Highlights include:
Warming Puts Wind Energy at Risk
and academic essays on
Climate Change and Nuclear Power
from Brilliant Club scholars
4 What is The Brilliant Club? Learn about our mission and programmes.

5 News All of the latest news from The Brilliant Club.

6 Research Highlights Including updates on climate change, physics, neuroscience and medical research.

7 Guest Article Guest article from Professor Julian Wright, Head of Humanities, Northumbria University.

8 STEM Articles This term, we hear from scholars in the Science, Technology, Engineering and Maths disciplines on subjects including dementia, nuclear power and geological surveys.

34 Arts and Humanities Articles The Arts and Humanities articles in this edition explore subjects including genre theory, the French Revolution and community-based urban farming.

42 Social Sciences Articles Our social Sciences scholars look at topics such as emotional eating and the psychology of marketing.

The Brilliant Club
What is The Brilliant Club?

The Brilliant Club is an award-winning charity that exists to widen access to highly-selective universities for under-represented pupils. We do this by mobilising researchers to bring their academic expertise into state schools through two core programmes: The Scholars Programme and Researchers in Schools.

The Scholars Programme trains PhD and postdoctoral researchers to deliver university-style courses with rigorous academic challenges to small groups of pupils. These courses begin and end with information, advice and guidance trips to highly-selective universities.

Researchers in Schools is a unique teacher training route, designed exclusively for PhD graduates. It provides the training necessary for PhD graduates to become excellent classroom teachers and university-access champions within their schools. Both programmes are designed to support pupils to develop the knowledge, skills and confidence necessary to secure places at highly-selective universities.

The Brilliant Club is building a national movement to mobilise PhD researchers to engage with state schools serving low HE-participation communities. At present, we are supporting over 500 PhD tutors from 30 universities to work with more than 11,000 pupils from over 600 schools across the UK. Through The Scholars Programme, our PhD tutors deliver courses of university-style learning to pupils from Year 5 through to Year 12. The courses they deliver focus on fascinating topics ranging from ‘Are Some Infinities Bigger than Others?’ to ‘Making Maps, Constructing Worlds: Geopolitics and Geography’.

As the diagram to the right shows, The Scholars Programme consists of trips to highly-selective universities, a series of tutorials and the completion of university-style assignments, as well as one-to-one feedback for pupils from their PhD tutors. It is the best of these university-style assignments that are debuted here, in The Scholar. We are delighted to showcase our pupils’ work and celebrate their achievements in the country’s only academic journal dedicated to publishing university-style assignments authored by school pupils. Publishing original work is an important component of academia and it is exciting for us to introduce our pupils not only to the world of research but also to the next stage of publishing in academic journals.
Welcome to the latest edition of The Scholar!

We are delighted to be able to celebrate twenty of the best assignments written by pupils on The Scholars Programme here in The Scholar, Issue 9. The pupils featured here come from schools across the UK and their work covers a vast array of fascinating topics, from the causes of chronic pain to the representation of nature in literature.

This edition of The Scholar features more articles authored by Key Stage 2 pupils in years 5 and 6, than any other edition! We are very proud of these young scholars and commend them on their courage to take on some big questions in their assignments.

Research shows that early intervention is crucial in promoting fair university access, however 85% of outreach programmes targeting pupils from backgrounds underrepresented in higher education focus on 16 – 18-year olds. To address this in our work, The Brilliant Club runs The Scholars Programme, our university access programme, with pupils from the age of 10.

Our PhD tutors that work with Key Stage 2 pupils receive specialist training on how to deliver courses based on academic research to younger pupils. The courses they deliver are designed by a team of primary specialists in partnership with experts on the topic covered. For example, in 2016 we worked with No. 10 Downing Street and King’s College London to create a politics course titled, ‘Inside No. 10: The British Prime Minister in the Post-War Years’.

We have also created fascinating courses with UCL Engineering, including a new course entitled, ‘Illuminating the Body’, in which pupils explore how light can be used to provide information about what is happening inside the body. Pupils on this course also design their own machine for doing this!

On the opposite page we share some exciting updates on our upcoming conference, MP visits to schools running The Scholars Programme and recruitment for our Researchers in Schools programme.

We would like to say congratulations to the pupils published in this edition of The Scholar and to all pupils who completed The Scholars Programme. The programme is designed to challenge pupils and encourage them to take on new academic challenges, so all pupils who graduate from the programme should be very proud of themselves indeed!

If you would like to find out how your school can get involved with The Brilliant Club, please visit our website at www.thebrilliantclub.org or send an email to hello@thebrilliantclub.org.

If you are a teacher who would like to find out more about our work with Key Stage 2 pupils, we would love to hear from you! Please get in touch with the contact for your area below:

Scotland and the North of England
Dr Natalie Day
natalie.day@thebrilliantclub.org

East of England
Lucy Preston
lucy.preston@thebrilliantclub.org

South of England
Stephan Hamilton
stephan.hamilton@thebrilliantclub.org

Midlands and West of England
Joe Loudon
joe.loudon@thebrilliantclub.org

Wales
Greg Scannell
greg.scannell@thebrilliantclub.org

The Brilliant Club Conference 2018

We are delighted to announce that The Brilliant Club will be holding its fifth national conference on Friday 13th of July at Nene Park Academy in Peterborough. This year’s conference is titled Measuring Up: Research, Evidence and Urgency in University Access and Student Success, and will be delivered in partnership with King’s College London, Ormiston Academies Trust, Nene Park Academy, Cambridge Meridian Academies Trust, University of Cambridge and UEA.

We will welcome delegates from a range of sectors to join us for an event which will focus on how to conduct robust and realistic evaluations of interventions, and facilitate the sharing of research and evidence-based practical activity with a view to better supporting young people to access and succeed at university. In particular, we look forward to hearing from keynote speaker Chris Millward, Director for Fair Access and Participation at the Office for Students on his vision for the newly created regulator’s role in widening participation.

This year, we are pleased to offer travel bursaries for teachers who would like to attend the conference and are unable to claim travel expenses from their school. We have a limited fund available to refund travel and bursaries will be granted on a first-come-first-served basis up until 13 May 2018. For more information, please contact finance@thebrilliantclub.org.

The Brilliant Club Conference aims to support work across the sector to widen access to highly-selective universities for underrepresented pupils. If you would like to find out more and secure your place, please visit www.thebrilliantclub.org/conference and follow us on Twitter @BrilliantClub for the latest updates!

Independent UCAS evaluation shows The Scholars Programme has a statistically significant effect on progression to highly-selective universities

For the last two years, The Brilliant Club has worked with the Universities and Colleges Admissions Service (UCAS) to evaluate the impact of its programmes on progression to highly-selective universities. The UCAS data shows that pupils who completed The Scholars Programme applied, received offers from and progressed to highly-selective universities at the following rates:

<table>
<thead>
<tr>
<th>Offer</th>
<th>Selective University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied</td>
<td>79%</td>
</tr>
<tr>
<td>Received an offer</td>
<td>76%</td>
</tr>
<tr>
<td>Progressed to a highly-selective university</td>
<td>55%</td>
</tr>
</tbody>
</table>

This analysis found that pupils who completed The Scholars Programme were significantly more likely to progress to a highly-selective university than pupils in the control groups, having made the conditions of their offer including their A-Level grades.

For more information about this impact evaluation, or about how The Brilliant Club measures its impact for pupils and stakeholders, please email the charity’s Research and Impact Director, Dr Lauren Bellaera at lauren.bellaera@thebrilliantclub.org.

Our Researchers in Schools programme is now recruiting for its 2018 cohort!

Researchers in Schools is a unique teacher training and development programme. It is specifically designed to utilise the academic expertise of PhD graduates for the benefit of pupils, schools and universities.

We are now recruiting PhD graduates to join our 2018 cohort! This year we are excited to announce that we are working to significantly increase the number of participants training to teach subjects other than maths and physics. While we have focused on these subjects historically, we are now recruiting participants in English, history, geography, languages and the other sciences. We aim to place participants into non-selective state schools in all areas of England.

If you would like to learn more about training to be a teacher with Researchers in Schools, please visit www.researchersinschools.org.
Climate Change

Warming puts wind energy at risk
Global warming could alter the way air moves around the world, ultimately affecting one of the most popular means of generating clean energy: wind turbines.

Kristopher Karmasakas and his colleagues at the University of Colorado Boulder used ten global climate models to explore how winds might change in two warming scenarios. Their results suggest that, in both low- and high-emissions scenarios, wind resources will decrease across the northern mid-latitudes, mainly as a result of weather patterns associated with accelerated warming in the Arctic. In the Southern Hemisphere, high emissions see wind resources increase on average, because of temperature differentials over land and sea. The effects vary by location, however.

The results indicate that energy planners can’t assume the wind available for electricity generation will remain constant over time, and could help to drive more detailed local and regional analyses.

Nature Geosci. https://doi.org/10.1038/s41561-017-0023-0 (2017)

Why lattes have layers
It takes a quick pour to create the stripes in a layered latte.

When a barista makes a latte, distinct horizontal layers sometimes form as the espresso settles into the denser milk. To investigate this process, Howard Stone of Princeton University in New Jersey and his colleagues ran computer simulations and experiments that involved injected warm, dyed water into denser salt water. They found that if espresso is injected fast enough into a glass of warm milk, the espresso–milk mixture closest to the wall of the glass cools, becomes denser and sinks until it reaches a layer of the same density. At that point, it stops sinking and begins to circulate horizontally, forming multiple convection cells that can retain their structure for hours.

The team demonstrated a way to use this technique to create layered gels that could be useful for cell cultures. The method could also be applied in manufacturing and tissue engineering, the authors write.

Nature Commun. 8, 960 (2017)

Physics

Why lattes have layers
It takes a quick pour to create the stripes in a layered latte.

When a barista makes a latte, distinct horizontal layers sometimes form as the espresso settles into the denser milk. To investigate this process, Howard Stone of Princeton University in New Jersey and his colleagues ran computer simulations and experiments that involved injected warm, dyed water into denser salt water. They found that if espresso is injected fast enough into a glass of warm milk, the espresso–milk mixture closest to the wall of the glass cools, becomes denser and sinks until it reaches a layer of the same density. At that point, it stops sinking and begins to circulate horizontally, forming multiple convection cells that can retain their structure for hours.

The team demonstrated a way to use this technique to create layered gels that could be useful for cell cultures. The method could also be applied in manufacturing and tissue engineering, the authors write.

Nature Commun. 8, 960 (2017)

Brain cells that curb food intake
Nice lose their appetite in response to activation of a brain area that is involved in emotion and cognition.

Eating is prompted, in part, by brain regions that help to maintain the body’s energy levels. But hunger pangs are not the only motivation for a trip to the snack bar. In an effort to understand how the brain’s emotional and cognitive machinery influences appetite, Yunlei Yang and his colleagues at the State University of New York Upstate Medical University explored how winds might change in two warming scenarios. Their results suggest that, in both low- and high-emissions scenarios, wind resources will decrease across the northern mid-latitudes, mainly as a result of weather patterns associated with accelerated warming in the Arctic. In the Southern Hemisphere, high emissions see wind resources increase on average, because of temperature differentials over land and sea. The effects vary by location, however.

The results indicate that energy planners can’t assume the wind available for electricity generation will remain constant over time, and could help to drive more detailed local and regional analyses.

Nature Geosci. https://doi.org/10.1038/s41561-017-0023-0 (2017)

Neuroscience

Brain cells that curb food intake
Nice lose their appetite in response to activation of a brain area that is involved in emotion and cognition.

Eating is prompted, in part, by brain regions that help to maintain the body’s energy levels. But hunger pangs are not the only motivation for a trip to the snack bar. In an effort to understand how the brain’s emotional and cognitive machinery influences appetite, Yunlei Yang and his colleagues at the State University of New York Upstate Medical University explored how winds might change in two warming scenarios. Their results suggest that, in both low- and high-emissions scenarios, wind resources will decrease across the northern mid-latitudes, mainly as a result of weather patterns associated with accelerated warming in the Arctic. In the Southern Hemisphere, high emissions see wind resources increase on average, because of temperature differentials over land and sea. The effects vary by location, however.

The results indicate that energy planners can’t assume the wind available for electricity generation will remain constant over time, and could help to drive more detailed local and regional analyses.

Nature Geosci. https://doi.org/10.1038/s41561-017-0023-0 (2017)

Medical Research

Stem cells defeat autoimmune ills
Stem-cell transplants can help people to survive a rare and deadly form of the autoimmune disease scleroderma.

Scleroderma causes the skin to harden and become immobile. In its most severe form, it affects the internal organs, and is usually fatal. Individuals who receive conventional drug therapy today are no more likely to survive the disease than patients 40 years ago.

Keith Sullivan at the Duke University Medical Center in Durham, North Carolina, and his colleagues tested an innovative approach in a multi-year clinical trial. Stem-cell transplants given after chemotherapy and total-body irradiation significantly improved survival rates, reduced the likelihood of relapse and left some people disease-free.

The results are consistent with two previous stem-cell trials, and should help to establish stem-cell transplants as a standard treatment for individuals with severe scleroderma, according to the researchers.


Your Voice in the World

Guest Article

Professor Julian Wright
Head of Humanities, Northumbria University

To be able to speak with clarity, authenticity and cultural empathy is the great gift that you gain from a strongly research-driven degree in the humanities. You learn to take your ideas and your insights and deepener them with rigorous research, challenge them by testing them against different cultural contexts, refine them with argument and debate. And above all you develop the independent confidence, as someone who thinks in original ways about great cultural, artistic, political or social problems, to stand up and speak with authority in our wider society.

And while we need people like you to speak out and tell better stories, in Britain, America and the wider world, these are also valuable skills for the world of work. I sometimes say that humanities degrees contain a heavy dose of leadership training. People who can tell the story of the business they are running, the local government organisation they are working in, the charity they are developing, are people who wind up leading those institutions. Scanning the horizon to understand the economic and cultural context in which your marketing business is operating, or being able to set out an inspiring story of a school’s place in its community, is the first attribute of a leader. Bring that together with a deep understanding of different cultural perspectives and you have someone who can lead their business in a shifting global economic context. Add the rigour you gain from having developed your own research projects and you have someone who can hold their employees to high standards for independent, self-motivated work. All these are skills that are embedded in degrees in history, literature, the arts, philosophy or language.

