exist as there would be no contrast with everyone living in a peaceful harmony.

I believe that there is a more fundamental problem – that is, that the faith in an omnibenevolent, omniscient and omnipotent God requires the strong belief in a Creationist theory over the more scientifically backed Darwinism approach. Creationism puts an unnatural

emphasis on the importance of Man in the universe. If you look at God on a much larger scale would the pain and suffering on one planet within the entire universe be something that an all-powerful, loving and knowing God would be concerned with? Do we believe in a powerful God who concerns Himself with the day to day business of Man?

My belief is that Hume's inconsistent triad is the most appropriate theory which cannot be contested by the Free Will Defence for the reasons above and therefore doesn't solve the Problem of Evil.

In summary, the Free Will Defence, although argued for by some of the best philosophers in the world, cannot solve the Problem of Evil. This is a complicated matter, with many contrasting opinions. There are those who believe in Hume's inconsistent triad; all three qualities must coexist to prove God's existence – but as a group mean that evil is not real. The Existentialists, like Jean-Paul Satre, who promote the theory of radical free will, we are all born condemned to be free with no life plan and can be judged to support the Free Will Defence. The least complicated group are those whose faith allows the ongoing battle of good and evil, who firmly and unquestioningly believe in God and His antithesis, the Devil. There are also others, like John Locke and Martin Luther, who have completely dispelled the idea of free will and query whether we have any freedom of choice at all or are we, in fact, all ignorant of our situation in the world? If we follow their theories the Free Will Defence couldn't possibly exist.

Finally, there are those who do support The Free Will Defence attempting to exonerate God by saying it is the humans who have abused the right of free will, who have chosen the wrong path and are slowly destroying God's perfect world. Isn't this much too high a price to pay for freedom?

Bibliography

<https://www.youtube.com/watch?v=L67dlpMgDa4>
<https://www.youtube.com/watch?v=prWSGbDW3LU>
<https://www.iep.utm.edu>
www.tutor2u.net/blog/free-will
www.trinityfoundation.org/luther-on-free-will
en.wikipedia.org/alvin_plantinga
getrevising.co.uk/grids/philosophyofreligion
<https://www.youtube.com/watch?v=YaDvRdLMkHs>
link.springer.com/article/10.1007/978-1-4020-2620-0_1
en.wikipedia.org/Augustinian_theodicy
jonathandavidgamer.wordpress.com
experimentaltheology.blogspot.com
www.philosophyofreligion.info/thefreewilldefence

Tutor comment:

W. is an outstanding young philosopher. Throughout the programme he consistently asked thought-provoking questions and always prioritised thinking over learning. Naturally curious, W.'s researching techniques were impressive: he produced written work of an excellent standard – clearly signposted and insightful. It was a pleasure to read such nuanced arguments from someone new to Philosophy. It was an absolute pleasure teaching W. at West Somerset College and I hope he feels inspired to continue asking the Big Questions!



Analyse the significance of fantastical figures in medieval French literature

Year 9, Key Stage 3

Pupil: B.J. Vanderplank
School: Ormiston Park Academy, Thurrock
Supervised by: M. Siôn Lampitt
Tutor University: King's College London
Course Title: *Fantastic beasts and where to find them (in medieval French literature)*

Throughout history, fantastical figures such as fairies, werewolves, snakewomen and giants have appeared in stories, poems, paintings and other material. In medieval France however, these figures are especially significant, as they demonstrate the gaps and issues in society with regards to gender, sexuality and traditional ideas about humanity in general. They are specifically important, because after demonstrating what is viewed or deemed as normal in that time, they destroy these rules and ideas, leaving a free world within these tales where normal does not exist. Fantastical figures in medieval France challenge and beat traditional ideas and opinions. One example of a fantastical figure that challenges tradition, is Bisclavret.

Bisclavret begins by telling us of a man, Bisclavret, who each week becomes a werewolf for 3 days. His wife becomes highly suspicious of these disappearances each week and eventually asks Bisclavret where he goes. At this point, it is made clear that she asks Bisclavret with fear of angering him and is quite scared for the man's response. The wife's obvious distress demonstrates to us the male dominance Bisclavret has over his wife in this marriage and can allow us to infer that Bisclavret's wife is not treated the best way by her husband, potentially even abused. This inference can be made due to the fact that it is made clear she was afraid to ask Bisclavret of his disappearances. Clearly, if she was as frightened as she was to simply ask her husband a question, then she knows what Bisclavret will do to her or at least knows what she expects him to do to her, reflecting to us the beliefs of male privilege during medieval times. During this time period, men were seen as dominant over women, whilst females were portrayed as weak, powerless figures, who had to obey the orders of men. This idea is further supported by the fact that the wife has no name throughout the entire text because she is seen as insignificant and uncared about, even though in the text she plays an important role. While this does not actually make Bisclavret, a fantastical figure, significant in any way to medieval France because men were viewed as superior to women anyway, it does create a successful demonstration of the roles that were deemed as 'normal' during that time and then later on in the text, breaks those gender roles.

As we read further into the text, it is then told that upon finding out the reason behind Bisclavret's weekly

disappearances, his wife calls upon a knight to take Bisclavret's clothes so that he may not return to human form and also expresses her refusal to sleep with him anymore. This sudden contrast in the wife's behaviour and her presentation in this part of the text to how she had been presented a few lines ago, creates the interpretation that now she has taken on the typical medieval male role, becoming much more independent and her own person in comparison to Bisclavret, who now is stuck as a wolf in an almost vulnerable state. For a woman in medieval France it would be extremely unlikely that they would ever have the power to leave their husband. The way men treated their wives so horribly and then abused them is now being flipped, with Bisclavret's wife treating him in this cruel way by leaving him and then hurting him, all while being the dominant role in the current situation. The gender roles included in this text have been reversed. This reversal happens once again, later in the reading, when Bisclavret bites the nose off his wife in court: 'When Bisclavret saw her coming, no man could hold him back: he ran at her as if enraged. Hear how he avenged himself! He tore her nose from her face.'(Quant Bisclavret la veit venir, nuls huom nel poeit retenir : vers li curut cum enragiez. Oëz cum il s'est bien vengiez ! Le nes li esracha del vis." lines 231-235). This act of utter violence and brutality demonstrated by Bisclavret towards his wife, once again shows the male dominance within medieval times. Therefore this makes Bisclavret significant, as his representation of the male role of that time period is made clear, broken and then demonstrated once again. This reading blurs the gaps between male and female roles within the marriage of Bisclavret and his wife, creating an idea extremely unusual and unexpected during this period of time, making Bisclavret's character significant in this area as he defies expected gender roles.

The section of text where Bisclavret is in court and bites his wife's nose off is also very important to interpretations and lends itself well to being interpreted via posthumanist theory. Specifically the line in which a wise man within court argues that the wolf must have a reason for his attacks because: "It has never before attacked a man or shown malice" ("Unkes mes hume ne tucha/ ne feluine ne mustra," lines 245-246.) This argument given by the wise man is strange and confusing due to the fact that wolves are violent animals anyway. Why does this man just suddenly decide that it must have had to have justification? If a wolf attacks a man, it is simply because of the wolf's nature, not because they have a reason against that human. The wise man's argument that Bisclavret's actions are justified simply because he didn't attack anyone else does not satisfy the idea of what we know as simply animal behaviour and therefore leaves us confused with as to how far these people think Bisclavret is an animal. As written by Marie in the prologue: "Garulf is a wild beast; while he is in that rage, he eats men and causes great damage," ("Garulf, ceo est beste salvage ; tant cum il est en cele rage. humes devure, grant mal fait," lines 9-11), so what is Bisclavret? A beast or a human? This blur between the human and non-human world is quite difficult to understand at points within the text, but does break the idea of boundaries between human and animals

and challenges anthropocentrism. As Emma Campbell writes, 'the difficulty of deciding between human and animal violence is highlighted by the repeated glossing of Bisclavret's action for both characters and reader' (2013, p.100). Every action taken by Bisclavret can be interpreted in two ways: human and animal. And that is what makes it so hard to understand what is deemed to be human or animal behaviour at times because the boundaries are constantly being blurred not only for us, but also for the characters within the text. Once again, Bisclavret successfully demonstrates an idea and then destroys it entirely.

Difficulty in distinguishing what is human and what is not between characters can also be seen in the section of the text where the king has his foot kissed by Bisclavret whilst he is in wolf form. As Peggy McCracken writes: 'Many readers of *Bisclavret* have emphasised that the king recognises the wolf's gesture of submission as demonstrating the beast's human-like-intelligence – that is, he understands that this is no ordinary wolf' (2017, p.62). This scene between the king and the wolf seems to also include a blur between humans and animals. It is almost as if the human world is familiar with that of the non-human world and can easily distinguish a human in non-human form. But at the same time, they struggle. Why do they not expect animals to be violent? Again, there is no real justification as to why a character within the text has decided an animal is not animal but instead much more human. The king does not even so much as flinch when a wolf comes before him and kisses his foot. While it may be argued the reasoning is that wolves do not kiss feet as it is not in their nature, why was it that the king did not then expect when the wolf came near that he was going to attack, as a wolf would? The king even goes as far as sleeping in the same bed as this wolf without truly even knowing if he is human or not. As the text would suggest, the king believes the wolf is not animal, so then why does he domesticate him and keep him as a pet? The difference between the animal and human world here seems to be extremely blurred and unpredictable.

While *Bisclavret* does include a traditional heterosexual relationship between a man and a woman in the beginning, the text also includes suggestions and ideas related to that of queer theory. This is another key example of *Bisclavret* demonstrating and then breaking the traditions of medieval France. In the beginning of the text, Bisclavret is presented as a traditional male character, married to a lady. This was what would have been expected during this time period, as heterosexual relationships were the only ones permitted. However, later on in the text, specifically when the king takes in Bisclavret and adopts him, there is a hint to homosexuality. We are told that the king and wolf sleep in the same bed. As readers, we are aware that Bisclavret is a human male. But the real question is, to what extent does the king know this? Some may argue that this is not homosexuality, because the king adopted Bisclavret as his pet and so clearly, he views him as animal. While this may be the case, it is even suggested in the text that the king thinks or knows Bisclavret is no ordinary wolf. When he found Bisclavret, he did not expect him to be violent, but he was also amazed by his courtly behaviour. It seems unclear to what the king really thinks. However, later when Bisclavret becomes man again, there is no anger or embarrassment

from the king. Surely he would be ashamed to have known he was sleeping in the same bed as a man, especially when homosexuality in medieval times was highly frowned upon and could lead you to your death.

But this is not the case. When the king learns the truth after torturing Bisclavret's wife, he wants Bisclavret to become a man. Does this mean he wants people to know that the 'animal' he had loved and adored so, was actually a human male? He seems to show no remorse for sleeping near Bisclavret and actually is happy when he returns to human form. Surely, the king would rather keep his secret of being with a man hidden and would have kept Bisclavret as a wolf to keep his pride, but he did not. When the text ends and Bisclavret is human once again, we are left with no idea of what happens between the two next. Can they really continue as knight and king after knowing what happened between them? William Burgwinkle writes that Bisclavret presents us with "identity by then so imbued with homosocial affection that it shows no signs of returning to heteronormative knighthood" (2004, 169). The text leaves us with no information on how close king and knight remain. All we have come to understand is that *Bisclavret* critiques against heterosexual normality, yet we are also not told to what extent the relationship between king and knight progresses and how close they remain. The King and *Bisclavret* have been presented with quite an unusual relationship throughout the text which leads the reader not knowing to what extent they know the true identities of one another. Surely Bisclavret knows he is in fact human beneath this wolf façade? And if he does, why does he choose to let it continue given the beliefs at the time that strictly only man and woman should be together. The fact that this idea was played out with a king, such a high and noble figure in which this not-so-traditional idea was placed is extremely crucial because it was something completely unexpected and shocking to talk about a king in this way during medieval times. This is definitely a brave move by not only Bisclavret but also the writer, Marie de France.

In conclusion, fantastical figures like the werewolf Bisclavret are so significant in medieval French literature because they demonstrate the traditional ideas of anthropocentrism, male privilege and heterosexuality, the things that were deemed 'normal' at the time. However, they then challenge them, breaking them in the process and introduces ideas that are not so traditional such as a dominant female role, blurred boundaries between the human and animal world and homosexuality. *Bisclavret* especially is a text that strongly conveys disapproval of these traditional ideas and that is why it is so significant because these fantastical figures challenged normality and were so different to anything the word had ever seen in that period of time.

Bibliography

Primary Sources
Marie de France: Warnke, Karl, ed., Harf-Lancner, Laurence, trans. 1990. *Bisclavret*. In *Lais de Marie de France*, 116-133. Paris: Le Livre de Poche.
Secondary Sources
Burgwinkle, William E. 2004. *Sodomy, Masculinity, and Law in Medieval Literature: France and England, 1050-1230*. Cambridge: Cambridge University Press.
Campbell, Emma. 2013. "Political Animals: Human/ Animal Life in Bisclavret and Yonec." *Exemplaria* 25 (2): 95-109.
McCracken, Peggy. 2017. *In the Skin of a Beast: Sovereignty and Animality in Medieval France*. Chicago: The University of Chicago Press.

Tutor comment:

I thoroughly enjoyed my time teaching at Ormiston Park Academy, and this essay is an excellent illustration of the level of engagement and imagination demonstrated by the students there. This essay focusses on the medieval French text *Bisclavret* by Marie de France, which B.J. analyses from three critical perspectives (feminist, posthumanist, and queer). The essay has a cogent and well-developed argument, is written in a clear and confident style, engages with the critical literature, demonstrates conceptual sophistication, and even quotes from the Old French! It was very easy to justify the mark of 76 that this essay richly deserves.



‘I have the body but of a weak and feeble woman; but I have the heart and stomach of a king’ – Elizabeth I

To what extent do Margaret, Elizabeth and Anne conform to or challenge this idea of queenship in Shakespeare's plays?

Year 9, Key Stage 3

Pupil: M. Woolridge

School: Tredegar Comprehensive School, Blaenau Gwent

Supervised by: E. Jones

Tutor University: Cardiff University

Course Title: A game of thorns: Putting the 'roses' of the wars centre stage in the 1590s

William Shakespeare, who was an English playwright and poet born in April 1564, wrote four plays based on the Wars of the Roses, which are called the *First Part of Henry VI* (1 Henry VI,), the *Second Part of Henry VI* (2 Henry VI,.) the *Third Part of Henry VI* (3 Henry VI,.) and *Richard III*. This was called the first tetralogy. Shakespeare includes the three queens, Margaret of Anjou, Elizabeth Woodville, and Anne Neville, who play significant roles in the plays by not only being part of the Wars of the Roses, but also challenging the idea and stereotypes of queenship. Shakespeare also lived during the reign of Queen Elizabeth I, so he may have based certain traits of the three queens on Elizabeth.

Margaret of Anjou is in all the plays in the first tetralogy and is the most active of the queens. She was born on the 23rd of March in 1430 in Pont-a-Mousson, France. Her parents were René, Duke of Anjou, and Isabella, Duchess of Lorraine, and married King Henry VI when she was 15 years old. During *Henry VI, Part 3*, Henry VI agrees that Richard, Duke of York will become king after his death, which means he had disinherited his only son.

When Margaret finds out about this, she becomes irritated and leads an army against York. At the end of the battle, she taunts York, saying, ‘look, York: I stain'd this napkin with the blood that valiant Clifford, with his rapier's point, made issue from the bosom of the boy; and if thine eyes can water for his death, I give thee this to dry thy cheeks withal.’ [1] In this quote, she is explaining that one of her men have killed his son, and she has stained a napkin

with his blood so if he wants to cry over the death of his son, he can use the napkin to dry his cheeks. This shows that Margaret was not a stereotypical queen, by having a violent nature.

I think that out of all three queens in these plays, Margaret challenges the idea of conventional queenship the most. Not only does she fight and lead an army, she also shows that she is a violent person when provoked and is not afraid to get her hands dirty if she needs to. She also seems to act in a similar way to Queen Elizabeth I when she said the Tilbury Speech in 1588, which also challenged the expectations of a good queen. ‘To think foul scorn that any prince of Europe, should dare to invade the borders of my realm,’ [2] best describes Margaret because she was angered by the fact that Henry VI would disinherit his own son for the Duke of York, and went to kill him so he could not take the throne. Both Elizabeth I and Margaret show the same anger when their throne is being threatened.

The second queen to appear in Shakespeare's Wars of the Roses plays is Elizabeth Woodville, who makes an appearance in both *Henry VI Part 3* and *Richard III*. Her full date of birth is unknown, but she was born in 1437. Her parents were Sir Richard Woodville and Jacquetta of Luxembourg. She married Earl John Grey, where she became Lady Grey, however, when he died, she was married to Edward IV. At the time, marriage for a king was ‘negotiating for an influential foreign bride,’ [3] but the marriage between Edward IV and Elizabeth Woodville was believed to be for love, due to Elizabeth being a lower rank than Edward and could not offer any foreign influence.

Unlike Margaret, Elizabeth mainly conformed to the idea of queenship, and although she ‘may have begun her reign as unsuitable and unpopular, she was the perfect embodiment of the beautiful, submissive, fertile queen—an archetype of medieval literature.’ [4] However, she is first dismissive of the idea of marrying Edward IV, as she believed that he was making fun of her for not being born into royalty. When she finally agreed, she became the stereotypical queen, producing ten children with Edward IV. The most important in the Wars of the Roses were Edward V, Richard Duke of York, and Elizabeth of York.

During *Richard III*, Richard was only able to take the throne after Edward IV and Edwards two sons, Edward V and Richard Duke of York, had died. Edward had already fallen ill, and it was believed that Richard had taken the two princes into the Tower of London, where he had killed both princes to take the throne. This story gave them both the nickname of the ‘Princes in the Tower.’ [5] When Elizabeth found out about their deaths, instead of fighting in revenge of their death, like Margaret did when her son was disinherited from the throne, her initial response is to mourn. She says ‘ah, my young princes! My tender babes! My sweet unblown flowers, new-appearing sweets! If yet your gentle souls fly in the air, and be not fix'd in doom perpetual, hover about me with your airy wings and hear your mother's lamentation!’ [6] In this small speech, she mourns over the loss of her two sons, yet she does not blame anyone

or say anything that indicates that she will attempt to avenge her murdered children. ‘Wilt thou, O God, fly from such gentle lambs, and throw them in the entrails of the wolf? When didst thou sleep when such a deed was done?’ [7] explains that she does not seem to accuse anyone for her two sons' deaths, but she blames God for allowing them to die.

Later in the play, Richard III attempts to convince Elizabeth Woodville to allow him to marry her daughter, Elizabeth of York, who was a Yorkist. She agrees to arrange this marriage, but later arranges for Elizabeth to marry Henry VII, who was a Lancastrian, which joins both sides of the war together, and causing the Wars of the Roses to end. Although Henry VII had already beaten Richard III in battle, I don't think that the Wars of the Roses would have ended if Elizabeth had not arranged the marriage between her daughter and Henry VII, as there may have still been disagreements between the Yorkists and Lancastrians after Richard III had been killed.

Although Elizabeth Woodville does not seem to act in the same way that Elizabeth I did when she said the Tilbury Speech, I think that the quote ‘I know I have the body but of a weak and feeble woman; but I have the heart and stomach of a king.’ [8] best describes Elizabeth. This is because she was never violent like Margaret, which made people assume she was weak and was not a big threat in the war, so she could easily be taken advantage of. However, she used this to her advantage to trick Richard III into believing that she would arrange a marriage between him and her daughter, and then let her daughter marry Henry VII to end the Wars of the Roses.

Finally, Anne Neville, who is the least featured queen in the Wars of the Roses plays, only makes an appearance in *Richard III*. She was born on the 11th of June 1456, and her parents were Richard Neville and Anne de Beauchamp. She was married to Edward Prince of Wales, and then after he was killed, she married Richard III. Anne first appears in *Richard III* during the funeral of her father-in-law Henry VI.

In this scene, Richard attempts to seduce Anne after killing her husband and father-in-law. At first, she is angered with him, accusing him of murdering her husband, which he denies. However, Richard later says ‘lo, here I lend this sharp-pointed sword; which if thou please to hide in this true bosom. And let the soul forth that adareth thee, I lay naked to the deadly stroke, and humbly beg the death upon my knee. Ney, do not pause; for I did kill King Henry, but ‘twas thy beauty that provoked me. Ney, now dispatch; ‘twas I that stabb'd young Edward, but ‘twas thy heavenly face that set me on.’ [9] Here, he explains that he killed Edward for her love, but if she wants to kill her, she could use his own sword to kill him. Instead of killing him, she believes him, and they marry.

Halfway into *Richard III*, Richard becomes king. When Anne finds out about this, she becomes quite dejected, as she knows that for her husband to have become king, he would have killed the two princes in the Tower. As she does not want to be queen through the death of two

young children, she says ‘and I in all unwillingness will go. I would to God that the inclusive verge of golden metal that must round my brow were red-hot steel, to sear me to the brain! Anointed let me be with deadly venom, and die, ere men can say, God save the queen!’ [10] In this quote, she says that she would rather die than be queen if it meant that it was caused by the death of children, and if she has to be queen, she hopes it will be short and painful. However, like Elizabeth Woodville, she does not say anything that will suggest she will avenge the death of the two princes or find a way to prevent herself from becoming queen. This suggests that she is helpless and weak, however I think that she does not want to fight, as it will lead to many people being killed by her, which is not what she wants.

Historically, Anne Neville had a son, who was not present during the Wars of the Roses plays. This may have been because he had died at a young age, so did not play a part in the Wars of the Roses, like Elizabeth's children did. However, this could have also been done to prove that Anne was still a reasonably good conventional queen, even if she did not have any children, which is one of the main traits a queen was expected to have. Shakespeare lived during the time that Queen Elizabeth I was queen, so he could have been based the three queens in a similar way that Elizabeth I would act.

I don't think Anne challenged the idea of queenship, like Margaret did, but did not conform to the idea of queenship either. She did not fight in battles, yet never seemed to be portrayed as weak or passive like Elizabeth. She began with a hatred towards Richard III after he had killed her husband, but it only took a little persuasion for her to marry him. I think that the quote from Elizabeth I's Tilbury Speech that best describes Anne is ‘I assure you I do not desire to live to distrust my faithful and loving people. Let the tyrants fear.’ [11] This is because she did not want to become queen after Richard had killed the princes in the Tower, which could have been to show that she cares about her people trusting her. She also wanted to show that she was a good person, even if she couldn't be a good ruler, unlike her husband, who had murdered to get to the throne.

In conclusion, all the queens challenged the idea of queenship in different ways, even if it was not completely obvious. Margaret challenged the stereotypes of queenship the most, due to her active participation in the war and violent nature. Elizabeth did mainly conform to the idea of queenship, but later used this to her own advantage to arrange a marriage that ended the war. Anne did not want to become queen when she found out as it meant that Richard had killed the princes in the Tower, which shows that she had a sense of morality, and did not want to become queen if meant murdering someone. I think that the queens did not have to challenge the idea of queenship like Margaret did, but could have challenged it in the same way Elizabeth did, using the stereotypical traits a queen would be expected to have at the time to her advantage, and proving that a queen is more than just a pretty face.

References

- [1] William Shakespeare, 1591, Henry VI, Part 3, Act 1, Scene 4
- [2] Elizabeth I's Tilbury Speech, July 1588.
- [3] Amy Licence 'Marrying for Love- Edward IV and Elizabeth Woodville' History Extra, February 16th, 2017.
- [4] Amy Licence 'Marrying for Love- Edward IV and Elizabeth Woodville' History Extra, February 16th, 2017.
- [5] 'The Princes in the Tower' http://www.bbc.co.uk/history/historic_figures/princes_in_towers.html [11 March 2019]
- [6] William Shakespeare, 1592, Richard III, Act 4, Scene 4
- [7] William Shakespeare, 1592, Richard III, Act 4, Scene 4
- [8] Elizabeth I's Tilbury Speech, July 1588.
- [9] William Shakespeare, 1592, Richard III, Act 1, Scene 2
- [10] William Shakespeare, 1592, Richard III, Act 4, Scene 1
- [11] Elizabeth I's Tilbury Speech, July 1588.

Tutor comment:

M.'s final assignment was a joy to read. It offers a well-written, nicely evidenced, and carefully structured argument that demonstrates excellent critical evaluation skills and knowledge and understanding of this interdisciplinary course. The essay is testament to M.'s consistently mature and thoughtful approach to her studies. She undertook plenty of preparation and research before every tutorial, which demonstrated her willingness to work hard and independently. M.'s conscientiousness and talent saw her achieve a thoroughly deserved first class mark on The Scholars Programme. I hope that having her work recognised in The Scholar will encourage this modest, very able pupil to have more confidence in her abilities going forward. Well done, M.!



Evaluate the most important aspects of the government of medieval Dubrovnik

Year 9, Key Stage 3

Pupil: **B. Browning**
School: **The Warriner School, Oxfordshire**
Supervised by: **R. Shields**
Tutor University: **Royal Holloway, University of London**
Course Title: **Power and politics in medieval Dubrovnik**

The ancient City State of Dubrovnik, otherwise known as the republic of Ragusa, was created in 1358 and is located, to this date, in Croatia. The City State lasted for 450 years due to many reasons, such as the geographical location of the City-state^[1]; however, its success mainly was due to its very well-structured government. This paper will outline all the important aspects of the government of Ragusa and explain why the Consilium Rogatorium was the most important part in keeping the Republic of Ragusa successful.

The Consilium Rogatorium “was the most influential of the three Councils”^[2] for its members acted as a supreme court, controlled how all the money of the city-state should be utilised, this included control over taxes, and the council, consisting of the Consilium Minus, the Rector, and around thirty other functionaries, remained in power for a year^[3]. Much like in Dubrovnik, Venice has an extremely similar body of officials. The Venetian senate controls the taxes, and the foreign policy of the city-state^[4]. The extreme similarity between the two senates expresses just how important the two councils are because both the city-states needed a council to look over taxes and foreign diplomacy specifically. “The senate, [...], was,

beyond doubt, the most important of the three councils from the point of view of both Dubrovnik's international politics and life inside the city itself”^[5], I heavily agree with Krekić's view as the council has control of money and taxes which is vital to not only a city-state but a country and without proper management of money the Republic of Ragusa would collapse, which in turn would ruin the livelihood the citizens of Dubrovnik. This therefore makes the Consilium Rogatorium the most important aspect of Ragusa.

