Mutant Zebrafish!
How filming fishtanks can help us understand psychiatric disorders!

Fight for the Right to Choose!
Should assisted dying be legalised?

Do SuperMuscules Make SuperHeroes?

Killer Salads! Is Salmonella lurking in your lunch?
Editorial

As a PhD student at the University of Leicester, I was the first editor-in-chief of FRONTIER for its launch in 2014 and I’m delighted to have been asked to write the editorial for this issue.

When we began work on the first issue of FRONTIER, we hoped that it would become a permanent fixture at the University, giving PhD students a chance to share their research with the wider university community for years to come. It’s great to see that FRONTIER has found a permanent home at the Graduate School and is still going strong. This wouldn’t be possible without the dedication of Felicity Easton, the whole editorial team, and the authors who work incredibly hard every issue to put everything together (all while also working on their own PhDs!).

This issue covers subjects as diverse as psychosis, Trump’s link to ancient Rome, superhero biceps and the bacteria lurking in our salads. It can be difficult to describe your PhD research, which is at the cutting edge of your field, in such a way that anyone can pick up your article and understand what you’re trying to do and why. Writing for a non-specialist audience, as the authors have done here, is a hugely important skill to learn – whether you plan to write grant applications in the future, or just want to explain your research to your relatives.

If you’d like to share your research in a future issue of FRONTIER, gain experience in editing and designing a magazine, or just have some feedback, Felicity and her team would love to hear from you. Just email frontier@le.ac.uk and let them know how you’d like to be involved.

Acknowledgements

FRONTIER was launched with a grant provided by Professor Sir Bob Burgess during his time as Vice-Chancellor of the University of Leicester, with additional funds from the Career Development Service and the Graduate School. We are incredibly grateful in their help in kick-starting FRONTIER, especially so to the Graduate School who continue to fund FRONTIER.

We have received incredible support and advice from Dr Sarah Bugby and Dr Jason Wickham, who are always available to help and guide us. We would also like to extend our thanks to staff across the University for supporting FRONTIER and helping us to spread the word, to Merv Stevenson for his efforts in assisting the composition of the layout, and to all the postgraduate students who have contacted us with feedback, articles and offers to get involved.

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Editorial Team

Editor-In-Chief - Felicity Easton

Working in Respiratory Medicine Felicity is researching how ion channels regulate airway smooth muscle contraction. Escaping from the lab (occasionally) to bake or enjoy a glass of wine - usually at the same time! Felicity has been involved with FRONTIER for the past few issues and enjoys the opportunity to promote the amazing research happening at the University of Leicester in a fun and accessible way.

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Studying the prevention and management of type 2 diabetes. Charlotte’s interest in the area comes from her own love for physical activity.

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Francisco is a part of the INTREPID Forensics Programme, Department of Criminology. He enjoys music, art and cooking with red wine by the side!

Dr Sergio Gonzalez Sanchez
As a Roman Archaeologist and an experienced editor Sergio has provided expertise to the magazine as well as assisting the design process.

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A side of Salmonella with your salad?

Salad leaves are an important part of a healthy diet but in recent years they have been associated with infection by food poisoning bacteria such as Salmonella. Research by Giannis Koukkidis in the Department of Infection, Immunity & Inflammation reported by the BBC, CBS, Reuters, The Guardian, Mirror, Daily Mail, NHS, and hundreds of internet news outlets and radio shows, has revealed that the juices which drip from the cut ends of leafy greens inside bagged salads can massively boost Salmonella growth even when refrigerated and increase its capacity to cause infection.

Not so innocent salad leaves

It is a common held misbelief that food poisoning can only originate from the fish or meat component of a meal. However, recent research highlights the contribution of your salad side dish in this issue. Surveys from the Food Standards Agency report that fresh produce such as salads and fruit are responsible for nearly 50,000 incidents of food poisoning in the UK every year. Salmonella, E. coli, Campylobacter and Listeria are the top bacterial pathogens associated with uncooked salads and other fresh produce. In the UK Salmonella is responsible for more than 2,500 hospital admissions every year.

“Consumption of salad leaves such as lettuce, spinach and rocket have increased... so have cases of Salmonella and E.coli”

Healthy Salads?

Because of their claimed health benefits, the consumption of salad leaves such as lettuce, spinach and rocket has increased considerably in recent years, but along with this increase in consumption, increased cases of salad-associated food poisoning such as Salmonella and E. coli.