But at the heart of the better society we want to build are people who can speak clearly and confidently. Your next step will train you to speak out with an authoritative, articulate voice in society. Use The Scholars Programme seminars to get you ready for the discussions and debates that your future university tutors will want you to participate in. Make sure you are leading the debate, and take this confidence into your university, where you will help your peers speak up and drive the seminar debates from day one. We need your voice.

Professor Julian Wright
Head of Humanities, Northumbria University
What Is Pythagoras’ Theorem?

Vol. 1 No. 9, April 2018
S. Ainsley, Elgon Academy, Harrogate.
Supervised by G. Oyenyi, University of Sunderland.

The Pythagoras Theorem tells us that with a right-angle triangle the hypotenuse (the side opposite to the right angle) multiplied by itself is equivalent to the two legs (the other sides) squared and added together.

This can be written as the formula: \( a^2 + b^2 = c^2 \)

It is useful because if you know the length of two of the sides of a right-angle triangle this can be used to work out the length of the third side.

We can use this understanding when designing and building structures or making items from wood. This is because if I know the length of two straight lines of information to work out the length of a diagonal line that would connect them.

For example, we could use it when building a rood with a slope. If we know the height of the roof and the length it will cover we can use Pythagoras’ equation to find out the diagonal length of the roof’s slope. We can then cut the correct size for the supporting timber and work out how many timbers are needed to cover the roof.

Pythagoras’ Theorem can also help us find the shortest way between two points. For example, if I am on a ship and want to get to an island and I know two lengths of the distance, North and West for example, I can use this to work out the shortest route to take. If the island is 200 miles north and 100 miles west I can use the equation to find the distance from my ship to the island and also the direction I need to follow to get there.

As well as helping you to find the missing side to a triangle, Pythagoras’ Theorem can also be used to find the missing side lengths to squares and rectangles.

Builders use the theorem to help keep walls at right angles and this helps to build houses and make sure that windows, doors and floors are put in straight.

A further example of an everyday use of the theorem might be finding the distance a plane has to travel from one place to another. The distance between the x value (across the earth) and the y value (up the earth), without taking into account the curvature of the earth and the altitude, represents the a and b values in the formula. The c value represents the distance travelled between the two airports.

Pythagoras’ maths ‘proved’ the theorem in the clay tablet called Plimpton 33. This tablet was made approximately 4000 years ago. It is written in a language called cuneiform script. It was translated into modern language about 100 years ago. Unfortunately, parts of it had broken away so researchers had to guess that the numbers that were missing but even though it was broken the researchers could see that it proved the theorem.

The tablet gave the measured lengths of a side a and side b and the outcome of the diagonal. For example:

- Side A = 119
- Side B = 120
- Diagonal = 169

Therefore \( c = \sqrt{18561} \) (169)

This proves the equation works. It also works out the values on the tablet shown below:

The Pythagoras 33 Tablet

Bibliography:
- Pythagoras: What the Pythagorean theorem is important. Available at: http://www.mathsgenie.co.uk/what-is-the-pythagorean-theorem-important.html
- The Scholars Programme Course Handbook, Key Stage 2, Programme 2, Ancient Greece, Pythagoras’ Theorem p. 16

How Many Engineers Does It Take To Make An Ice Cream?

Vol. 1 No. 9, April 2018
G. Avendano, Keir Hardie Primary School, London.
Supervised by R. Farman, King’s College London.

Introduction

Hello, G. and I am taking part in the Scholars Programme with The Brilliant Club. We have been learning about engineers that make ice cream and even got to learn how to make it ourselves. The plan was by understanding the design process, the engineering design process starts with a problem to solve, ideas to solve the problem, plan what you do will do to carry out these ideas, then the people who improve and maintain it for the solution for the next time (problem, ideas, plan, do and improve).

This process can be used to solve everyday problems and has helped me with my work and is in my plan for the future. I learned that engineering is the application of science and maths to solve problems. Engineering figures out how things work and finds practical uses for scientific discoveries. Engineering is everywhere in the world around us and it helps us to improve the way we work, travel, stay healthy and entertain ourselves. It is all around us and has helped shaped the world we live in.

This proves the equation works. It also works out the values on the tablet shown below:

<table>
<thead>
<tr>
<th>The Pythagoras 33 Tablet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side A</td>
</tr>
<tr>
<td>119</td>
</tr>
</tbody>
</table>

Let’s say I wanted to make the perfect ice cream, as ice creams are different textures, flavours, colours, consistency, etc. I would have to choose what kind of ice cream I wanted to make and then have to think up different ideas of how to achieve my goal, then elaborate a plan to make my ideas come into action, perhaps make a list or draw a diagram. Next I would follow my plan and finally I would think of different ways I may be able to improve or better my solution.

Problem

I want to make tasty bubble gum flavoured ice cream, one that is not too smooth or too creamy, but a little icy and not overly sweet.

Ideas

- I will need to use: — Vanilla extract — Milk — Bubble-gum — Cream (of course) — Sugar
- Sponge cake
- Soft ice cream
- Ice cream needs a bit of salt as well

I got this recipe from the houseofyumm.com website.

I almost forgot a very important ingredient: Air – and it is free too! The amount of air added to ice cream is known as overrun. If the volume of ice cream is doubled by adding air, the overrun is 100%, which is the maximum allowable amount of air that can be added to commercial ice cream. The less expensive brands usually contain more air than the premium brands. One side effect of adding a lot of air to ice cream is that it tends to melt more quickly than ice cream with less air.

I got these cool facts from the American Chemical Society website (www.acs.org)

Another interesting fact about ice cream is that the air incorporated in the ice cream helps the flavours to be released into the mouth slower therefore it does not taste sickly or overly sweet! I got this fact from the www.wowzascor.com. I would be incorporating air to my ice cream because as I mentioned I don’t want it to be overly sweet, but not too much air because I don’t want it to melt too quickly.

Plan

I will call my ice cream Bubble-Gum Delish, as in delicious! I want it to be not too creamy and not overly sweet (as some bubble-gum ice creams tend to be), mine will be a little icy (therefore refreshing in the hot summer days) but still a little creamy. It will also have some actual bubble-gums in it, but not too many to make it too sweet or sickly.

What makes ice cream so smooth and creamy is the fats it contains but as I said I don’t want my ice cream too creamy, so I won’t be using a high percentage of fat.

Do

In order to manufacture this ice cream the way I want it, I would need the help of different types of engineers: Mechanical engineers, biochemical engineers, chemical engineers and industrial engineers. I would need a mechanical engineer to help me choose the right freezing method or equipment for the ice cream, a mechanical engineer would also help me to choose how to achieve best results with the minimum energy use to reduce the detrimental impact of CO2 emissions on the environment.

I would need a chemical engineer to help me choose the right agents I should use to get the right texture of the ice cream so I think this is very important for my recipe because I want my ice cream to be hard and not as creamy as a normal ice cream and a chemical engineer could help me with that. I also would need an industrial engineer to help me decide the adequate machines and the most effective manufacturing process that will ensure we can make the ice cream we desire at the most affordable price and in the quantities that we may require.

A biochemical engineer would also help us with making our ice cream as they would advise us on the different ways we could achieve a great bubble-gum texture. In order to work with additives and also colourings to make our ice cream look delicious and taste delicious using many natural ingredients as some good natural colourings to make the ice cream look and taste awesome. We also need to strives the right viscosity by finding of having just the right size of ice crystals.

Improve

The good thing about my ice cream is that it is a flavour that everyone would most probably like. Also, it is not going to have any added bubble-gums in it which is not going to melt too quickly.

I think people with a sweet tooth may like my ice cream to be sweeter, people who like hard bits on their ice cream may not want any added bubble-gums in the ice cream and those who don’t like the taste of bubble-gum would probably not want any added bubble-gums in the ice cream to make it so. My target audience would be children as I think most of them like bubble-gum and also ice cream therefore to love to have them together and as it will be a little icy would be the ideal treat for those hot summer days when you want something cold but not too icy like ice lollies.

That is the engineering design process; I hope you enjoyed it as much as I did!
How Was The Spread Of Ebola Controlled?

How is the spread of Ebola controlled?

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa.

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa.

How did West Africa control the Hemorrhagic Fever?

West Africa controlled the Hemorrhagic Fever by educating people on the behaviors that are a sign of the disease and the way they spread the infected people. When the recent outbreak began, healthcare workers in Liberia, Guinea, and Sierra Leone had to learn from the beginning how to treat Ebola. The odd of survival increased rapidly with early, effective symptom management. The infected person’s attitude was that Ebola was not controlled in the correct manner. This may be because professionals and scientists took a little while to discover a cure and did not try to handle the problem quickly. Professionals underestimated the gravity of the situation.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human.

Ebola outbreak was controlled by quickly recognizing and isolating patients to prevent new contaminations. Anyone that had been in contact with a patient without the protection of special contaminated clothing or masks, even for a couple of minutes, may catch the fever, it may take weeks to see whether they become ill too (6). If they did, they were immediately taken to hospital, where they were isolated, and hospital staff were educated on how to avoid contamination. Doctors who treated these patients had to wear protective clothing and follow strict rules to prevent contamination and spread the disease. The Ebola outbreak was controlled by handling and comparing data in the different regions of West Africa to monitor the spread.

WHO explained that the outbreak was controlled by monitoring how the disease spread. The outbreak was put to an end. However, some may argue that the Ebola virus was not controlled nor handled in the correct manner. This may be because professionals and scientists took a little while to discover a cure and did not try to handle the problem quickly. Professionals underestimated the gravity of the situation.

Bibliography:


How is the spread of Ebola controlled?

The spread of Ebola is controlled in several ways including, practicing good hygiene habits such as washing hands frequently, avoiding contact with body fluids such as saliva [3]. Healthcare workers could be exposed to people with Ebola and in order to control an outbreak they have to wear appropriate personal protective equipment, isolate people with Ebola, try to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human [2].

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human [2].

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human [2].

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human [2].

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human [2].

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human [2].

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.

Spread of Ebola

Ebola can be spread in several ways. Examples of this include: being spread by close contact with the infected blood, secretions, and organs or by handling infected animals such as fruit bats, monkeys, and gorillas. The disease can also be spread from human to human [2].

Conclusions

As some people started to get better, the community started to notice that Ebola was still present in the region. To control the outbreak, it is important to avoid direct contact with the bodies of infected people and make sure to notify health officials if they have contact with body fluids. Sources of information and research are designed to help people make choices for the healthcare professionals in West Africa; doctors are overworked and paid very little [10]. More awareness and funds are given so doctors and medical staff can buy necessities such as clean water, food, clothes and equipment such as medicine.
The complication of less developed regions not having enough funding seems as if it could become a problem of the past, due to countries such as the USA donating over $420m (Dearden, 2014, to the UN crisis fund (Dearden, 2014). However, this article also indicates that international donations to a UN crisis fund are falling far short of the amount needed (Dearden, 2014). This could be because China is not contributing enough to fight Ebola (Sanchez, 2014), and will not in the foreseeable future because we continent, or the whole world,’ however Ebola hasn’t reached pandemic is prevalent throughout an entire country, considerable progress has been made in preventing Ebola who haven’t been trained on controlling diseases and aren’t healthcare facilities in areas such as Sierra Leone, to staff that the UN has requested almost $1 billion ($620 million) to combat the crisis (Dearden, 2014). President Obama had also been encouraging other nations to provide support in tackling this disease along with warning them that funding this dilemma is compulsory to containing Ebola ‘This is not simply charity,’ Obama said, warning that the best way to prevent the spread of the virus was to contain the ‘tough epidemic’ in West Africa (Sanchez, 2014). The source is from The Independent, a daily newspaper, launched in 1986 and have enjoyed a reputation for quality and innovation (Blackhurst, 2012). This proves that they are respectable and reliable. Furthermore, the author of this article, Lusia Dearden, who does not have any biases on the topic of the Ebola outbreak, instead she stays unprioritised throughout the entirety of the article.


Conclusion

In conclusion, I believe that Ebola will not become the next international pandemic. Although, nations across the world have the resources and knowledges why the disease has happened to be identified. This includes the weaker healthcare systems in Sierra Leone, to staff who haven’t been trained on controlling diseases and aren’t aware of how Ebola is spread (Shute, 2014). Despite this, it’s considerably improving the situation in Sierra Leone and Ebola from becoming widespread and sweeping across many countries (Lafferty and Rowe, 1998), as it has been funded by over US $459 million (WHO), facts and figures abound with support, therefore successfully tackling Ebola has become a reality: A pandemic is prevalent throughout an entire country, continent, or the whole world. However Ebola hasn’t reached that level, and will not in the foreseeable future because we are managing it. The most reliable sources that I used to form this conclusion are the first (Chris McGreal, 2014) and the third source (Dearden, 2014). In comparison, they both provide reliable facts and sources about Ebola than the second source (Nassos Stylianou, 2014).

Brain Oscillations And Brain Disorders

Brain disorders such as bipolar disorder and epilepsy will be looked at in the next section to gain a better understanding of how brain oscillations affect these conditions, and whether this can help with further medications. Additionally, there is information provided on how other forms of transmission signals and action potential work in a role that affects the overall function of the brain, and how this links to certain brain disorders.

To begin with, brain oscillations include transmission signals – also known as action potentials – that occur at the end of a neuron cell with a minuscule gap between them. Their main function is to transfer electric nerve impulses between them from the presynaptic neuron to the postsynaptic neuron by using chemical neurotransmitters (stored inside the synaptic vesicles) which can be seen in Figure 1.

Synapses occur so that the two cells can communicate, with the involvement of three steps: the presynaptic neuron sending the information, the neurotransmitters travelling across the gap, and the postsynaptic neuron receiving it (Sanchez, 2014). The source is from The Independent, a daily newspaper, launched in 1986 and have enjoyed a reputation for quality and innovation (Blackhurst, 2012). This proves that they are respectable and reliable. Furthermore, the author of this article, Lusia Dearden, who does not have any biases on the topic of the Ebola outbreak, instead she stays unprioritised throughout the entirety of the article.

In Figure 2 of the resting potential stage, the neuron cell can be seen at -70 mV, an inactive state. This means it needs an impulse to reach the threshold of excitation in order for action potential to occur (A). The principle it acts on is all or none, so the cell must reach this threshold or action potential cannot take place at all (A). It will need a form of stimuli, which can be heat, touch or pain that includes electricity, pressure or chemicals (5). The inside of the cell has cytoplasm with a negative electrical charge of K+ (potassium), whereas outside of the cell the fluid that surrounds it contains a positive charge of Na+ (sodium). Even though both substances are positive, a transport protein called the sodium-potassium-pump moves more sodium out of the cell than moving potassium in (A), causing an imbalance in the cells concentration gradient.