Another important aspect to Dubrovnik's government was the Consilium Minus, which came to replace the Consilium Maius for the members could not meet frequently^[6]. The small council consisted of the Rector and ten other trusted council men. The members of this council organised all ceremonies, protected certain people who need protection, e.g. orphans, they dealt with all the complaints made toward other council members, and they oversaw all actions made by both councils, such as making sure the taxes were not ludicrously high^[7]. In Venice many Doges were corrupt or bent the law in some way towards their benefit. To counter this, the council of six were introduced; they advised the Doge and kept him bound within the law^[8]. This example portrays the importance of the small council in Dubrovnik because they kept the Rectors from abusing their limited power, in which they succeeded in stopping the Rectors from falling into extremity. The small council was the closest link to the citizens of Ragusa and the government; therefore the small council was vital for keeping the internal relations of Ragusa strong, and preventing any civil wars, in which it succeeded^[9]. However, the Consilium Rogatorium was more influential because it could directly alter important aspects of Ragusa welfare, whereas the Consilium Minus could only oversee the important decisions and provide advice to the Rector, whom had little power himself.

The final council of the Ragusan government is the Consilium Maius, the largest of the three Councils. The great council was in place to elect all of the other important members of the Ragusan government^[10], to provide a final decision on whether to go to war, and to control lots of the internal laws in Dubrovnik which would usually affect daily life^[11]. The members of the great council were all of the male aristocrats above the age of twenty years old. However, the council only need sixty members to form a quorum^[12] and have to swear to an oath, along with minor councillors, which binds the councillors to not commit fraud or any other crime^[13]. This is similar to the great council of Venice, the great council members were elected by the public. Then the great council voted on who would become the Doge^[14]. This shows the importance of the great council in Ragusa because it was used to keep the public pleased with the Rector, giving the citizens of Ragusa a say whilst keeping a competent head of state. When talking about the Consilium Maius many believe “all the power of the Republic”^[15] lies in it, for they can control who gains the positions of importance. However, I believe that although the great council have power, they have little control of many important affairs after they select whom would be placed into which important positions. Furthermore, the

council is the largest and easiest to enter of the three meaning your vote lacks as much meaning, therefore I believe that the Consilium Rogatorium is more powerful than the Consilium Maius.

The Rector of Dubrovnik was an important title within the citizens of the city, requiring the Rector to state an oath; vowing not to do intentional harm to Dubrovnik or its citizens^[16]. The title of Rector brought with it much respect from other councillors and was considered as the biggest mark of honour in Ragusa^[17]; however, the Rector could not act without the approval of the ten other minor councillors and the Rector could only remain in power for a month. Furthermore, the Rector had to wait two years before being able to be re-elected^[18] meaning the Rector acted as more of a figurehead. A story outlining the reason why the Rector has a lack of power named: ‘The story of Damiano Juda’^[19] stated that in the year 1203 a Rector by the name Damiano Juda abused his powers, which lay with the title Rector at the time, to remain in office. This story is likely untrue, however, along with other historians it does convey a possible reason that the Rector has an absence of power, which is to keep the power within the councils, implying that Ragusa was against any major authority in a single man's hands^[20]. The Rector still had some heightened authority, such as the power to propose issues he wants the councils to look over^[21]. The Rectors were very influential in effecting the votes of councillors, especially a Rector named ‘ser Pasqualis de Resti’ who was elected as Rector sixteen times and ‘ser Clemens de Bodača’ who was elected Rector eight times^[22]. These Rectors in particular had a large amount of respect from the other patricians who considered the Rectors opinions carefully. This gave Rectors an important say in the politics of the Republic of Ragusa. In Venice a similar position was in place, called the Doge, the Doge had power over the armies of Venice and could call for appointments with other officials.

The Doge was brought in to bring together different villages and to act as a figure everyone in Venice was united under^[23]. This proves the importance of the Rector because other city-states needed a similar position to unite the citizens. However, the Consilium Rogatorium was more important because it had the power to actually change the fundamentals of Ragusa's success, unlike the Rectors, the wellbeing of Dubrovnik and its citizens relied on the Consilium Rogatorium.

The final important aspect of the Ragusan government was the Massarii Bladorum, Latin for officials of cereal. The Massarii Bladorum is a body of three people who are tasked with the job of providing grains and cereals to the city. The Massarii Bladorum had approval from the Consilium Rogatorium to ration their grains and to support the parties hiring grain merchants^[24]. The three men could provide 70000 staria, approximately seventy kilograms per staria, of grains when the city needed it the most. In an oath, the members of the Massarii Bladorum must state that “Whatever our Lord Count with his Council shall add to all the aforesaid, or abbreviate, I will obey”^[25]. This explicitly shows that the Massarii Bladorum had little power within the government of

Ragusa because they must follow the Rector's and small council's wishes. However, the importance of the Massarii Bladorum is still great for all convenient living in the city^[26]. This Consilium Rogatorium is much more important to the city's welfare than the Massarii Bladorum because you have to be in the Consilium Maius around twelve years longer to be in the Consilium Rogatorium than you do to be an official of cereal^[27]. Furthermore, to trade for grains the Massarii Bladorum must manipulate money, however, the Consilium Rogatorium controls Ragusa's money, therefore if the Consilium Rogatorium failed in anyway it would severely affect the Massarii Bladorm's activities. This makes the Consilium Rogatorium around more important to the Republic of Ragusa's success.

In conclusion the most important aspect of the Ragusan government was the Consilium Rogatorium because, for a small City-state, the only power Ragusa could hold was power deprived from wealth. The effectiveness of the Consilium Rogatorium's decisions with the wealth of Dubrovnik led them to a prosperous 450 years, even though they were surrounded by medieval super-powers, for example the Otto-man Empire. However, the other four previously mentioned also greatly contributed to the success of Ragusa, the next most important being the Consilium Minus because they were part of every other council and advised the Rector. The overwhelming success of the small city-state Dubrovnik clearly expresses how a city run by aristocrats whom earned their wealth for themselves is a superior structure for government compared with many other popular governing techniques.

Bibliography

- Evans, A. J., ‘Through Bosnia and Herzegovina on Foot during the Insurrection, August and September 1875 – with a historical review of Bosnia and a glimpse at the Croats, Slavonians, and the ancient Republic of Ragusa’, Longmans, Green and Co, London, 1877.
- Krekić, B., ‘‘Contribution to the study of Ragusan presence in Venice in the Fourteenth century’’, Unequal Rivals – Essays on relations between Dubrovnik and Venice in the Thirteenth and Fourteenth Centuries’, The University of Chicago Press, 2007.
- Krekić, B., ‘Dubrovnik in the 14th and 15th Centuries’, University of Oklahoma Press; First Edition edition, November 1, 1972.
- Rheubottom, D., ‘Age, Marriage, and Politics in Fifteenth-Century Ragusa’, Oxford Studies in Social and Cultural Anthropology’, OUP Oxford, 2000.
- Carter, F., ‘Dubrovnik A Classic City-state’, Academic Press Inc, 1972.
- Havrylyshyn and Szenti, ‘Institutions Always “Mattered” – Explaining prosperity in Medieval Ragusa’, Palgrave Studies in Economic History’, Palgrave, 2015.
- de Diversis de Quarfigianis, Philippus, ‘‘Situs /Edificiorum Politice et laudabilium consuetudinum incoltyae civitatis Ragusij’’, Codice inedito della Biblioteca Ginnasiale de Zara pubblicato ed illustrato’, OBP, 1882.
- Harris, R., ‘Dubrovnik – A history’, Saqi Books, 2006.
- Shields, Robin, ‘Mini-lecture’, unpublished, 2018.
- M. Stuard, ‘A State of Defence – Ragusa / Dubrovnik in the Medieval Centuries’, University of Pennsylvania Press, 1992.
- Rimac, Vesna, ‘The Statue of Dubrovnik of 1272’, Dubrovnik : Džavni arhiv u Dubrovnik, 2012.
- Roscoe, William, ‘A Short History of Venice’, B. K. De Fabris, 1908.

[1] O.Havrylyshyn and N. Szenti, ‘Institutions Always “Mattered” – Explaining prosperity in Medieval Ragusa’, Palgrave Studies in Economic History (Basingstoke & New York, 2015), 106.
[2] F.W. Carter, Dubrovnik A Classic City-state (London & New York, 1972), 115.
[3] F.W. Carter, Dubrovnik A Classic City-state (London & New York, 1972), 115.
[4] William Roscoe, A Short History of Venice (Boston, Houghton, Mifflin, 1908), 87
[5] B.Krekić, Dubrovnik in the 14th and 15th Centuries (Norman OK, 1972), 39
[6] B.Krekić, Dubrovnik in the 14th and 15th Centuries (Norman OK, 1972), 39
[7] F.W. Carter, Dubrovnik A Classic City-state (London & New York, 1972), 115.
[8] William Roscoe, A Short History of Venice (Boston, Houghton, Mifflin, 1908), 56
[9] R. Shields, ‘Mini-lecture’ (Cambridge, 2018)
[10] B.Krekić, Dubrovnik in the 14th and 15th Centuries (Norman OK, 1972), 38-39
[11] F.W. Carter, Dubrovnik A Classic City-state (London & New York, 1972), 114-115.
[12] F.W. Carter, Dubrovnik A Classic City-state (London & New York, 1972), 114-115.
[13] The Statue of Dubrovnik of 1272, trans. V. Rimac, ed. V. Bačić and N. Lanza (Dubrovnik, 2012), 105
[14] William Roscoe, A Short History of Venice (Boston, Houghton, Mifflin, 1908), 56
[15] Biblioteca Ginnasiale di Zara pubblicato ed illustrato, ed. V. Brunelli (Zadar, 1882), 58
[16] The Statue of Dubrovnik of 1272, trans. V. Rimac, ed. V. Bačić and N. Lanza (Dubrovnik, 2012), 101
[17] R. Harris, Dubrovnik – A history (London, 2006) 133
[18] D. Rheubottom, Age, Marriage, and Politics in Fifteenth-Century Ragusa (Oxford, 2000), 34
[19] A. J. Evans, Through Bosnia and Herzegovina on Foot during the Insurrection, August and September 1875 – with a historical review of Bosnia and a glimpse at the Croats, Slavonians, and the ancient Republic of Ragusa (London, 1877), 404
[20] R. Harris, Dubrovnik – A history (London, 2006) 130
[21] R. Harris, Dubrovnik – A history (London, 2006) 133
[22] B.Krekić, ‘Contribution to the study of Ragusan presence in Venice in the Fourteenth century’,

Unequal Rivals – Essays on relations between Dubrovnik and Venice in the Thirteenth and Fourteenth Centuries, ed. V. Stipetić (Zagreb & Dubrovnik, 2007), pp.231-270, at p 268 and p 263
[23] William Roscoe, A Short History of Venice (Boston, Houghton, Mifflin, 1908), 15
[24] Philippus de Diversis de Quartigianis, 'Situs Ædificiorum Politice et laudabilium consuetudinum inclytæ civitatís Ragusi', Codice inedito della Biblioteca Ginnasiale de Zara pubblicato ed illustrato, ed. V. Brunell (Zadar, 1882), 82
[25] The Statue of Dubrovnik of 1272, trans. V. Rimac, ed. V. Barić and N. Lanza (Dubrovnik, 2012), 119
[26] S. M. Stuard, A State of Defence – Ragusa / Dubrovnik in the Medieval Centuries (Philadelphia PA, 1992), 157
[27] D. Rheubottom, Age, Marriage, and Politics in Fifteenth-Century Ragusa ,Oxford Studies in Social and Cultural Anthropology (Oxford & New York, 2000), 44-46

Tutor comment:

B. is a brilliant historian and talented writer. He clearly illustrates his abilities and shows high level understanding of the complicated structure of the government of a medieval city state. This essay is of university standard and he has a great career as a medieval historian ahead of him.



What was the context of the Yorkshire Eagle and how may it have been perceived by different groups within Roman society?

Year 10, Key Stage 4

Pupil: T. Anderson
School: The John Warner School, Hertfordshire
Supervised by: B. Greet
Tutor University: University of Reading
Course Title: Understanding an ancient symbol

Despite our having of limited knowledge regarding the origins of the Yorkshire Eagle [1], its context can still be utilised in order to predict its most likely purpose. From this context, it is possible to gain an insight into the way in which the people of Roman society may have perceived the Yorkshire Eagle. In this essay, I will explore the context of the Eagle and how this could have impacted on Roman society's perception of it as well as the way in which it may have been interpreted as a symbol of safety by the Roman military, its religious significance within Roman society, its affiliations with Roman medicine and the way in which it could have been perceived as a symbol of protection by the women of Rome. Perhaps the symbol of the eagle was chosen for this reason to attract Roman people who were in Britain to inhabit the newly built city.

In regards to the context of the Yorkshire eagle [1], the probability that it was discovered in York means that it was most probably constructed by Roman stone masons during the early construction of the city. From the phrase "Probably from York" [1], the most probable location of the stone's discovery is made evident. For this reason, it is likely that the stone was cut in the Peak district or in the Yorkshire Dales as both are nearby and have an abundance of gritstone. It is certain that gritstone was often used in construction [7] by the people of Rome, most likely because gritstone is a hard stone [2]. It is also possible that this slab of stone was a part of the fortifications which formed the city's boundaries as this type of stone was abundant in York's neighbouring areas. The people of York would have seen this wall incredibly

frequently, as would the tribes which inhabited the surrounding area. For this reason, its purpose would have been to protect the Roman people of York from any hostility from said tribes. This possibility of the inclusion of the Yorkshire Eagle within the perimeter wall would have helped the people of York to feel safe for reasons which I will later explore. This slab would have been carved during the Roman occupation of York, which lasted from roughly 71AD until the Roman withdrawal from Britain in roughly 410AD. The aforementioned points form the context of the Yorkshire Eagle.

From the perspective of the Roman military, the Eagle would have been a symbol of the might of the Roman army. From the phrase "Petrodius... threw the eagle within the legion's camp and was himself killed" [3], one can learn that the eagle was such an important symbol that Roman soldiers were willing to sacrifice their lives to protect it. As it is likely that this slab of stone was a fragment of the wall which surrounded the city of York which the Roman Ninth Legion had built [9] from only the materials available to them, the use of the Eagle upon this wall would have served as a reminder of the Roman presence in Britain. In addition, the use of the symbol of the eagle upon a wall which was built by the Roman military would have served as a reminder of the amazing feats of which the Roman military was capable. As this stone was most likely placed upon the walls of York, the Eagle would have been an assurance of safety to the inhabitants of York. As the eagle was a symbol of the Roman Empire, it would have assured the people of York that they were as safe under the protection of this wall as they would be if they were in Rome. For this reason, the military garrison of York could have viewed the eagle as a symbol of their triumphs as well as a symbol of safety.

Furthermore, from a religious perspective, this Eagle would have been perceived as a symbol of the protection of the gods. The use of this stone in the wall which surrounded York would have symbolised the safety which the wall brought. As the eagle was a symbol of Jupiter, its use upon the wall was most likely supposed to assure the people of York that the gods were watching over the city. This would have improved the faith of the inhabitants of York in the walls protecting them from the potentially hostile natives of England which they lived in relatively close proximity with. As the Romans had invaded Britain, it was not uncommon for their settlements to be raided by the native people of England in an attempt to drive the newcomers away, so to have the protection of the gods would have given great relief to the inhabitants of York, causing them to feel safe. As many Roman people were religious, the protection of the gods would have been highly valued by much of Roman society. In addition to this, it is stated by Pliny the Elder that eagles cannot be struck by lightning [4]. This is in connection with the belief that the eagle is the servant of Jupiter. This would have given the people of York assurance that they were safe from harm. For these reasons, Yorkshire Eagle may have been viewed as a symbol of safety from a religious perspective.

In addition to this, the eagle could have been perceived as a symbol of safety for pregnant women within Roman society. Pliny the elder, a Roman intellectual, wrote that "If eagle-stones are attached to pregnant women... they can prevent the unborn baby from dying" [5], stating that the eagle-stone was a symbol of good luck regarding pregnancies within Roman society. The use of this in the architecture of York allowed many people

to have access to the image of the eagle. Perhaps this was intended to establish that unborn children and pregnant women were safe within York. This would have further emphasised to the inhabitants of York that despite their being in a foreign, somewhat hostile place, they were safe. However, the fact that this was written by an intellectual means that, to access this information, one would have to both be able to afford to buy Pliny the Elder's Historia Naturalis - which would have been expensive considering that the book is 37 volumes long and would have to have been copied out by hand – and be able to read. As education was not free in ancient Rome [8], the poor in Roman society would not have had access to such information as they may not necessarily have been ever taught how to read. This means that not all people would have been able to read the books of Pliny the Elder, thus meaning that it would have been harder to gain information of this type. They would have had to have been told orally to know this, meaning that a person of higher class would have had to have told them that this was so. This is an extra barrier in this type of knowledge being passed on. Thus, only the rich citizens of Rome would have been able to easily access this. For this reason, the pregnant women of higher classes would have viewed the symbol of the eagle as one of protection.

In addition to this, the statement within the writings of Pliny the Elder that "If eagle-stones are attached to pregnant women... they can prevent the unborn baby from dying." gives an insight into the medical beliefs of Roman society. Eagle stones were certainly believed by many ancient civilisations to have benefits. For example, there is evidence of the use of Eagle stones as early as the Bronze Age in Britain. From the phrase "Some Eagle Stones were found at the feet of two skeletons... in a grave from the Early Bronze Age." [10], one can learn that there is evidence of the use of the Eagle stone for superstitious purposes in ancient society before Rome had an influence over Britain. This superstition certainly existed before the birth of Pliny the Elder as the Bronze Age ended in 1500BCE and Pliny the Elder was born in 23CE, indicating that it was believed by more than one society and over more than one time period that the Eagle stone had superstitious powers decreased the chance that Pliny could have lied about this. For this reason, Pliny is a trustworthy source regarding the superstitious beliefs of Roman society.

Finally, the Yorkshire Eagle could have been interpreted as a symbol of the emperor as well as a symbol of wealth by every part of Roman society. Due to the fact that the image of the eagle can be found depicted upon some Roman coins [6], the Yorkshire Eagle could have been a symbol of prosperity to all of Roman society. In addition, as the face of the Emperor was often included upon Roman coinage - for example a silver coin depicting Vespasian and an Eagle on each side [11] - , it is likely that society saw the Eagle as a symbol of the emperor and thus a symbol of the Roman Empire. Due to the links between the Eagle and the emperor, the people of York would have been reminded of the power of their empire by the Yorkshire Eagle. This may have aided in their feeling safe, as though the might of the empire was protecting them. In addition, the connection of the eagle with money symbolised that one could achieve affluence in York. This would have created hope among the people of Rome that the future was to be positive. For the aforementioned reasons, Roman society as a whole could have viewed the Yorkshire Eagle as a symbol of

affluence and imperialism.

In conclusion, this stone slab [1] was likely cut and carved in Roman Britain by Roman masons. It was most likely used for construction, possibly as a piece of the perimeter wall of York. The Eagle was most likely viewed as a symbol of hope, affluence and imperialism by the majority of Roman society due to its connections with the Emperor through Roman coinage; however, it could also have been perceived as a symbol of triumph by the Roman military. Alternatively, it could also have been perceived as a symbol of safety from a religious perspective and by pregnant Roman women.

Bibliography

- [1] Her Majesty's Stationary Office, 1962. An Inventory of the Historical Monuments of the City of York, Volume 1: Eboracum, Roman York. London: HMSO.
- [2] Neundorff, K.K.E.; Mehl, Jr., J.P.; Jackson, J.A. eds (2005). Glossary of Geology (5th ed.). Alexandria, Virginia: American Geological Institute. ISBN 0-922152-76-4
- [3] Julius Caesar, The Civil Wars, 3.64
- [4] Pliny The Elder, Historia Naturalis, 10.4
- [5] Pliny The Elder, Historia Naturalis, 36.39
- [6] <http://www.wildwinds.com/coins/sear5/s0003.html>
- [7] <https://www.britishhistory.ac.uk/ichme/york/vol1pp111-135>
- [8] Oxford Classical Dictionary, Edited by Simon Hornblower and Anthony Spawforth, Third Edition. Oxford. New York: Oxford University Press
- [9] www.historyofyork.org.uk/timeline
- [10] Professor Leslie Grinsell, 1953. Early Funerary Superstitions in Britain. Folklore, Volume 64, Issue 1, p.275
- [11] The Roman Eagle: Understanding an Ancient Symbol, Ben Greet, p.47

Tutor comment:

It was a pleasure working with the students from The John Warner School and all of them produced fantastic essays with some surprising insights. T.'s was particularly interesting because of his clear grasp of the need to view ancient symbols from multiple perspectives, but also through his use of his own historical imagination, backed up with the appropriate evidence, to imagine how the ancient Roman people of York would have viewed the eagle that likely adorned their city walls. It was a great read and I hope he continues this excellent work into his eventual undergraduate programme..



In 1945, after the scale and horror of the Holocaust emerged, calls of “never again” asked that the world unite to prevent the recurrence of genocide. How successful has the United Nations been at preventing genocide in the 20th century?

Year 12, Key Stage 5

Pupil: A. Dhoopnarain
School: Swakeleys School for Girls, Hillingdon
Supervised by: J. Teale
Tutor University: Royal Holloway, University of London
Course Title: After Auschwitz: What happened to "never again"?

To unite the world into preventing genocide has proven to be a difficult task within the twentieth century despite the mass destruction, horror and atrocities which

emerged from World War II. The aftermath of this war rendered a draft of The Charter of the United Nations (UN) to be founded in 1945 at the UN Conference on International Organization in San Francisco, California. Fifty-one nations and several non-governmental organisations attended the conference, all of which signed this charter. Three of the core principles of the UN have been to 'save future generations from war, reaffirm human rights, and establish equal rights for all persons.'¹ In spite of the UN being formed and all 193 member states agreeing to the charter, two main acts of genocide have taken place whereby hundreds upon thousands of innocent civilians have been killed. Between 1992 and 1995, 100,000 people were killed and more than 2 million were forcibly displaced from their homes in Bosnia. Between the Bosnian war, a civil war broke out in Rwanda whereby an estimated 500,000 to 1,000,000 people were killed; the rate of this killing surpassed that of the Holocaust drastically. These inconceivable statistics inevitably raise a plethora of questions in regards to whether the UN was successful at achieving their aims of the organisation as presented in their charter. Within this essay the causes for the failure of preventing genocide in Bosnia and Rwanda will be outlined, furthermore the extent to which it may be argued that despite the UN's failure to prevent genocide, the UN cannot be wholly responsible for the number of deaths which took place after the second World War.

In 1944, the term "genocide" was initially coined in by the Polish Lawyer Raphaël Lemkin in his book *Axis Rule in Occupied Europe* whereby the word itself derives from the 'ancient Greek word *genos* (race, tribe) and the Latin *cide* (killing)'² which was partially developed in response to the Nazi policies of Jewish people during the holocaust. Lemkin later on campaigned to have this term recognised as an international crime. Essentially, the term genocide can be defined as 'a coordinated plan of different actions aiming at the destruction of a nation, except when accomplished by mass killings of all members of a nation'³ and according to Lemkin's study, such a plan would aim to disintegrate religion, social and political institutions, culture and language. As Lemkin's term of 'genocide' is now a recognised international crime, the killings and mass destruction which took place in both Rwanda and Bosnia can by definition, be treated as an act of genocide. The United Nations has a complex structure, however The United Nations Security Council (UNSC) is primarily responsible for maintaining peace and security. They can impose sanctions and authorise the use of force to maintain international peace and security which can be achieved by passing through resolutions. The Security Council consists of five permanent members- China, the United Kingdom, the United States, France and the Russian Federation in addition to ten non-permanent members. The five permanent members have the right to veto a draft resolution whereby if one of the countries do not agree in passing a resolution, they have the authority to allow for the resolution not to be adopted. For example, the U.S has used its veto forty-two times for Israel since 1972. A criticism which must be addressed in regards to the structure of the UN is that its five permanent members do not represent the world as a whole and rather,

represent the favours of most westernised countries. Due to this huge downfall in the UN's structure, national interest of nation states will play a huge role into how the permanent five members respond to acts of genocide which evidently, has resulted in a lack of political will to intervene when such atrocities have taken place in other countries besides their own. This is one of the key reasons as to why the UN were not as effective at pursuing their aims.

In March 1992, a Serbian paramilitary unit raided the village of Bijeljina in north-east Bosnia after Bosnia declared independence from Yugoslavia. The reason being was that the Serbian government and Bosnian-Serbs were opposed to their independence which rendered the Serbian paramilitary unit to aim to "ethnically cleanse" the area. More than two million people were displaced from their homes and at the peak of the war, 8,372 Muslims were murdered. In response to the massacre, the United Nations Security Council sent a peacekeeping mission to Bosnia with 10-23 thousand uniformed personnel whereby the main aim was to deliver humanitarian aid to the capital city - Sarajevo (which force is known as United Nations Protection Force in Bosnia (UNPROFOR)). The UNSC passed through four resolutions in which extremely tentative language was utilised such as 'need for an urgent negotiated political solution to the situation'⁴ and 'Commending the UNPROFOR for its continuing action in support of the relief operation'⁵. Language such as 'need for an urgent [...] solution' and '[...]continuing action in support' do not clearly indicate which measures need to be undertaken in order to prevent or stop the mass killings from worsening. Tentative language has proven to be consistent through many of the passed resolutions which further reinforces the idea that there was great reluctance to invest money into preventing further destruction whilst also a lack of political willpower by member states in order to create change. The war was taking place during a time whereby America was retreating into isolationism where America was to remain apart from the political affairs or interests of other countries which resulted in one of the most powerful countries not sending in their troops in assisting aid to Bosnia during their darkest hours. On the contrary, it is imperative to acknowledge how their actions did benefit the people in Bosnia as the UN did send in humanitarian aid which according to Colonel Bob Stewart, did help 'a great deal'. Stewart claims that 'it is no good blaming the United Nations when its troops are hamstrung by ineffective mandates'⁶. In essence, Stewart fervently believes that the troops helped to prevent the 'hundreds and thousands' of people that were supposedly going to die that winter but 'thanks to the troops', it did not happen. However, he also addresses an issue previously mentioned regarding ineffective mandates. No official orders to prevent the war were undertaken due to the tentative language utilised in the resolutions but rather 'monitoring' the situation and attempting to 'keep the peace' which implies that the UN itself is not to be blamed but rather the ineffective mandates.