I was therefore curious about the behaviour of the bacteria if they got into the salad bag. To investigate, I extracted juices from salad leaves, and collected the juice-rich watery fluid that accumulates at the bottom of the plastic bag that holds ready cut salads, and looked at what it did to promote the risk of food poisoning by bacteria such as Salmonella.

The salad leaves used in our research were cos lettuce, baby green oak lettuce, red romaine lettuce, spinach and red chard.

“Salmonella can even grow in the fridge when it comes in contact with salad juices”

Scanning electron micrograph (SEM) images of spinach juice-exposed Salmonella on a section of spinach leaf. Salmonella magnified (right).
Salad juices increase *Salmonella*... even in the fridge

Investigations began with *Salmonella*, as this is one of the most aggressive food-poisoning bacteria. It was found that even tiny traces of salad leaf fluids (as little as 1/500th of a teaspoon) or even the watery bag fluid massively stimulated the growth of *Salmonella*, even if the bacteria were incubated in the fridge. This was most surprising as it was believed that *Salmonella* should stop growing in any environment below 7 °C, yet it grows quite happily at 4 °C if provided with salad juices.

"Consumption of damaged leaves or salad juices may exacerbate a *Salmonella* infection carried by the salad"

In the fridge, I found that fewer than 100 *Salmonella* on day 1 (not enough to cause illness) became more than 100,000 by day 5 (more than enough to cause food poisoning), these 5 days represented the use by date of the salad, so many people would consider the salad still "safe" for consumption.

Behaviour of *Salmonella* in the salad bag

We also found that *Salmonella*'s ability to attach to the salad leaves was much greater when salad juice or fluid was present, and washing the leaves in water did not remove the bacteria.

When we used higher magnification electron microscopy we noticed that the *Salmonella* also made more biofilm, an aggregation of bacteria encased in a jelly like slime which they make to attach themselves to surfaces. This biofilm was extensive when salad juice...
was present and extended as far as the stomata, the microscopic pores in the salad leaves. The Salmonella biofilm formation occurred despite the presence of many thousands of bacteria and other microbes that naturally colonise the salad leaves (known as the microflora).

What was also surprising, was that the salad juice helped the Salmonella to attach to the interior of the salad bag itself – previously, no one had considered the salad container was a bacterial attachment site.

In fact, the Salmonella treated with the salad juice displaced the leaf microflora that were naturally growing there! And, again, the biofilm formed with the salad juice was not washed away with water.

**Implications of eating the infected salad?**

Salad juices also increased Salmonella growth when added to a liquid designed to support the growth of bacteria and replicate the environmental conditions inside a human.

This was up to 2400-fold when compared to the non-juice supplemented controls. The salad juices stimulate growth by helping the bacteria steal iron from a normally non-accessible iron-binding protein called transferrin, whose role is to prevent growth by sequestering all free iron and making bodily fluids bacteriostatic (inhibitory to bacterial growth).

Salad juices made Salmonella more aggressive, as we found increased expression of proteins involved in the direct invasion of human gut cells. This means that consumption of damaged leaves or salad juices may exacerbate a Salmonella infection carried by the salad.

“**There are around 50,000 food poisoning cases per year in the UK which come from fresh produce**”

“**Salad juices made Salmonella more aggressive**”
Final thoughts - and how can we avoid food poisoning?!

Our project did not indicate that there was any increased risk to eating leafy salads, but it does provide a better understanding of the factors contributing to food poisoning risks from bagged salads.

Our research did not look for evidence of food poisoning bacteria in salad leaves, instead, it examined how *Salmonella* behaves on salad leaves when they are damaged inside the plastic bag environment.

The findings from this research compel us to provide the following advice when buying and storing bagged salads: when purchasing bagged salads choose those with the latest use by dates, avoid bags with mushy leaves, and bags or containers that look swollen.

Use the salad as quickly as possible after purchase to minimise the growth of any pathogens that might be present, and wash the leaves thoroughly before consumption – this will remove juices which could increase growth of food poisoning bacteria.

Our future work will investigate the use of novel techniques to prevent attachment of pathogenic bacteria to salad leaves and fresh produce.