After there has been a stimulus that initiates it to reach the threshold (which is usually -55 mV, see Figure 3), Na+ would rush in, entering the cell through the channels that have been opened the moment it reached the threshold. This is called depolarisation - stage two. It allows the cell to become positively charged, bringing the potential up to close to potential zero. However, it doesn’t stop when this occurs, leading to the next stage, which is called the resting potential stage, which is at around +30 mV (5). The ions would equalise the concentration gradient of the cell.

It is a common misconception that there are different action potential peaks because it can respond to a number of different stimuli. This is not true: all action potential peaks reach +30 mV because it is all the same process (8).

Once it has reached this action potential peak, it needs to decline to go back to its resting potential state to balance out the channel since there is the sodium (5). This is the third stage of the potential, repolarization. The gates that opened for the sodium ions would close, preventing the flow while the K+ (potassium) channel remains open. This will reduce the number of K+ ions inside and allow the cell to restore back to its regular state of -70 mV.

The final stage of hyperpolarization happens shortly after the third stage. This is achieved by sodium ions being depleted even after it has reached -70mV, making it more negatively charged than normal (5). Although it would only be temporary, it prevents the sodium-potassium-pump to get the cell back to its resting state (9).

Brain oscillations are the rhythmic, repetitive electrical activity that occur in response to the central nervous system, and often happens spontaneously (10). There are five typical types of brain oscillations that take place in everyday life as demonstrated in the table (Figure 3).
This disorder is a condition that affects the person's moods which results in them having periods of depression and mania, often swinging extremely from one to the other (if untreated). The depression can last from six to twelve months (13). Lateness in depressive episodes (14) can affect a wide range of people which suggests age is not a main factor; although it's more common among teenagers between 11-18, but people of all ages can be affected. Furthermore, both genders have an equal chance of developing bipolar disorder (15) and environmental factors have not been proven to contribute to the condition.

Yet another source claims that another type of brain oscillation is involved in bipolar disorder: A. Özerdem et al (20) investigated the long distance gamma waves, which are critical for long distance synchronisation, that could be linked to the diseases. These waves are linked to recalling memories and storing them in the brain, but occurs during working memory and learning (21) It said that there was a delay in the associated cyclic oscillation (22) between two locations in the structure of the brain (bilateral prefrontal and parieto-occipital cortex) and what we are aware of the memory and attention in bipolar disorder. In the conclusion, it remained uncertain whether gamma oscillations regulated the activities of the brain. However, it raised a useful question (23), which means it can still be taken into consideration.

Bipolar disorder, for example, is connected with the beta activity. It occurs in the premotor cortical areas B (24) in the neocortex or the thalamus (12). Theta tracks the activity in the brain's venous sinuses (26). In recent years there have been effective treatment methods in the oscillatory activity which ranges from 100 - 500 Hz, patients with this neurological disorder have higher frequencies the brain's venous sinuses (26). It said that was affected which can determine the type and length of the seizure varies as every person is different; some may experience a trance-like state, others feel no awareness at all (27). Bipolar disorder is a mental illness that affects the abnormal electrical activity and the specific area of the brain that was affected which can determine the type and length of the seizure (24).

The possible causes of epilepsy are congenital abnormalities in the brain (abnormal development), lack of oxygen during birth, infections such as meningitis, brain tumours or cerebral thrombosis (25) this occurs when a blood clot forms in one of the brain's venous sinuses (26).

Patients with this neurological disorder have higher frequencies in the oscillatory activity which ranges from 100 - 500 Hz, which was recorded using depth microelectrodes (27). This puts the oscillation frequency on a very fast level, above the average, normal gamma oscillation of 30-100 Hz (Figure 3). In research there have been effective treatment methods that have been proven to help with the disorders. For epilepsy, antiepileptic medicines would be given to stabilise electrical activities in the brain. Helping it prevent the overstimulation of nerves, which is the cause of fits or seizures (27). Anticonvulsant drugs are also prescribed by doctors and control about 70% of seizures (27). However, sometimes patients who are advised to resort to surgery to remove a part of their brain that is causing the seizures, but only if it occurs in an area that would not result in permanent damage or a disability (28).

On the other hand, bipolar disorder has three main classes for treatment: mood stabilisers, antipsychotics and antidepressants - the latter being something that is rather controversial in its effectiveness for the condition (29). Psychotherapy is also involved along with the medication the doctor provides, which would typically be Depakote (lithium carbonate); as it is the most widely used class of treatment for this disorder (29). This is categorized as a mood stabiliser. Yet in spite of it being effective at reducing mania, the doctors still have no certain answer on how it works, but continue using it as it has prevented a relapse in depression. Therefore, it leaves out the mood swings on both sides of bipolar disorder by affecting the chemical signals in the brain and making the cells communicate better (30). Unlike epilepsy, it cannot remove a part of your brain as a cure since it takes place in the main regions like the medial prefrontal cortex (29).

The importance of brain oscillations are becoming increasingly evident, especially for cognitive processes (30). The two disorders differ in the rate of the oscillation frequencies they both only concern the gamma oscillation. By being able to perform these waves in particular parts of the brain, such as the mesial temporal lobe where oscillations were identified near the time of seizure in epileptic patients, the better understanding can be applied to prevent further abnormal brain activities from taking place. Due to the brain oscillations role in neuromodulation and present not to be able to learn more about this topic in order to be able to gain better knowledge about how to close it (31). Long-term wrong in the brain so doctors can create a definite cure. This would hopefully allow patients to have the rest of their lives free from these disorders, relieved of stress and being able to lead a normal, healthy life.

References:
2. A. Özerdem, V.S. Yalcinkaya, Clinical and experimental evidence for the association... J Neurophysiol, [25 July 2017]
4. Cerebral Venous Sinus Thrombosis (CVST) | Johns Hopkins Medicine..., www.hopkinsmedicine.org ›... › PubMed Central (PMC), [3 July 2017]
11. Types of Brain Oscillations and Their Frequency Range - Google Images, [8 July 2017]
12. https://www.bbc.co.uk >...> OCR 21C Additional Science (Pre-2011) > Brain and mind, [27 June 2017]
18. Photo via Aneeq Ahmad/HSU, Abnormal brain chemistry in PET scans signaling bipolar disorder, sciencedirect.com/science/article/pii/S2213158213000909, [27 June 2017]
20. A. Özerdem et al, Investigating the long distance gamma waves, which are critical... PLoS Biology, journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1001045, [25 July 2017]
23. Types of Brain Oscillations and Their Frequency Range - Google Images, [8 July 2017]
24. Episode of Brain Oscillations and Their Frequency Range - Google Images, [8 July 2017]
26. Types of Brain Oscillations and Their Frequency Range - Google Images, [8 July 2017]
Another positive reflection on animal models’ influence on the understanding of human learning comes from research focused on caffeine’s effect on rats facing the Morris Water Maze Test (6). The research concluded that caffeine enhances memory performance during their non-optimal time of day.

Influencing our understanding of human learning, the study shows the effect caffeine has on memory retention and acquisition is no less pronounced in humans. Animal models have had a positive influence on our understanding in this area because it would have been unethical to conduct this exact experiment with humans. Yes, there are many variations one could use with humans as alternatives, but the water provides a physical, unmitigated benefit.

Again, the question arises: what if there were no need to test on animals, what if these models could have been replaced by humans? Animals prove a quicker and more efficient test bed for studying the effects of different substances on learning and memory, as demonstrated in the vast research into caffeine’s effect on learning. By analysing the effect of caffeine, we can see it’s outcomes on memory. Nonetheless we would not be able to make a precise determination if this effects use on animals models. It allows experiments to be operated without the inconvenience of humans, thus reducing the participant’s fundamental rights- undeniable a positive influence and a great method of sparing time. As a result, we can see how animal models of learning have improved our understanding of learning and memory performance during their non-optimal time of day.

In conclusion, I believe that the use of animals in scientific research has furthered our understanding of the pharmacological processes of learning and the effects different substances have on our memory. I am of this state of mind because the majority of experiments and animal models have been used to discover the effects of caffeine on human learning.

Regarding arguments that humans could be used as alternatives to animal models and that it would have a positive effect on our developing understanding, I disagree. There are many advantages on using animals as learning models; such as the efficiency of the tests and the time (and paperwork) spared (8). Also, there is currently no need to pay animals for their use in experiments- merely the costs to buy or breed them - which proves inexpensive (8). Therefore, animal models of learning have influenced our understanding of human learning positively; providing a truth (‘Suggestions with scientific authentication’) amidst rumours regarding caffeine’s effect on learning and memory.

References:
1. Animal research: The bigger picture and why we need psychologists to speak up: Allyson J.
2. Violence: The world’s most popular drug: Nicola Talbot, Cymbera Grober; March 2016
3. How animals help us to understand our brains: Camilla Graham-Campbell, Louisa Howard, Louise Thomas; Psychology today
4. Why do medical researchers use animals?: Why don’t they just use humans instead?: Life Vantage: February 2017
8. Why do medical researchers use animals? : Why don’t they just use humans instead?: Life Vantage: February 2017
9. Drinking coffee improves memory in rats facing the Morris Water Maze Test (14). The study conducted on students aged 18-21, whom were divided into two groups. One group drank caffeinated coffee whilst the other drank decaffeinated coffee (14). The experiment was conducted twice; once, early morning and once in the afternoon. The study stated that in the morning experiment, the participants who drank caffeinated coffee were shown to have increased memory performance for comparisons made between young rats (14). As quoted from the study’s participants in the caffeinated group performed significantly better than the group who drank decaffeinated coffe (14). However, in contrast to the morning testing session, caffeine did not influence memory performance of students in the afternoon test (14). The study showed that the results of the memory test across time of day, and concluded caffeine only improved memory performance during their non-optimal time of day (14). The study also tested whether participants who drank coffee before the test or after (15). The study found that participants who drank coffee before taking the study’s test or after (15). The study found that caffeine had no significant effects on cognitive, learning, and memory performance (15). The lack of significant differences in memory performance between to-moderate users of caffeine performed better at a certain memory task (recalling words) than lower users, particularly at night (14). It is possible that the caffeine caffeine used in this study. The results -being valid and reliable- were merely taken from human-only tests. This disproves many claims that caffeine is not safe. The use of animals is vital in science and research.

I believe that animal models of learning are more reliable than human models of learning. I think this because animals share 98% of their DNA with humans, which is identical and so is their intelligence. Humans are biased by personal opinions and beliefs, animals are not. A weakness in animal models of learning is the possibility that the study, the possibility that the difference in memory performance and learning was affected by the participants’ beings to avoid the use of a benefit of caffeine, rather than the caffeine itself (15).

Briefly, the effect of caffeine on human learning is suggested to vary depending on which learning task is conducted. It does not fully assist learning but consolidates memories – when consumed after learning (4). Caffeine has its greatest influence on memory retrieval of non-optimal time of day. In the like of some studies, caffeine is given 30 minutes before a memory task, and the participants are then tested 30 minutes after, which is when the test is conducted.
to be able to solve two large problems of nuclear power: the large amounts of nuclear waste generated by Gen 2 and Gen 3 reactors, as well as the fact that instead of the nuclear waste being taken directly from the power plant, it will only last radioactive for a few centuries. This is due to the fact that the majority of Gen 4 designs are able to reuse old reprocessed nuclear waste and when given fresh fuel rods (either Uranium or Thorium) almost all of the fissile material is used, making it a more efficient and less hazardous waste that is currently in service today [7].

Many fear another Chernobyl-level accident in the coming years. Large environmental groups such as Greenpeace, warn that nuclear power is ‘inherently dangerous’, that ‘safeties are just accidents – the release of large quantities of deadly radiation into environment’ and that during normal operation, radioactive elements are released into the atmosphere. Firstly, they state that the points which state that nuclear power is dangerous and not safe are factually correct and backed up by evidence.

There have been three major and well-known nuclear accidents; these are Three Mile Island, Chernobyl and Fukushima. In 1979, one of the reactors located in Pennsylvania was used, which showed that the cooling intakes were not as efficient as needed. This means that the majority of Gen 4 designs were able to use more fresh water to cool the reactor, making Gen 4 reactors more efficient. Also, Gen 4 reactors are able to be made more resistant to radioactive power with it. Nuclear is one of the safest forms of energy, we possess with less deaths per kWh than any other source currently used by today’s society. The amount that nuclear power is used for power generation should increase not only to drastically increase the supply of power but to make power generation even safer than it already is and the longer that we use nuclear power, the more we learn and the more efficient and safe it can become.

There has also been a lot of worry about suspected increased in cancer rates which came under public spotlight in 2016 after it was published which showed that the cooling intakes in, the reactors are designed to let in fresh water and not to let out contaminated water. This means that the majority of Gen 4 designs are able to reuse old reprocessed nuclear waste and when given fresh fuel rods (either Uranium or Thorium) almost all of the fissile material is used, making it a more efficient and less hazardous waste that is currently in service today [7].

While researching this topic, multiple biases were found. Most of them were against nuclear power and most of the sites that had this bias were either using false data or, more commonly, only showing the data that supports their argument. An example of this would be that some environmental groups as well as shock media sites claiming that it was satellite imagery that showed that the reactors were released into the ocean by the Fukushima disaster [13], while in fact it was proven through the use of satellite images released after a tsunami by NOAA (It is even measured in cm while radiation levels are measured in sieverts).

Another of the points, which states that during normal reactor accident procedures, all of the reactors accident management radiologically contaminated materials are transported to a central facility fuelling the anti-nuclear lobbyists [16], which are active have plans to be phased out by sometime in the 2050’s. Well done, A. – keep it up.'

Adaptive immunity is the branch of the immune system which protects the body from disease and pathogens. The immune system can be split into two parts, innate immunity and adaptive immunity. The innate immune system consists of physical barriers such as skin, which are the first line of defence, and reactions like producing tears or mucus. The skin physically stops any pathogens from entering the body. Another is natural killer cells which reside in tissues, and upon detecting a foreign body they can destroy pathogens from entering the body, meaning they must travel through broken skin or other entrances such as the mouth. Tears and mucus both contain an enzyme called lysozyme which destroys bacterial cell walls. This is the first step to fighting the threat. Neutrophils are granulocytes, meaning they contain and produce granules. A granule is a small vesicle containing cytotoxic proteins which can destroy cells under certain conditions. Neutrophils can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.