Within the years of the Bosnian conflict, a civil war broke out in Rwanda between the Tutsi and the Hutu in

October 1990 and lasted until mid-1993. Before World War I, Rwanda was a German colony but as part of the Treaty of Versailles peace settlement, Germany lost all its colonies and Rwanda became placed under Belgian administration. The Tutsi group, who were a minority, generally occupied the highest positions of power in Rwanda and as a result, the Hutu population (which made up 85%) created a political movement in which they stood to gain democratisation as the wave of decolonisation threatened the social system in Rwanda. In 1994, a plane carrying the Rwandan President, a Hutu, was shot down and Hutu extremists used this as a cover to plan to destroy the entire Tutsi civilian population in an act of genocide. Following this, 800,000 Tutsi and moderate Hutu civilians were killed within 100 days. Resolution 872 was passed on the 4th of August to create the UN Assistance Mission for Rwanda (UNAMIR) whereby the main aims were to monitor the ceasefire and monitor the security situation in the run up to the upcoming elections. Growing concern regarding the increasing death toll authorised Resolution 918 which called for an increase in the number of troops in Rwanda and changed the role of the UN from a 'neutral mediator' to bring an end to the civil war and deliver humanitarian aid. The Resolution 918, once again, was written using very tentative language whereby they were only 'expressing once again its alarm at continuing reports of systematic, widespread and flagrant violations of international humanitarian law'⁷ and that they are 'deeply disturbed by the magnitude of the human suffering caused by the conflict'.⁸ The fact that these resolutions are simply 'expressing' the concern for the issue emphasises this idea of not being firm in their actions to pursue the main purpose of the UN. A lack of political willpower invested by member states is one of the biggest flaws which ultimately led to the downfall of preventing genocide in Rwanda. A small number of troops were sent to help civilians and not enough money was invested into providing assistance and aid to help the people of Rwanda. Peacekeepers in Rwanda were murdered and the Belgian government decided to withdraw its troops from UNAMIR and attempted to get the UN to shut the entire mission down in April 1994 which is when the troops were reduced to just 270. In addition to this, the US government pressured the UN to end the mission due to high costs because the US was responsible for paying up to two thirds of the bill. Taking all of these circumstances into account it is justifiable to say that UNAMIR failed at carrying out their aims as originally intended. General Romeo Dallaire suggests that it 'is the fundamental indifference of the world community'⁹ which failed Rwanda implying that member states should have intervened a lot more than they did.

The United Kingdom and the United States were hesitant to characterise the tragedies in Rwanda as 'genocide'. The reasons for this was that 'such a designation would bind the international community to intervene under the Genocide Convention. [...] signatories are expected to call on the UN to take specific actions to prevent or suppress acts of genocide'.¹⁰ As Gold describes, neither the US nor the UK wanted to intervene in the Rwandan conflict and a resolution for Rwanda by the Security Council was never proposed. Michael Keating, Head

of UN Assistance Mission in Somalia, only called for a 'personal statement' in which the Rwandan massacre was not defined as a 'genocide' and only provided the Security Council's opinion on the situation rather than a legally binding act instructing what orders should be undertaken. Throughout this time period the UN, arguably, continued to sit on the side-lines and not take further actions without acknowledging that the definition of genocide to the UN is 'acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group'¹¹ which is exactly what was happening in Rwanda. Critically, there is an absurd aspect to this which must be illustrated before ultimately placing the fault wholly on the UN. Throughout this crisis, the representative of Rwanda's Hutu-dominated government sat on the UN's Security Council as one of the non-permanent members, however, the Rwandan ambassador continued to deny that any genocide was underway. Nevertheless, member states did not work together to solidify a plan and ultimately, the UNAMIR was unsuccessful at preventing genocide which unfortunately, led to the deaths of many innocent lives.

There is a strong argument to be made which is that the UN is only as effective as its member states. If not all member states are cooperating effectively, funding efficiently and lacking political willpower it is undoubtable that the UN will be unsuccessful at achieving their purpose and fulfilling their aims. The UN as a cohort may not be the root of cause for the genocides which have taken place in the 20th century however it must be acknowledged that if the member states do not come together to execute a plan with an intention of ending a war, the world will not see an end to the number of deaths and massacres which continue to arise through the generations.

References

- 1 Amanda Briney, 'History and Principles of the United Nations', <https://www.thoughtco.com/the-United-nations-p2-1435441> [7 January 2019]
- 2 Raphael Lemkin, (1944), *Axis Rule in Occupied Europe*, 89.
- 3 Raphael Lemkin, (1944), *Axis Rule in Occupied Europe*, 89.
- 4 Security Council at its 3106th meeting, 'Security Council Resolution 770', <http://unsr.com/en/resolutions/770>, 13 August 1992, [8 January 2019]
- 5 Security Council at its 3106th meeting, 'Security Council Resolution 770', <http://unsr.com/en/resolutions/770>, 13 August 1992.
- 6 Colonel Bob Stewart, *Broken lives: A personal View of the Bosnian Conflict* (London: Harper Collins, 1993)
- 7 Security council at its 3377th meeting, 'Resolution 918- The expansion of the mandate of the UN Assistance Mission for Rwanda and imposition of an arms embargo on Rwanda', <http://unsr.com/en/resolutions/918>, 17th May 1994, [8 January 2019]
- 8 Security council at its 3377th meeting, 'Resolution 918- The expansion of the mandate of the UN Assistance Mission for Rwanda and imposition of an arms embargo on Rwanda', <http://unsr.com/en/resolutions/918>, 17th May 1994, [8 January 2019]
- 9 General Romeo Dallaire, 1993, *Shake Hands with the Devil: The failure of Humanity in Rwanda*,
- 10 Dore Gold, 2004, *Tower of Babel: How the United Nations Has Fueled Global Chaos*.
- 11 United Nations, Article II Genocide, <http://www.un.org/en/genocideprevention/genocide.html> [8 January 2019]

Tutor comment:

Working with the students at Swakeleys School was an absolute privilege. Each of them engaged with a demanding topic in a mature and thoughtful manner, offering perceptive insights throughout the course. This was all the more impressive as so few of them were studying history. As well as being beautifully written, A.'s essay demonstrates a pragmatic and sophisticated understanding of the challenges that the United Nations faces in realising the principles enshrined in the 1948 Genocide Convention and deserves to be widely read.



Was the Becket dispute a result of conflicting ideologies or a clash of personalities?

Year 12, Key Stage 5

Pupil: **M. Eldridge**
 School: **Coombe Girls' School, Kingston-Upon-Thames**
 Supervised by: **C. Healy**
 Tutor University: **University of East Anglia**
 Course Title: **Thomas Becket: Saint or sinner?**

The Becket dispute was the tension of relations between the Archbishop of Canterbury, Thomas Becket and the King of England, Henry II. The dispute lasted from 1163 to 1170. Although historians have argued that Becket and Henry came to terms with each other in July 1170, the dispute came to an end when Becket was murdered in Canterbury Cathedral December 29, 1170. The dispute started following a change in Becket's attitude after he was appointed Archbishop of Canterbury in 1162. As Becket was already chancellor of England - a position where the appointed would usually support the king and his interests - Henry hoped that by putting Becket (who at the time was good friends with Henry) as Archbishop of Canterbury, he could affirm his royal supremacy over the English Church. However, Becket resigned the chancellorship and started living a new, pious life and began to "champion ecclesiastical rights".¹ There were a number of issues of disagreement between Henry and Becket. However, the two most important ones were the disagreements over sheriff's aid and the jurisdiction system for clergymen. First, Henry proposed that sheriff's aid - an additional payment by landowners - should be given to the royal treasury rather than the sheriffs.² Secondly, and more prominently, was the problem concerning the judiciary system for clergymen - a male member of the Christian Church. The issue at stake was, under what type of court - the Church court or the Royal court - should clergy who had committed secular crimes be tried.³ Becket felt that clerks who worked for the Church should be tried under the Church court, even though they may not be members of the clergy. Henry, on the other hand, felt that Church courts deprived him of the ability to govern effectively. As Staunton writes, "it was equally Henry's duty to protect and advance the privileges which his royal ancestors had possessed".⁴ To try and resolve this problem, Henry proposed the Constitutions of Clarendon in 1164. Consisting of 16 articles, the Constitutions were designed to limit some of the freedoms of the Church and to restrain the power of Church courts. Becket refused to seal the Constitutions leading to a worsening of relations between himself and Henry.

In 1164, Becket attempted to go to France without the King's permission, this was against the Constitutions and Becket was found guilty of treason, consequently, Becket fled the country. As an attempt to end the dispute, in 1170 the Pope threatened to excommunicate Henry, and as a result, Henry let Becket return to England. Following this, Becket

excommunicated three more bishops who supported the king, even though the Pope had advised him not to. As a result, Henry shouted in anger for the trouble that Becket was causing him, four knights overheard Henry and, in an attempt to please the king, murdered Becket at the altar of Canterbury Cathedral, December 29, 1170. The Becket controversy was now over, however, the reasons behind the dispute remain a heated disagreement between historians. There are two main sides of the argument, many historians, including Anne Duggan, take the view that it was conflicting ideologies that led to the dispute.⁵ Ideology is defined by a collection of beliefs that a person holds: Becket's ideology lay in the interests of the Church, whereas Henry's lay in the interests of the Monarchy. However, some historians, such as David Knowles, argue that it was not a result of conflicting ideologies, but a clash in personality that led to the dispute.⁶ Personality is the combination of characteristics or qualities that form an individual's distinctive character. Becket and Henry had a wavering relationship and neither of their temperaments helped the dispute. This essay will consider whether the Becket dispute was a result of conflicting ideologies or a clash of personalities, and to answer that question, it will mainly focus on the role played by each man as head of separate institutions; the relationship between Becket and Henry including Becket's "conversion" and each man's temperament; and the Constitutions of Clarendon, 1164.



14th-century depiction of Becket with King Henry I

In order to judge whether the Becket dispute was a result of conflicting ideologies or a clash of personality, one must understand the role of the Church in the context of the Middle Ages. Firstly, the Church was not just a religious institution; it ran "rather like a government".⁷ The Church was in charge of many key areas such as schools, hospitals and poor relief,⁸ all in all, the Church "dominated everybody's life".⁹ However, most importantly - perhaps partly due to its very prominent role in society - the Church believed that it had power over the monarchy.¹⁰ Churchmen believed that they were 'messengers of God' and therefore were independent of, and above the monarchy. The Pope, as head of the Church, claimed authority over all kings and bishops; and bishops acted as the king's advisors. One example of the independence that the Church had was the fact that they had their own jurisdiction. This meant that

clergy who committed secular crimes would be treated under Church courts rather than Royal courts. Often the penalty was significantly softer than punishments of the Royal court, however, it was the fact that this privilege of the Church gave them too much independence that led to the dispute. As king, it was Henry's duty to "protect and advance the privileges which his royal ancestors had possessed",¹¹ and therefore try to bring everyone under one secular jurisdiction. This leads us on to the ideology of the monarchy, King Henry II's set of beliefs. Henry believed that as king he was 'chosen by God' and therefore, above the Church and in particular, the Archbishop of Canterbury. He believed that clergymen should answer to the king and not the Pope. The differences in ideology between the Church and the King is one of the key factors for the Becket dispute. Becket believed that he should answer to the Pope and the interests of the Church over the king.

For example, in July 1163, Henry II and Thomas Becket clashed at Woodstock. Henry attempted to divert sheriff's aid - "a traditional surcharge to the general land tax" - from the sheriffs to the royal treasury.¹² Had Becket supported the interests of the monarchy, he would have supported this proposal, however, as Archbishop, he "vehemently opposed" it.¹³ This is one example where a difference in ideology has led to tensions between Thomas Becket and King Henry II. However, conflicting ideologies is not the only reason for the Becket dispute. As we will find out, Becket did not always follow the advice of the Pope. Although Becket arguably experienced something of a 'conversion', his self-centred attitude did not change; and it was his pride that partly led to the Becket dispute. The next paragraph will consider the relationship between Henry and Becket, the personalities of the two men and Becket's 'conversion'; and to what extent this was the reason for the Becket dispute.

Firstly, in order to understand the relationship between Henry II and Becket as well as Becket's 'conversion', we must take a look at the personalities of the two men. Both Henry II and Thomas Becket had careless personalities. Many historians argue that at the very centre of the dispute is the personality of Thomas Becket.¹⁴ He was "rash and often arrogant",¹⁵ "a proud, self-centred man",¹⁶ "ignorant and incompetent"¹⁷ and stubborn.¹⁸ Likewise, Henry too was "led astray by uncontrollable temper and poor counsel",¹⁹ had a big ego and was stubborn²⁰ and proud.²¹ It is clear that both men had personalities which were self-centred and uncompromising, two assets which lead to arguments. When Henry and Becket were "intimate friends",²² Henry made Becket chancellor in 1155. Being pleased with Becket as chancellor, (who was also archdeaconry at the time) when Archbishop of Canterbury Theobald died, Henry gave the position to Becket.²³ He did this in the hope that by having someone who he had the favour of, in charge of the English Church, Henry may be able to use Becket to reform the Church to bring it under the power of the monarchy. Until Becket was made Archbishop in 1162 the two were good friends and Becket, in particular, had a more likeable personality: he had "excellent manners and was a good talker".²⁴ However, Becket's personality was similar to that of a rollercoaster. Having started off as a pleasant man, his

friends became aware of his faults: "he was guilty of frivolity, ostentation in dress, and pursuit of all the follies of the fashionable world".²⁵ However, once he became Archbishop of Canterbury, he suddenly changed his actions. He started living a pious life and doing religious acts such as wearing a hair shirt.²⁶ This change in attitude must have greatly displeased Henry as he had hoped he could use Becket to curb the power of the Church. This is partly what led to the dispute as Henry could no longer use Becket how he wanted and Becket didn't like Henry's goals to limit the power of the Church.

There are many suggestions as to why Becket suddenly changed. Some historians argue that as many people were furious at the appointment of Thomas Becket as Archbishop due to his immoral lifestyle, Becket may have wanted to prove himself worthy as a pious man capable of leading the English Church. On the other hand, some historians, such as Anne Duggan argue that Becket had a genuine 'conversion' experience. She says that "Thomas of London was much more than the shallow and flashy cleric described by some critics".²⁷ Although it is hard to say whether Thomas Becket was a saint or sinner, the majority of historians argue that at the heart of his character - including when he was Archbishop - lay pride and ultimately he was a self-centred man.²⁸ In addition, Gilbert Foliot, Bishop of London, noted that when Becket was chancellor, he used "the sword of the realm" to turn his anger on anyone he disliked.²⁹ Had Becket (and Henry) not been so arrogant, then even though there may have been ideological differences between the two after Becket's 'conversion', they may have been able to end the dispute. However, neither of them had the patience and good manner to peacefully resolve the dispute. Therefore, it is clear that personality was a huge reason for the Becket dispute. Not only did Becket's 'conversion' lead to so many arguments and clashes, but their personalities kept these disputes alive rather than bringing them to an end.

Finally, the Constitutions of Clarendon, 1164, and the tensions that rose afterwards, is a third reason for the Becket dispute. However, it too is relevant to the question of whether the Becket dispute was a result of conflicting ideologies or a clash of personality as it could be argued that the Constitutions of Clarendon was driven by both ideology and personality. Firstly, the

Constitutions of Clarendon were 16 articles passed by Henry II in January 1164 defining Church-state relations.³⁰ They attempted to "restrict ecclesiastical privileges and curb the power of the church",³¹ and increase the king's influence over bishops and Church courts.³² This included ensuring secular people who worked for the Church were tried under secular courts and also ensuring that everything the clergy do has been checked by the King. This shows that the Constitutions of Clarendon were driven by ideological reasons as Henry wanted to assert Royal power and diminish the power of the Church. However, limiting the power of the Church was not the only reason why Henry passed the Constitutions of Clarendon. Henry also wanted to be seen as a legitimate ruler by making official what life was like under his grandfather. Henry II's grandfather, King Henry I ruled England from 1100

to 1135. However, power then moved to Henry's sister's side, Adela to her son Stephen. Stephen reigned from 1130 to 1154 when power moved back to Henry I's side of the family and Henry II became king in 1154. Henry II, therefore, wanted to reassert his authority by ignoring the reign of his uncle and making official what life was like under his grandfather by making into law life under his grandfather.³³ This then is evidence showing that Henry II's Constitutions of Clarendon were driven by personality as he attempted to assert his own authority (most likely due to his pride and big ego).

When the Constitutions were presented to Becket, Becket wavered between sealing and not sealing them. He eventually declared "in the hearing of all that he would observe the laws and customs of the kingdom in good faith: and the rest of the bishops followed suit".³⁴ Notice that the fact that the bishops were under the control of Becket shows the ideological power that Becket had which Henry wanted to limit. This led to a number of events. Firstly, Becket attempted to go to France without the King's permission, this was against the Constitutions and Becket was found guilty of treason, consequently, Becket fled the country.³⁵ As an attempt to end the dispute, in 1170 the Pope threatened to excommunicate Henry, and as a result, Henry let Becket return to England.³⁶ However, Becket excommunicated three more bishops who supported the king, even though the Pope had advised him not to.³⁷ Earlier I said that the ideology of the Church is a key factor in the Becket dispute as it makes Becket believe he should answer to the Pope, not the king. However, the fact that Becket decides to ignore the advice of the Pope shows that Becket was driven by personality and his own aims rather than ideological views. This proves that the Becket dispute was due to personality rather than ideology.

In conclusion, I believe to a large extent that the Becket dispute was a result of a clash in personality rather than conflicting ideologies. Although ideology is what started the debate, what started the ideology was personality. What I mean by this is that Henry II used ideology as the reason to justify what his personality desired. Henry was a proud, self-centred man with a big ego. He wanted to assert his rule, to show everyone that he was king and that he meant business. He did this by using the Constitutions of Clarendon, 1164, to make official what life was like under his grandfather showing that he was the rightful king. This desire was driven by personality - he wanted unquestioned reign because he was a proud man. However, the reason he used to justify these changes is ideological. He argued that the Church was gaining too many rights and independence from the monarchy, in particular, due to their separate system of jurisdiction. Therefore, Henry used an ideological reason to fulfil his personal desires by passing the Constitutions of Clarendon. Even so, his belief that the Church was drifting from the monarchy's power in itself shows that this was not down to ideology but personality, as it shows that Henry wanted complete control - greed. However, the clash in personality does not end here. Both men were stubborn, self-centred men, and although once friends they fell out after Becket's 'conversion'. It is clear that the Becket dispute was a result of a clash in

personality because even if the two friends had fallen out after Becket's conversion, they would have almost certainly restored their relationship had both men not had so careless personalities.

Instead, their clash in personality fuelled the debate. At the clash at Woodstock, 1163, Becket forcefully opposed the king's proposal towards sheriff aid and would not back down. In the same way that Henry used ideological reasons to justify his greed for power over the Church; Becket too used the ideology of the Church to justify his greed for power over the monarchy. This becomes most obvious when Becket - a man who believes in the ideology of the Church, and therefore should answer to the Pope, not the king - goes against the advice of the Pope and excommunicated three more of Henry's bishops. This shows that Becket was not driven by ideology but personality. Therefore, it is clear that it was a result of a clash in personality that led to the debate, not conflicting ideologies. Both men used ideological reasons to satisfy their personal desires, and the fact that neither men backed down due to their clash in personality shows that personality not only started the dispute but kept the dispute alive. The Becket dispute was not a result of conflicting ideologies but a clash of self-centred, stubborn personalities.

References

- 1 'History Hit: How Falling Out with Henry II Resulted in Thomas Becket's Slaughter' <https://www.historyhit.com/how-falling-out-with-henry-ii-resulted-in-thomas-beckets-slaughter/> [Accessed 21/02/2019]
- 2 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 3 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 4 The Lives of Thomas Becket trans. M. Staunton (Manchester 2001) p.4
- 5 A. Duggan, Thomas Becket (London 2004) p.263
- 6 D. Knowles, The Episcopal Colleagues of Archbishop Thomas Becket (Cambridge 1951) p.55
- 7 Ed West, 'Feast Day of St Thomas Becket' <http://www.edwest.co.uk/history/feast-day-of-st-thomas-becket-december-29/> [Accessed 02/12/2017]
- 8 Ed West, 'Feast Day of St Thomas Becket' <http://www.edwest.co.uk/history/feast-day-of-st-thomas-becket-december-29/> [Accessed 02/12/2017]
- 9 C.N. Trueman, 'The Medieval Church' (5th March 2015) from www.historylearningsite.co.uk [Accessed 29/11/2017]
- 10 'BBC Bitesize KS3 Thomas Becket and Henry II' <https://www.bbc.com/bitesize/guides/zw3wxnb/revision/2> [Accessed 11/03/2019]
- 11 The Lives of Thomas Becket trans. M. Staunton (Manchester 2001) p.4
- 12 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 13 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 14 The Lives of Thomas Becket trans. M. Staunton (Manchester 2001) p.2
- 15 The Lives of Thomas Becket trans. M. Staunton (Manchester 2001) p.2
- 16 W. L. Warren, Henry II (London 1973) p.451
- 17 F. Barlow, Thomas Becket (2nd edition London 2000) p.271
- 18 F. Barlow, Thomas Becket (2nd edition London 2000) p.271
- 19 The Lives of Thomas Becket trans. M. Staunton (Manchester 2001) p.2
- 20 The Lives of Thomas Becket trans. M. Staunton (Manchester 2001) p.2
- 21 D. Knowles, The Episcopal Colleagues of Archbishop Thomas Becket (Cambridge 1951) p.55
- 22 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 23 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 24 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 25 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 26 'BBC Bitesize KS3 Thomas Becket and Henry II' <https://www.bbc.com/bitesize/guides/zw3wxnb/revision/2> [Accessed 11/03/2019]
- 27 A. Duggan, Thomas Becket (London 2004) p.264
- 28 W. L. Warren, Henry II (London 1973) p.451
- 29 Letter from Bishop Gilbert of London to Archbishop Thomas Becket (1166) The Correspondence of Thomas Becket Archbishop of Canterbury 1162-1170 vol.1. trans. A. Duggan (Oxford 2000) pp.498-537
- 30 'Encyclopedia Britannica Constitutions of Clarendon' <https://www.britannica.com/event/Constitutions-of-Clarendon> [Accessed 26/03/2019]
- 31 'Encyclopedia Britannica Constitutions of Clarendon' <https://www.britannica.com/event/Constitutions-of-Clarendon> [Accessed 26/03/2019]
- 32 BBC Bitesize KS3 Thomas Becket and Henry II' <https://www.bbc.com/bitesize/guides/zw3wxnb/revision/2> [Accessed 11/03/2019]
- 33 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
- 34 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of

National Biography (Oxford 2004)
35 F. Barlow, 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
36 Roger of Howden, The Annals of Roger de Hovendon vol.1 trans H.R. Riley (London 1853) p.279
37 'History Hit: How Falling Out with Henry II Resulted in Thomas Becket's Slaughter' <https://www.historyhit.com/how-falling-out-with-henry-ii-resulted-in-thomas-beckets-slaughter/> [Accessed 27/03/2019]

Bibliography

Primary Sources
Letter from Bishop Gilbert of London to Archbishop Thomas Becket (1166) The Correspondence of Thomas Becket Archbishop of Canterbury 1162-1170 vol.1. trans. A. Duggan (Oxford 2000)
Roger of Howden, The Annals of Roger de Hovendon vol.1 trans H.R. Riley (London 1853)
The Lives of Thomas Becket trans. M. Staunton (Manchester 2001)
Secondary Sources
Barlow, F. 'Becket, Thomas [St Thomas of Canterbury, Thomas of London]' Oxford Dictionary of National Biography (Oxford 2004)
Barlow, F. Thomas Becket (2nd edition London 2000)
Duggan, A. Thomas Becket (London 2004)
Knowles, D. The Episcopal Colleagues of Archbishop Thomas Becket (Cambridge 1951)
Warren, W. L. Henry II (London 1973)
Websites
'BBC Bitesize KS3 Thomas Becket and Henry II' <https://www.bbc.com/bitesize/guides/zw3wxnb/revision/2> [Accessed 11/03/2019]
C.N. Trueman, 'The Medieval Church' (5th March 2015) from www.historylearningsite.co.uk [Accessed 29/11/2017]
Ed West, 'Feast Day of St Thomas Becket' <http://www.edwest.co.uk/history/feast-day-of-st-thomas-becket-december-29/> [Accessed 02/12/2017]
'Encyclopedia Britannica Constitutions of Clarendon' <https://www.britannica.com/event/Constitutions-of-Clarendon> [Accessed 26/03/2019]
'History Hit: How Falling Out with Henry II Resulted in Thomas Becket's Slaughter' <https://www.historyhit.com/how-falling-out-with-henry-ii-resulted-in-thomas-beckets-slaughter/> [Accessed 21/02/2019]

Tutor comment:

M. was a real pleasure to teach throughout the course. He was extremely hard-working and enthusiastic, and it was great to see him progress in skills and confidence. I really enjoyed hearing about his future plans for university and I hope The Scholars Programme has shown him how capable he is of achieving highly.

Social Sciences



Which is more efficient, soft or hard power?

Year 9, Key Stage 4

Pupil: R. Kapoor

School: The Archer Academy, Barnet

Supervised by: F. Ghiretti

Tutor University: King's College London

Course Title: Is China the new America? The use of power to influence the world

Introduction

In political terms, 'Power' can be described as 'the ability a person, group or state has to control events' (Ghiretti, 2018). These events can be local, regional, national or international. In fact, one could say that power is now being used in space as well, as China has just landed a craft on the dark side of the moon, a 'propaganda win' (Malik, 2019).

So, what is 'efficient' power? I would define it as the swift and successful taking of power and then its maintenance over a long period of time. The longer the period of time, the more efficient the power usually is. I am not only going to look at the type of power that is used to control a population within a nation's borders, but also at how

power is used to contain or expand control outside national boundaries.

Largely, this control takes three different forms, hard, soft and smart power. At different times in a nation's or empires history, these forms are used in different ways, depending on the existing situation. They may not be applied successfully, and misuse can lead to the loss of power/control.

In this essay, I will consider which form of power is most effective; soft power, hard power, or the combination of the two - smart power.

Hard power

Politically, Hard Power is the use of force, or the threat of force to control groups of people, nations or empires.

Whenever empires have grown, they have always done so by the use of Hard Power. Rome expanded from a city to an empire through the use of their Roman Legions. Britain defeated other European nations in wars and took their territories from them. White Americans spread from the east coast of North America, subjugating the native population so that the whole of the continent came under their control.

If local populations ever rose up against their rulers, Hard Power was regularly used to wipe out opposition. When William of Normandy invaded Britain in 1066, he defeated Harold at Hastings (Hard Power) and was crowned king in London. He had to continue to use Hard Power to remain king.

'Despite his victory at Hastings, despite the surrender of London, William's position was still a precarious one and he had good reason to tremble. It was to take another five years before he could feel fairly confident that the conquest had been completed. There were risings against Norman rule in every year from 1067-1070.' (Gillingham, 1984)

'The greater part of Yorkshire and Durham was laid waste and remained almost unpeopled for a generation.' (Morton, 1938)

Through his use of 'cold ferocity', (Morton, 1938) William created a dynasty of Norman rulers.