Giannis Koukkidis began working in the field of food technology during his Masters this subsequently became his PhD project at the University of Leicester. He is currently studying the interaction of a range of food poisoning bacteria with bagged salad leaves with the aim of reducing infections from fresh produce.
A Role for Grandparents?
Child Welfare at the Heart of Work-Life Balance

Can regulating the role of grandparents help to prioritise the welfare of the children? Currently parents face financial demands of working whilst also having to provide care for their children at home. Ruksar Sattar explores why it is important for child welfare to be the centre of attention when discussing legislation regarding work and home life...

Whilst recognising the valuable contributions of the existing reconciliation policies and legal measures towards the promotion of a family-friendly workplace, my research reveals that very little attention has been paid to the welfare of children within the reconciliation discourse.

I argue that the Court of Justice of the European Union has, instead, reached decisions which disregarded and potentially are to the detriment of the very welfare of the children it seeks to protect.

Fundamental to my research is the need to emphasise the importance of children in the development of policies and legal measures for the reconciliation between work and family life. Contrary to what appears to be the policymakers’ view that children are objects and obstacles to the participation of parents in the labour market, my research argues that children are subjects in their own right with their own needs and potentials. It is crucial that the welfare of children forms part of relevant employment law dialogue.

A core aim of my research is to consider how to address the disregard for the welfare of children within the reconciliation discourse. It is proposed that one of the possible ways to do so is through the regulation of the role of grandparents who play a significant role in childcare. According to the Eurochild, 63% of UK grandparents provide care to their grandchildren. Grandparents provide full-time care for their grandchildren regularly, and often facilitate a work-life balance for their children by providing childcare whilst parents are at work. Such care may either take the form of occasional childcare when the need arises, or be more structured, through the provision of regular childcare. The provision of informal care by grandparents not only allows the state to explore different avenues to look at the topical issue of childcare, but it also allows intergenerational learning which contributes to the emotional, social and cognitive

Grandparents directly facilitating reconciliation by providing informal childcare.

Parents worldwide have long been confronted by the demands of participating in paid work and providing care for their children. Over the last few years, the United Kingdom’s legal framework has significantly changed to address this evolving social reality and the European Union has played a pivotal role in this through the introduction of the reconciliation of work and family life principle. Under this principle, a dynamic set of policies and legal measures have gradually been developed focusing on the tension inherent in juggling work and family responsibilities.

“Parents worldwide are confronted by the demands of participating in paid work and providing care for their children”
development of children. Taking this into consideration, my research urges policymakers to do more to recognise and support the vital contributions that grandparents make to the social and economic well-being of their grandchildren, their families and the state as a whole.

“... children are not only the future of the economy but they are also subjects in their own right with their own needs and potentials.”

Policymakers must recognise that the reconciliation principle will only ever be successful when leave, time, and childcare provisions are regarded as complementary and developed in parallel. Caregiving and care-receiving have always been universal and inevitable parts of the human condition, and childcare initiatives should reflect this ubiquity through structured childcare provisions that recognises the time and leave necessary to raise children. Given the benefits of the provision of informal care by grandparents, my research recommends that policymakers extend the existing leave and time measures to grandparents and introduce new childcare provisions which recognise grandparents as integral carers alongside parents. One of the proposals is based around the introduction of welfare benefits for grandparents who provide informal childcare. In investigating the support services available in Europe to grandparents who provide informal care to their grandchildren, Eurochild reported that 65% of the grandparents surveyed criticised their states for the lack of funding and support available for the provision of childcare they provide.

“... extend the existing leave and time measures to grandparents and introduce new childcare provisions which recognise grandparents as integral carers alongside parents.”

Questions may be raised in relation to the eligibility criteria for the attainment of the proposed welfare benefits in the UK. My research recognises the need to devise a system that tackles these concerns by proposing a robust criterion for access to the welfare benefits. Similarly, concerns may be raised in relation to the voluntariness of grandparents in providing informal childcare.
Many grandparents are still at work due to the continuous increase in the state pension age. Even though most grandparents enjoy caring for their grandchildren, caring for children in addition to work commitments can be detrimental to grandparents’ health, which can result in greater dependence on the public health care system and in higher costs for the NHS.

My research recognises these concerns and aims to identify a means to ensure grandparents voluntarily choose to provide care to their grandchildren. Despite these concerns, the UK government has recently recognised that this is an area worth exploring. My research will thus endeavour to contribute further to the existing debates in this emerging field.