Adaptive immunity is the branch of the immune system comprising of components that specifically adapt to stop pathogens. When a pathogen enters the body for the first time, there will be a short delay – specific markers to distinguish cells – on its surface. Two types of lymphocyte, a type of leukocyte, will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. Each lymphocyte will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. These lymphocytes can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.

Understanding The Relationship Between Inflammation And Disease: The Role Of Inflammation In Rheumatoid Arthritis

Rheumatoid arthritis is an autoimmune disease which causes a loss of movement, pain and swelling in the joints – typically hands and feet. It is caused when the immune system mistakenly targets the body with antibodies against the joints. This causes the synovium, a thin layer of cells that cover the joint so the bones do not rub against each other, to become inflamed, causing damage or erosion bone, ligaments and tendons. This results in pain and stiffness. Inflammation plays a key part in rheumatoid arthritis, inflammation can lead to cartilage and bone erosion. Rheumatoid arthritis does not have a known specific cause, but there are risk factors including age, weight, and genetics. Rheumatoid arthritis can not be cured as such, but through multiple ways to ease its symptoms and provide more comfort for the ill person. These include disease-modifying anti-rheumatic drugs (DMARDs) and other biological treatments (NHS, 2016). People are also encouraged to try and minimize the risk factors mentioned earlier where possible. This essay will explain the symptoms of rheumatoid arthritis and how they relate to the immune system.

Inflammation and the Immune System

In order to understand rheumatoid arthritis, it is important to understand the immune system. The immune system is the part of the body which protects it from disease and pathogens. The immune system can be split into two parts, innate immunity and adaptive immunity.

The innate immune system consists of physical barriers such as skin, which are the first line of defence, and reactions like producing tears or mucus. The skin physically stops any pathogens from entering the body. Another is natural killer cells which reside in tissues, and upon detecting a foreign body they can destroy pathogens from entering the body, meaning they must travel through broken skin or other entrances such as the mouth. Tears and mucus both contain an enzyme called lysozyme which destroys bacterial cell walls. This is the first step to fighting the threat. Neutrophils are granulocytes, meaning they contain and produce granules. A granule is a small vesicle containing cytotoxic proteins which can destroy cells under certain conditions. Neutrophils can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.

Adaptive immunity is the branch of the immune system comprising of components that specifically adapt to stop pathogens. When a pathogen enters the body for the first time, there will be a short delay – specific markers to distinguish cells – on its surface. Two types of lymphocyte, a type of leukocyte, will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. Each lymphocyte will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. These lymphocytes can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.

Adaptive immunity is the branch of the immune system comprising of components that specifically adapt to stop pathogens. When a pathogen enters the body for the first time, there will be a short delay – specific markers to distinguish cells – on its surface. Two types of lymphocyte, a type of leukocyte, will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. Each lymphocyte will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. These lymphocytes can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.

Adaptive immunity is the branch of the immune system comprising of components that specifically adapt to stop pathogens. When a pathogen enters the body for the first time, there will be a short delay – specific markers to distinguish cells – on its surface. Two types of lymphocyte, a type of leukocyte, will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. Each lymphocyte will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. These lymphocytes can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.

Adaptive immunity is the branch of the immune system comprising of components that specifically adapt to stop pathogens. When a pathogen enters the body for the first time, there will be a short delay – specific markers to distinguish cells – on its surface. Two types of lymphocyte, a type of leukocyte, will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. Each lymphocyte will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. These lymphocytes can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.

Adaptive immunity is the branch of the immune system comprising of components that specifically adapt to stop pathogens. When a pathogen enters the body for the first time, there will be a short delay – specific markers to distinguish cells – on its surface. Two types of lymphocyte, a type of leukocyte, will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. Each lymphocyte will make use of these B and T lymphocytes, which correspond to the B and T lymphocytes. These lymphocytes can be triggered either by spontaneous apoptosis or death - and upon detecting a hostile cell the neutrophil releases the granule, spreading these proteins into the bacteria, killing the threat.
delivering cytotoxic proteins via tubes known as microtubers.

This specific targeting ensures there is no collateral damage of other cells. During this whole process, cells which are adapted to other targets release cytotoxic proteins and the body will have slowly proliferated, ensuring there are enough of them to effectively neutralise the threat. After this threat is gone, some of the leucocytes in the body will undergo apoptosis. This means that next time the same pathogen invades the body, the body can defend itself much quicker as all the cells will need to do is reproduce and proliferate.

This differs to the immune system because there are certain cells specifically adapted with certain pathogens, which deliver a more targeted, albeit slower, response.

Pathogenesis

Rheumatoid arthritis is caused when cells mistakenly attack the body, specifically the area around joints. Cells such as lymphocytes and macrophages perceive the body as something to be attacked. The synovium, or synovial membrane, surrounds and encases a viscous white fluid called synovial fluid. This synovial fluid is produced by the synovial tissue and helps nourish the joint. This synovial fluid is produced by the synovial tissue and helps nourish the joint.

Inflammation

This differs to the innate immune system because there are certain cells specifically adapted with certain pathogens, which deliver a more targeted, albeit slower, response.

A key feature of the synovial tissue’s inflammation is that when macrophages are harvested in it, they can potentially change shape and cell signalling the growth of osteoclasts (Schoett, 2007). Osteoclasts are bone cells which break down and erode bones into minerals. This ensures the transfer of calcium into blood. While osteoclasts are important, too many osteoclasts compound bone damage and can be severely harmful.

In addition, B cells, which will also gather at the inflamed site, contribute to the number of leucocytes gathered by releasing the signalling molecule called RANKL. RANKL promotes the degradation of bones through osteoclast production, and while B cells are useful in maintaining protective immunity, the danger of RANKL means they are also a key part of the illness (Kintie Saltzmann, 2016).

B cells also produce chemokines and cytokines which contribute to rheumatoid arthritis. Although the creation of new blood vessels – is important in rheumatoid arthritis because it sustains the pannus (EM, 2004). A pannus is a growth of tissue with weak cell walls such as rheumatoid arthritis. In rheumatoid arthritis specifically, the pannus forms from the synovium, and can grow and spread (EM, 2004). This is a result of the inflammatory response and prevents the growth of bone, making B cells more important.

Treatments

There is no true cure for rheumatoid arthritis, many treatments exist to ease or lighten the pain and symptoms of sufferers. Probably the most common of these are DMARDs and corticosteroids, however both are one of the more common DMARDs. It reduces inflammation in the body through it is not known exactly how it works (EM, 2004). This reduction means that the impact of rheumatoid arthritis in affected joints will be lessened, changing the way the immune response is responsible for it can have a negative effect on the immune system’s effectiveness.

If methotrexate is not sufficient, it may be taken in combination with a biological treatment or another DMARD such as leflunomide, leflunomide. As with methotrexate, this has potential side effects due to its suppression of the immune system.

Biological treatments are also a possibility. These are a newer type of treatment, and are injected only if DMARDs are ineffective on their own (NH, 2016). They include infliximab, which affects a cytokine produced mainly by the T cells known as TNF alpha (Mans & Feldman, 2004). This particular cytokine makes it easier for inflammation to happen, for example in vascular cells it promotes inflammation and makes the adhesion of leucocytes easier (Bradley, 2008). Inhibiting the production of TNF alpha reduces some of the severity of inflammatory diseases such as rheumatoid arthritis.

Another biological treatment is rituximab, which lowers the amount of B cells. As established earlier, B cells contribute to rheumatoid arthritis through angiogenesis and osteoclast production. Lowering the amount of B cells therefore lowers bone damage, among other things.

As mentioned earlier, the female hormones oestrogen and progesterone may have a protective effect on rheumatoid arthritis. Some research shows that women who undergo HRT (hormone replacement therapy) to increase these hormones reported that the frequency of their rheumatoid arthritis seemed lower (Ciino, 2016). However, when rheumatoid arthritis did happen, it is possible these hormones worsened the severity.

Conclusion

This clearly shows how inflammation plays a key role in the pathogenesis and sustainment of rheumatoid arthritis. The inflammation itself creates pain, swelling and contributes to loss of function, while the nature of inflammation means that cytokine producing cells like B cells or macrophages will gather at the affected joint, creating more problems, for example osteoclasts. The example of rheumatoid arthritis shows the importance of inflammation in many diseases, and, despite its protective nature, the extent to which it can be damaging to our own body.

Bibliography


Chandrasoma, n.d.). The purpose of inflammation overall is to act as an emergency response to a threat, and quickly remove or disable the pathogen.


Can We Predict The Course Of A Brain Disease? Year 10, Key Stage 4

M. Klitoswa, English Martyrs School, Leicester. Supervised by M. Clarke, University of Nottingham.

The aim of this article is to determine the whether future course of Multiple Sclerosis (MS) can be predicted in patients. Specifically, it will investigate how accurately the current treatment plans and determine whether the MS of the patient will develop or remain stable.

What is Multiple Sclerosis?

MS is a brain disease that affects 2 million people worldwide, mainly young women (De Stefano et al, 2014). It is the most common cause of neurological disease in young adults. MS occurs in the central nervous system, when the myelin, a protective layer in nerves, becomes damaged. A neuron consists of dendrites and cell body (soma) which send and receive signals to and from the cell. The signal has to ‘jump’ over it. Therefore, myelin speeds up nerve impulses, while protecting the axon.

In MS, the immune system begins to turn on the body and attack down myelin, which is the white covering of nerves. This causes the nerve cells to get damaged, exposing the axons (these may become damaged too), and forming brain lesions. This process is called demyelination.

In MS, only the myelin in the central nervous system is damaged – diseased nerves in the peripheral nervous system remains healthy. This occurs because Schwann cells produce myelin for the peripheral nervous system, whereas myelin in the central nervous system is supplied by oligodendrocytes.

MS comes with many symptoms, depending on where the brain lesions are located. Symptoms range from balance problems to weakness and blindness. MS can also cause cognitive impairment where the patient may have issues with thinking, learning and planning. Also, it has been found that 50% of people with MS develop depression, allegedly due to threats and losses that follow, living with an unpredictable and disabling disease (Patten et al, 2017).

What are Brain Lesions?

Brain lesions form in areas of demyelination. These could be described as scars in the brain as multiple sclerosis means ‘many scarring’ or ‘many scars’. In MS, these scars appear over time, however others may stay or grow larger.

Brain lesions can be detected using an MRI (magnetic resonance imaging) scan. An MRI scan uses strong magnetic fields and powerful magnets to create a detailed image of the body. In order to see clearly, a contrast agent is injected into the patient; it will most often be gadolinium-based. New lesions can be detected using gadolinium as they appear very bright.
Brain atrophy has been found to occur in patients early on in MS with CIS. However, some reports suggest that the rate of atrophy can vary throughout the course of the disease. A study found that patients with greater brain atrophy showed a larger progression of disability than those who had less brain atrophy. However, the rate of atrophy is also influenced by the type and location of lesions. A cross-sectional study found that patients with a higher lesion load and rate of brain atrophy in a patient, the worse their illness will be in the future. If doctors use this information to predict the course of MS in an individual, they could offer more personalised treatment depending on how severe their illness develops. The best model to predict the course of MS this way. As previously stated, different MRI scanners may present different results. Therefore, in order to ensure results are more accurate I would suggest scanners to be standardised. If all hospitals used the same type and same quality scanner, all scans would be the same, reducing the risk of inaccurate treatments.

Can the Course of MS be Predicted?

The future of a patient's disease can be estimated by looking at the number and type of lesions they have at the beginning of the disease. The course of brain atrophy on a disease progression may vary at 1 year, it can predict disability progression over 10 and 13 years. A correlation between brain atrophy and intellectual damage suggests early brain atrophy can predict long term mental changes (Smith et al., 2010).

The brain is made up of the centre (white matter) which is the axon, and the grey matter, which consist of folded bulges called gyri that create dips called sulci. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation. The release of pro-inflammatory substances causes demyelination and then further axonal damage will lead to neuronal loss. The axon's myelin sheath is white in colour, while the axon itself is grey. The cortex contains the soma of the neuron and it consists of folded bulges called gyri that create dips called sulci. The ventricles and sulci expand and the gyri get thinner. The brain atrophy process is preceded by neuroinflammation.
inflammatory drugs can be used to reduce the inflammation of the joints, hence reducing the swelling and pain as the joints are less sensitive. If the swelling of the synovium has been reduced, pain at the affected joint will also reduce. However, this produces that damage nearby bones and cartilage will also be reduced, overall. This means there will be less damage to the body and the patient will feel less pain. Because, if there is less damage being done to the body, the brain will receive less pain signals from the body. An example of this is NSAIDs (Nonsteroidal Anti-Inflammatory Drugs) which reduce inflammation and pain. Other drugs that also reduce pain and inflammation are easy to obtain over the counter are ibuprofen and naproxen sodium. The side effects of using these drugs include ringing in ears, stomach pain, and internal bleeding. Another potential way to stop rheumatoid arthritis is stopping the immune system from producing inflammatory healthy tissues. This would stop the damage being done to the joints, which would allow the patient to move and stop the pain as the immune system is no longer producing inflammatory substances. Other drugs such as DMARDs (Disease-Modifying Antirheumatic Drugs) are used as an attempt to prevent the damage to the body from continuing. For some sufferers of rheumatoid arthritis, the diagnosis has been made; that the condition is due to a fault in a gene. This means that also doesn't cure the condition and only allows the patient to control the sodium channels can reduce the pain the patient is feeling greatly, examples such as lidocaine block voltage-gated sodium channels, meaning fewer electrical impulses are sent to the brain and the patient feels less pain overall (9). To treat or handle the condition, local measures can be taken by cooling or increasing the temperature of the extremity by putting it in warm or cool water as this can relieve pain, aches and swelling and reduces inflammation, but it also doesn’t cure the condition and only allows the patient to endure it.

Chronic pain can be caused by many factors, such as rheumatoid arthritis and erythromelalgia. Due to these diseases, patients are in pain consistently, in many cases, for years. By understanding these pain mechanisms, we have had the possibility to eradicate chronic pain, the sodium channels must be blocked as the pain is due to the sodium channels firing at an abnormally fast rate. From this, it becomes clear that the sufferers of the disease endure. Simply curing the disease is not enough as the patient will still feel pain after stopping treatment from it. In other words, most of the time and for some time, the pain may be mild for many years and progress slowly but gradually, but in some cases it can be sudden, very painful and continue to get worse quickly. If one of the above-mentioned conditions does not improve, the actual cause of erythromelalgia isn't known completely, but an assumption has been made that it is due to the malfunction of constricting the sodium channels, which causes blood vessels causing abnormal blood flow. However, for some people who suffer from erythromelalgia, it is due to a mutation in a gene that means this can be inherited and run in families. Through the study of families that have suffered from this condition, a further discovery has been made that the disease is due to a mutation in the sodium channels Nav1.7 where responses to stimul have been exaggerated in mutated channels and impulses have been sent to the brain, causing severe sensations. This would cause chronic pain as sodium channels have been mutated and release impulses randomly at high frequencies for long periods of time, although it may only be a reaction to a small stimulus. Due to the lack of clarity surrounding the cause of the condition, it is unclear if it is primary or secondary to an unknown or underlying disorder (7).