Hard Power often has to be sustained for many years for control to take root. However, history is full of examples of other nations rising up to compete with powerful countries or empires. So when Rome did not have enough Hard Power to control its empire, it gradually collapsed, from 'the battle of Hadrianople in 378AD, when the emperor Valens and two-thirds of his army (upwards of 10,000 men) fell in a single afternoon at the hands of an army of Gothic migrants, to the deposition of Romulus Augustulus nearly a century later.' (Heather, 2011). So if you rule by Hard Power you can fall by Hard Power.

In the 20th century, Nazism used Hard Power internally and externally and for a short period of time it appeared that Germany could become the most powerful

country in the world. In order to gain power, Hitler and his supporters used violence to overcome opposition. In the election of 5 March 1933, *‘The campaign is one of unprecedented violence. Gangs of Hitler’s Brownshirts are unleashed on the streets to break up the meetings of opposition parties. The police are instructed not to intervene’* (History World, 2019)

To sustain power, the Nazis continued using violence or the threat of violence to control Germany. Because they were in fear of Hitler’s Hard Power, European countries failed at first to strongly oppose him when Germany created Anschluss and invaded Czechoslovakia. Hitler said he was creating a thousand year Reich. The Reich actually lasted less than fifteen years.

Paul Kennedy (The Rise and Fall of the Great Powers, 1988) discusses how the major empires of the last 500 years have grown and declined. He quotes the German mercantilist writer von Hornigk: *“whether a nation be today mighty and rich or not depends not on the abundance or security of its power and its riches, but principally on whether its neighbours possess more or less of it.”*

Kennedy shows that Hard Power is necessary both to get power and also to maintain it. He says:

‘Historical records suggest that there is a very clear connection in the long run between an individual Great Power’s economic rise and fall and its growth and decline as an important military power (or world empire). This, too, is hardly surprising, since it flows from two related facts. The first is that economic resources are necessary to support a large-scale military establishment. The second is that, so far as the international system is concerned, both wealth and power are always relative and should be seen as such’ (Kennedy, 1988).

Hard Power alone cannot maintain an empire or regime for a long period of time. For example the communist states of Eastern Europe broke down at the end of the 20th century, even though Hard Power was being used against the countries’ populations.

A successful use of Soft Power may have led to them surviving longer.

Soft power

Soft Power is ‘a persuasive approach to international relations, typically involving the use of cultural influence’ (Ghiretti, 2018). Cultural influences take many forms. Architecture, cuisine, the arts, sport and fashion help to embed the ruling party. America is probably still the most powerful nation on earth. It has military bases (Hard Power) across the planet, but it also has McDonald restaurants in almost every city worldwide. Marvel films in almost every cinema, and Nike sportswear on millions of bodies. All of these elements have extended the American dream right across the globe.

Through these cultural influences, America has ‘invaded’ countries without going to war with them.

These influences are more easily rooted into a nation if the ruling language is absorbed by the population. In many cases, the governments of weaker countries have used the Empire’s language as its main tongue. So in Southern Africa, English is used as the means of communication in government and law, because it was controlled by the British Empire. Latin is no longer a spoken language, but it is the root of many European countries’ languages because of the influence and control of the Roman Empire. Language is a really useful tool when utilising Soft Power.

The U.S. benefits from the fact that English is regularly the language of business, international relations and culture worldwide. But of course, the US could not do this if it was not economically strong. As Kennedy says above you need economic strength to sustain an empire. So economic trade is another way in which soft power can be used. So the more two countries trade the more they are bound together. Usually the stronger country dominates the way trade is negotiated.

This can create an unhealthy balance. In British controlled India, *‘India’s surplus, instead of being invested so as to create the modernised and industrialised economy needed to support a growing population, was being drained away by the ruling power. The main drain emptied in London with a flood of what the government called “home charges”. These included salaries and pensions for government and army officers, military purchases, India Office overheads, debts servicing, and the guaranteed interest payable to private investors in India’s railways. They came to something like a quarter of the government of India’s total revenue.’* (Keay, 2000)

The consequences of this imbalance, according to Yuval Noah Harari, could be terrible; *‘The British conquered Bengal, the richest province in India, in 1764. The new rulers were interested in little except enriching themselves. They adopted a disastrous economic policy that a few years later led to the outbreak of the Great Bengal Famine. It began in 1769, reached catastrophic levels in 1770, and lasted until 1773. About 10 million Bengalis, a third of the province’s population, died in the calamity.’* (Harari, 2011)

Soft Power may have been efficient for the British, but it was not at all efficient for eighteenth century Bengalis. I stated in the introduction that efficient power was the ‘swift and successful taking of power and then its maintenance over a long period of time’. I feel however, that truly efficient power should benefit not only the rulers, but the inhabitants as well.

Smart power

The Roman Empire lasted 500 years. The Romans suffered wars, defeats, destruction. However, one of the reasons why it lasted so long was that it used a form of Smart Power.

Once the Romans established themselves in a region, initially by invasion, they gradually tried to Romanise the local population. The Empire had many cities which were economically wealthy. The cities were grown in the Roman style. Roman clothes were worn by non-Romans. The Roman language spread across the territories, as far south as Egypt and as far north as Britain.

The Romans understood that to maintain the Empire, they needed the local populations to be at peace with Rome and that *‘when native aristocrats adopted a Roman lifestyle and acquired a taste for Mediterranean luxury and refinement, the rulers of the empire were delighted.*

Instead of jealously guarding their privileges, they were eager to share them. They understood that if the empire was to be stable and to endure, it required wide foundations. Rome’s rulers were happy to welcome native aristocrats as fellow citizens. This was possible because citizenship in the ancient world was not defined by nationality.

Anyone could, in theory, be granted citizenship of the city-state of Rome, even if they had never been there and had no intention of going.

Place of residence, language, religion, parentage - none of these was decisive. If you had standing in your own community and supported the new order, you were likely to attract attention as someone to be cultivated.’ (Faulkner, 2011)

As resident of Empire, could not only be a citizen of Rome, he could also become Emperor. Trajan, (ruled 98-117 AD) was born in Spain, his family originally from Umbria.). Philip ‘the Arab’ (ruled 244-249 AD) was Syrian.

By assimilating non-Romans and making them feel as if they are a positive of the Empire, the Romans succeeded in holding onto power across Europe, Arabia and North Africa for an amazing amount of time.

It is interesting that the U.S. has used culture and language in a similar way to the Romans, but that their president is currently attempting to build a wall to stop non-Americans become U.S. citizens.

Conclusion

Without Hard Power it is difficult for a country to take control over another region or nation. It is very rare that countries or states voluntarily join another without being conquered. Germany unified in 1871, when a number of states joined with Prussia. This unification was peaceful, but the fact that Prussia had defeated both Austria and France, demonstrating that it was the strongest nation in Central Europe, was the catalyst for unification.

To maintain control, Hard Power, or the threat of Hard Power usually has to be present, when dealing with a new acquisition. However, Hard Power cannot ensure the maintenance of control. Either other strong nations can challenge and overcome the controlling nation, or the population can rise up in rebellion. The defeat of France by Britain in the Napoleonic Wars is an example of the former. The breakdown of communism in Eastern Europe is an example of the latter.

It is Soft Power that can keep the territories of an Empire under its authority. By tying the territories in a number of peaceful ways, the inhabitants are less likely to oppose the rulers. These ‘peaceful ways’ tend to be cultural, linguistic and economic. However, there are examples in history where the economic imbalance is so great, the

effect on the local population is as bad as if Hard Power was always being used.

To create and sustain power most efficiently, the ruling nation should make the occupants of the Empire feel as if they are benefitting as much as anyone else, no matter where they live. This is Smart Power that is efficient not only for the ruler, but for the inhabitants of the controlled region as well.

Bibliography

Dr Neil Faulkner – ‘Romanisation: The Process of Becoming Roman’ 2011
http://www.bbc.co.uk/history/ancient/romans/romanisation_article_01.shtml
Francesca Ghiretti - ‘Is China the new America? The use of power to influence the world’ – Scholar’s Programme 2018
John Gillingham - ‘The Early Middle Ages’. ‘The Oxford Illustrated History of Britain’ Edited by Kenneth O. Morgan 1984, pp. 105
Yuval Noah Harari – ‘Sapiens’ 2011 pp. 336-337
Dr Peter Heather - ‘The Fall of Rome’ 2011
http://www.bbc.co.uk/history/ancient/romans/fallofrome_article_01.shtml
Hermitage Museum (Philip the Arab)
<https://www.hermitagemuseum.org/wps/portal/hermitage/digital-collection/06.+Sculpture/770>
History World ‘History of Germany’
<http://historyworld.net/widhis/PlainTextHistoriesResponsive.asp?ParagraphID=agy>
John Keay – A ‘History of India’, 2000 pp. 450-451
Paul Kennedy – ‘The Rise and Fall of the Great Powers’, 1988 pp. xii
Kenan Malik - ‘Power Politics always drives space conquest. China’s coup is no different’ – Observer
Guardian group, 6 Jan 2019
https://www.theguardian.com/commentisfree/2019/jan/06/power-politics-always-drives-space-conquest-china-coup-is-no-different?CMP=Share_iOSApp_Other
A.L. Morton - ‘A People’s History of England’, 1938 pp. 60

Tutor comment:

R. is a clever and hardworking student. Not only has he always actively contributed to the discussions during the tutorials, but also, he has produced an excellent final essay. He was able to assimilate complex concepts and apply them to original cases, showing exceptional analytical skills and drive to learn. His final work reflects R.’s keen intelligence and willingness to work hard to produce high quality results.



Analyse the effects of culture on leadership

Year 9, Key Stage 4

Pupil: C. Kiew
School: Prospect School, Reading
Supervised by: T. Ogbe
Tutor University: King’s College London
Course Title: Leadership & culture

How is culture able to affect leadership? Extensive research has shown that leadership and culture can influence each other greatly as leadership and culture are very closely linked. Defined as ‘the ability to lead or guide an individual, team or organisation’, leadership is present in everyday life and can build inspiring visions and empower people to make life-altering decisions.¹² Culture is commonly described as the social behaviour, norms, characteristics and knowledge found within a collective that defines identity. Culture encompasses the language, religion(s), cuisine, social habits, music and art of a collective and is often passed down from generation to generation.¹³ Culture can affect leadership in many different ways, one of which includes affecting how well subordinates work under certain leadership styles. The effectiveness of specific leadership

styles are often determined by culture as culture affects people's actions, thoughts, values and behaviour. In order to judge the effects of culture on leadership, the different leadership practices in China and the United Kingdom will be analysed to study how effective the different leadership styles are within the chosen cultures.

China has a high power distance with a rank of 80 in PDI.¹⁴ Despite its claim of being a communist country, there is a distinct social hierarchy in China and the Chinese are a population that believes inequalities among people are conventional. The word of formal authority like the government impacts the citizens greatly as the Chinese tend to be more psychologically dependent on power and believe that people should not have aspirations beyond their rank, a rank which is often determined by their social standing. The dependence on power and acceptance of unequal power distribution is present in their everyday life, especially in working environments. It is common for inferior-superior relationships in China to be polarised and there is often little to no defence against power abuse from superiors. This high power distance directly affects leadership in China and directive leadership works well in the Chinese society because directive leaders are proficient at giving instructions, setting expectations and creating performance standards.¹⁵ As the Chinese are dependent on power and heavily influenced by formal authority, like political figures, directive leaders work well in a Chinese environment. This is partly due to the Chinese belief that "one should be the best in what they choose to do" leading to this type of leadership style working well within the Chinese community as being directive ensures accuracy and reduces time-wasting mistakes, which in turn will produce better results.

On the other hand, the UK (United Kingdom) is a low power distance nation with the PDI rank of 35, which implies that the British believes that inequalities amongst its citizens should be minimised and everyone ought to be treated as equals.¹⁶ This is shown in their political system as Britain is a democratic country that expects everyone to participate in decisions that will affect them and citizens are also willing to readily question authority. Interestingly, compared to the PDI (power distance index) of the working classes of the UK, the PDI in the upper classes of the UK is lower. This suggests that the working classes of Britain are more dependent on power and are more able to accept the social inequalities within the well-established British class system. Supportive leadership would work well within the British culture because the United Kingdom has a low power distance. In contrast to directive leaders, supportive leaders are not as interested in directing their followers and managing every detail in their process. Instead, supportive leaders work alongside their subordinates to improve their skills and enhance their unique qualities.¹⁷ This is effective within the UK because the British value independence and uniqueness and supportive leaders prefer to let their followers deal with their own problems along the way. This allows followers to utilise their creativity to their full capacity, which can be achieved through independence and can showcase their uniqueness.

Additionally, with a score of 20, China is also a highly

collectivist culture where communal and interconnected relationships form a key part in people's identities.¹⁸ The Chinese are shown to be a collectivist culture during the period when the Great Leap Forward campaign (1958-1962) was at large.¹⁹ Led by Chairman Mao Zedong, the Great Leap Forward was a campaign that aimed to rapidly develop the country from an agrarian-based economy to a more socialist society through the process of industrialisation and collectivisation. The culture of collectivisation that occurred during the time period 1958-1962 remained with the people of China even up until modern day. Rather than acting for their own personal interests, the Chinese people are more attentive to the interests of the whole team or organisation they work for. This includes their colleagues and superiors as consideration of other people besides themselves will sometimes result in preferential treatment and a higher chance of promotion. Relationships with close colleagues are maintained as positive and more supportive whereas the treatment towards out-groups, particularly in a competitive area of expertise, can be cold and even hostile. This directly links to and affects leadership, specifically transactional leadership. Contingent punishment, a form of transactional leadership, does not work well within the Chinese community. This is again due to the fact that China is a highly collectivist country and as contingent punishment is meant to motivate followers by appealing to their self-interests, it is often ineffective within the Chinese community due to China being a collectivist country. When punishment or negative feedback is given, the Chinese are led to think that as a collective they are not doing well and are discouraged and consequently, this form of leadership tends to produce substandard results. As a result, contingent punishment is usually ineffective when used on the Chinese.²⁰

In contrast, the UK has an individualistic score of 89 and its people are extremely individualist and private.²¹ They are a culture that stresses the needs of individuals over the needs of the group as a whole. They believe that happiness is equal to personal fulfilment. Instilled in them is a sense of independence from a young age. The British are taught to individually contribute to society through their own unique purposes in life. Their social behaviour is shaped by their own attitudes and preferences instead of the expectations and pressure from society—the direct opposite to China. The British value independence, self-reliance, self-sufficiency, assertiveness and strength.²² They are expected to display initiative and be independent in most aspects of school life and also expected to apply this later in the business world. When promoting workers, the British base their decision on merit, potential and ability. In 2017, meritocracy (the holding of power by people selected according to merit) in Britain was still central to conceptions of fairness and justice, showing once again just how individualistic the British are.²³ Transactional leadership, in particular contingent reward, would be effective within the UK.²⁴

This is because transactional leaders are responsible for maintaining routine by managing and overseeing an individual's performance. They emphasise on managing

the performance of individuals and determine how well they will perform in a structured environment. Because the UK is a highly individualistic culture, this style of leadership works well on the British as transactional leaders focus on individuals.

China is also a masculine society with a rank of 66 which means the Chinese are success-oriented and driven.²⁵ Money and materialistic things are deemed as more important than the quality of life and lives of people in general. The need to succeed in both education and work is emphasised when the Chinese sacrifice leisure time and family priorities to work. Leisure time is thought of as less important in Chinese culture and is associated with laziness. This is shown in the rigorous and strict education system where a typical high school student starts school at 7am and ends at 11pm, conveying just how much the Chinese value success.²⁶ Another example of the masculinity found in China is the academic ranking poster hanging in every classroom that is supposed to give students an incentive to work harder in order to achieve more in their academic life, which in turn will improve their future life post-education. China's masculinity affects leadership, particularly charismatic leadership. Charismatic leaders are eloquent speakers and skilled communicators that lead on emotional levels.²⁷ Essentially, charismatic leaders persuade their followers to encourage particular behaviours by articulating a compelling vision. This type of leadership works well within a masculine society as charismatic leaders will ensure that their followers are motivated to achieve what they can and produce a good end result.

Despite valuing modesty and a more reserved lifestyle, Britain is a fairly masculine society, with a score of 66, that values success and whose citizens are extremely goal-orientated. The British society is driven by competition, achievement and success, with success being defined as the amount of wins accumulated over the years. Moreover, the UK is a capitalist country in which its trade and industry are controlled by private owners for profit.²⁸ Capitalism applies more in this country than most of its other European counterparts. This highlights how economic growth is highly prioritised by the government in the country and also reflects how important money is seen to be within Britain. There is the common belief within the British that "people should strive to be the best they can be" and success and achievements in life are often commended. People living in the United Kingdom tend to value their careers and are more comfortable about expressing their ambition. Compared to other European cultures that are more feminine, Britain has a clear performance ambition and the British people live in order to work to obtain monetary rewards and as a consequence attain higher status. Similarly to China, charismatic leaders are also effective in the UK because charismatic leaders inspire action within others to help them achieve their goals and will motivate their followers to produce the best result possible, proving very efficient within a masculine society. Charismatic leadership is shown to be effective in both China and the UK as have the same score of 66, making them both masculine societies that focus on high levels of achievement.²⁹

In conclusion, culture impacts the leadership style that is effective within a group of people or within an organisation. Cultural norms that are absorbed can lead to positive or negative results in leadership. This is shown in the two case studies of leadership styles in different cultures above. Different cultures work differently under different leadership styles and will produce different results. Others may argue that culture has little to no impact on leadership practices. They may say that leadership works well in all different types of organisations, regardless of culture. However, different people will react differently to different types of leadership styles because of the differences in culture. Culture influences all aspects of leadership.

Bibliography

<https://en.wikipedia.org/wiki/Leadership>
https://www.mindtools.com/pages/article/newLDR_41.htm
<https://en.wikipedia.org/wiki/Culture>
<https://www.livescience.com/21478-what-is-culture-definition-of-culture.html>
<https://www.hofstede-insights.com/country/china/>
http://www.widener.edu/about/widener_values/leadership/oskin_leadership/az/directive.aspx
<https://www.hofstede-insights.com/country/the-uk/>
<https://smallbusiness.chron.com/definition-supportive-leadership-style-21835.html>
<https://www.hofstede-insights.com/country-comparison/china,the-uk/>
https://en.wikipedia.org/wiki/Great_Leap_Forward
https://en.wikipedia.org/wiki/Transactional_leadership
<https://www.hofstede-insights.com/country-comparison/china,the-uk/>
<https://www.verywellmind.com/what-are-individualistic-cultures-2795273>
<https://www.google.com/search?q=meritocracy&rlz=1CAXGER>

Tutor comment:

Teaching Leadership and Culture at Prospect School was a pleasant experience as the students were very engaging and well behaved. However, C.'s enthusiasm and intellectual maturity stood her out, and these same attributes came out strongly in her essay. Not only did she demonstrate a deep understanding of the key concepts we explored in our tutorials, she also went a step ahead using practical data on cultural dimensions to illustrate the linkages between culture and leadership in different parts of the world. C.'s essay presented one of the most sophisticated analysis I have seen on the subject from anybody in her grade.



Inclusive future smart cities

Year 10, Key Stage 4

Pupil: K. Aksu

School: Holly Lodge High School College of Science, Sandwell

Supervised by: S. Shtebunaev

Tutor University: Birmingham City University

Course Title: Can you plan the future smart city?

Introduction

In this assignment I will be talking about how digital technology can be used to plan a more inclusive future city, and analyse qualitative data linking to technology and inclusive, smart cities. An inclusive city is one of that values all people and their needs equally.³⁰ From this we can understand that an inclusive city is one in which all citizens have a representative voice in governance, planning processes and that all citizens have the right to take part in long term planning and development. We need the development of technology for the lives of people to become easier and much safer. Therefore,

taking advantage of technology to build a safe, sustainable, smart city is extremely essential and important for the future. Technologies such as printers, fingerprint payments, interactive boards, laptops and security cameras can be used in the education department (schools) for an inclusive, comprehensive city. We need the development of technology for the lives of people to become easier and much safe. Therefore, the ways in which technology affects our neighbourhood (Smethwick) will be the focus in this assignment.

Stakeholders are an important part of a planning process as they are involved in the planning of an inclusive future city. A stakeholder is either an individual, group or an organisation who is impacted by the outcome of a project and can be within or outside the organisation that is sponsoring the project.³¹ In 'education' or in a school, the term stakeholder typically refers to anyone who is invested in the welfare and success of a school and its students, including administrators, teachers, staff members, parents, families and community members. I think the most important stakeholder of Holly Lodge and in general for all schools are the local authority (government). I think the Sandwell council are the most important stakeholder for Holly Lodge, because the local authority and the government are the ones that give the school a budget to spend its money on for necessary utilities in school and also, they give access to the internet, sort out placements for schools, and organises the checks of schools e.g. the Ofsted. Moreover, the local authority is also in charge of new technologies available in schools. Nevertheless, students and teachers (stakeholders as citizens) are also important because with their request and needs they can influence and make the technologies available in their schools. This is supported by Arnstein's "ladder of citizen participation"³² in planning as it shows participation range from levels where citizens do not have any power or control to the highest levels of citizen power. This illustrates that the students and staff (society) can bring changes in the school system and technologies within school for a more efficient, safe, inclusive neighbourhood. This demonstrates that planning is instrumental to ensure that planning will work towards to satisfy the priorities and interests of all the people and that these people will have to work to change a plan into action.

The reason why we must have smart cities is because there are urban challenges, which have been automatically produced as the use of technology increases. The urban challenges are the environment, good governance, mobility, prosperity, the growing population and the population density etc. ³³ The smart city planning's and projects should respond in a sustainable way and therefore will save energy, water, raw materials and financial resources to continue to prosper in an era of transition, while reducing it polluting emissions. Also, not only a smart city should consider its resources, it should also consider the society and the citizens. The social divisions of education, gender, age, health should be reduced as Smethwick is a diverse neighbourhood. Therefore, a smart city should encourage its citizens, businesses and public services to come up with new ways to plan a more inclusive future city.

Method

In order to analyse and understand how technology may be used to plan a more inclusive future city, we must collect

in data by the people, who live in Smethwick. There are over 40 secondary schools in Sandwell³⁴, and I have conducted a survey utilising 'SurveyMonkey'³⁵. This online survey has helped me to get qualitative data about technology in Sandwell and Smethwick. This survey was accessed online by many people in a range of age groups; the link was sent to them. An online survey method emerged because of the interaction of the teenagers and young adults to social media and technology. It was easier to get in contact with people through social media like Instagram and this provided enough information. I received replies of the online survey in couple of days, which presented the knowledge and understanding of the citizens in Smethwick. I have mostly sent links of the website to citizens in the age of 14-22. The reason for this was because this age group had easy and quick access to online technology. In addition to this I have interviewed 13 people between the ages of 14-33 years, which additionally helped to collect information about digital technology and the citizens in Smethwick and Sandwell. In both the online survey and the one on one interview questions related to digital technology and our neighbourhood were asked. I have used different, multiple methods in my research to get more accurate results as Bell, (2014)³⁶ says that if possible, efforts should be made to cross-check findings, and in a more general study, to use more than one method of data collecting. This multi-method approach is known as triangulation. Triangulation is the process of using more than one method to collect data on the same topic.³⁷ This is a way of assuring the validity of research using variety of methods to collect data on a topic. However, the purpose of triangulation is not necessarily to cross validate but rather to capture different dimensions of the same phenomenon and to see the different perspectives.

Results

The online survey website survey monkey <https://www.surveymonkey.com/> has provided qualitative data which gives an indication of level of awareness and understanding towards the concept of 'smart city' and the technology in their own school. From the qualitative data collected, we can see that majority (80%) of the students are unaware of what a 'smart city' is even though they utilise the modern technologies in their schools. All the students use the internet daily in school for their class work. Other technologies the students use are printers, interactive boards, and laptops. This wide range of technology indicates how widespread technology is and that it makes the lives of people easier and safer.

From the one on one structured interview, I can see that the people in the ages of 14-23 have not been in any planning processes. This means they have not filled any application form for planning or were not a stakeholder of any projects which involves digital technology. Furthermore, 80% of my interviewees have not seen or heard of new digital technology in their neighbourhood (Smethwick). The other 20% have seen technology such as contactless bus payments, interactive white boards in their schools etc. From this we can infer that majority of the people in Smethwick and Sandwell are unaware of the concept of a 'smart city' and that they have not seen any or few, new digital technologies.

Moreover, the interviewees have explained their needs and demands for a new smart, inclusive future. Many of them have said that schools are their main focus as it will decide on their future; therefore, they have said that new technologies in school will be beneficial for them. It will most likely improve their learnings, safety and the environment. Some examples of what they have said that they want was fingerprints for card payment, USB port in the printers, security cameras in the multi-use games area (muga). Also, with the current digital technologies in Smethwick and in their school (surveyed students of Holly Lodge High School and Shireland Collegiate Academy) the students and citizens feel safe. However, a question of 'do you know what information is being collected of you by your school or neighbourhood?' was asked. The people responded in a shocked way as I recall it from the recordings of the interviews. They had absolutely no clue of data being collected of them through their phones, school and cameras.

Discussion

The fact that 80% of the people surveyed and interviewed was unaware of the concept of 'smart city' shows the lack of awareness and the lack of education of the students and citizens in Smethwick. This shows that for a more inclusive, smart future city we must educate the people first as if they do not know what a smart city is then we cannot have an inclusive city, in which everyone is involved. We can educate the students in school by visitors from outside school and can give out leaflets, which fully explain what a smart city is and the purpose of it. By this way we can encourage people into planning processes and this links we the point of the age group of 14-22 have not been in any planning processes.

Furthermore, for an inclusive, smart, safe and sustainable future city we can make use of multiple embedded computer systems such as printers, which have USB ports and a fingerprint scanner. By this way the students of Holly Lodge and Shireland Academy can have a better opportunity to print via USB's and it will ultimately make it more secure for the students. Also, only a couple of people were aware of the contactless bus payments in the 'West Midlands National Express'³⁸. Therefore, an increase of contactless payments in buses will ensure the security of the elderly, adults and the students. Smethwick is a dangerous area³⁹ for the elderly and the children who use the bus, so contactless payments will secure their money and will decrease the chances of robbery, assault and crime. In addition to this, security cameras which detect the face of each person going in the bus and apps which show the location of a person may be used to decrease the rate of crimes as this digital technology will discourage people from committing crimes. This is a way of using digital technology for a safer and more inclusive future city, because it involves the participation of every citizen in neighbourhood (Smethwick). However, it is very important to explain the data collected from every individual as some may be private and against people's ethical views, as all of the people who were part of the survey and the interview were fully unaware of what data was collected of them; I am "shocked" said one of the interviewees. This shows the importance of informing people about the data collected of them.

Conclusion

In conclusion to this assignment, I believe that educating people, printers with USB ports, advanced security cameras with special applications and the increase of contactless payments not only in buses but in every or most aspects of our daily lives in Smethwick will make our neighbourhood part of a smart city. These technology advancements are important for the future of our children in the future as it will lead their lives and the world must be kept clean using technology as there is still an increase of pollution and global warming. These technologies can make a more inclusive, smart future city.

Bibliography

1 Rhonda Douglas, "Commentary: What we mean by inclusive cities?", <https://nextcity.org/informality/entry/commentary-what-we-mean-by-inclusive-cities> [6 March 2019]
2 Project Manager, "What is a Stakeholder?", <https://www.projectmanager.com/blog/what-is-a-stakeholder> (14 March 2019)
3 Arnstein, S., (1969). A ladder of citizen participation. *J.Am.Inst.Plann.* 35, 216-224. (15 March 2019)
4 Mike Hower, Green Biz, "The 5 toughest challenges tomorrows cities face" <https://www.greenbiz.com/article/5-toughest-challenges-tomorrows-cities-face> (15 March 2019)
5 Sandwell Council, "Secondary Schools" http://www.sandwell.gov.uk/info/200295/schools_and_learning/1031/secondary_schools (17 March 2019)
6 SurveyMonkey, <https://www.surveymonkey.com/> (17 March 2019)
7 BELL, J. (2014) Doing Your Research Project, Milton Keynes: Open University Press. Available at: <<https://doi-org.ezproxy.wlv.ac.uk>>.
8 Research Gate, https://www.researchgate.net/post/What_is_trianguation_of_data_in_qualitative_research_Is_it_a_method_of_validating_the_information_collected_through_various_methods (21 March 2019)
9 West Midlands National Express, "Contactless" <https://nxbus.co.uk/west-midlands/contactless/> (24 March 2019)
10 Birmingham Live, <https://www.birminghammail.co.uk/news/midlands-news/most-dangerous-places-live-near-12806992>

Tutor comment:

I really enjoyed working with K. His approach to the subject was critical from the onset, however, he took his time to research the theory and literature around the issues of smart cities. K. succeeded to relate theoretical issues of planning and technology to his immediate environment - the school settings. By applying theoretical concepts to existing issues, he managed to achieve a critical insight into the way technology might change our experience of the city.



Inclusive future smart cities

Year 10, Key Stage 4

Pupil: J. Alkatheri
School: Holly Lodge High School College of Science, Sandwell
Supervised by: S. Shtebunaev
Tutor University: Birmingham City University
Course Title: Can you plan the future smart city?



Introduction

Through an analytic survey, it was discovered that the advent of technology is absolutely crucial to our development of life and advancements of city building. The effect of a lack of awareness of good planning and design in the cities causes several problems to many cities in the world. That is why it is crucial to have a good planning system in the city and also to put the planning into practice with the design of the city itself. This can be achieved with the assistance of technology to plan a more inclusive city.

To achieve smart cities, data and technology are used to, ‘improve sustainability, and enhance the quality of life factors for people living and working in the city’. This article will highlight some models of implemented smart solutions in the world and a survey was made about the inclusivity of teenagers in planning processes. This aims to investigate the implications of smart solutions for a sustainable city. These solutions concentrate on the core area of the city administration, education, transportation, etc. All areas of high priority. As part of a study to assess the benefits of technology in the modern day, participants from the ages 13- 16 were surveyed on the benefits of urban technology and its impacts. The association between technology and their daily lives is used regularly. This information will assist in the development of urban cities and help incorporate the use of technology to improve our daily lives.

Before embarking on the survey, the development of technology usage in cities was researched in order to acquire sufficient knowledge that was of relevance. Participants were asked to answer questions related to their experience in the city and technology usage.

The findings of this survey indicated that technology is an essential part of our lives, and it could be argued that we could not thrive without it. A theoretical issue that has dominated the field for many years is the safety of technology for public security. Public security is a growing problem for cities worldwide, and it is planned for an ‘intelligent city-wide law enforcement and response network’ to be installed in cities. This technology will help provide a safe environment for citizens which is more effective and efficient. An example being the integration of devices and systems. Security cameras being connected to help track a criminal offense that may have took place in the streets which includes automated alerts and license plate tracking.

However, it could be argued that entrusting our security to technology is a dangerous mistake as our identities are prone to theft due to hacking. There are challenges posed by emerging scientific and technological developments for security. We need to understand how perceptions of security threats are themselves formed in relation to conceptions of science and technology.

The controversy over the dangers of technology has risen over the past years as technology has advanced. On the other hand, technology has vastly improved our lifestyles. There is now a different degree of complexity that has emerged in the 21st century. An example being our solution

to congestion, normally another lane to a road would be added which would eventually cause even more traffic. However, our solutions now would be driverless cars that can take the fastest, simplest route to your destination. Technology contributes immensely to our quality of life, and our end goal is to achieve a leading digital city which can then encourage other cities to develop their cities, therefore, resulting in inclusive, smart cities worldwide.

Review

In a world characterised by rapid demographic growth, high traffic congestion and increased pressure on public services, the concept of a "smart city" emerged and the need to create high-end cities based on the use of technological solutions to improve services, improve efficiency, reduce costs, achieve economic prosperity, Improving the way of life of citizens and ensuring their safety, security and well-being. The cities of the world welcomed this concept, went on to design strategies and develop projects, but then collided with a difficult reality. The building of the smart city seemed long and arduous as a result of the transformations it required to bring this into reality.

These cities have shared the desire to become smart cities and need to use technology solutions to achieve this. Their strategies and ambitions have diverged, such as ways to establish their strategies, ways of implementing them, in addition to making recommendations thereon, all of which are broad and long-standing topics.

The city's smart strategies have broad ambitions encompassing multiple areas such as economic, social and environmental life. Over time, these aspirations have moved from efficient service delivery to improving the quality of life of citizens, engaging the public, and providing citizens' safety and security. Thus, the smart city concept evolved from a technology-driven strategy to a citizen-centered strategy, in which suggestions were shared on transforming services and building infrastructure to improve citizens' lives. Many cities see technological solutions as a factor for achieving goals such as improving services and efficiency and reducing costs at a time of rapid demographic growth, overcrowding and pressure on public services. From these German cities Berlin knows a demographic increase not seen before, and the Chinese city of Wuhan which bet on the use of technology to solve the problem of traffic congestion.

Among other things, to ensure that the disadvantaged segments of society benefit from digital solutions, avoid digital exclusion and its negative effects, and ensure that all citizens benefit from the funded projects. Many African cities seek to use technology to achieve a prosperous, equitable, and just society free of racial and sexual intolerance. This is also the preoccupation of American cities such as Chicago and New York, where justice and equality are a priority. Reports show that 45 percent of the population is in the poverty category.

A growing number of cities around the world are paying special attention to citizens' participation in political decision-making through the Internet by giving opinions to solve their city's problems. Smart initiatives, which call for the use of open data, are the best way to enhance

transparency in transactions and reduce opportunities for corruption. In Kenya, the government is working hard to introduce electronic payment services such as paying water and electricity bills to reduce the risk of corruption and transparency. Latin American countries also seek to benefit from technological solutions to enhance transparency. The movement toward technology and the development of smart cities will be active around the world. “The smart city has recently moved away from traditional one-off major projects and has grown into a major market opportunity,” said Serena da Rold, Program Manager, IDC Customer Insights & Analysis Group in the United States. A major technology investment will be made.

This concludes that Smart City must be tailored to local needs in particular, to a lesser extent national needs, with citizen involvement, and improved levels of awareness, transparency, and credibility. A smart city must also be designed to meet the needs of the citizens, and better results for those living and working in the city which is only achievable with the use of technology.

A considerable amount of literature had been published on the effects of smart cities and how they may benefit us. However, not much literature has been written on how to make these future cities more inclusive and beneficial to the population. Numerous studies have argued that the only way to advance our cities and develop them to become comprehensive is with the help of technology. It has been conclusively shown by the outputs of the survey that everyone questioned agrees that technology has improved life around the city for them whether it be travel or places of interest.

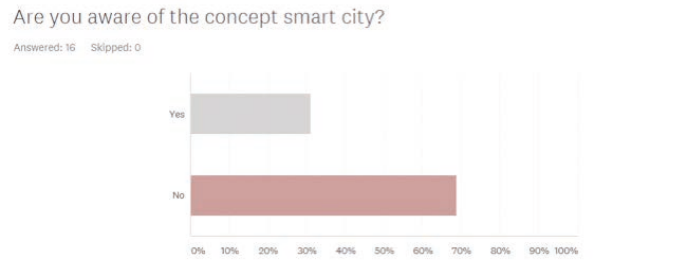
Statistics and findings

To carry out the survey, a series of questions were put together to form a questionnaire which was then sent to participants via link attachment. This methodology has a number of advantages such as being able to send the survey to many partakers in a short period of time. The answers to the survey were also received immediately after completion. There were no limitations nor disadvantages to the approach taken therefore meaning the use of technology to carry out the survey was efficient and effective.

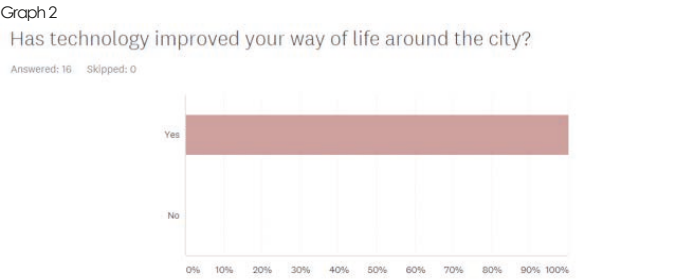
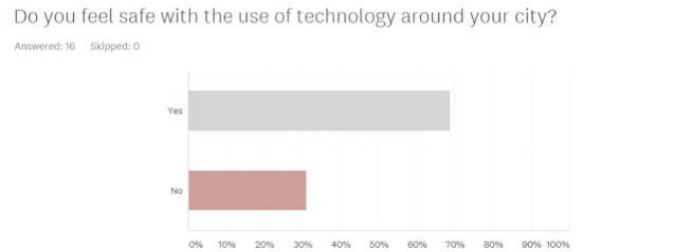
It is apparent from graph 1 that many people are unaware of the concept of smart city and we should bring awareness to this concept as it is our future. The data in graphs 2 and 3 indicate that a majority of participants feel safe and trust the use of technology as all participants believe that technology has improved their life around the city. A majority of respondents have seen many forms of technology around the city proving that the development of smart cities has already taken place and will possibly continue to do so. A small number of respondents shared their views on their use of mobile applications on their city experience with many stating its use to find places of interest or travel times. Others stated that cities could be improved by the use of smart cars to prevent car accidents and congestion or further use of online banking to prevent a bank robbery. However, there is still a chance of online crime. Free Wi-Fi in public areas was also a benefit people wanted to see more around cities.

Contrary to expectations, the research proved that as well as

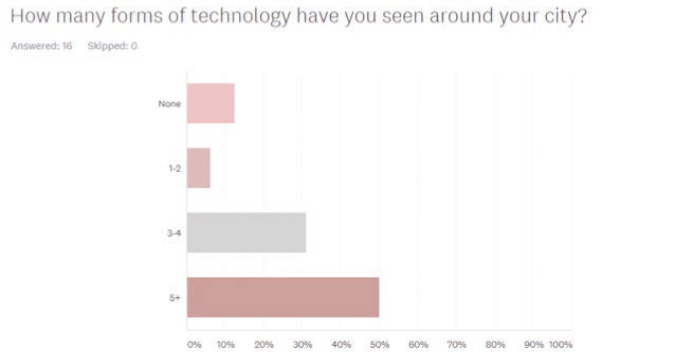
a smart, inclusive city, participants wanted to ensure their city to feel safe and comfortable by adding more greenery, trees, and wildlife to create a natural environment to prevent the city from feeling over- engineered. Contrary to expectations, the research proved that as well as a smart, inclusive city, participants wanted to ensure their city to feel safe and comfortable by adding more greenery, trees, and wildlife to create a natural environment to prevent the city from feeling over- engineered.



Graph 1



Graph 3



Graph 4

References

UKessays. 2018. Urbanisation of City Centres | Essay. [online]. Available from: <https://www.ukessays.com/essays/geography/urbanisation-city-centres-essay-9954.php?vref=1> [Accessed 27 March 2019].
ResearchGate. 2017. Digital Technologies for Inclusive Urban Planning. [online] Available at: https://www.researchgate.net/publication/318583532_Digital_Technologies_for_Inclusive_Urban_Planning [Accessed 27 March 2019].
Geospatial World. 2017. How can we achieve more inclusive smart cities? [online] Available at: <https://www.geospatialworld.net/blogs/achieve-inclusive-smart-cities/> [Accessed 27 March 2019].
Oliver wainwright. 2017. The Guardian. [Online]. [27 March 2019]. Available from: <https://www.theguardian.com/cities/2017/jan/24/finder-cities-technology-making-urban-planning-interactive>
Meetingoftheminds.org 2017. Meeting of the Minds. [Online]. [27 March 2019]. Available from: <https://meetingoftheminds.org/build-connected-inclusive-cities-22240>
Wikipedia.org 2019. Wikipedia.org [Online]. [27 March 2019]. Available from: <https://en.wikipedia.org/wiki/>

Smart_City
 Idc.com 2019. IDC: The premier global market intelligence company. [Online]. [27 March 2019].
 Available from: <https://www.idc.com/getdoc.jsp?containerId=US44385318>

Tutor comment:

J. is a very capable student and I was impressed by her critical comments throughout our group discussions and readiness to engage with the material. What stood out, however, was her openness to collecting primary data, as well as, her follow-up analysis and presentation. Her graphical skills helped the data to come to life and engage the reader. J.'s methodical and professional approach will be well suited to an undergraduate programme.



Anti-social behaviour: What is it and how does it affect us?

Year 10, Key Stage 4

Pupil: **M. Kocker**

School: **Ysgol Bryn Alyn, Gwersyllt, Wrexham**

Supervised by: **W. Cronin-Wojdat**

Tutor University: **Wrexham Glyndwr University**

Course Title: **Anti-social behaviour: What is it and how does it affect us?**

This essay will consider the definition of anti-social behaviour (ASB) and the impact ASB has on members of society, particularly youth ASB.

The definition of ASB will be presented, and an explanation will be given about why ASB is difficult to define. In addition, criticisms about the definition of ASB will be mentioned. It will discuss how age affects people's perceptions of ASB and examine why youths are commonly associated with ASB. It will establish how media stories influence groups of the population differently. The idea of moral panic and media amplification will be applied, referencing a case study. The Broken Windows Theory will be used to explain how signal crimes can cause changes in an area. Finally, it will analyse reassurance and zero-tolerance policing and consider how successful these methods are at reducing fear of crime.

This essay uses the definition of ASB from the Anti-social Behaviour, Crime and Policing Act 2014. ASB is, '(a) conduct that has caused, or is likely to cause, harassment, alarm or distress to any person, (b) conduct capable of causing nuisance or annoyance to a person in relation to that person's occupation of residential premises, or (c) conduct capable of causing housing-related nuisance or annoyance to any person.'

ASB encompasses a range of behaviour, including low level crime incidents to typical nuisance and disorder (Strickland, 2018).

Millie (2008) explained that several definitions for ASB have been proposed over time. The phrase 'harassment, alarm or distress' has been used many times. Millie argues that this phrase does not help to define ASB; everybody is different, and one person's view of harassment, alarm

or distress can be completely different to another individual's view.

Whitehead et al. (2003) recognised that a range of factors cause activities to be considered anti-social, including the tolerance levels of people, the context in which the action occurs and the setting. For example, graffiti could be classed as a form of ASB in one area, but it might be accepted in other areas (Millie, 2008). It can also be difficult to distinguish between criminal acts and ASB. Millie (2008) explained that there would be a clear overlap between criminal behaviour and ASB in a simple Venn diagram.

The Coalition Government passed the Anti-social Behaviour, Crime and Policing Act 2014 with the aim of reforming ASB legislation. Six new powers replaced the nineteen existing powers (Strickland, 2018). According to the Coalition Government, these would be faster, more effective and centred on the requirements of the victim (Home Office, 2012). However, the definition of ASB in the Anti-social Behaviour, Crime and Policing Act 2014 is comparable to that of the Crime and Disorder Act 1998. Critics expressed concerns about the non-specific definition from 1998. Behaviour targeted by new powers was open to considerable interpretation, therefore restrictions were imposed on behaviour not in itself illegal (MacDonald, 2006). The definition of ASB concentrated on the impact of the defendant's actions on the victim. Critics argued this meant there were no provisions for cases in which the victim was oversensitive or prejudiced (MacDonald, 2006).

Hulley's (2014) study found that perceptions of ASB differ greatly, particularly those of young people and adults. When asked to identify anti-social behaviours, the different generations agreed on murder, assault and shoplifting. However, Hulley's research revealed that adults are more likely to interpret public behaviour as anti-social; this is especially true when associated with young people. 40% of adults viewed young people gathering in public as ASB whereas only 9% of adolescents held the same view. The investigation confirmed that 'young people are particularly likely to be labelled perpetrators of ASB - especially by adult observers' (Hulley, 2014, p. 3).

Young people are associated with ASB due to their negative depiction in the media. A study by Clark et al. (2012) highlights that many of the media's stories portray young people negatively. This is supported by Hulley (2014) who linked the media's negative portrayal of young people to the misconception that groups of youths pose a threat to adults. Research by Clark et al. (2012) used the James Bulger case as an example of previous negative coverage. This suggests that negative reporting of young people is not new. The media can influence the perceptions and views of society. It can alter perceptions about young people, creating stereotypes; older generations could believe that all adolescents are involved in ASB. However, this publicity is not representative of the entire demographic and focuses on minority groups that are extreme examples of young people and their behaviour (Clark et al., 2012). Groups of adolescents gathering in the streets could

cause concern due to the risk of peer pressure; young people are heavily influenced by their peers (Monahan et al., 2009). Somebody could hold certain moral values, but they could disregard these and commit uncharacteristic acts to impress others. This is likely to have a detrimental outcome in relation to ASB, which is a real concern because 'criminal behaviour in adolescents is a result of social influence' (Esiri, 2016, p.8). Members of groups where criminal behaviour is considered acceptable are more likely to hold the same views than someone not part of such a group (Esiri, 2016). Peer pressure could lead to more ASB (Monahan et al., 2009).

Negative media coverage about anti-social adolescents has a detrimental impact on other young people, causing adolescents to feel scared of their peers. Several individuals reported feeling unsettled or intimidated by other young people (Clark et al., 2012). Research carried out by Clark et al. (2012) found that many adolescents felt resentful that the negative behaviour of minority groups within the youth population influences society's perception of the demographic. The subsequent negative stereotypes impact on their daily lives. For instance, some of the young people surveyed felt concerned about how they would be viewed wearing items of clothing that are associated with ASB. It seems the media's incorrect representation of the youth population caused some of the young people to change elements of their behaviour.

A worrying misconception is that groups of youths pose a threat, despite previous studies showing that youths gather in public places to feel safe (Hulley, 2014). Adolescents congregate in public places to socialise, with no intent to harass others (Home Office, date unknown). They also gather in the streets because nationwide cut-backs and restrictions have reduced the number of places available to them. Previously, they had access to more communal places, therefore smaller numbers were seen on the streets (Travis, 2013).

Johnstone (2016) explains that the Anti-social Behaviour, Crime and Policing Act 2014 has increased the possibility of people being removed from public spaces if their presence is considered problematic. It is unclear what impact the new dispersal powers will have on young people and their use of public space.

When the public's concerns about an issue are heightened, a moral panic can occur. A moral panic leads to changes in society, such as how people behave. Moral panics often spread quickly through media amplification (Cronin-Wojdat, 2018). An example of a moral panic and the impact of media amplification is the 1993 James Bulger case. The negativity surrounding the case altered people's perceptions of young people, giving the impression that children are evil, not innocent (Morrison, 2003). People often feel intimidated by groups of youths due to their negative media portrayal. Feeling vulnerable causes some people to change their behavioural patterns. This can result in them making complaints about groups of youths even if they are not involved in ASB (Home Office, date unknown).

Kelling and Wilson (1982) developed the Broken Windows Theory. People generally like living in well-ordered places, feeling reassured when the police help maintain that order. They explained that 'serious street crime flourishes in areas where disorderly behavior goes unchecked' (Kelling and Wilson, 1982, p.8). Kelling and Wilson (1982) illustrated the theory by writing that if one window is broken and left unrepaired, all the other windows will soon be broken because people feel that no one cares about the area. Signal crimes are 'minor public disorder and crimes that can increase a person's fear of crime' (Cronin-Wojdat, 2018, p.7). They relate to the concept of the Broken Windows Theory because when signal crimes occur, those fearing crime leave the area if they can do so, creating an environment where serious crimes are more likely to occur. Due to their negative portrayal in the media and the subsequent stereotypes that are formed about adolescents, people could associate them with these fear-inducing acts (Clark et al., 2012).

Whitehead et al. (2003) found that some groups are more likely to be impacted by ASB than others. For example, people with little money are unable to move away from areas where ASB is having a negative impact. Those that already face discrimination may be unwilling to ask for help or support, potentially leading to an increased fear of crime. Kelling and Wilson (1982) found that elderly people are less likely to be victims of crime than younger people due to the precautions they take. Cronin-Wojdat (2018) wrote that a person's fear of crime can be greater than the likelihood of them becoming a victim of crime; this appears to be the case for elderly people. Kelling and Wilson (1982) explain that for a vulnerable person, confrontation with anti-social youths can be just as frightening as the prospect of meeting an actual intruder.

Policing involves a balance between fighting crime and maintaining order (Millie et al., 2005).

Reassurance policing (RP) is integral to UK policing, concentrating on tackling and finding long-term solutions to ASB. RP aims to reduce fear of crime (Cronin-Wojdat, 2018). Officers viewed RP as a way of improving community confidence and cooperation, ultimately impacting upon levels of criminal behaviour (Millie and Herrington, 2004).

Kelling and Wilson (1982) discussed the impact of foot patrol on neighbourhoods in Newark, USA. They concluded that crime rates were not reduced, but residents in foot-patrolled areas felt more secure compared to other areas, believing crime had been reduced. Subsequently, they were less fearful about becoming a victim of crime, taking fewer measures to protect themselves. Walking the beat is an important part of RP (Millie and Herrington, 2004). Beat policing allows interaction between the police force and community members. From experience, Kelling and Wilson (1982) believe that people like talking to police officers because they can explain what is concerning them.

Nevertheless, RP has been interpreted as a renamed version of community policing and issues with applying RP have been identified (Millie and Herrington, 2004). The demand for resources can lead to officers being diverted

to other duties. Consequently, communities are not given the consistency they require, making it difficult for officers to engage with and be trusted by the local people (Millie and Herrington, 2004).

Zero-tolerance policing (ZTP) was first introduced in New York and is 'a policing strategy that punishes people for even the most minor type of offence' (Cronin-Wojdat, 2018, p.7). Some believe that dealing with minor offences reduces the number of more severe crimes.

According to Millie *et al.* (2005), some participants in focus groups wanted a thorough approach to enforcement and punishment, as the only possible way of implementing change regarding ASB: 'Zero tolerance, that's what we want' (Millie *et al.*, 2005, p.27). According to Bratton (1998), the people of New York felt safer as there were 166,737 fewer victims of violent crime between 1994 and 1996 under the new policing strategies.

Alternatively, ZTP places little emphasis on the need to work closely with communities and focuses on short-term results (Pollard, 1998). Pollard (1998) notes that every arrest in the UK takes an officer off the streets for several hours and questions whether this is a sensible use of police time. The impact of ZTP on the community is also considered; it could destroy the relationship needed for effective policing. People do not want to see police officers whose zero-tolerance attitude is autocratic, or officers who have no discretion (Pollard, 1998).

In conclusion, the definition of ASB is imprecise in helping decide what anti-social is because a range of factors must be considered. The definition of ASB in the Crime and Disorder Act 1998 was heavily criticised. The definition in the Anti-social Behaviour, Crime and Policing Act 2014 is comparable and therefore likely to attract the same criticisms. Perceptions about the types of behaviour that are anti-social differ between generations. Young people are commonly associated with ASB because of their negative media portrayal. They are more susceptible to peer pressure which increases concerns about them gathering in groups. This media coverage negatively affects their lives and the stereotypes formed can cause them to alter their behaviour. Behavioural changes can also occur due to a moral panic. When people see or read about local youth ASB, it can cause them to relocate for fear of becoming a victim of crime. The Broken Windows Theory explains that this leads to more serious crimes because criminals can inhabit the area. Some groups of the population are more likely to be impacted by ASB than others; this links to increased fear of crime. Evidence suggests that RP and ZTP respectively can be successful in reducing fear of crime, but both face criticisms.