To diagnose erythromelalgia the patient can take pictures of their feet or the part of the body that suffers from an episode as the skin can turn red due to the skin being tender and the skin can become discoloured and turn purple. These signs will allow the doctor to know if the patient has the condition, but it will not measure the amount of pain the person is in. Erythromelalgia can also be diagnosed by putting the patient’s feet or hands in warm water to see what happens. People with this condition, who feel pain regularly, feel temperature changed or soothed when their foot or hand is in warm water. Doctors can also find out how much pain they are in by asking if the water completely or partially removes the pain from their skin. The problem with this diagnosis is that it is subjective and depends on the patient’s age or lifestyle meaning that it may not be accurate to ask a patient how much pain is soothed by putting their foot or hand in warm water. A test which is used to find out if the erythromelalgia is caused by an underlying condition is putting lidocaine block voltage-gated sodium channels. A common method of diagnosis also doesn’t account for the patient’s pain (8).

For some patients, where erythromelalgia is caused by a primary disease, treating the original one can relieve the patient of the condition. However, with other patients where erythromelalgia is caused by a primary disease, treating the original one will not relieve the symptoms and pain. Therefore, to ensure that the sufferer of erythromelalgia is not the section consisting of the crust and the upper mantle. However, the layers are not entirely separate. The lithosphere is the thin crust and the upper mantle, which is segmented into solid and can be either oceanic or continental (displayed in figure 3). Lastly, enveloping the mantle is the thin crust; this layer is solid and can be either oceanic or continental (displayed in figure 4). The outer core is a liquid sphere and is made up of iron and nickel. Within the core, there is a solid inner core which is made up of iron, nickel and some heavy metals. The inner core likely to be solid due to the high pressure and temperature within the core. The outer core is liquid due to the lower pressure and temperature. The Earth has a magnetic field which is created by the motion of the molten iron in the outer core. This magnetic field protects the Earth from solar and cosmic radiation. The Earth’s magnetic field is constantly changing, which can affect the behavior of currents, such as the Gulf Stream, which is a warm ocean current that flows from the Caribbean Sea to the North Pole. The movement of the Earth’s magnetic field can also affect the behavior of animals, such as birds, which use the Earth’s magnetic field to navigate. The Earth’s magnetic field is also used by humans, such as in the operation of a wind turbine, which converts the kinetic energy of the wind into electrical energy. Additionally, the Earth’s magnetic field is used in the operation of a magnetometer, which is a device used to measure the strength and direction of a magnetic field. The Earth’s magnetic field is also used in the operation of a seismometer, which is a device used to measure the intensity and duration of earthquakes. The Earth’s magnetic field is also used in the operation of a gyroscope, which is a device used to measure the orientation and angular velocity of an object. The Earth’s magnetic field is also used in the operation of a compass, which is a device used to determine the direction of a magnetic field.
good example of this boundary is the San Andreas Fault, which will be described in depth later.

Lastly, the collision plate boundary occurs between two continental plates that are being pushed together. This causes immense amounts of pressure to build up between the plates. The hanging wall block then moves down due to the pressure, deforming due to the ductile nature. As seen in figure 5, huge mountains are formed because the plates crumple and deform under the pressure. Lots of folding is included, in which the ductile plates change shape but do not break (Strachan, 2017).

Faulting:
Plate margins occur between tectonic plates that have formed due to convection currents. These plate boundaries have resulted in further deformation of the Earth’s crust, which is known as faulting. Faulting can occur in three main types: normal faulting, reverse faulting and strike-slip faulting (Strachan, 2017).

Normal faulting is the extension of the crust in a given region and happens with constructive plate boundaries. When the two tectonic plates pull apart (like in figure 4), magma that was settled underneath rises and then cools along the margin. This causes the crust to extend and thin out further.

As the plates pull apart, a block descends to form a hanging wall block while the upper block is called the footwall block. The footwall block therefore descends underneath the hanging wall block. This kind of faulting can also lead to rocks being displaced and dragged further down into the earth.

Reverse faulting usually takes place with destructive plate boundaries. When the two tectonic plates pull apart (like in figure 4), magma that was settled underneath rises and then cools along the margin. The friction and pressure from the boundaries produces a reverse fault. In a collision plate boundary, two tectonic plates are pushed together and compressed, which causes a block to be forced upwards and forms the hanging wall block.

The footwall block therefore descends underneath the hanging wall block. Copper is mainly found in reverse faults due to their association with destructive margins. The movement of the hanging wall block causes layers of rocks to be dragged upwards, resulting in the plate boundaries. These rocks may contain ore, in particular, copper. The action of raising the rocks to the surface then enables the copper to be more visible, and therefore easier to extract.

Lastly, strike-slip faulting is the result of two blocks moving past each other in a horizontal movement. This type of faulting often takes place at conservative plate boundaries and can cause features of the landscape (such as rivers) to be displaced. Figure 6 displays right-lateral strike-slip faulting; however left-lateral strike-slip faulting can also happen. Whether the strike-slip faulting is defined as left-lateral or right-lateral depends on the movement of the hanging wall block. If the landscape has seemed to move to the right, then it is defined as a right-lateral strike-slip. Similarly, if it has seemed to move to the left, then it is concluded as a left-lateral strike-slip (Amherst, 2017).

A well known strike-slip fault is the San Andreas Fault which occurred between the North American plate and the Pacific plate. The strike-slip was concluded as a right-lateral strike-slip fault as the North American plate and Pacific plate slid past each other. The fault has been identified as 800 miles long and runs through California, Hill, Taylor, Herdson, & Sherlock, 2007 (Lynch, 2005–2017).

Porphyry Copper Deposits:
Copper follows destructive plate margins, particularly in Chile and the west region of North America. Destructive plate boundaries result in plutons (magma chambers) that form under volcanoes. The plutons provide the fluid that seeps through the rocks to form the deposits. These rocks often contain crystals, some larger than others depending on the conditions and duration of the cooling process. These porphyries are then pushed up by the movement of plate tectonics, folding and reverse faulting. As the plates move towards each other reverse faulting takes place where rocks previously buried are now exposed and the ore deposits are shifted upwards to the surface (Australia, 2016). We can then identify these crystals and extract the commodities required from them.

Many copper deposits can be found in the areas highlighted on the map in figure 10, the destructive plate boundaries are shown as red, this is where copper is primarily found within reverse faults. The figure above displays the destructive plate boundaries in red. The margins are quite prominent in South America (Chile in particular). They are also found in large quantities near Asia; however they are less easily accessible due to their position in the ocean. Therefore, proposing to investigate South America for its copper resources would be the most appropriate and easily accessible region for this project.

Discussion:
Escondida in Chile has the largest resource of copper in the world; therefore Collahuasi in Chile would have a good amount of extractable copper available, however it has been reported that the copper is of lower grade, meaning that it would be more beneficial to look elsewhere (Barrera, 2017).

An overview on the copper deposits found in Peru proved to be relevant to our expedition in Chile (Laverdure, 2016). North of Chile, the mining industry in Peru is described as successful because of the large quantities of minerals available for extraction. The geological setting for Peru is quite similar to that of Chile, meaning that Peru will potentially contain enough valuable resources worth investigating. Many sources prove that this region of the earth is abundant in copper deposits, and as a result would be the smartest place to explore.

Primarily, exploring Chile seemed like the optimum proposal because of its history of having successful copper mines. However, recently Chile’s copper industry has been facing some drawbacks that will affect business and further trades. These include strikes by workers due to disagreement between them and the contractors of the mine. Also, heavy rains have disrupted the mining processes (Yeomans, 2017) (Cambero, 2017). Due to these factors, it would be wiser to invest in the land found in Peru. It is worth noticing that the Peruvian government is welcoming investment into copper by foreign companies. Peru is believed to have around 200 mines currently operating, which shows to be promising to new investors (Laverdure, 2016).

Delving further into the map, it is visible that there are many unexplored towns nearby that may contain the resources needed. Towns such as Tacalaya and Quellaveco would be worth exploring. The existing copper mines could be investigated as well to observe any patterns or continuous deposits.

Peru lies between the Nazca tectonic plate and the South American plate, as seen in the figure below. In the region we are going to search in South Peru, the area has been labelled as a central volcanic zone. This further highlights why this area would be suitable to explore. We are more likely to discover porphyry copper deposits in a volcanic zone that has a destructive plate boundary. The plutons under the volcanoes caused by tectonic plate movement will eventually cool to form crystals, some of which will contain copper in the form of ores.
How Do Different Memorisation Techniques Affect Our Ability To Recall Information?

Year 12, Key Stage 5

G. Callaghan, Blessed William Howard Catholic High School, Stafford.
 Supervised by: J. Runacres, Birmingham City University.

Abstract:
This study investigated the effectiveness of three different methods that are used to optimise encoding, each relating upon a different component of the short-term memory to retain the information. The varying use of the three different tests could suggest a distinction between different components of the short-term memory, hence providing support for the model between them and encoding. A repeated measures design was utilised, in which a group of 16 participants, aged 16–19, were asked to undergo three tests using different methods of memorisation: mnemonics, auditory, and visual. The outcome of this research was that the visual method was the most effective in aiding recall, and combining information and is split into four primary types: visual (for images and visual sensory information), auditory (for data that involves hearing and speech), tactile (for information that is previously known to relate to it in the new experience) and semantic (specific meanings of contexts) (Katona, 1940). Contrastingly, the working memory model exhibits this sensory stage as a ‘central executive’ - a supervisory function concerned with managing and filtering attention, as well as processing information to one of the slave systems (Baddeley and Hitch, 1974).

Introduction:
Memory is the capability of an organism to store and then retrieve information. Not all information has been processed through their senses. It is comprised of three main stages: encoding (the processing of new information from sensory stores into the short-term memory); storage (creating a permanent record of information); and retrieval (calling back stored information for use) (Graf and Schacter, 1985).

Over the years, many attempts have been made to conceive a model which explains the cognitive function of the brain, a notable example of one of these attempts is the multi-store model (Atkinson and Shiffrin, 1961). The working memory model fails to describe the cognitive function of the brain. This is an alternative design to combat criticism of the limitations that its predecessor - the multi-store memory model - had, particularly regarding the short-term memory. A working memory model was founded when Baddeley and Hitchcock undertook an experiment in which, using dual task techniques, they discovered what the brain could do better than information at the same time, leading to a more complex description of the functions within the short-term memory. Strikingly, one similarity between the two models is the parallel processing: both models suggest a sequence of stages for memories to be formed. For example, in the multi-store memory model, information is collected at the sensory store and is then transferred to the short-term memory when attention is paid to it and eventually transferred to the long-term store after rehearsal. Similarly in the working memory model, the information is also distributed in a parallel way by the central executive to the slave systems – visuospatial sketchpad that is responsible for visual information; the phonological loop – before being transferred to the long-term store.

Both models have an initial stage at which the information is collected from an organism’s surroundings, yet their explorations of the components are remarkably different. In the multi-store model, the sensory store is the stage where physical and chemical impulses within our environment are transferred to our sensory organs. It is then retained in a duration of between 1/4 and 1/2 second and is encoded in a semantic-sensory form with a limited capacity (although this is difficult to verify as there is no current way of directly measuring the capacity of the human brain) (Atkinson and Shiffrin, 1968). To better understand the working memory model, the central executive controls the primary process, which involves organizing information, and combining information and is split into four primary types: visual (for images and visual sensory information), auditory (for data that involves hearing and speech), tactile (for information that is previously known to relate to it in the new experience) and semantic (specific meanings of contexts) (Katona, 1940). Contrastingly, the working memory model exhibits this sensory stage as a ‘central executive’ - a supervisory function concerned with managing and filtering attention, as well as processing information to one of the slave systems (Baddeley and Hitch, 1974). Furthermore, both the multi-store and the working memory model have a short-term memory facility, nevertheless, one of the differences between them is how this function is presented. Within the multi-store model, the short-term memory is a way of storing information for a brief period, with some retention occurring only for the first 10 seconds (Atkinson and Shiffrin, 1968). This happens when information from the sensory store is attended to and goes beyond the short-term memory. Contrastingly, the short-term memory must be repeatedly verbally, by a method known as rehearsal in acoustic encoding (Baddeley, 2009). The working memory model has also provided insight into the number of items which can be stored at one time can be 7 ± 2 items before replacement occurs (Miller, 1956).

The consensus is that the working memory model is a successful reworking of the multi-store model because the two models have similar methods of how the short-term memory is split up into varying components. These three models are recognized as the fundamental ideas that the central executive to the slave systems – visuospatial sketchpad (provides visual information) and the phonological loop (provides auditory information) – these can then be retrieved when needed (Atkinson and Shiffrin, 1968). Overall, this study aims to provide an insight into which encoding technique is most effective in aiding recall, and discover whether certain methods of retaining information are more effective than others, hence leading to a potential conclusion that some areas of the short-term memory are more vulnerable to the effects of the working memory model’s idea that the short-term memory is split into multiple sections. This research is concerned with the idea that mnemonics, auditory, and visual memory, with images (processed within the visuo–spatial sketchpad) of the short-term memory, fewer words were recalled when using this method of encoding. This indicated that the working memory model is an accurate depiction of memory, as it provided evidence to support the idea that the short-term memory is split into separate components.

Recall Information?

Techniques Affect Our Ability To Recall Information?

Overall, this study aims to provide an insight into which encoding technique is most effective in aiding recall, and discover whether certain methods of retaining information are more effective than others, hence leading to a potential conclusion that some areas of the short-term memory are more vulnerable to the effects of the working memory model’s idea that the short-term memory is split into multiple sections. This research is concerned with the idea that mnemonics, auditory, and visual memory, with images (processed within the visuo–spatial sketchpad) of the short-term memory, fewer words were recalled when using this method of encoding. This indicated that the working memory model is an accurate depiction of memory, as it provided evidence to support the idea that the short-term memory is split into separate components.

Recall Information?

Techniques Affect Our Ability To Recall Information?

Overall, this study aims to provide an insight into which encoding technique is most effective in aiding recall, and discover whether certain methods of retaining information are more effective than others, hence leading to a potential conclusion that some areas of the short-term memory are more vulnerable to the effects of the working memory model’s idea that the short-term memory is split into multiple sections. This research is concerned with the idea that mnemonics, auditory, and visual memory, with images (processed within the visuo–spatial sketchpad) of the short-term memory, fewer words were recalled when using this method of encoding. This indicated that the working memory model is an accurate depiction of memory, as it provided evidence to support the idea that the short-term memory is split into separate components.

Recall Information?

Techniques Affect Our Ability To Recall Information?

Overall, this study aims to provide an insight into which encoding technique is most effective in aiding recall, and discover whether certain methods of retaining information are more effective than others, hence leading to a potential conclusion that some areas of the short-term memory are more vulnerable to the effects of the working memory model’s idea that the short-term memory is split into multiple sections. This research is concerned with the idea that mnemonics, auditory, and visual memory, with images (processed within the visuo–spatial sketchpad) of the short-term memory, fewer words were recalled when using this method of encoding. This indicated that the working memory model is an accurate depiction of memory, as it provided evidence to support the idea that the short-term memory is split into separate components.

Recall Information?

Techniques Affect Our Ability To Recall Information?

Overall, this study aims to provide an insight into which encoding technique is most effective in aiding recall, and discover whether certain methods of retaining information are more effective than others, hence leading to a potential conclusion that some areas of the short-term memory are more vulnerable to the effects of the working memory model’s idea that the short-term memory is split into multiple sections. This research is concerned with the idea that mnemonics, auditory, and visual memory, with images (processed within the visuo–spatial sketchpad) of the short-term memory, fewer words were recalled when using this method of encoding. This indicated that the working memory model is an accurate depiction of memory, as it provided evidence to support the idea that the short-term memory is split into separate components.

Recall Information?

Techniques Affect Our Ability To Recall Information?

Overall, this study aims to provide an insight into which encoding technique is most effective in aiding recall, and discover whether certain methods of retaining information are more effective than others, hence leading to a potential conclusion that some areas of the short-term memory are more vulnerable to the effects of the working memory model’s idea that the short-term memory is split into multiple sections. This research is concerned with the idea that mnemonics, auditory, and visual memory, with images (processed within the visuo–spatial sketchpad) of the short-term memory, fewer words were recalled when using this method of encoding. This indicated that the working memory model is an accurate depiction of memory, as it provided evidence to support the idea that the short-term memory is split into separate components.

Recall Information?

Techniques Affect Our Ability To Recall Information?

Overall, this study aims to provide an insight into which encoding technique is most effective in aiding recall, and discover whether certain methods of retaining information are more effective than others, hence leading to a potential conclusion that some areas of the short-term memory are more vulnerable to the effects of the working memory model’s idea that the short-term memory is split into multiple sections. This research is concerned with the idea that mnemonics, auditory, and visual memory, with images (processed within the visuo–spatial sketchpad) of the short-term memory, fewer words were recalled when using this method of encoding. This indicated that the working memory model is an accurate depiction of memory, as it provided evidence to support the idea that the short-term memory is split into separate components.

Recall Information?

Techniques Affect Our Ability To Recall Information?
different methods that can be used to improve our ability to recall new information.

This topic is a useful area of research because the maximization of the brain’s cognitive function is a vital part in the development and achievement of skills for an individual. Thus, to gain an understanding of the best way in which to encode new information would be beneficial, it would lead to faster ways of retaining new information and be applicable to many areas of everyday life. It will also provide more evidence for the working memory model by showing that the different components of the short-term memory work separately.

Method:
A repeated measures design was used to discover which method of encoding was most effective.

Participants – To complete the research project, 16 participants were selected when the opportunity arose. Both males and females, via opportunity sampling (a method by which participants are selected when the opportunity arises).

Materials – A room free from extraneous confounding variables such as noise, other people, or visual distractions was used to ensure that the participants’ attention was not distracted when completing the study, so the accuracy of the results was not impaired. A timer was used to ensure the same amount of time was allowed per activity that participants undertook.

Sheet 1 – A sheet of paper with 20 random words arranged in two groups of 10 words. The participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly. All participants were informed that they had the right to withdraw at any time. All participants completed a consent form, and were read to the participants three times so that they can hear it clearly.
Alzheimer's Disease

Alzheimer's disease is the most common form of dementia (Alzheimer's Association, 2016), and is a neurodegenerative disease that begins in the hippocampus region of the brain which initially causes memory problems. However, as the disease progresses beyond the hippocampus region, other cognitive functions begin to decline, thus increasing dependency on caregivers. This occurs when cells in the brain called neurons begin to die due to the degeneration of cell structure and function. Amyloid plaques also form between the individual neurones (Koetsch Shoghi–Jadid et al, 2002), causing transmission between cells to become increasingly difficult. Common symptoms of Alzheimer’s include memory loss, changes with planning and problem-solving, and difficulties with completing complex tasks or performing daily activities. Sleep disorders are also common in Alzheimer’s, which can cause more profound problems in the brain such as the frontal lobe, which leads directly to the manifestation of attentional and movement problems.

Dementia with Lewy Bodies

Dementia with Lewy bodies is another form of dementia that affects around 10% of all dementia patients (Alzheimer's Association, 2016). According to McKeith, dementia with Lewy bodies is a very common form of dementia in the UK alone (Ian McKeith, 2015). Symptoms of dementia with Lewy bodies include Parkinsonisms, slowed movement, cognitive fluctuations, hallucinations, and delusions. Parkinsonisms with attention and alertness are very common in patients with this form of dementia, though any such issues are likely to fluctuate throughout the day. Parkinsonisms with attention and alertness are likely to occur before they do so. These results are not subjective, like the aforementioned MMSE, and are therefore more reliably used to predict the progression of the disease.

There are very high misdiagnosis rates in dementia, especially between Alzheimer's and dementia with Lewy bodies. For example, patients who in actually have dementia with Lewy bodies often report subjective symptoms of being Alzheimer’s disease, including but not limited to amyloid plaques of a similar density and distribution, and the fact that their motor symptoms and hallucinations co-exist which are common between multiple forms of dementia. Due to dementia with Lewy bodies’ heterogeneous and complicated nature, there is a high misdiagnosis rate. Furthermore, cognitive fluctuations and visual/auditory hallucinations in dementia with Lewy bodies are more conservative issues, which are more difficult to diagnose due to the short span of time the patient spends with a consultant or doctor, and the doctor’s inability to observe the patient in everyday situations. Correct diagnosis of the dementia subtypes is very important due to the different methods of treatment. There are early diagnostic tools that have been used to test the effects of memory loss from Alzheimer’s but actually worsen the effects of dementia with Lewy bodies (Ian McKeith, 2017). As between the EEG and the earlier the diagnosis, the more likely the patient will survive longer due to the circuitry and the way their condition worsens. In order to track dementia and its subtypes even earlier, research has turned to the link between gait and cognition.

Gait and Cognition

Gait width cannot have been an automatic function, but it is now understood to use complex cognitive processes that work together at once. This essay will use a validated model of gait and cognitive impairment across different forms of dementia. This model is based on a series of studies that have shown that gait and cognitive impairment can affect each other, and that the relationship between cognition and gait, though there are several problems with this, studies have found a high correlation between the two. This is due to the person’s overall health and lifespan but does not provide sufficient answers to the question of which comes first: that is, whether it is a different form of dementia, which then leads to the brain being unable to survive and eventually declines as a different form of dementia. In a study conducted by scientists at Albert Einstein College of Medicine, out of 27,000 people who were to be assessed, 10% had motoric cognitive risk syndrome (MCR) (Alissa Sauer, 2018). The researchers in the study believed that the decline in cognitive performance was a factor in motoric cognitive risk syndrome (MCR). The fact that a large proportion of patients with dementia were found early on that the brain was more than two times more than two times as likely to develop Alzheimer’s disease than those without MCR.

The dual-task paradigm

Gait and cognition have also been linked through the dual-task paradigm. The dual-task paradigm (the DT paradigm, as it is often referred) is the simultaneous execution of two tasks. With regards to research into the link between gait and cognition, these two tasks almost always consist of a walk and a motor task (M. has consistently demonstrated his hard work and dedication in order to alleviate the burden of misdiagnoses and the effects of inaccurate treatment methods including ineffective or inappropriate medicine. The link between gait and cognition is present, characterised largely by the decline in one and other gait domains as the condition of dementia worsens in asymptomatic patients. The link between gait and cognition is very important due to the different methods of treatment. Future studies into dementia should work to expand the literature of the topic, conducting research into other cognitive domains that are rarely tested such as variability and asymmetry.}

Bibliography:

in this paper I will discuss what representations of nature can tell us about the settings found in literature. To illustrate my point of view I will use a variety of texts including Aesop's Fable, The Town Mouse and the Country Mouse, William Wordsworth's Westminster Bridge and the sonnet Spring, by Gerard Manley Hopkins.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.

In Aesop's Fable, The Town Mouse and the Country Mouse, the country is described as 'poor but peaceful, whereas the town is depicted as a glamorous place where mice can live in peace and comfort. However, our individual experiences of cities will vary depending on our age, gender and culture.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.

In Aesop's Fable, The Town Mouse and the Country Mouse, the country is described as 'poor but peaceful, whereas the town is depicted as a glamorous place where mice can live in peace and comfort. However, our individual experiences of cities will vary depending on our age, gender and culture.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.

In Aesop's Fable, The Town Mouse and the Country Mouse, the country is described as 'poor but peaceful, whereas the town is depicted as a glamorous place where mice can live in peace and comfort. However, our individual experiences of cities will vary depending on our age, gender and culture.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.

In Aesop's Fable, The Town Mouse and the Country Mouse, the country is described as 'poor but peaceful, whereas the town is depicted as a glamorous place where mice can live in peace and comfort. However, our individual experiences of cities will vary depending on our age, gender and culture.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.

In Aesop's Fable, The Town Mouse and the Country Mouse, the country is described as 'poor but peaceful, whereas the town is depicted as a glamorous place where mice can live in peace and comfort. However, our individual experiences of cities will vary depending on our age, gender and culture.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.

In Aesop's Fable, The Town Mouse and the Country Mouse, the country is described as 'poor but peaceful, whereas the town is depicted as a glamorous place where mice can live in peace and comfort. However, our individual experiences of cities will vary depending on our age, gender and culture.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.

In Aesop's Fable, The Town Mouse and the Country Mouse, the country is described as 'poor but peaceful, whereas the town is depicted as a glamorous place where mice can live in peace and comfort. However, our individual experiences of cities will vary depending on our age, gender and culture.

The settings found in literature often have many natural aspects to them such as the environment and the weather. Our personality and who we are as a person will affect how we view the literature. For example, travel brochures may describe a place as 'a natural paradise, relaxing and laid back' [1]. For someone who wishes to relax this may be their idea of utopia, but it equally could be dystopia to someone who likes to be busy and adventurous. Settings can be viewed differently by different people; for example, some people may see mountain climbing as a fun and exciting experience if they are an adventurous or athletic person but to someone else this could be frightening; perhaps if they were a timid person or if they had a phobia of heights. As well as settings being influenced by our personality and past experiences, the setting of a text can be influenced by the writer's choice of words. The same setting can be described differently giving the reader an altered perspective.
In this essay, I will be examining and analysing the story Bluebeard using the theory genre studies. Bluebeard is a story which I think has been based on the classic genre, ‘chivalric romance’, but has been revamped to be quite different from this genre. The story Bluebeard is about a ‘powerful’ king from the late middle ages who was Bluebeard due to the gints of blue in his shaggy black beard. He was gifted with good looks and charm but was very cruel when it came to women. This was the sad tale of how he eventually getting remarried as his wives had always fallen ill (or so he always said). The story he is about his old, next wife. Her sense of curiosity and wonder is what landed her in a frightening near death experience. Bluebeard made his inhuman marriage vows to her, but there was a role reversal in the middle of the story. Bluebeard, who I thought exuded moral values and goodness was in fact nothing but a villain. The wife’s literal love for him and the fact that he take his place as the hero of the story, saving the damsel in distress, the king or the prince and the fair maiden meeting and falling in love, it is the wife’s brothers that come to her rescue. It is not the prince who is ‘happily ever after’ you would expect. It even says at the end that it was a ‘sad story’. Yes, good did triumph against evil, however the rest of Bluebeard’s ‘powerful’ wife was still dead. The wife did not meet her knight in shining armor and along with this traumatic experience, the young lady had completely lost all her sense of curiosity. Bluebeard completely defies our expectations by the end of the story, tainting the chivalric code.

Examining the text through genre studies has shown different meanings to the text. Specific elements of the story that show how much the story differs from its genre would have gone unnoticed without this technique. For example, the story starts off by praising Bluebeard, however, it doesn’t continue in this manner. The next part of the story is quite a twist on the simple line by the fairy-tale genre. You must die’ he says to his wife when she comes to the realisation that it was in fact the reason for all the mysterious deaths of events presents Bluebeard in a very negative light, completely contrasting what his character is supposed to be.

When Anna enters the castle, she grieves Bluebeard and says, ‘you seem rather pale’. Bluebeard replies, ‘not at all, we’re quite well,’ which makes me see behind the charade he was trying to pull. Throughout the story there is a sense of the character’s good but there is also a sense of being elusive and unsuspecting when in reality, Bluebeard completely contradicts what we assumed his character was. ‘Nobody found anything but a dead body’ and then his next lines were completely of the story line and the one he was trying to portray. ‘There was something about you, Anna, that was going to happen’. From the very beginning of the story it is quite clear that the telling of the story is very different from this genre. The beginning of the story fits another genre studies, discussing Perrault’s version of the fairytale Bluebeard as an inverted Chivalric Romance. The story Bluebeard itself is essentially about the quest to save Bluebeard’s wife. The knights had, fantastic adventures killing savage monsters to conquer which added to the effect of the story. Chivalric romance itself is essentially about the quest or journey that the hero goes on. Writers usually put emphasis on the sense of excitement and thrill and less on the role of their protagonist. In a chivalric romance, the hero (who is near perfect), a fair maiden in need of rescuing and a villain. The knights had, fantastic adventures killing giants, dragons and ogres to protect their fair maiden. In conclusion, I don’t think that the story Bluebeard fits its genre because of how it is structured. By this, I mean how there was a role reversal between certain characters, making Bluebeard the hero of the story which made the story overall more capturing than any other. This was the reason for this was because of how our expectations of genre structure were completely ignored, and I think Perrault knew this, which is why he thought to take a different route in the story and surprise his audience, which I think worked very efficiently.