References

Anti-social Behaviour, Crime and Policing Act 2014, Chapter 12. Available at: <http://www.legislation.gov.uk/ukpga/2014/12/contents/enacted> [Electronically accessed 26th December 2018]
Bratton, W. (1998), Zero Tolerance: Policing a Free Society. 2nd edition. London: IEA Health and Welfare Unit. Available at: <http://civitas.org.uk/pdf/cw35.pdf> [Electronically accessed 27th December 2018]
Clark, C., Ghosh, A., Green, E. and Shariff, N. (2012), Media Portrayal of Young People – impact and influences. Available from: www.open.ac.uk/researchprojects/childrens-research-centre/sites/www.open.ac.uk/researchprojects/childrens-research-centre/files/files/ecms/web-content/clarkc.pdf Crime and Disorder Act 1998, Chapter 37. Available at: <https://www.legislation.gov.uk/ukpga/1998/37/section/1/enacted> [Electronically accessed 7th January 2019]
Cronin-Wojdat, W. (2018), Anti-social Behaviour: What is it and how does it affect us?
Esi, M. O. (2016), 'The Influence of Peer Pressure on Criminal Behaviour', IOSR Journal of Humanities and

Social Science, Vol. 21, pp. 8-14. Available at: <http://www.iosjournals.org/ios-jhs/papers/Vol.%2021%20Issue1/Version-3/8021130814.pdf> [Electronically accessed 23rd December 2018]
Home Office (2012), 'Putting victims first: more effective responses to anti-social behaviour'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/228863/8367.pdf [Electronically accessed 27th December 2018]
Home Office (Date unknown), 'Reform of anti-social behaviour powers' Groups 'hanging around'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/248750/01_GROUPS_HANGING_AROUND_WEB.PDF [Electronically accessed 23rd December 2018]
Hulley, S. (2014), Generation blame: how age affects our views of anti-social behaviour. Available from: <https://www.cam.ac.uk/research/news/generation-blame-how-age-affects-our-views-of-anti-social-behaviour> [Electronically accessed 23rd December 2018]
Johnstone, C. (2016), 'After the Asbo: Extending control over young people's use of public space in England and Wales' in Critical Social Policy, 36(4), pp.716-726. DOI: 10.1177/0261018316651943
Kelling, G. L. and Wilson, J. Q. (1982), 'Broken Windows: The police and neighbourhood safety', The Atlantic, March, pp. 4-16. Available from: <https://www.theatlantic.com/magazine/archive/1982/03/broken-windows/304465/> [Electronically accessed 23rd December 2018]
MacDonald, S. (2006), 'A Suicidal Woman, Roaming Pigs and a Noisy Trampoline: Refining the ASBO's Definition of Anti-Social Behaviour', The Modern Law Review, Vol. 69, No. 2, pp. 183-213. Available at: <https://www.jstor.org/stable/3699070> [Electronically accessed 27th December 2018]
Millie, A. (2008), 'ANTI-SOCIAL BEHAVIOUR, BEHAVIOURAL EXPECTATIONS AND AN URBAN AESTHETIC', The British Journal of Criminology, Vol. 48, pp. 379-394. DOI: 10.1093/bjc/azm076
Millie, A. and Herrington, V. (2004), 'Reassurance policing in practice: views from the shop floor', Selected papers from the British Criminology Conference, Vol.7., Portsmouth, July 2004. Available at: <http://www.britisocrim.org/volume7/002.pdf> [Electronically accessed 27th December 2018]
Millie, A., Jacobson, J., McDonald, E. and Hough, M. (2005), Anti-social behaviour strategies: Finding a balance. Bristol: The Policy Press. Available at: <http://eprints.bbk.ac.uk/22246/1/ASB%20IRF%20report.pdf> [Electronically accessed 27th December 2018]
Monahan, K., Steinberg, L. and Cauffman, E. (2009), 'Affiliation With Antisocial Peers, Susceptibility to Peer Influence, and Antisocial Behavior During the Transition to Adulthood', PubMed Central. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2886974/> [Electronically accessed 23rd December 2018]
Morrison, B. (2003), 'Life after James', The Guardian, 6th February. Available at: <https://www.theguardian.com/uk/2003/feb/06/bulgerukcrime> [Electronically accessed 23rd December 2018]
Pollard, C. (1998), 'Zero Tolerance: Short-Term Fix, Long-Term Liability?' in Bratton W., Zero Tolerance: Policing a Free Society, 2nd edition. London: IEA Health and Welfare Unit. Available at: <http://civitas.org.uk/pdf/cw35.pdf> [Electronically accessed 27th December 2018]
Strickland, P. (2018), Constituency Casework: Anti-Social Behaviour in England and Wales, House of Commons Library. Available at: <http://researchbriefings.files.parliament.uk/documents/CBP-7270/CBP-7270.pdf> [Electronically accessed 27th December 2018]
Travis, A. (2013), "'Growing up" behaviour too often labelled antisocial, says police chief', The Guardian, 11th November. Available at: <https://www.theguardian.com/society/2013/nov/11/antisocial-behaviour-police-chief-young-people> [Electronically accessed 23rd December 2018]
Whitehead, C. M. E., Stockdale, J. E. and Razzu, G. (2003), The Economic and Social Costs of Anti-Social Behaviour. London: London School of Economics. Available at: https://webarchive.nationalarchives.gov.uk/20100405142127/http://asb.homeoffice.gov.uk/uploadedFiles/Members_site/Documents_and_images/About_ASB_general/EconSocialCostASB_0142.pdf [Electronically accessed 26th December 2018]

Tutor comment:

I was continually impressed by M.'s enthusiasm, participation and work ethic during the course. M. showed what I consider to be critical attributes in a high achieving student. An enquiring mind that continually seeks a deeper understanding and making links between concepts, usually obtained through additional independent reading beyond the course content. Furthermore, a willingness to ask for and receive constructive feedback about her understanding of the topic and written work. When I suggested to M., her writing style would be improved if she used the Harvard referencing style, although not required the course, she willingly took the effort to learn it. The combination of her attributes and academic skills resulted in this exceptional criminology essay. I understand that M. aspires to study at Oxbridge. From my experiences of M.'s intellect, attributes and academic skills, this wish will soon become a reality.



Critically evaluate how juries make decisions of guilt or innocence in England and Wales

Year 12, Key Stage 5

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Course Title: Guilty or innocent? How do juries decide?

The jury service in England and Wales can trace its roots back nearly one thousand years to the 11th century, however the jury we currently know today is something which is quite different. Over the millennia, the service has evolved with the most recent revision in 1974. The Juries Act of 1974 currently dispenses the relevant requirements relating to those who are eligible, disqualified and excused from jury duty. To be eligible for jury service: you must be registered to vote thus on the electoral roll, be aged between 18 and 75, and British citizenship. Along with this, there are a few ways to be excused from jury service which include service in the armed forces, legislative bodies and medical professions but in practice, other reasons are also often considered by the jury officer who must be notified of absences. Those convicted of criminal offences are disqualified from jury service.

With the jury system, it sets a precedent for openness in an often very exclusive and cordoned off section of society which decides the fate of many. This allows the public to take part in a system which plays an influential role on society. It also ensures impartiality based on the fact the system is basically a lottery based on three criteria being met, every verdict is formed from opinions as a result of a case being heard; this assists in keeping the system clean of malpractice. The removal of a jury from all cases also causes public displeasure, especially when it becomes apparent that one person, a judge, yields all the power on deciding the verdict. The simple understanding that 12 people deciding is fairer than 1 person choosing with everyone having a chance to input their understanding of the case at hand. Finally, the jury allows for the introduction of a viewpoint outside of a legal stance. The role of the judge is to simply sentence based on legal matters; on the other hand the jury can acquit defendants based on circumstantial events rather than just the law.

Contradictory to the praises of the randomised selection, the chance of choosing people who are incompetent, or unwilling is a real factor. The possibility of a hung jury must also be considered. In this case, a retrial must occur. The problem with this is that jury service is already a very timely and expensive process and a retrial just increases the cost furthermore. Lack of understanding regarding the case also can jeopardise the case, this can lead to issues arising where the best barrister is favoured instead of the case or social loafing where jurors depend on other members to decide on a verdict. Above all these issues, the most pressing issue is external influences which may sway the jury in a particular direction. This is further enhanced by the coverage some cases receive through the huge platforms available to media services on paper and online.

In this essay, we shall focus on criminal cases within England and Wales which involve juries. Although involved in only 1% of criminal cases, the offences are normally the most serious including rape and murder with the greatest sentences. The decision-making process for juries is fuelled by the selective use of evidence. Evidence submitted to the trial has to meet certain standards as set by the Home Office. Factors affecting juries including public opinion differing from place to place which can

also affect the conviction rate of some crimes or crimes overall. Similarly prejudices which include those being motivated by race or gender can once again play a major role in the conviction of certain crimes and continue to be a hotbed topic when the fairness of juries is brought up. Another important factor which contributes to the success of a jury is the understanding of legal lingo and the justice system overall. With the selection system being wholly randomised, you are guaranteed to encounter people with totally different understandings of law and court proceedings. These points shall be discussed in the following paragraphs.

Firstly, looking at societal issues which often are linked to issues as simple as geography are observable in statistics. For example, Snaresbrook Crown Court is known to have a very low jury conviction rate which can be pinpointed on nothing other than widespread public stances on convictions in the area. On the other hand, the same study cites that it could also be linked to police performance in certain areas and their ability to gather evidence to convince a jury to convict a defendant. These are two different viewpoints which both fall under the umbrella of societal issues linked to geography.

In the past studies such as (Kelly *et al.*, 2005) and (Temkin & Krahe, 2008) have cited that rape cases have a significantly lower conviction rate than other cases. This has often been blamed on prejudice on women, however recent studies have shown that rape cases have a 55% conviction rate, with more than half of juries convicting the defendants as guilty. Another more recent study by Dominic Wilmcott explains that juries tend to act with rape myths instead of evidence. The study concluded that the preconceived attitudes towards rape often led to the prediction of verdicts by the juries before the official verdict was announced. This raises a shocking look into how decisions by juries may lack objectivity and instead be subjective and exemplifies the role of biases and heuristics.

To understand the decision-making process of juries, it is important to look at times where the jury made the wrong decision. This normally led to the defendant being acquitted post-trial and the case being classified as a miscarriage of justice. The case of Sam Hallam was one where evidence tampering led to the wrongful conviction and seven-year sentence of Sam Hallam on murder charges. The witnesses also changed their recounts of the story multiple times and the gaps between testimonies made the credibility questionable. It is also notable that this trial involved eight people which means that eight defendants were being tried at the same time. The events of the case led to a guilty verdict for Sam Hallam who was sentenced to a minimum of 12 years. During the appeal, it became evident that the police failed to investigate important pieces of evidence which would have helped the defendant's case. This case highlights the importance of police investigations and evidence during a trial. The jury were deprived on important evidence which could have changed the outcome of the case.

Returning to the influence of biases and heuristics, there are a multitude of psychological processes which can

affect the verdict of a jury. Confirmation bias happens as a result of preconceptions about a certain hypothesis which leads to evidence pointing to the contrary as being disregarded. This can also be paired with hindsight bias in which the judgment of events after they've happened becomes more predictable thus creating a sense of knowing what has happened. This happens as a result of the story model in which we tend to fill in the gaps to form a story from the events told. This combination can sometimes be detrimental to the process of decision making, however combined with the input of other jurors can provide a variety of useful insights into the case as understood by other members of the jury. On the other hand, this variation can also distort the story and create a dilemma in which the most plausible interpretation must be accepted, regardless of whether all facts were taken into account.

This distortion of facts can be linked to the length of juries. Some deliberations can last years and have profound effects on not only the defendant's lives, but the members of the jury themselves. A prime example of this being the 21-month Jubilee Line Corruption trial in which one juror had her wedding cancelled and lost her job whereas another jeopardised his chances of studying at the University of Oxford. The jury collapsed after one juror refused to attend further court dates. This exemplifies, firstly the profound effect jury service can have on a juror's life and secondly how the credibility of cases can decline as they become longer. For example, alternatively a verdict could have been passed regardless of the evidence just to end the case. An example of this exists in what is known as the Ouija board trial. In this case, the murder trial of Stephen Young which had lasted more than one day and thus resulted in the jurors being provide accommodation at a hotel. The events which transpired that night involved a Ouija game board where the alcohol fuelled group of jurors subsequently decided on the verdict via the game. After this became apparent, a retrial was ordered over ten years after the actual event.

Another study which exemplifies the issue surrounding the distortion of memories and the tendency for humans to fill in gaps when recalling or telling stories is the 'Lost In The Mall' study by Loftus and Pickerell in which a group of candidates, some who had been lost in a mall before and some who had not were told about a story where they were. The study revealed that even the people who had not been lost in the mall as a child still recalled a similar memory during each case. As mentioned briefly at the start of the essay, evidence plays a huge role in the outcome of a case, especially when a jury is involved. The case study of Sam Hallam also highlighted how police evidence mishandling caused a major miscarriage of justice. When looking at evidence, the most compelling type which comes to find is forensic. Especially as the science has evolved, the reliance on this type of evidence has increased. A study into this reliance was conducted in 2013. It explains that as our reliance on forensic evidence increases, the potential for unjust outcome increases. This study declares that the more serious the matter, the more likely the mishandling of forensic evidence can lead to wrongful imprisonment. The possibility of cross contamination especially through

the justice silo effect in which multiple law enforcement agency work without coordination can also lead to crucial evidence being destroyed or contaminated. The high regard held for forensic evidence often makes the evidence admissible, especially in modern courts. The accuracy of these methods when done properly and presented in court can easily sway the jury to a verdict. It is also important to realise that not all forensic evidence provide the same evidentiary value as one may assume.

The umbrella of forensic evidence contains physical, biological, impression, comparison and trace evidence. Being aware of the vast range of evidence makes it understandable why the Smith and Bond study states that not all evidence is equal. For example, impression of a shoe left on a victim's blood instead of the blood of the defendant may yield totally different results. Although the blood of the defendant at the crime scene would be more incriminating, if the defendant owns shoes with the same impression it can also be sought as evidence of a similar value. Along with this type of evidence, other types of evidence are also admissible in court. This includes scientific evidence such as those obtained from post-mortem exams, character evidence, oral testimony from a witness or an expert, witness statements and alibi evidence. Once all of this has been added to the mix, it can be understood why jury decisions can be difficult.

Furthermore, photographic evidence can be submitted as evidence for the jury to view. These are often graphic. A study by David Bright, a psychology professor (Bright, 2008) looked specifically into the effects of gruesome photographs on decision making. The results concluded that in a criminal case, mock jurors who are exposed to gruesome evidence will be more likely, two times more likely, to find the defendant guilty compared with mock jurors exposed to non-gruesome evidence. This raises a key question on whether a jury is truly subjective or objective. As evident through the results of the study, the addition of gruesome elements to the same cases enhanced the conviction rate significantly. It is understood that emotions are often affected by the use of such evidence. It was noted that anger especially was presented to the defendant when gruesome photographs were presented which preludes to a guilty verdict. This also links into the objectivity of a jury with this study exemplifying the presentation of emotion as a result of photographs being presented. It shows that emotion often overtakes objectivity with the graphic nature of the images blurring the evidential value of the photographs presented.

To conclude, the topics explored throughout this essay provide a deeper look into the complexity of jury decision making. Juries continue to be an important part of the justice system which has stood the test of time. However, the process in which juries make decision is a very delicate one. Any malpractice can lead to the system failing. This can include the unwillingness of the jury, the misappropriation of evidence by police, life experiences, exposure to certain types of evidence, human psychology and even general attitudes presented by location.

Although the factors which could potentially affect a case are plentiful, the principal of a jury is in practice balanced by the presence of multiple people. Although miscarriages of justice occur, the jury provides a platform for normal citizens to take part in the key institution which decides the fate of many people. Even against its pitfalls and unfortunate accident which cause miscarriages of justice, it remains an overwhelmingly popular concept and acts as a check and balance for the courts, especially in the most sensitive cases where sometimes an alternative view from legal interpretation is necessary to make the most suitable decision.

References

(Baker, 2002, pp.72-73)
LawTeacher, November 2013, The jury is an essential part of the legal system, [online]. Available from: <https://www.lawteacher.net/free-law-essays/criminal-law/the-jury-is-an-essential-part-of-the-legal-system-law-essay.php?vref=1> [Accessed 5 January 2019]
(Juries Act 1974, 1974, pp. 5, 15-16)
(Thomas, 2012, p. 20)
(Home Office, 2014)
(Hansard, 1982)
(Temkin & Krahe, 2008)
The Psychologist Volume 3, December 2018, 'There is a problem with juries acting on myths rather than evidence' [online].
(Regina v Sam Hallam, 2012) Available from: <https://thepsychologist.bps.org.uk/volume-31/december-2018/there-problem-juries-acting-myths-rather-evidence> [Accessed 5 January 2019]
(Peer & Gamliel, 2013)
(Pennington & Hastie, 1981, 1986, 1993)
The Telegraph, March 2005, Marathon trial cost juror her wedding and a job, [online]. Available from: <https://www.telegraph.co.uk/news/uknews/1486420/Marathon-trial-cost-juror-her-wedding-and-a-job.html> [Accessed 5 January 2019]
ABC, May 2018, Who killed you? The jurors who used a Ouija board to find a murderer guilty, [online]. Available from: <https://www.abc.net.au/news/2018-05-08/ouija-board-juror-misbehaviour-murder-trials/9734868> [Accessed 5 January 2019]
(Loftus & Pickrell, 1992; 1995)
(Kelly, Julian, & Ross, 2013)
(Smith & Bond, 2015)
(Bright, 2008)

Tutor comment:

I really enjoyed teaching at Ormiston New Academy. All of the students were great, but S. went from someone who was not really interested in the topic, although he was always open minded, to someone who really engaged with it. S.'s essay was of a very high standard. He not only dealt with complex arguments, but gave interesting case examples and understood the importance of further research into the group decision making of juries. The work was extremely well written, and S. would be a great addition to any university.



An ethical evaluation of Sports Direct and its failure to pay staff the minimum wage

Year 12, Key Stage 5

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Supervised by: **S. Oldham**
Tutor University: **Royal Holloway, University of London**
Course Title: **The business of ethics**

Overview of the case study

On 7th June 2016, before a committee of MPs in Westminster, Mike Ashley, owner and CEO of Sports Direct, acknowledged that the deduction of 15 minutes' wages^{1,2} for being one minute late and the

11-minute unpaid wait to undergo security checks was "unacceptable" and "unreasonable"³. The Guardian article sighted is believed to be an accurate and truthful account of conditions in a Sports Direct warehouse because it is a primary source from someone who has visited and spoken to staff, witnessing the cues and late fines. The Department for Business, Energy and Industrial Strategy later fined Sports Direct £2 million after being found to have underpaid staff for the previous 4 years. It is important to critique Sports Directs' crimes, under the National Minimum Wage Act 1998⁴, using Ethical theories because without taking an academic and analytical approach to the case we are left with emotional and specious argument promulgated by people with agendas looking to reaffirm their views.

Introduction

The case raises important questions about ethical business practice and how actions that may, initially, be in the best interests of profit can prove damaging in the long run. Business ethics are important because they help us evaluate complex and multi-layered practices with a critical eye. As unethical as this may seem, and that is the conclusion drawn from this study, the minimum wage question raises several questions that differing approaches to ethics answer in contrasting ways.

The two ethical approaches that this study will call upon and examine Sports Directs failures' with will be those of Egoism and Kantian ethics of duty. Firstly, the study will aim to dissect how under Egoism, promulgated by thinkers such as Thomas Hobbs, Adam Smith and Ayn Rand, Sports Directs' protection of its' own self-interests and profiteering may, in fact, present no ethical dilemma in its' hedonistic⁵ exploitation of staff. It will examine how different sects of Rational Egoism would perceive the case study in question. Secondly, it will examine how Sports Directs' actions are unethical in accordance with the Kantian ethics of duty and deontological theory. In having violated: 1. The humanity of others; 2. Made and exception of their duty and 3. Broken a legal code that is supposed to be applied universally throughout the UK, Kant would see Mike Ashley's negligence as unethical.

Egoism

To first assert that Mike Ashley, or Sports Direct depending on how involved in the debacle one believes the Chief Executive Officer to have been, acted out of self-interest is essential. Formulating a business structure that underpays staff, at great risk to the company's image and hence its' profits, should they be 'found out' as they were, would be an entirely pointless exercise if its' goal was any other than to increase profits. The intention was certainly not philanthropy.

Proposition of psychological and Smithian egoism

As the British Victorian historian Thomas Babington Macaulay⁶ would put it: Ashley, as all "men always act from self-interest", could do nothing other do what was best for his business. Thomas Hobbs similarly outlines the impossibility of acting in anyway other than that in our own self-interests stating that "of all voluntary acts the object to every man is his own pleasure."⁷

By determining that all people are motivated by self-interests and hence excusing Sports Directs' actions, establishing that there is no moral high ground in the way humans act and think, it justifies behaviour on the basis that "everyone is doing it". However, psychological arguments aside, Adam Smith's justification for egoism uses a similar logic but, in fact, goes one step further. Smith reasoned that everybody was acting out of their own self-interests would not only not unethical but also of a net benefit to the rest of society. In 'Wealth of Nations' Smith states: "It is not from the benevolence of the butcher, the brewer, or the baker, that we expect dinner, but from their regard to their own self-interest. We address ourselves not to their humanity but to their self-love, and never talk to them of our own necessities but of their, advantages."⁸

This line of ethical thought assumes positive teleological consequences whilst the theory, more equivalent to deontological ethics, applies a universal rule - 'do what prospers the self'. In bypassing the fact that the consequences of some people's self-interests are more harmful or have an all-round more positive impact than others, Smith's Ethical egoism can whole heartedly be used to justify Sports Directs actions. The fact that Sports Directs' actions had a negative impact on its' staff, some of the poorest people in the country, already on what has recently been sighted as a poverty wage⁹, is irrelevant because, according to Ethical Egoism, acting out of self-interest, without fail, has a positive impact on a system as a whole. The workers being exploited will see lower prices in shops to counter out their wage decreases because Sports Direct, and companies like them, will be able to charge lower prices because they have reduced costs by paying staff less. Hence, Sports Direct, according to a Smith's view on economics, haven't negatively impacted their employees and, therefore, their actions are entirely ethical.

Rebuttal to psychological and Smithian egoism

Firstly, David Hume¹⁰ rebuts Ethical Egoism by arguing that it neglects the existence of "moral sentiments" such as Love, friendship, compassion, and gratitude boils one's motivations and intended rewards down to a singular cause; something Hume referred to as a "A fruitless task". Hume and other critics, Mosley⁶, attest that Egoism claims to have an unfounded and unprovable insight into the human psyche. Without this assumption that all humans do things for a singular reason, in Smith's case this is often for monetary reward, we are presented with a situation in which our monetary ambitions and "moral sentiments" are working at cross purposes. In the case of a hitman it is in their monetary interests to kill somebody but is potentially damaging to their "moral sentiments", such as empathy, if they were to go ahead with the job. Hence, we can assert, as Hume insists we should, that Sports Direct's actions are unethical because, even if their actions were not economically damaging to staff, though this paper with argue that they were, the presents of remorse or guilt in those people who instigated the debacle, or the feeling of under appreciation felt by staff, preventing them from reaching self-actualisation¹¹ in the work place, presents an alternative motivation that has negative impacts

upon even the perpetrators. Secondly, the premise that the economic impacts of Sports Direct's actions unequivocally have a positive impact is problematic. It could be argued that undercutting employees' wages has a negative impact on both the company and staff. The cost of living has consistently increased with inflation since 1989, as far back as the Office of National Statistic offered data¹², and wages had not been able to keep up with rising prices. To argue that Sports Direct would do anything other than charge the most that they could for their products, it could be argued, is naïve and employees with undercut wages will not see any decrees in the prices they make up for the decrees in their income.

Proposition for rational egoism

Rational Egoism as argued by Ayn Rand¹³, a school of thought claiming, in contrast with the closed theory of Psychological egoism and the Egoism of Smith, that the preservation of one's own self-interests is the most rational course of action when making a decision, offers an alternative justification for Sports Directs' actions. Rand's reasoning is that a man's "ultimate purpose is happiness, his most important virtue is rationality, and his life is his highest value of all"⁵. It establishes that selfishness is a virtue which, when the consequences are positive to you personally, should be embraced. The Randian claim is that there is nothing unethical about treating others in a way which is contrary to certain sets values as long as the result is one that is prosperous for the actor. Therefore, it could be argued, there was not unethical about the failure of Sports Direct to pay its' staff the legal lower limit because it was of a net benefit to the profit margin and shareholders. In paying staff less Sports Direct cut costs and make large profits; this could be the very definition of rational business. However, in the long term Sports Directs' infringement of UK law has had a net negative impact of profit margins – paying £946,000² as a fine on top of the initial back payments to staff. The unpredictability of the business world presents a dilemma for a Randian because, despite the initial action being of net benefit to Sports Direct, the ultimate consequence of the scheme was not 'happiness' for Mr Mike Ashley: Instead, it presented a PR disaster. To this we call we may, rightly, question the subjective nature of rationality.

Rebuttal of Randian egoism

Alexander Mosley's⁶ criticism of Rational egoism offers the example of a teacher inflating grades. "The teacher could conceivably free-ride on the tougher marking of the rest of the department or university and not worry about the negative consequences of a diminished reputation to either. However, impartiality considerations demand an alternative course - it is not right to change grades to make life easier. Here self-interest conflicts with reason." In another example he states "Suppose that two men seek the hand of one woman, and they deduce that they should fight for her love. A critic may reason that the two men rationally claim that if one of them were vanquished, the other may enjoy the beloved. However, the solution ignores the woman's right to choose between her suitors, and thus the men's reasoning is flawed." Similarly, in the case of Sports direct,

the board were rationally decided that paying staff under the National Minimum Wage would potentially make life easier for Sports Direct financially. They neglected to consider the legal obligations they have as employers and ended up being fined – not resulting in the personally happiness Rand holds so dear. Secondly, Game theory¹⁴ suggests that egoism results in both parties being made worse off. For instance, the Prisoners Dilemma, most clearly set out by Albert W. Tucker in 1950¹⁵, presents a situation where if both prisoners act in their own interests they both received a longer sentence by confessing the crimes of their partner in crime. Linking this to Sports Direct, we can establish that, given the total back pay of £946,000¹⁶, acting out of self-interests is not always the rational course of action.

Kantian ethics of duty

Kantian Ethics, Jankowiak asserts¹⁷, is "The moral law [that] is determined by what Kant refers to as the Categorical Imperative, which is the general principle that demands that one respect the humanity in oneself and in others, that one not make an exception for oneself when deliberating about how to act, and in general that one only act in accordance with rules that everyone could and should obey." Jankowiak's account is a reliable source as it is informed by Kant's Groundwork for the Metaphysics of Morals (1785), Critique of Practical Reason (1788), and the Metaphysics of Morals (1797).

Universality and consistency

Firstly, from the very outset, Sports Directs' actions "make an exception for oneself" by breaking a law that is applicable to every UK business. Kant would reject the argument that Sports Direct's actions were of benefit to their self-interests stating: "There is no conceivable circumstance in which we regard our own moral goodness as worth forfeiting simply in order to obtain some desirable object."¹⁸. If exceptions were made this would negatively impact the industry in general by giving a competitive advantage to some companies over others. This is because costs are higher, meaning the breakeven point of rival businesses will be higher, and "When it comes to fashion purchase, personal needs motivate consumers. [There is] little evidence that ethical issues have any effect on consumers' fashion purchase behaviour."¹⁹

Rebuttal to universality and consistency

A Utilitarian rebuttal of this could be made: that if the undercut wages were being given to charity for people who needed it more – genuinely starving people – then this would benefit more people and adhere to Bentham's rule of the "Greatest happiness of the greatest number."²⁰. This may leave us to conclude that if Sports Direct had donated the extra capital generated to a 'more important cause', whatever that might be, then they would have been acting ethically. Unfortunately, Sports Direct did not do this, or at least they have publish that they did this. Therefore, we can conclude that, despite the criticism of utilitarianism, they still acted in a way which was unethical. However, Mill, in an alternative approach to utilitarianism, argues that some beings satisfaction is worth more than others: "better to be Socrates dissatisfied than a fool satisfied."²¹.

The argument could be made that Sports Direct were clever in their plans, like "Socrates", while the employees are "fools", having accepted the wages for so long, and that the owners of Sports Directs 'happiness' is worth more than that of its employees.

Humanity

Secondly, Sports direct expressed a disregard for "respect for humanity"¹⁷, seen in the reported conditions of the Sports Direct warehouse¹, it is clear that Kantian Ethics do not offer justification for their actions. The desirable object in the case of Sports direct, and of business in general, was to make a profit; without question this undermines what we understand to be meant by the categorical imperative, and abiding by values of 'good will'. Jones⁹ suggests that paying staff any amount less than the "living wage"²², let alone the minimum wage, is a "poverty wage" and can be seen to disregard "respect [for] the humanity in oneself and in others"¹⁷. Bowie²³ argues that "Kantians, at a minimum, would argue that paying a wage that puts employees in poverty when the company could afford more dose not respect humanity in employees". Thus, Sports Directs actions were in conflict with the Kantian value of 'humanity' and can be seen as unethical.

Rebuttal to humanity

Furthermore, Sports Directs actions once again contradict the categorical imperative because they potentially lied to their staff when initially not paying them for the 11 minutes waiting to go through security. If this deception was conscious this is lying. Kant believed that "a lie is a lie, and in itself intrinsically evil, whether it be told with good or bad intents"²⁴ and would hence reason that Sports Directs action were also "intrinsically evil" and unethical. However, we can reason that it would be impossible to prove whether it was or was not a conscious act of lying or a coincidental case of inadequate information being on offer to staff. Thus, we are unable to determine if a Sports Defect's supposed 'lying' contradicts the Categorical Imperative.

Conclusion

In summary, the continued violation of workers' rights by Sports Direct are is: if we follow Smithian Egoism, all part of a healthy economy; if we follow Randian Egoism, the most rational way of behaving; and, if we follow the Kantian ethics of duty, wholly unethical and in conflict with values of humanity, consistency and universality. The two vastly different ethical theory's covered give conflicting interpretations of Mike Ashley's PR predicament. Ethical egoism values self-interest at the heart of every decision while it has been outlined that Kantian ethics of duty emphasise the categorical imperative. The findings of this evaluation are that Sports Directs actions were wholly unethical. The Kantian approach is far more compatible with modern employment laws while its points of criticism, although valid, have no relevance to the case of Sports Direct underpaying staff in itself. Rebuttal along the teleological lines is, likewise, fundamentally flawed due to its negative consequences outlined in the rebuttal to Randian and Smithian egoism. This study finds ethical egoism to be fundamentally flawed, in reference to the case study, due to its negative impacts on staff as well as

on Sports Directs profit margins, having to pay a £946,000 fine for breaking the law.

Bibliography

<https://www.theguardian.com/business/2015/dec/09/sports-direct-warehouse-work-conditions>, Goodley and Ashby, December 2015.
<https://www.bbc.co.uk/news/business-42271522>, December 2017.
<https://www.theguardian.com/business/2016/jun/07/mike-ashley-admits-sports-direct-staff-were-not-paid-minimum-wage>, Goodley, June 2016.
<http://www.legislation.gov.uk/ukpga/1998/39/contents>, 1998.
<https://www.wiep.utlm.edu/hedonism/> (Dan Weijers, Victoria University of Wellington)
Author and lecture Alexander Moseley, <https://www.wiep.utlm.edu/egaim/>, (accessed 06/03/2019)
Thomas Hobbs, Leviathan, 1651
Adam Smith, Wealth of Nations, 1776.
<https://www.theguardian.com/global/video/2019/jan/25/owen-jones-meets-tim-martin-wetherspoons-no-decl-brex-it-poverty-wages-dont-ask-childish-questions-video>, Jones, 25th/1st/2019,
Hume, David, Enquiry Concerning the Principles of Morals.
Abraham Maslow, "A Theory of Human Motivation", 1943,
<https://www.oas.gov.uk/economy/inflationandpriceindices/timeseries/1550/mm23>, Office of National Statistics, 20/03/19,
The Virtues of Selfishness, Rand, 1964.
John von Neumann's and Oskar Morgenstern's Theory of Games and Economic Behaviour, 1944
H. W. Kuhn (eds.): Contributions to the theory of games, Annals of Mathematical Studies, 1950
<https://www.theguardian.com/business/2017/dec/08/sports-direct-and-its-staffing-agencies-paid-workers-1m-too-little>, 2017, Butler
<https://www.wiep.utlm.edu/kantview/#H5>, Tim Jankowiak, Towson University (08/03/2019)
<https://plato.stanford.edu/entities/kant-moral/>, Robert Johnson & Adam Cureton
Cattin Joergens, (2006) "Ethical fashion: myth or future trend?", Journal of Fashion Marketing and Management: An International Journal, Vol. 10 Issue: 3, pp.360-371,
Francis Hutcheson, Inquiry concerning Moral Good and Evil, 1725,
John Stuart Mill, "Utilitarianism", 1863
<https://www.livingwage.org.uk/what-real-living-wage>, Living Wage Foundation, (accessed 10/03/2019)
Business Ethics: A Kantian Perspective, Norman E. Bowie, 1999
Immanuel Kant (1763), "Lectures on ethics"

only promoting positive mental health and well-being in education, but also dealing with and eventually preventing any major issues arising surrounding mental health and well-being. As a student researcher, I have both witnessed and experienced the effect that pressures within education can have on mental health and well-being amongst students. I believe that my position as a student researcher works as an advantage as I can use my own knowledge and understanding of what pressures have the most impact on students so can tailor my research to the most relevant issues in today's education system. Having said this, being a student researcher can lead me to have biased opinions on how education negatively impacts mental health and wellbeing, however whilst conducting my research, I have always been making myself aware of opposing opinions and viewpoints, especially throughout my literature review in order to avoid any bias. I believe that my role as a student researcher will be useful as it allows me to have a detailed understanding of what I am researching, and also gives me the opportunity to gain a better understanding of how we can work towards supporting pupils as I can use my own knowledge and experience to contribute towards this.

Literature review

A study by Dusana Dorjee (2018) [1] found that it is essential for schools to be teaching pupils to maintain good mental health and well-being in order to prevent any possible future decline in a child's positive mental well-being as well as supporting children, as she believes that it is crucial to prevent an issue rather than allowing it to escalate, then attempting to tackle it when it may be too late. Dorjee (2018) [1] stated that promoting positive mental well-being could have a lifelong positive impact which – given time – could eventually benefit a population. This is extremely important as improving education on mental health could be a huge stepping stone to improving the mental well-being of an entire population. The main goal of education is to teach skills that can be applied to everyday life such as basic mathematics or literacy skills, however, we very rarely focus on teaching pupils how to maintain positive mental health and well-being which is a skill that is just as – if not more – important than academic skills.

Dorjee (2018) [1] claims that noticing initial signs can prevent mental health complications from spiralling out of control, and with the right education, we can help students notice when they are feeling stressed or under pressure which can help to prevent any long-lasting mental health difficulties. She also found that strengthening meta-cognitive self-regulation can improve academic performance as it can help to reduce stress levels allowing pupils to work to their full potential rather than focusing on the negative aspects of a situation or getting themselves worked up about minor inconveniences due to the unnecessary pressure that they may have put on themselves, or pressures that others have put on them. Despite expressing the need for prevention, Dorjee (2018) [1] also highlights how it is vital that we put support systems in place to help those who suffering in the present. She states that there is a growing demand for mental health support for pupils

such as counselling and mentoring within schools due to a lack of awareness around promoting a positive mental well-being in earlier years of education. She also states how important it is that school policy guidelines are adapted to maximise support for those suffering in education. Dorjee (2018) [1] based her study on how teaching students how to maintain positive mental health would be more beneficial than simply putting certain support systems in place that students may not feel comfortable accessing, however this gives a really biased view whereas if she had focused a small part of her study on the effectiveness of support systems, she could have given a more balanced argument and further back up her point about teaching how to maintain positive mental health may be more beneficial than putting support systems in place. Lauren Carter-Davies (2016) [2] focuses on this in a little more detail in her study, she makes it clear that supporting pupils is 'essential practice' and that well-being programmes and external professionals can provide support for children who need it most which is why it is important that it is at the heart of school policy. Lauren Carter-Davies (2016) [2] theorised that school-based activities play a huge role in supporting mental health and well-being as they are a practical way for students to gain a better understanding and work towards preventing and mental health issues that they could potentially face in their life.

Much like Dorjee's (2018) [1] study, Lauren Carter-Davies' (2016) [2] study also focuses on working to eventually prevent any mental health complications, she states that there is no guarantee that simply supporting children will be effective, whereas an integrated, embedded approach to learning may be more effective as it teaches children how to spot the first signs of a decline in mental well-being which could help both them and their peers in the near or distant future. She also highlights how important it is that emotional health needs to become a core part of all school matters and it must be viewed as lying at the core of teaching and learning. By making education on mental well-being a core part of the curriculum we are educating both pupils and teachers on how to prevent difficulties or support people who are struggling. This can also help students and staff to maintain positive mental health and well-being for themselves which can allow them to work to their full potential therefore helping to alleviate any unnecessary pressures that pupils and teachers may put on themselves or each other. It also raises awareness for how staff can identify students who are struggling and put support in place for them as soon as possible to help them feel as comfortable as possible in school.

Finally, she states that the curriculum and staff should be coordinated to maximise support for pupils which ties in with my previous point that educating staff can benefit both themselves and their students in the future. Carter-Davies (2016) [2] mainly focuses her research on how we should be putting support systems in place however; I feel that it would be more reliable data if she had directed a fraction of her research at how other methods of support may have been more trustworthy and effective and compared it to her ideas.

Methodology

To gather my data for my research I decided to use two (similar) research methods; a paper questionnaire and a Survey Monkey survey as I wanted to reach out to students from Year 7 to Year 13 and I felt that this was the best way to do this. I decided that I wanted to gather more quantitative data rather than qualitative data as I knew that this way, I could gather more data so my research could benefit a wider range or students. I gave my paper survey to 20 students in a form of pupils from Year 7 to Year 11 at St Ambrose Barlow RC High School and posted a link to my Survey Monkey survey on a Facebook group specifically for Sixth Form Students where I had 100 replies so overall, I had 120 respondents to my survey. Both my paper questionnaire and my Survey Monkey survey had the same questions; however, I thought it would be more beneficial to gather Sixth Form Students from many colleges (which is why I posted a link online as this was the easiest way to do this) as they can vary in size and this can impact the support available at different colleges whereas high schools tend to be a little more similar in size and the support available.

I decided to choose a paper questionnaire as although it would have taken longer to input the data into a spreadsheet, I felt that I had more control over the amount and type of questions that I could ask students. It also gave me the opportunity to gather any qualitative data where necessary (for example if any of the options of a multiple-choice question didn't apply, they could select 'other' and state an answer which they felt was more appropriate). I also decided to use Survey Monkey for my survey because it was easier for me to access and process my data, and (much like the paper questionnaire), it allowed me to control which topic I wanted to focus on, whereas in a face to face interview, I am more likely to gather information that isn't as useful to my research. Although Survey Monkey only allows a minimal amount of questions, and it only allows me to gather generalised quantitative data, my paper survey was fairly short, and my questions mainly focused on me gathering quantitative data, so this didn't have an impact on my research. I decided to keep my survey short as I didn't want my respondents to spend too long thinking about each question as I wanted to gather reliable, accurate data that wasn't impacted by any demand characteristics as if I had given students too many questions or too much time to complete my survey, they may have changed their answers depending on what they think made them look better as a person or what they though wanted their answers to be like.

Findings

After completing my method, I decided to gather all of my data from my online survey and my paper survey into a spreadsheet where I could put it all into individual tables and represent it using different diagrams such as pie charts and bar charts:



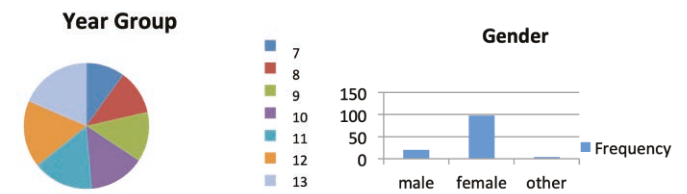
Using findings from empirical research, present a case for how the school system could be improved

Year 12, Key Stage 5

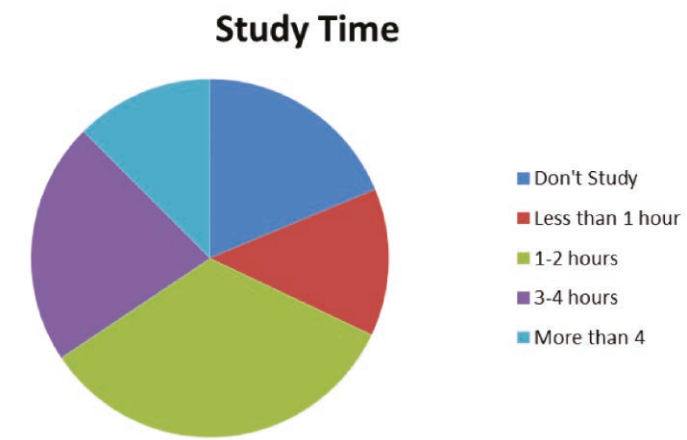
Pupil: H. Potts
School: St Ambrose Barlow RC High School, Salford
Supervised by: R. Marsden
Tutor University: Liverpool John Moores University
Course Title: How can we improve school with research?

Rationale

I decided to focus my research on tackling mental health within education as I feel that it is an issue that almost everyone will face either during education or afterwards that can be prevented with the correct resources and attention. I feel that this is such an important issue within schools as it is not only students suffering, it is teachers as well and I believe that with the correct support we can help to support everybody in need whether that be staff or pupils. With the growing pressure upon both pupils and teachers due to growing changes within the education system, it is critical that we work to prevent major issues escalating and work towards not

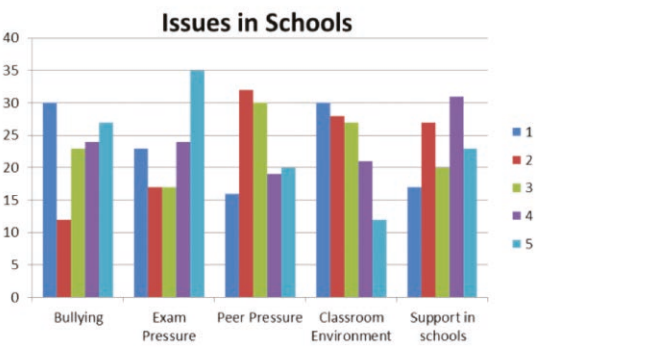
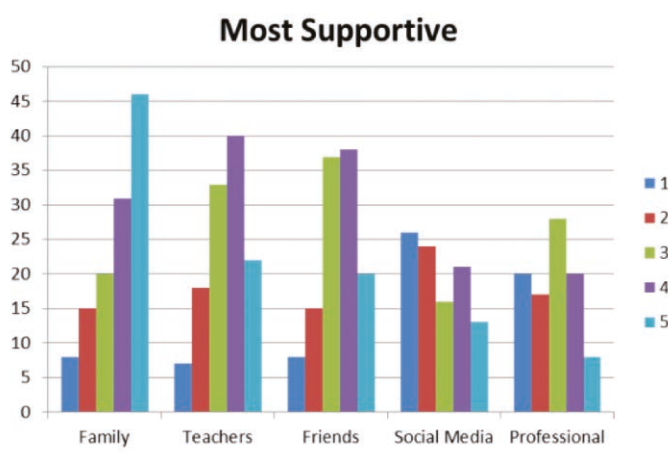


I decided to ask these questions to gather an understanding of which types of people were answering my survey so that when generalising my data, I could comment on how it may be difficult to generalise for an entire population of students as more females answered my survey than males. Alongside this, more Year 12 and Year 13 pupils answered my survey than any other year group, so my data may be more representative for sixth for students rather than high school students.

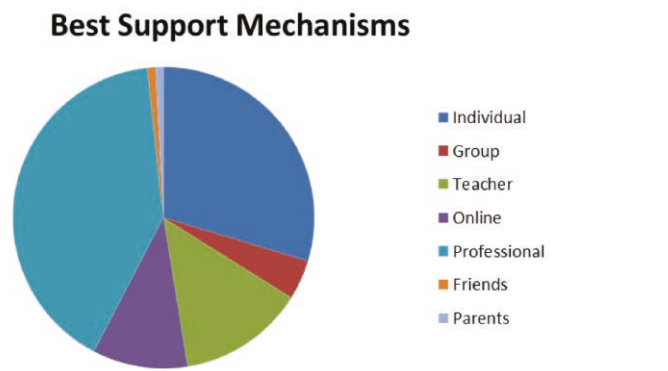


This data shows me that the majority of students that answered my survey complete 1-2 hours of independent study outside of school/college which alludes to the idea that students find it most beneficial to study for that period of time. It also displays that a great deal of students don't do any independent study which could suggest that more support needs to be put in place to support pupils who are struggling to revise.

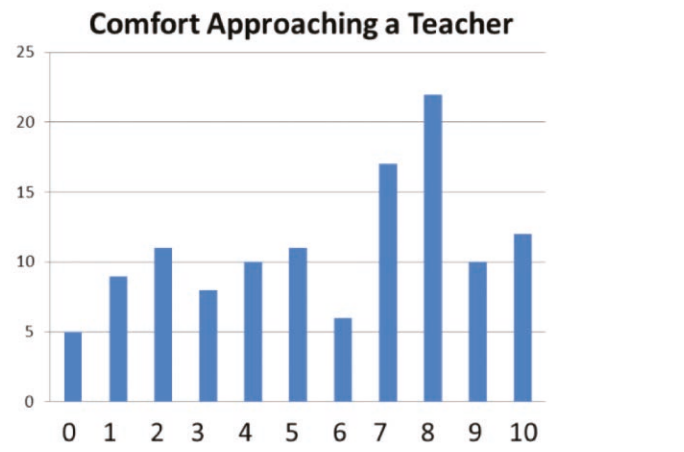
This data represents that pupils find their parents the most supportive overall which could highlight the fact that as well as educating pupils and teachers, we could work towards educating parents how to maximise support for their children with regards to mental health and well-being. It also shows that teachers and friends are equally as supportive, which could hint at a greater need for mental health support to become a greater part of the curriculum to both teach others how they can help those around them, and how they can help themselves when feeling stressed or under pressure.



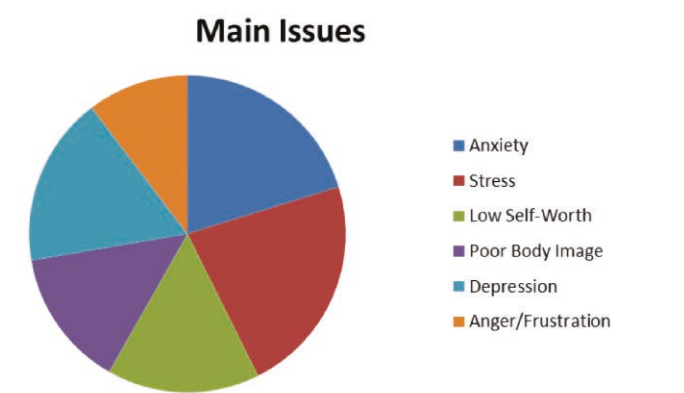
This data displays that exam pressure is a huge issue within schools which could allude to the idea that this could be one of the main reasons people struggle with mental health complications throughout school. It also highlights that support available in schools could be somewhat lacking which suggests that students feel that there could be a wider range of support available in schools.



This data presents that students find that an individual support meeting would be the very beneficial for them which suggests that schools could arrange regular one to one support meeting for students, possibly with their form tutors. It also shows that professional support would be the most beneficial so students may find it useful if schools made it easier for students to access professional support when necessary such as a school counsellor/therapist.



This data shows that most students would feel comfortable approaching a teacher, if they had an issue within schools which proves that there is some support available in schools where the majority of students would feel comfortable reaching out to. However, this also expresses the need to educate teachers on supporting pupils with maintaining positive mental well-being and supporting students with any issues they have as it seems to be a successful support mechanism for pupils that we can improve on to become even more effective.



This data highlights that all of the mental health issues mentioned are a major issue in schools, the main ones being anxiety, depression and most of all stress. This implies exam pressure and other pressures within schools is causing major stress which highlights that something needs to be done to reduce this stress and anxiety as that could then reduce mental health issues significantly in schools if we find the root of the problem and try to reduce that problem as much as possible.

Discussion

From my data, I have found that 41% of my survey respondents would find professional support the most beneficial support mechanism for them. This leads me to believe that it is imperative that schools provide some form of professional support for their students whenever they feel that they need it, whether that be through a school councillor/therapist or making it easier for pupils to reach out to an external professional whenever they need to. This supports Lauren Carter-Davies' (2016) claim that wellbeing programmes and external professionals can provide support for children in need of it. Dorjee's (2018) study found that strengthening meta-cognitive self-regulation can impact academic progress as well as mental well-being, and 22% of my survey respondents believe that stress is one of the biggest mental health problems amongst them and their peers, this alludes to the idea that positive mental

health and well-being is a key part of education as it can lead to better academic progress which can lead to reduced stress as pupils are working to their full potential in lessons. 51% of my survey respondents said that they felt comfortable approaching a teacher if they had an issue within schools which supports Carter-Davies' (2016) claim that the curriculum and staff should be coordinated to maximise support. This highlights the growing need to educate teachers on supporting students with their mental health as over half of the students who responded to my survey are comfortable approaching a teacher when they have an issue which is why it is crucial that we maximise the support that teachers can offer students to improve mental health and well-being as much as possible.

References

[1] Dusan Dorjee (2018) [4 December 2018] The Conversation <https://theconversation.com/schools-need-to-teach-pupils-skills-to-maintain-good-mental-health-here-how-95885>

[2] Lauren Carter-Davies (2016) [4 December 2018] The Conversation <https://theconversation.com/childrens-mental-health-needs-to-be-at-the-heart-of-school-policy-56091>

Tutor comment:

My tutees at St Ambrose Barlow RC High School did a great job of conducting their own educational research. H. in particular really thought about her methodological stance as a student researcher and produced fascinating results that any researcher would be pleased with! As well as this close-to-practice research project preparing students for university, I also hope that it has provided a platform for the student voice that is so often lacking in educational research.



Should written media be forced to give the same coverage to men's and women's sport?

Year 12, Key Stage 5

Pupil: R. Somers
School: Nene Park Academy, Peterborough
Supervised by: J. Welford
Tutor University: Loughborough University
Course Title: Where are all the female athletes?

The Women's Sport and Fitness Foundation found that just 5% of UK media coverage focuses on women's sport.¹ Not only are female athletes underrepresented, but they are also subjected to sexualisation and distorted portrayals of them and their sports. Whilst liberal feminists argue there has been an improvement in recent years, for example with the increased coverage of the FIFA 2015 Women's World Cup², radical feminists would argue that there is still a long way to go, with increased coverage not being enough. Instead, it's the content of the articles which will be influential in ending the patriarchal control over sport in media. Nevertheless, equal coverage of men's and women's sports is critical to decrease the harmful consequences of media representations, such as anxiety, continuing patriarchy, stigma, gender polarisation and objectification.

Most notably, differences between the media coverage of male and female sports can be seen through volume - open up a newspaper and it will immediately reveal the vast difference in number of articles covering women's sport to men's. In 1996,

women were featured on the cover of Sports Illustrated a mere 4 times out of 53.³ Moreover, they received smaller-sized articles and fewer photographs. This marginalisation can have a number of damaging effects, including a lack of role models for young girls, suggesting that female athletes simply don't exist. In the few articles on women's sport that do exist, there are often a number of distinguishing factors between those written on men's sports.

Female athletes are often demeaned and infantilised, referred to by their first name or as "girls".⁴ In contrast, men are often referred to by the surname, reinforcing radical feminists' view that men are dominant, and that sport is another means of control in a patriarchal society. It's important to note, however, that this infantilisation is more common from tabloids⁵, rather than broadsheets, suggesting a disparity between how the different types of print media portray athletes. Another form of reinforcing gender hierarchy is through gender marking - using "women's football"⁶ to describe it played by women, but just "football"⁷ when it's played by men. This represents the traditional view of sport being for men and not for women. However, it could be seen by liberal feminists as simply what the audience are used to, due to previous times in which women were banned from playing football by the FA.⁸

Bias refers to inclination or prejudice for or against one person or group, especially in a way considered to be unfair. In regards to sports coverage, written media is commonly biased against women. One explanation of this is because media journalists and editors assume their consumers are men, and so align coverage to suit men.⁹ This view takes an entirely materialistic view, explaining negative portrayals of female athletes as the product of a capitalist and consumerist society in which the main aim is to make money. Alternatively, however, radical feminists would argue that the differences in media sports coverage are due to men, five of whom control 80% of UK media¹, and their desire to oppress women and maintain their traditional role as wife and mother. Thus, the media is a way to preserve male power over women.¹¹ Similarly, multiple research studies have suggested that the imbalance between athletes presentations are due to a failure to conform¹² and the media's desire to maintain traditional gender roles.¹³ As competitiveness in some sports is 'unfeminine', the media works to 'protect' female athletes from rejection through emphasising their 'femaleness'. However, they only perpetuate the issue by suggesting women are unsuited for sports. It's therefore vital for written media to give a balanced and equal portrayal of all athletes in order to encourage more girls to participate in sport and decrease the bias which is so heavily evident in media.

Without change to coverage of women's sports in media, it will be impossible to break down gender barriers in wider society.¹⁴ Research suggests that this biased coverage of female athletes puts girls off sport, for example due to fear of having their sexuality questioned. Differences between the coverage of male and female sport creates a lack of interest in female sport and reinforces negative attitudes towards women, which can only be overcome with a move towards greater equality in sports media. Less coverage portrays women's sport as less interesting and important, however high visibility of women's sport is a necessary step

for increasing participation and in turn decreasing negative consequences. Benefits of sport include¹⁵: decreased social anxiety and depression, improved health, lower risk of cancer and Type 2 diabetes, and increased self-esteem. More positive media coverage of female sports will ultimately encourage more girls to participate and show sport as an acceptable activity for women¹⁶, therefore bringing the previously mentioned benefits.