References
The Scholastic Programme Handbook
Lawrence, R. (2004). Introduction to Literary Theory. Course was impressive, and her contributions to discussion were always thoughtful and original. Her final piece took a very sophisticated approach to genre studies, discussing Perrault’s version of the fairy-tale Bluebeard as an inverted Chivalric Romance. Congratulations, R!}

PhD Tutor’s comment: This essay was an interesting and detailed piece of work. Bluebeard is a story which was told in the edition in The Scholastic Programme Handbook and this particular one was very interesting. Instead of just describing the story, he or she has managed to argue his or her position on the relevance of Bluebeard’s tale in the modern world. The title, ‘Bluebeard: An essay in the modern world’ is an excellent title. The essay is well-structured and well-argued, giving a coherent and logical flow of ideas. The essay is well-argued, giving a coherent and logical flow of ideas. The essay is well-argued, giving a coherent and logical flow of ideas. The essay is well-argued, giving a coherent and logical flow of ideas. The essay is well-argued, giving a coherent and logical flow of ideas. The essay is well-argued, giving a coherent and logical flow of ideas.
In fact, we can now see the devastating consequences the changing climate brings to both our lives now and our future within our very own community: Greater Manchester. The Guardian reported that the government’s recent estimates predict that extremely wet winters—a result of global warming—could become up to five times more likely over the next 80 years. Meanwhile, the rise of the extreme amounts of precipitation will in turn lead to rising sea levels and the risk of damage to key real estate and infrastructure (The Guardian, 2013). Government figures show that about 330,000 properties are currently under threat of potential flooding, but this could rise to between 330,000 - 1.2 million by 2080 (The Guardian, 2013).

It is important for us to acknowledge that climate change is happening and to understand how our actions contribute towards it. We have a responsibility and moral culpability to protect our planet and do what we can to address its effect on our climate change. The consequence of what we do today is long term, not just for the current generation but those to come; they will have to live through the impact of our actions and the severe impact of climate change on their future. We have a responsibility towards our children and the people living on it, we must act now.

We need to encourage a lifestyle that does not compromise the environment or people living around us. To do this, we need to be aware and develop a way of consumption that will support the long-term future of our planet.

To live sustainably, we need to critique and rethink our current agricultural system and to create a society where community gardens can be a large contributor to the extreme rate of climate change.

Problem Formation: Pesticides, Wasted Land and Food Miles

Crop production on a mass, international scale has led to the extortionate use of pesticides and the massive amounts of food transportation. The demand for food is expected to increase up to 70% (The Guardian, 2011), which will add more pressure onto a system that is already run on huge inputs of carbon and has the largest environmental impact. So how can we supply this growing demand whilst managing the effects of food production and consumption?

Using more land to farm would undoubtedly have serious environmental consequences, not to mention most of the land suitable for agriculture is already in use. Somehow, we must find ways to manage this demand without placing more strain on our environment. This is a huge issue which my initiative aims to help solve.

Also, the recent damaging trend to have exotic foods, not sourced locally within the UK, available all year round has led to a large demand for imported food. As the Guardian reported, now the UK is not self-sufficient in food production, in fact, more than half of our food and feed comes from overseas. Since 1986, as demand for imported produce has increased, CO₂ emissions associated with the production and transportation of food has risen by 5% (the Guardian, 2016), feeding the food miles phenomenon. Finalised for years and over 18km by 2022 (pollutionissues.co.uk, 2017). Our everyday meals have all reached an all-time high in terms of CO₂ emitted which collectively releases an excessive amount of CO₂ into our atmosphere.

Farming in particular, is responsible for emitting significant amounts of CO₂ and other dangerous greenhouse gases. The European Environment Agency has in fact reported that for 10% of the EU’s greenhouse gas emissions (European Environment Agency, 2015). Along with mass importation of produce and inefficient farming techniques, this is a major issue with current agricultural practices is the use of pesticides.

A further study has stated that the recent use of pesticides, antibiotic-resistant bacteria and genetic engineering techniques have damaged the water, soil, wildlife and climate that are essential in our current food production industry (sustainweb.org). Not only do these methods of growing food for our cities not harm our planet's biodiversity or endanger spaces for the local community but also that the cost of producing CO₂ emitted by the food industry and help to tackle climate change. Additionally, locally-run allotments will be easier to organise and in situ the number of pollinators, like bees, are declining at an alarming rate.

We need to quickly re-invent our farming system to protect and conserve our environment. My initiative has been designed to provide an answer to this need. It will help to implement more sustainable methods now, before it’s too late. Urban farming spaces are a great idea to decrease the amount of imported produce, thereby reducing the carbon footprint of CO₂ emitted by the food industry and help to tackle climate change.

My Community: Greater Manchester

I have chosen to base my initiative within the towns of Greater Manchester. I think this would be an ideal place to do so because there are numerous towns that have been heavily industrialised. Greater Manchester is also covered by public sector bodies which would be ideal for urban growing spaces. I think it is important to both utilise these spaces to support sustainable whilst also adding more green spaces to our towns and cities. This will help to tackle some of the most environmentally harmful issues with the food industry, and raise awareness for climate change and encourage local communities to take action.

Evidence: An Article About Communal Allotments

Phillip Adam, in an article published in the Guardian, discusses the benefits of urban farming spaces, such as: “Food from Around the World, Homegrown in New York”. The article explores The United We Stand Community Garden, a community garden that was started with the local community to grow food and provides them with discount access to the weekend markets. To advertise these growing spaces, we will put up posters in local community centers. The weekend markets will also be a chance to involve the community and show that we can live sustainably and contribute to our environment without limiting ourselves and still having fun.

A key issue that my initiative might face is the initial start-up cost for fund raising equipment such as tools and seeds. My solution to fund raising is to engage from grant giving bodies interested in encouraging community cohesion and regeneration schemes.

Conclusion

To conclude, our current food industry needs to become more sustainable. By implementing urban farming areas, we can educate communities on how to become eco-friendly consumers because I believe awareness and education is the first step towards change. We can promote the importance of buying locally sourced and seasonal produce, growing organic crops and using the space within our towns to its full potential. This will collectively reduce our effect on climate change and ensure a healthy lifestyle for future generations if we can help them to minimise their contribution to climate change.

References:

- NASA, ‘Climate change: how do we know?’, https://climate.nasa.gov/evidence/ (17th October 2017)
- Grantham Research Institute and Duncan Clark, ‘What are the potential impacts of climate change for food?’, https://granthamresearch.ac.uk/ (3rd January, 2018)
- The Guardian, ‘Climate change: European Environment Agency; 6th June 2016, Farming system against natural system: convert derelict and underused spaces within our cities and towns into farming spaces to grow fresh, organic crops, which will help to reduce our carbon footprint and consumption count’.
- The Guardian, ‘New York gardens in the South Bronx. The article includes interviews with locals having fun.
- Evidence: An Article About Communal Allotments

began: is a contemporary poem, and the topic

Is Poetry Dead?

The relevance of poetry in modern society is often debated, with some stating it is merely a luxury for the educated upper classes or irrelevant with the advances of the 21st century. However, the integration of contemporary poetry into the modern world means it has greater pertinence and relevance than ever before. This is evidenced by the current trends in the poetry industry and the definitions of poetry that are not limited to simply text on paper written by a poet. Poetry can currently be described as “literary work in any essay, play, songs, or poems of any genre; having the characteristic qualities of distinctive style and rhythm” [8], or in even more general terms, as “a quality of beauty and intensity of emotion.” [1] This raises questions as to how the real definition of poetry is, and whether it can refer to works beyond text, such as works of art, music, films or animations. If so, this broadens the definition of poetry, and allows one to conclude that poetry isn’t in fact ‘dead’. In this essay, I will be exploring five gardens which are located within the UK and hold a relevance to the society of the 21st century.

The first poetic piece I have chosen to analyse is ‘Home’ by Warsan Shire. ‘Home’ is a contemporary poem, and the topic discussed in this poem proves that poetry can have a significant influence on people’s lives in the 21st century. The author is British-Somali poet Warsan Shire, who was born in Kenya, and lived in Somalia. Her poetry has been published in 2009 after spending time in Rome with some refugees who had fled their homelands of Somalia, Congo, Syria, and Eritrea. Shire talks about how it felt to be an undocumented refugee living in Europe.

Is Poetry Dead?

is a contemporary poem, and the topic
discussed in this poem proves that poetry can have a significant influence on people’s lives in the 21st century. The author is British-Somali poet Warsan Shire, who was born in Kenya, and lived in Somalia. Her poetry has been published in 2009 after spending time in Rome with some refugees who had fled their homelands of Somalia, Congo, Syria, and Eritrea. Shire talks about how it felt to be an undocumented refugee living in Europe.
The poem begins with very abrupt and direct words in lines 1-3, giving the sense of an imperative instruction. The first 3 lines appear to be of similar lengths, immediately creating a sense of order and purpose for the reader. These almost identical lines could indicate the calm before a war, where people are too busy to notice whether war is coming or not. However, line 4 breaks this pattern, with much longer line one, which shows the abrupt entrance of war in people’s lives. In the following stanza, the mention to order seen in lines 1-3, suggesting that nothing is truly ordered or manageable after the conflict begins.

Additionally, by making each line seem factual and imperative, Shire leaves no room for opinion in the reader’s mind. It seems as if the war is unwelcome in the world, the truth. The poem, which I would imagine could be performed as a slam poetry, makes the reader see the horror of war on the face of the following stanza. The lines “the boy you went to school with/ who kissed you” adds human emotion and anecdote to the poem. The poet uses humanize, objectifying the objects being personified. By giving them humanity, the reader can feel the experience of non-human entities more vivid, or can help readers understand, empathize with, or react emotionally to non-human events. This, however, could be a clear use of irony, Khan’s poem wholeheartedly rejects the feeling that some Muslims face of being forced to participate in a “war” through the body, to display the unnatural and perverted essence of war.

The imagery of this war not only resonates with the general understanding of war, but is also incredibly applicable to the myriad of wars and crises occurring on our planet today, such as the civil war in Syria and famine in Yemen and Somalia. Additionally, it suggests how children and adolescents living in countries of war do not get the chance to be children, as it is torn away from them by patriotism and fighting. This cynical view of patriotism may also relate to the propaganda used in the First and Second World War, where patriotism is presented as the ‘right’ thing to do. From the perspective of the poet, humanity and empathy are the only way to end this struggle, and not just as harmful.

The poem also uses simplistic and basic terms, and there are no words of punctuation apart from basic words such as commas and full stops. There is a lack of sophisticated language devices. Even when people are speaking, there are no speech marks to show this. This portrays how these actions faced by black people have been their daily lives, to the extent that speech marks do not have to be used to differentiate between the black and white speakers, as it is clear who is facing the prejudice in the poem. This links to the police brutality faced by many African-Americans, where they are often shot and killed as a result of the appearance they face by white police officers, who shoot them because they were ‘acting shady’ or ‘showing signs of aggression or anger’. Black people are five times as likely to be shot, and despite making up only 2% of the total US population, African-American males between the ages of 15 and 34 comprise more than 15% of all deaths logged this year by an ongoing investigation into the use of deadly force by police.[5] This poem suggests how the black person is seen as a threat, and as a result, any other signs of aggression, his fate would have most likely been much worse. This poem is incredibly significant in the respect it gives a side to poetry that is not at all dull, but thrilling and real.

In conclusion, the relevance and powerful messages of all the five of these poetic pieces prove that poetry can still be alive and living out there, reminding us of the events that mean greater than love, and thus have a vital impact on people’s lives. For example, Rankine’s poems on micro-aggressions allow the reader to understand the social and emotional choices as to not harm others. Additionally, the wide definition of poetry means it does not have to be restricted to just specific names and types, so it can be different forms and thus target many different groups.

Bibliography

an-american-lyric

PhD Tutor’s comment:

It’s easy on contemporary poetry and politics is first-class work. It follows the writing techniques to convince her reader of the salience of her subject, and clearly effective because of this. The text is easy to follow and readable, making the reader think of the things as a realistic approach of the idea of the events as something that is inherently linked to racism. The originality and the poetic forms of the poem also make the text an extremely powerful piece that is engaging and keenly researched.
Emotional eating is the concept of using food to make yourself feel better or comfort yourself when you are feeling emotional. This is often stimulated by eating and it is described as “eating to satisfy emotional needs rather than physical hunger” [1]. Some experts have even estimated that 75% of over eating is caused by emotions. However, emotional eating is believed to be the result of many factors rather than just emotions. The study showed that the foods that emotional eaters crave are often referred to as comfort foods, these are foods which have either high-calorie or high-fat content and have minimal to no nutritional value, such as; chocolate, cookies, crisps, chips and pizza. Around 40% of people eat more when they are stressed, then 20% eat when stressed and the minority of people (20%) experience no change in their intake of foods when exposed to stress [2].

One of the biggest myths about emotional eating is that it is only allowed by negative feelings, which is true, people often turn to food when they’re stressed out, lonely, sad, anxious, or bored. But emotional eating can be linked to positive feelings too, like the romance of sharing dessert on Valentine’s Day or the celebration of a holiday feast. Sometimes emotional eating is tied to major life events, like a death or a divorce. No matter how often, it’s still a little bit stressful that causes someone to seek comfort or distraction. The trouble with emotional eating (aside from the health issues) is that once the pleasure of eating is gone, the feelings that caused it stick around, and it hasn’t really solved anything. You will often feel worse about eating the amount or type of food you did [3].

Some of the relevant personality traits that are associated with emotional eating are characterised by Alexithymia comes from the Greek word for “no words for emotions” (Siemes,1973). It is characterised by a reduced ability to identify and describe emotional experiences and has been linked to a variety of psychological disorders, such as depression, anxiety and eating disorders. It is usually measured by a self-reported questionnaire, with the Toronto Alexithymia Scale (TAS-20) being the most commonly used. Individuals who reported Alexithymia; by being alexithymic you often can only describe the simple emotions such as being happy or sad but that score cannot fully describe how that person is feeling.

Now onto one of the other personality traits that we did not cover in the tutorials. The trait that I will be exploring is conscientiousness, it is how careful and cautious a person is. These traits are very prominent like alexithymia eating habits very well as the traits associated with emotional eating are usually very prominent like alexithymia or a temperament such as impulsivity and impulsivity. Both, as I’ve explained previously are traits that are associated with emotional eating.