Print media's descriptions of female athletes and sports often focus on appearance, private lives and sexuality primarily, as opposed to their athletic abilities and achievements.¹⁷ In contrast, male athletes' appearance rarely elicits comments on their appearance. This stems from the long-believed theory that sex sells, with the male media owners again producing content for their own interests, as opposed to those of the general audience. Also, this is a result of men benefiting from female subordination¹⁸, and presents them as inferior to men who are valued for athleticism. Radical feminists would further argue this point, explaining that in focusing on looks men are able to minimise the threat women pose towards male-dominated sport.¹⁹ On the other hand, it is also the athletes themselves who use their appearance and glamour to promote sports.²⁰ Many female athletes feel obligated to promote their sport through sexualising themselves²¹, suggesting that the media is not the only institution with the power to change public perceptions on female athletes. For example, in 2011, the German National women's football team posed naked in Playboy²², stating it was to promote the World Cup. Instead of promoting their own accomplishments, they promoted their bodies in an attempt to increase interest. However, their efforts are self-defeating and only perpetuate the issue, as they portray themselves as women first and athletes second, in a similar manner to print media. It is therefore important for the media and female athletes to work together in order to bring about greater representation of women's sport.

A big reason for the lack of coverage of female sports is the belief that there isn't any interest. However, since 2013, attendance at women's sports in the UK has grown by 38% each year²³, contradicting this explanation. The lack of coverage is a key component of the 'golden triangle', or the 'Sms triangle'. This is made up of sports, media and sponsors²⁴, in which each feature is dependent upon the other. Sponsorship depends on sport coverage, the media say they don't cover women's sport due to a small audience, and the audience are unable to remain interested due to the lack of coverage²⁵. For anything to change, this cycle will have to be broken, with one feature daring to take a risk. Tammy Parlour of the UK Women's Sport Trust said that consistent audience growth would increase sponsors²⁶, which should consequently increase both interest and the media. Parlour also noted that "big live crowds and viewing figures feed the interest of both the media and sponsors".²⁷ However, as explained by the 'golden triangle', this increased interest and viewing is unlikely without the media and sponsorships. Consequently, it's difficult to know how to break the cycle, which former women's England rugby captain Catherine Spencer sees as the "main barrier to significant development".²⁸ However, rather than seeing it as an issue that the media should help, Spencer says the way to break the cycle is "to put ourselves out there and be brave."²⁹ Nevertheless, based on the 'golden triangle' thesis,

equal media coverage would be influential in bringing greater equality to women's sport.

Equal media coverage of men's and women's sports will be pivotal in reducing the damaging impacts of unequal and biased coverage. Firstly, it will stop the symbolic annihilation that suggests women's sport is inferior to men's³⁰ and thus, from a radical feminists' view, end the reinforcement of patriarchal values³¹. Also, media descriptions affect general perceptions of athletes.³² Research found that, when female athletes are depicted in terms of attractiveness, they were seen as more attractive than those depicted in terms of athleticism, but there was no difference in the perceived attractiveness of men depending on their depictions.³³ Furthermore, athletes who were depicted by the media in terms of attractiveness were deemed less talented than those described in an athletic manner.³⁴ Consequently, if the media were to focus more on athletic ability than femininity³⁵, as is so common with written media, then it's likely that audiences will be more willing to enjoy female sports and see it as something acceptable for women, thus breaking down gender barriers, stereotypes and expectations.

There are a number of ways in which written media can change to become more equal for men's and women's sports. Crucially, the media must become aware of the aforementioned damage to perceptions from focusing on attractiveness, that audiences may prefer articles focusing on athleticism more than those on attractiveness, and that the media is influential in shaping public opinions, rather than simply reflecting them.³⁶ Therefore, the media should give equal amounts of coverage to male and female sports, and also focus on the relevant aspects: the athleticism and abilities of the athletes. An important way to overcome inequality in sport is for the media to re-examine how it portrays female athletes.³⁷

Although, it's also important for sports fans to change how they view female athletes, as everyone has the power to change the way women's sport is perceived and valued.³⁸ Despite the inequality amongst male and female athletes and how they're portrayed by the media, liberal feminists would argue that there has been an improvement, and that the differences in portrayal is not necessarily a bad thing. For example, during the 2015 Women's World Cup, many newspapers made comparisons between men and women.³⁹ Instead of this suggesting that women are inferior to men, the comparisons can be seen as breaking down gendered differences in terms of athleticism, suggesting that they're on track to being seen on an equal level as men. Radical feminists, in contrast, would argue that this merely trivialises the achievements of women. Also, improvements can be seen as coverage of this event was not marginalised, with newspapers having articles on the topic multiple times a week.⁴⁰ This is amplified further due to other large sporting events occurring at the same time, such as Wimbledon. Additionally, during the Women's World Cup, only 1 in 124 papers researched in the study referenced appearance, and even this was in a non-sexualised way. Therefore, liberal feminists would instead argue that there have been great improvements towards greater equality with regards to media coverage of male and female sports.

In conclusion, equal written media coverage of men's and women's sports would prove beneficial to overcoming a number of gender inequality issues within sports media. These include the sexualisation of women, trivialisation of their achievements and prejudice against female athletes. It is also likely to increase girls' participation in sport and provide strong, independent role models for them to aspire to. In recent years, sports fans have evidently become more interested in gender equality by increasingly watching women's sport.⁴¹ Improved media coverage will ultimately lead to this gender equality. Radical feminists, however, view the problem as more deep-rooted: a result of the patriarchal structure of society, and so do not deem equal coverage as enough. Instead, there needs to be a great change at the root of the issue: the men in power. On the other hand, liberal feminists instead argue there have been improvements in recent years, most notably with the 2015 Women's World Cup. It is therefore vital that these improvements continue, and the media give unbiased, equal and representative portrayals of both male and female sport. Although, improvements in media alone are not enough: this is a wider-societal issue which everyone, including the female athletes themselves, must address. Nevertheless, more equal media coverage is likely to have a profound impact on gender equality in sport.

Bibliography

- Catherine Spencer, 'How can women's sport become equal to men's? Through bravery', The Guardian, 16 March 2018
- Eoin J. Tolan, 'The impact of the media on gender inequality within sport', Social and Behavioral Sciences, 91, 10 October 2013
- Gareth Lewis, 'Nicole Cooke calls for women's sport to have equal coverage on BBC', BBC News, 20 March 2014.
- Jennifer L. Knight and Traci A. Giuliano, 'He's a Laker; She's a "Looker": The Consequences of Gender-Stereotypical Portrayals of Male and Female Athletes by the Print Media', Sex Roles, 45(3-4), August 2001.
- Kate Petty and Stacey Pope, 'A New Age for Media Coverage of Women's Sport? An Analysis of English Media Coverage of the 2015 FIFA Women's World Cup, Sociology, 4 October 2018.
- Robert Kidd, 'Why Women's Sports Sponsorship Is An Opportunity Brands Are Missing', Forbes, 2 November 2018
- Stefano Martelli, 'An emerging social configuration: the "sports-media-sponsors triangle", EJSS Journal, 2(1), 2014
- The New English Times, '5 Billionaires own 80% of UK media, new stats show', <http://newenglishtimes.com/5-billionaires-own-80-of-uk-media-new-stats-show/> [12 March 2019]
- Travis Sheadler and Audrey Wagstaff, 'Exposure to Women's Sports: Changing Attitudes Toward Female Athletes', The Sport Journal, 20, 5 June 2018
1. Gareth Lewis, 'Nicole Cooke calls for women's sport to have equal coverage on BBC', BBC News, 20 March 2014.
- 2, 5, 18, 39 Kate Petty and Stacey Pope, 'A New Age for Media Coverage of Women's Sport? An Analysis of English Media Coverage of the 2015 FIFA Women's World Cup, Sociology, 4 October 2018.
- 3, 13, 16, 30, 32, 36 Jennifer L. Knight and Traci A. Giuliano, 'He's a Laker; She's a "Looker": The Consequences of Gender-Stereotypical Portrayals of Male and Female Athletes by the Print Media', Sex Roles, 45(3-4).
- 4, 9, 11, 19, 22, 31, 35, 37. Eoin J. Tolan, 'The impact of the media on gender inequality within sport', Social and Behavioral Sciences, 91, 10 October 2013
- 6, 7, 8, 12, 15, 20, 27, 29, 33, 34, 38, 40 ibid.
- 10 The New English Times, '5 Billionaires own 80% of UK media, new stats show', <http://newenglishtimes.com/5-billionaires-own-80-of-uk-media-new-stats-show/> [12 March 2019]
- 14, 17, 21, 41 Travis Sheadler and Audrey Wagstaff, 'Exposure to Women's Sports: Changing Attitudes Toward Female Athletes', The Sport Journal, 20, 5 June 2018
- 23, 26 Robert Kidd, 'Why Women's Sports Sponsorship Is An Opportunity Brands Are Missing', Forbes, 2 November 2018
- 24 Stefano Martelli, 'An emerging social configuration: the "sports-media-sponsors triangle", EJSS Journal, 2(1), 2014
- 25, 28 Catherine Spencer, 'How can women's sport become equal to men's? Through bravery', The Guardian, 16 March 2018

Tutor comment:

This assignment asked pupils to consider in depth the reasons for unequal media coverage of male and female athletes, and whether media outputs should be forced to be more balanced. R. used knowledge gained from the tutorials alongside her experience of social sciences to produce a well-researched and argued essay, demonstrating depth of knowledge and analytical thinking. It was a pleasure working with R. as part of The Scholars Programme.



Using ecological dynamics as a theoretical framework, please discuss the affordances and constraints involved in the delivery of counselling in outdoor settings as opposed to indoor settings. Are the potential benefits worth the potential risk?

Year 12, Key Stage 5

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Course Title: People and places: Examining the psychology of human behaviour in relation to environmental setting

Outdoor counselling challenges the conventions and therapeutic frame of the more common mental health treatments, such as indoor counselling and medication. By taking therapy outdoors into 'nature', some believe that we have discovered affordances which benefit the move that have been allowed by the environmental factors such as fresh air and sunshine which aren't available in traditional areas of a doctors or a counsellor's office. Theories such as attention restoration theory (Kaplan & Kaplan, 1989), stress reduction theory (Ulrich, 1991) which this essay will later explore, provide a strong argument that outdoor counselling may be beneficial to some people. Issues begin to arise with those who may not necessarily dispute the research but believe that it does not outweigh the environmental constraints of this method such as the privacy and confidentiality lost by no longer being in a confined space, the constraints which may be present if the client has a disability or the environmental, unpredictable issues regarding the weather.

This essay therefore aims to examine the key theoretical, environmental, physical and psychological factors involved in the delivery of counselling outdoors in order to discuss whether the possible benefits outweigh the potential risks which arise from the use of outdoor settings. Attention Restoration Theory (ART) relies on the idea that four key properties present in nature can restore our cognitive functioning should we expose ourselves and choose to spend time within an outdoor setting (Kaplan and Kaplan, 1989). Their research proposes that if an individual allows themselves to [1] be in nature and escape every day activities which may cause them fatigue, [2] find extensive, expansive nature in which they can immerse themselves, [3] engage in activities which are compatible with our interests, and [4] experience aspects of nature which we find 'softly fascinating'

(Kaplan, 1995) then their "voluntary" attention has time to recover as the natural environment encourages us to use our "involuntary" attention (Kaplan, 1995) which we do not commonly use in conscious state in a simulated environment, excluding activities such as sleep. ART suggests that by being able to recharge our direct attention, it benefits many people as it allows a position in which people can reflect on their actions outside of nature and take time to reach resolutions for their troubles. Further research has been conducted since the introduction of this theory and many provide supporting evidence. A study compared the restorative benefits of relaxing in a natural, outdoor environment rather than an indoor version which simulated that same environment. After 30 minutes of relaxing, the study found that the natural environment yielded a significantly higher degree of altered states of consciousness and energy than the indoor setting, (Kjellgren & Buhrkall, 2010). This study receives credibility as the objective measures which it used means that the findings are not open for interpretation and the study contains less researcher bias. Therefore, attention restoration theory provides a strong argument as to the benefits of outdoor counselling, as by allowing clear thought it can help many clients who struggle with stress in their everyday lives. However, despite the benefits shown the theory has been unable to definitively explain details in the theory such as "soft fascination" and these therefore remain underdeveloped and open to interpretation and require clear operationalisation. (Joye & Dewitte)

Furthermore, stress reduction theory (SRT) also adds to the argument that outdoor counselling can be useful for some clients. Whilst ART focuses on the cognitive processes involved when interacting with nature, SRT focuses more on the emotional and physiological processes which occur at this moment (Nilsson et al 2010). Stress reduction theory proposes that as natural landscapes have afforded us the necessary resources to survive for many generations, our moods and physical recovery are moderated and supported within these environments (Ulrich, 1991). However, also according to his research, our initial responses to nature aren't always positive and can draw our attention if the stimuli is negative, as we are adapted for survival due to experiences in past generations (Ulrich, 1991). Despite this, his evidence still shows that our biological default may provide some benefits to outdoor counselling. By carrying out a counselling session with a stressed client in a natural setting such as a forest, aspects such as the water may be associated with survival and serve as positive stimuli which affords stress reduction and reduced anxiety which in themselves will have cognitive, psychological and physiological benefits for the client. However, an issue with stress reduction theory is that many of the current generation now prefer to spend their time in an urban environment and have discovered activities in them which can also reduce their stress. For example, a study asked participants a place in which they would visit to have a restorative experience. Their answers, such as going to the movies or listening to music are social activities were rated as restorative although they are easier to achieve in urban environments. (Scopilliti & Guiliani) This suggests that stress reduction theory may lack temporal validity.

Those who support outdoor counselling use research to back up their argument that it has many psychological and physiological benefits. For example, hiking or spending time resting in a forest had lower heart and cortisol rates along with a lower blood pressure (Park, Tsunetsugu, Kasetani, Kagawa & Miyazaki). A study by the University of Derby and the Wildlife Trust displayed these effects. After a month of interacting with nature, 30% more participants reported their health as "excellent" compared to at the start of the study. Although this is a subjective term which may make the findings less reliable, the other findings correspond with this, such as that the children taking part in the study reported increased self-esteem. A further study from the University of East Anglia conducted a meta-analysis and found that exposure to greenspace can lead to a reduced chance of type II diabetes, cardiovascular disease, premature death, preterm birth, stress and high blood pressure. These studies could be important as they present reasons why outdoor counselling could not only have mental benefits for the client but could also subsequently lead to better physical health for the clients in the meanwhile.

Therapeutic landscapes are environments - both natural and built that have inner meanings said to enable physical, mental and spiritual healing (Gesler 1992; 1993; 1996; 1998). Gesler (1996) was the first to define a therapeutic landscape as: 'healing places... [that] include such things as natural and man-made environments, historical events, cultural beliefs, social relations, and personal experiences... In many societies... [they are] closely tied to religion...'

A popular example of a therapeutic landscape is Lourdes, France. This site has become a place of healing for millions of people. Lourdes is important as by becoming a popular attraction, even a place of 'miraculous cures' for some it has positively contributed to France's economy and led to political, social and cultural changes (Gesler, 1996). However, within his research Gesler himself noted that he did not experience the 'healing' effects of Lourdes and this could suggest that religious and historical origins of therapeutic places might not to translate to people from other cultures. Nevertheless, for those who feel calmer within outdoor therapeutic landscapes, outdoor counselling may help them by offering a chance for more frequent exposure to these places. In a more relaxed state of mind, clients may feel more open to accepting suggestions from their counsellor and therefore outdoor counselling sessions may be more effective for some than indoor counselling.

Nature Deficit Disorder is a term coined by Richard Louv. In his book, Louv explores how the relationship between people and nature have separated over time and how this can be linked to childhood obesity, attention disorders and depression. In a modern society, in which the 'working woman' is encouraged, children no longer have a constant caregiver. This means that instead of spending evenings or weekends being able to interact with the outside - for example going to the park and climbing a tree like children in the past would do, the current generation of children rely on smartphones and technology to give them a sense of imagination and may become immersed in a reality world, rather than nature. It has led to a point in which 11-15-year-old children spend around 7.5 hours a day in front of a screen (which is a 40% increase in the last decade). Re-introducing

children to nature has proven especially beneficial to those with the medical condition ADHD. In one study, symptoms of ADHD reduced 3 times more when these children were outdoors in comparison to when they spent time indoors (Faber Taylor et al). This may indicate that there are stimuli within nature which can focus our attention, as suggested by theories such as Attention Restoration Theory explained above. Nature Deficit Disorder could provide an argument for outdoor counselling as it would give children an opportunity to be outside which they do not usually get, and could attempt to improve the poor physical and psychological health developed by being indoors the majority of their lives.

There are many types of outdoor therapy: Adventure Therapy, Wilderness Therapy, Therapeutic Gardening, Animal Assisted therapy, walk and talk therapy and outdoor counselling. The Association of Experimental Education describes adventure therapy as a mental health discipline that uses the natural environment to help individuals overcome cognitive, behavioural, social and affective disorders. Adventure therapy is useful as it involves setting goals and overcoming tasks which you may have thought were impossible. It gives the client a message that they cannot be certain of their capabilities until they try and allows them to attempt to overcome their mental health. Wilderness therapy uses adventure activities as it allows the clients to identify problems and allows them to develop solutions to these, all whilst increasing the self esteem of the client, who learns to trust their own opinion more since they managed to complete the tasks by themselves. It supposedly works as the unfamiliar situation means that the client will adapt new ways of thinking which they do not indoors. Animal Assisted therapy uses an animal as stimulus to create feelings of pleasure and a sense of calmness in the client which diverts their attention away from any stress which they are under. A meta-analysis found that there were positive outcomes when an animal was involved with the therapy, especially in clients with autism, medical conditions, or behavioural issues (Nimer & Lundahl). This indicates that having an animal may be particularly useful for the progress of some clients. However, using an animal within the session is not exclusive to outdoor counselling as it could be facilitated within an indoor setting. Although, allergies of other visitors and permission from the building owners means that it is easier and more efficient to use them in an outdoor setting.

Counselling is a talking therapy that involves a trained therapist listening to you and helping you find ways to deal with emotional issues. (NHS, 2017) Counselling explores difficulties in a client's life and attempts to give them strategies to handle these. Counselling can help cope with mental health conditions such as depression or anxiety, difficult life events such as a loss of a family member or friend, difficult emotions or other details such as sexual identity which may be causing someone stress and upset. (NHS, 2017) The British Association for Counselling and Psychotherapy (BACP) set certain standards and a code of ethics which counsellors and psychiatrists must maintain during their sessions. According to the BACP, confidentiality is a significant part of counselling, found in two of their key ethical principles: [1] Being trustworthy- "Regard confidentiality as an obligation arising from the client's trust". [2] Autonomy- counsellors who

adhere to this “protect confidentiality” and “normally make any disclosures of confidential information conditional on the consent of the person involved”. This means that confidentiality is important, as it allows the client to be more authentic and to discuss their problems freely to their counsellor due to a sense of trust formed in their relationship. Despite 1 out of every 4 people suffering a mental health problem at some point in their lives, the stigma around mental health remains. Nearly nine out of ten people who have a mental health problem have said that stigma and discrimination has had a negative effect on their lives. This may explain society’s preference for indoor counselling. Many people prefer staying indoors to maintain the confidentiality and reduce the risk of their associates finding out, which would be heightened if the sessions were outside in a public park, for example.

Outdoor counselling is appealing to some people as the natural setting affords a large diversity in the delivery of sessions (Berger & McLeod, 2006; Jordan & Marshall, 2010). Jordan and Marshall (2010) suggest that by shifting sessions into the outdoors can actually be beneficial to the quality of the sessions, as the power, which is usually held by the counsellor indoors, moves onto a more equal level between the counsellor and the patient. Outdoor counselling is also described as ‘walk and talk therapy’ which is more formal than other types of outdoor therapy. It includes the therapist walking side-by-side in an outdoor setting during the counselling session (Revell, Cooper & Duncan, 2014).

Ecological dynamics was proposed by James Gibson. He explores the possibility that each time we perceive an environment, we do so directly and do not reference our earlier experience. This means that with each interaction we can perceive affordances in the stimuli around us, allowing opportunities for behaviour (Gibson, 1986). Ecological dynamics can help to understand how tasks have affordances and constraints based on individual and environmental factors. This has practical applications within nature-based therapy as therapists can manipulate the settings they choose to maximise the affordances available (Brymer, Davids & Mallabon, 2014)

The idea of this essay is to debate whether the potential benefits of outdoor counselling outweigh the potential risks. The argument for the benefits is heavily weighted, not only does the outdoor setting afford a clear mindset, focus and relaxation as explored earlier in the essay, but being outside also affords the client fresh air, sunshine, and an opportunity to walk and exercise. Some therapists also find that being outdoors can provide a useful tool as they can use the environment and weather to create metaphors, such as the rain “washing problems away”. (White, Mallabon & Bates, 2019).

Nevertheless, taking sessions into nature can also have constraints. Outdoor counselling may not be suitable for all clients. A large concern held by many is the loss of confidentiality which may occur holding the sessions in an open space. It is possible that people may eavesdrop, which since extremely private issues are shared within counselling, it prevents many people from opting to have their counselling outdoors. There is also a chance that people may eavesdrop and this may make the session feel unauthentic and stop the client from being honest about their issues. The client may also have individual constraints such as a disability or an allergy in which they cannot hold their sessions in a natural environment,

even if they wished to. Another large constraint is the unpredictable weather. During autumn or winter especially, the weather may not be suitable to go outside in and could mean that appointments with potentially vulnerable clients are often cancelled. This could even lead to their issues worsening. (White, Mallabon & Bates, 2019)

Despite these constraints, it could be argued that conclusively the evidence suggests that the potential benefits could outweigh the potential risks. Ideas such as Attention Restoration Theory, Stress Reduction Theory and Nature Deficit Disorder have been criticised, yet I believe the ideas proposed by them are able to provide a stronger argument. Although outdoor counselling may not be suitable at all periods of time or for all clients, I believe that this essay has shown that should the counsellor and client discover how the shift of environment can work best for them, and the therapeutic frame continues to be delivered correctly, then the potential benefits do, on average, outweigh the potential risks.

References

Berger, R. & McLeod, J. (2006) Incorporating Nature into Therapy: A Framework for Practice. *Journal of Systematic Therapies*, 25 (2), 80-94

Brymer, E., Davids, K. & Mallabon, L. (2014) Understanding the Psychological Health and Well-being Benefits of Physical Activity in Nature: An Ecological Dynamics Analysis, 6 (3)

Dr Davies, N. (2012). Ethics in Counselling: Confidentiality. (Accessed: 24 March 2019). Available at: <https://healthpsychologyconsultancy.wordpress.com/2012/03/03/ethics-in-counselling-confidentiality/>

Faber Taylor, A. et al (2001) Coping with ADD: The Surprising Connection to Green Play Settings. *Environment and Behaviour*, 33 (Jan 2001) pp. 54-77.

Gesler, W.M. (1996). Lourdes: healing in a place of pilgrimage. *Health and place*, 2(2): 95-105.

Jeremy Coles/ BBC (2016) How nature is good for our health and happiness. (Accessed: 23 March 2019). Available at: <http://www.bbc.co.uk/earth/story/20160420-how-nature-is-good-for-our-health-and-happiness>

Joye, Y., Dewitte, S. (2018). 'Nature's broken path to restoration: A critical look at Attention Restoration Theory', Kaplan 1995 Kaplan, S. 1995. The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology* 15:169-82. doi:10.1016/0272-4944(95)90001-2.

Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York, NY, US: Cambridge University Press.

Khachatourians, A, K. (2003). 'Therapeutic Landscapes: A Critical Analysis', Master of Arts, Simon Fraser University, Burnaby, Canada

Kjølgren, A., & Buhrkal, H. (2010). A comparison of the restorative effect of a natural environment with that of a simulated natural environment. *Journal of Environmental Psychology*, 30(4), 464-472.

Louv, Richard. *Last Child In The Woods: Saving Our Children From Nature-deficit Disorder*. Chapel Hill, NC : Algonquin Books Of Chapel Hill, 2005. Print.

Mental Health Foundation. *Stigma and Discrimination*. (Accessed: 24 March 2019). Available at: <https://www.mentalhealth.org.uk/a-to-z/s/stigma-and-discrimination>

NHS. (2017) Counselling. (Accessed: 24 March 2019). Available at: <https://www.nhs.uk/conditions/counselling/>

Nisson, K; Sangster, M; Galls, C; Hartig T; de Vries, S; Seeland, K; Schipperijn J. (2010). *Forest, Trees, and Human Health*. Springer: Manhattan, New York City

Nimer, J., & Lundahl, B. (2007). Animal-assisted therapy: A meta-analysis. *Anthrozoös*, 20(3), 225-238.

Park BJ, Tsunetsugu Y, Kasetani T, Kogawa T, Miyazaki Y. (2010). 'The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. *Jan*;15(1):18-26.

Psychology Today. *Animal-Assisted Therapy*. (Accessed: 24 March 2019). Available at: <https://www.psychologytoday.com/gb/therapy-types/animal-assisted-therapy>

Revell, S, Duncan, E., & Cooper, M. (2014) Helpful Aspects of Outdoor Therapy Experiences: An Online Preliminary Investigation. *Counselling and Psychotherapy Research*, 14(4), 281-287.

Scopelliti, M., and Giuliani, M. V. (2004). Choosing restorative environments across the lifespan: a matter of place experience. *J. Environ. Psychol.* 24, 423-437. doi: 10.1016/j.jenvp.2004.11.002

The Guardian. (2011) Teenagers would rather lose TV than internet or mobile – survey. (Accessed: 24/03/19). Available at: www.guardian.co.uk/technology/2011/oct/25/teenagers-lose-tv-internet-mobile

Ulrich, R. S. (1983). Aesthetic and affective response to natural environment. In I. Altman & J. F. Wohlwill (Eds.), *Human Behavior and environment: Vol. 6. Behavior and the natural environment* (pp. 85-125). New York: Plenum.

Unity College. *What is Adventure Therapy?* (Accessed: 24 March 2019). Available at: https://www.unity.edu/news_and_events/blog/what-is-adventure-therapy/

University of East Anglia. (2018) It's official- spending time outside is good for you. (Accessed: 24 March 2019). Available at: <https://www.uea.ac.uk/about/-/its-official-spending-time-outside-is-good-for-you>

University of Suffolk. (2013) What is counselling. (Accessed at: 24 March 2019) Available at: <https://www.uos.ac.uk/content/what-counselling>

White, V., Mallabon, L. & Bates, E. (2019) *What Makes a Space a Healing Place: An Ecological Dynamics Analysis*. (Unpublished)

Tutor comment:
I am delighted C.’s essay has been selected for publication. She listened carefully to the guidance she was given and answered the essay question in an original and thought-provoking manner. She followed the marking criteria and made sure her work met the required areas to a very high standard.