References

**PhD Tutor’s comment:**
It was a pleasure to work with D on this programme. He was an excellent student who showed a lot of dedication and commitment. He very well, especially during class discussions. D showed a great level of understanding of the topic and took the opportunity to explore the topic in depth. The feedback that was presented in his essay (I know D will do well in his GCSEs) and he has a very bright future in the future.

**Abstract:**
We conducted this research as part of our undergraduate studies. The topic is emotional eating and that is why there’s little research on their effectiveness. We conducted an experiment where we had an experimental group watch into the product placement and a control group watch in, and a control group watch the same clip without the product placement. We later offered them two biscuits (KitKat and Omnifast, and the Perceptions of Emotional Eating Behaviour by Bennett, Greene and Schwartz-Barcott, I firmly believe that personality traits associated with emotional eating and dieting is well. For example, if we look at a particularly impulsive person, they are more likely to engage in impulsive eating patterns. Impulsive eating patterns can and have been proven to lead to extremely self-destructive behaviours as it plays a key role or manifests as a preoccupation with food. Eating disorders associated with the highest degree of impulsivity include classic anorexia nervosa, bulimia nervosa and a form of anorexia not otherwise specified in the U.S. A., an estimated 20 million females and 10 million males suffer from a clinically significant eating disorder at some point in their lives. Impulsivity is also a key ingredient in the binge eating person then you are more likely to engage in emotional eating habits. A method such as alexithymia; by being alexithymic you can often often can only describe the simple emotions such as being happy or sad but that score cannot fully describe how that person is feeling. The feedback that was presented in his essay (I know D will do well in his GCSEs) and he has a very bright future in the future.

**Introduction:**
Placement statements are a form of advertisement where brands pay to have their product featured in movies and video games. They are a popular way of advertising and will be women, being exposed to an average of 4.59 per day and being expected to grow by 29% annually until 2020 (Kantar & Wyse, 2016). They are also expected to outpace the use of traditional advertising and are an increasingly popular platform. This raises a whole host of questions for brands and marketers alike. Advertisers want to know why they are so popular and higher return on investment than traditional advertising. This raises a whole host of questions for brands and marketers alike. Advertisers want to know why they are so popular and higher return on investment than traditional advertising.

**The Effect of Audiolvisual Product Placement on Choice of Biscuit Brand**
H. Ibhid, Driers Allerton Academy, Bradford, Supervised by J. Armstrong, Lancaster University.

<table>
<thead>
<tr>
<th>Social Sciences</th>
<th>Emotional Eating</th>
<th>Emotional Eating</th>
<th>Emotional Eating</th>
<th>Emotional Eating</th>
<th>Emotional Eating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 5, Stage 4</td>
<td>D. Buchanan-Burbidge, Llangatwg Community School, Neath. Supervised by A. Pink, Swansea University.</td>
<td>Emotional eating is the concept of using food to make yourself feel better or comfort yourself when you are feeling emotional. This is often stimulated by eating and it is described as “eating to satisfy emotional needs rather than physical hunger” [1]. Some experts have even estimated that 75% of over eating is caused by emotions. However, emotional eating is believed to be the result of many factors rather than just emotions. The study showed that the foods that emotional eaters crave are often referred to as comfort foods, these are foods which have either high-calorie or high-fat content and have minimal to no nutritional value, such as; chocolate, cookies, crisps, chips and pizza. Around 40% of people eat more when they are stressed, then 20% eat when stressed and the minority of people (20%) experience no change in their intake of foods when exposed to stress [2].</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Impulsivity on Eating**
For example, if we look at a particularly impulsive person, they are more likely to engage in impulsive eating patterns. Impulsive eating patterns can and have been proven to lead to extremely self-destructive behaviours as it plays a key role or manifests as a preoccupation with food. Eating disorders associated with the highest degree of impulsivity include classic anorexia nervosa, bulimia nervosa and a form of anorexia not otherwise specified in the U.S. A., an estimated 20 million females and 10 million males suffer from a clinically significant eating disorder at some point in their lives. Impulsivity is also a key ingredient in the binge eating person then you are more likely to engage in emotional eating habits. A method such as alexithymia; by being alexithymic you can often often can only describe the simple emotions such as being happy or sad but that score cannot fully describe how that person is feeling. The feedback that was presented in his essay (I know D will do well in his GCSEs) and he has a very bright future in the future.

**Concientiousness as Predictors of Emotional, External, and Restrained Eating Behaviours’**
Perceptions of Emotional Eating Behaviour by Bennett, Greene and Schwartz-Barcott, I firmly believe that personality traits associated with emotional eating and dieting is well. For example, if we look at a particularly impulsive person, they are more likely to engage in impulsive eating patterns. Impulsive eating patterns can and have been proven to lead to extremely self-destructive behaviours as it plays a key role or manifests as a preoccupation with food. Eating disorders associated with the highest degree of impulsivity include classic anorexia nervosa, bulimia nervosa and a form of anorexia not otherwise specified in the U.S. A., an estimated 20 million females and 10 million males suffer from a clinically significant eating disorder at some point in their lives. Impulsivity is also a key ingredient in the binge eating person then you are more likely to engage in emotional eating habits. A method such as alexithymia; by being alexithymic you can often often can only describe the simple emotions such as being happy or sad but that score cannot fully describe how that person is feeling. The feedback that was presented in his essay (I know D will do well in his GCSEs) and he has a very bright future in the future.

**Restrained Eating Behaviours’**
Perceptions of Emotional Eating Behaviour by Bennett, Greene and Schwartz-Barcott, I firmly believe that personality traits associated with emotional eating and dieting is well. For example, if we look at a particularly impulsive person, they are more likely to engage in impulsive eating patterns. Impulsive eating patterns can and have been proven to lead to extremely self-destructive behaviours as it plays a key role or manifests as a preoccupation with food. Eating disorders associated with the highest degree of impulsivity include classic anorexia nervosa, bulimia nervosa and a form of anorexia not otherwise specified in the U.S. A., an estimated 20 million females and 10 million males suffer from a clinically significant eating disorder at some point in their lives. Impulsivity is also a key ingredient in the binge eating person then you are more likely to engage in emotional eating habits. A method such as alexithymia; by being alexithymic you can often often can only describe the simple emotions such as being happy or sad but that score cannot fully describe how that person is feeling. The feedback that was presented in his essay (I know D will do well in his GCSEs) and he has a very bright future in the future.

**References**
Research in the past has attempted to gather data to find out what a fruitful product placement is composed of. Such studies include Russell’s (2002) and Gupta and Lord’s (1999) research which similarly found that auditory placements not only affect consumers positively, but are also better recalled because they resonate with a consumer on a deeper level. Explicitly, if a person is asked to recall something, they are more likely to recall than if they are not asked. However, we wanted to use an audiovisual placement as these are more prevalent in our day to day lives. Furthermore, and in line with previous research, we suspected that because placements are exposed to the placement, the more a person is familiar with it, the more their fondness of it grows. Product placements seek to utilise this mere-exposure theory by Zajonc (2001) suggests that people tend to develop a tendency to prefer things because they are familiar with them. The more a person is exposed to a certain thing, the more their fondness of it grows. Product placements seek to utilise this mere-exposure effect by having consumers exposed to their product repeatedly. Auty and Lewis (2004) have tried to research the effect of previous exposure on choice and also how implicit and explicit memory can interact with each other. We wanted to test the mere-exposure effect by exposing the participants to the product placement and which of the two types of memory has a more staggering effect on choice. Interestingly, their research suggested that auditory placements do better; it suggests that consistent repeated exposure leads to more positive feelings about the brand and a higher likelihood of choosing the brand. Formerly, Gibson (2006) conducted research into food choice and its relation to a person’s underlying emotional mechanisms. The research found that depending on the product, participants would tend to pick foods with a fatty texture that were found to mitigate foods with a fatty texture that were found to mitigate Karreman, Stroebe and Claus’ (2006) research indicated such a relationship between a need state and picking a product that could mitigate it. Hence, females who were thirsty were more likely to choose Lipton Ice Prime and were more likely to choose Lipton Ice Prime than participants who were not thirsty. The participants clearly had a desire to consume and that placement works better for females. A lot of work has been done on the relationship between hunger and how these relate to the influence of placements, such as hunger levels. Research such as Gillespie’s (2005) has indicated that hunger drives those who are hungry or irritable people would be more influenced by the brand. Joireman and Muehling’s (2012) has indicated that different hunger levels are, so should be studied. A prominent strength of our study was the diversity of our sample which had people from the ages of 16–46. A lot of the research in this area tends to use students and therefore the findings cannot be directly transferred to the population because of the pronounced participant subjectivity. Our study was also done in an ethical manner as we not only debriefed our participants, but we also gave them the right to withdraw their participation at any stage. This led us to believe that if participants recalled the placement, which led us to believe that if participants recalled the placement, the more likely they are to pick the brand featured in the placement.

Hypothesis 1- Participants who are exposed to the placement are significantly more likely to pick the brand of biscuit featured in the placement than those who have not been exposed to the placement.

Hypothesis 2- Participants who recall the brand placement are significantly less likely to pick the biscuit brand featured.

There has been little attempt to see how demographic differences such as gender correlate with the effectiveness and recall of placements. We suspected that because previous research (Auty & Lewis, 2004 and Gregorio & Sung, 2010) has clearly found some trends between gender and how they engage with placements, such as the fact females often recall placements more than males, and that these individual differences play into how influential and memorable placements are. We wanted to take this further and see if we can replicate these results to see if such differences still exist. Additionally, gender differences can be used to test if people are more concerned, the findings have been rather contradictory, with Nelson and McLeod’s (2000) research finding no gender differences in adolescents’ liking or awareness of placements; and Gregorio and Sung’s (2010) results suggest that males engage with product placements more than females, suggesting they are more influenced by them. Despite placements affecting males more, they are actually recalled more by females. Gregorio and Sung’s (2010) research was done in 2010 and took a modern approach, with the group being conducted online in a space where a lot of the modern population is constantly engaging. Therefore, guided by their research, we hypothesised on gender differences:

Hypothesis 3- Males are significantly more likely to be affected by product placements, such as recalling the brand, and will pick the brand of biscuit featured in the placement.

Hypothesis 4- Females are significantly more likely to recall the placement than males.

Formally, Gibson (2006) conducted research into food choice and its relation to a person’s underlying emotional mechanisms. The research found that depending on the product, participants would tend to pick foods with a fatty texture that were found to mitigate feelings of positive growth. Notably, it was high energy foods with a fatty texture that were found to mitigate Karreman, Stroebe and Claus’ (2006) research indicated such a relationship between a need state and picking a product that could mitigate it. Hence, females who were thirsty were more likely to choose Lipton Ice Prime and were more likely to choose Lipton Ice Prime than participants who were not thirsty. The participants clearly had a desire to consume and that placement works better for females. A lot of work has been done on the relationship between hunger and how these relate to the influence of placements, such as hunger levels. Research such as Gillespie’s (2005) has indicated that hunger drives those who are hungry or irritable people would be more influenced by the brand. Joireman and Muehling’s (2012) has indicated that different hunger levels are, so should be studied. A prominent strength of our study was the diversity of our sample which had people from the ages of 16–46. A lot of the research in this area tends to use students and therefore the findings cannot be directly transferred to the population because of the pronounced participant subjectivity. Our study was also done in an ethical manner as we not only debriefed our participants, but we also gave them the right to withdraw their participation at any stage. This led us to believe that if participants recalled the placement, which led us to believe that if participants recalled the placement, the more likely they are to pick the brand featured in the placement.

Results: The independent variable of our study was whether or not the participants saw the TV clip with the product placement. We wanted to measure how that affected choice, so we recorded which of the two biscuit brands the participants chose, and this was our dependent variable. We found that in the experimental group, more participants (68%) picked the KitKat (the brand featured) than the Club (32%). This shows that product placements are extremely effective; the placement being displayed in the clip only once and still having such an effect. We found that this is a very good form of advertising it is. The results obtained have also replicated the findings from Auty and Lewis’ (2004) research where they found that placements do influence choice, thus our results are reliable as they are in line with other research. Hypothesis 1- was supported by the recall of the KitKat (48%) more than the Club (52%). Therefore, our hypothesis is supported as it is evident that people in the experimental group picked KitKat more often than in the control group, and the control group saw people pick a similar number of each brand, with the KitKat being picked less often than in the experimental condition.

Effect of recall on choice

![Figure 3a](image) Figure 3(a) bar chart showing the number of females and males that recalled and did not recall the brand featured in the placement.

Of the people who recalled the placement, more of them chose the KitKat (69%) over the Club (31%). Of the people who did not recall the placement, again more of them picked the KitKat (75%) over the Club (25%). Hence our hypothesis is not supported as there was no significant effect of recall on choice, was there is a significant difference in choice between those who remembered the placement and those that did not.

In terms of gender and influence of the placement, we found that in the experimental condition, males picked the KitKat (74%) more often than the Club (26%). Similarly, females picked the KitKat (75%) more than the Club (25%). Therefore, the hypothesis is not supported as there was no significant difference in choice preference.

Effect of gender on recall:

![Figure 3b](image) Figure 3(b) bar chart showing the number of females and males that recalled and did not recall the brand featured in the placement.

In term of gender and recall, we found that of the participants, most of them forgot the placement (62%) with a few recalling it (38%), whereas of the female participants, more of them remembered (67%) and fewer forgot it (33%). Exclusively, females do recall placements more so than males, meaning our hypothesis is supported.

Finally, in terms of hunger levels, people in the experimental group were more likely to choose Lipton Ice Prime, with an average rating of 5.78 and the people who picked the Club had an average rating of 3.43. This isn’t a significant difference, therefore our hypothesis isn’t supported and hunger does not mediate product placement influence.

Discussion: From our research, it is clear that product placements successfully influence and prompt consumers to choose a certain brand. This shows that product placements are extremely effective; the placement being displayed in the clip only once and still having such an effect. We found that this is a very good form of advertising it is. The results
important avenue for marketers to follow up, as society is now more diverse and brands need to aim to target all people to thrive.

Bibliography:

PhD Tutor’s comment:
H. is an outstanding student who produced an impressive assignment. The essay demonstrates a sophisticated level of understanding of complex psychological theories and critical thinking. H. used existing academic research and psychological theories to effectively develop and substantiate her hypotheses and interpretations of the experimental findings. I am confident that H. will excel in whatever she chooses to do in the future.