Questions that need to be asked

Given the social and political context just described this research hopes to address a very relevant question, namely:

To what extent could the regulation of the role of grandparents contribute to place the welfare of the child at the heart of work-life balance?

However, at least three additional questions emanate from this:

1. To what extent is the consideration for the welfare of children lacking within the traditional reconciliation discourse and theoretical framework?
2. Do the current relevant reconciliation policies and legal measures at both EU and UK level take into consideration the welfare of children?
3. What reforms can be proposed to address the disregard for the welfare of children and to what extent does the regulation of the role of grandparents put the welfare of the child at the heart of the reconciliation principle?

How to find the right answers

My research utilises two distinct methodologies, combining the traditional doctrinal or theoretical approach with the developing socio-legal interdisciplinary approach.

Doctrinal research is the expository process used to identify, analyse, and synthesise the content of the law. In order to illustrate the extent to which consideration for the welfare of children is lacking within the reconciliation policy and legal measures, my research requires a process of selecting and weighing materials taking into account hierarchy and authority within the wider social context to support a particular principle. Most doctrinal scholars would agree that the immediate first step in doctrinal research is to understand the content of the law before being concerned about its derivation or effects on society. Despite the general criticism that doctrinal research is too narrow in its scope and application of legal understanding by reference primarily to case law, doctrinal research is necessary to demonstrate how the law (here, relating to reconciliation) has developed in terms of judicial reasoning and legislative enactment. As a result, given that the second question of my research focuses on discovering what the law is through an evaluation of primary sources (legislation, case law and policies) as well as analysing the law through an examination of secondary sources (textbooks and journal articles), the doctrinal research approach is essential.

In contrast with the doctrinal research approach, socio-legal research looks beyond the legal doctrine to understand law as a social phenomenon or type of social experience. My research analyses the causes for and consequences of the disregard for the welfare of children, and therefore requires a consideration of the social factors involved which impact current law and practice. Apart from showing whether the laws have achieved their intended effect and revealing how the law actually works in practice, socio-legal research can assist in law reform proposals by linking law to policy goals. A socio-legal critical approach is vital to my research because I focus on analysing the impact of the existing provisions on society as well as the impact of proposed recommendations for redressing the disregard for the welfare of children.

Impact on Law and Society

My research has the potential to enhance social and economic well-being in the UK. It has the potential of having not only a conceptual impact contributing to the understanding of policy issues and furthering debates but also an instrumental impact influencing the development of policy and altering legislation.

“The European Commission and the UK government have recently recognised that this is an area worth exploring.”

My research aims to explore the possibility to establish a normative framework through the extension of the existing leave and time measures to cover the new social reality of grand-parenting and the introduction of new childcare provisions geared towards grandparents. The European Commission and the UK government have recently recognised that this is an area worth exploring.

Ruksar Sattar is a School of Law PhD student at the University of Leicester. She successfully secured an AHRC Midlands3Cities PhD studentship. She is happy to be contacted about any aspect of this article written for Frontier at rs525@le.ac.uk.
Gender in Comics

Gender Studies carried out within comics mostly focuses on the female characters and how these comics and characters engage with or negate sexist stereotypes. There is a lack of significant engagement with the issue of masculinity in comics that is only recently becoming the focus of research. When examining male characters, it is clear that male superheroes have always been designed to conform to the dominant masculine ideal of the time, an ideal that is becoming increasingly hypermasculine.

First described in the social sciences by Donald L. Mosher and Mark Sirkin in 1984, hypermasculinity is defined as a set of behaviours and beliefs that exaggerate traits which are popularly considered to be masculine, especially “toughness as emotional self-control, violence as manly, danger as exciting and calloused attitudes toward women and sex”. While these behaviours have mainly been regarded as quintessentially masculine, since the 1980s, Western audiences have become obsessed with hypermasculinity, especially regarding how artists represent it in images of the male body. In a similar way that the global media has obsessed over women’s bodies, the ever-critical public eye has now been cast onto male bodies. There is increased pressure on men to conform to the supercut hypermasculine ideal glorified in American superhero comic books.

Following narratives on masculinity throughout American history, it becomes clear that American men are haunted by a panic about how manly they are, while the media produces compensatory images for them to aspire to. The 1930s had the physically formidable

“Superheroes are a power fantasy attempting to purge anxiety about the state of masculinity

“The inverted triangle-shaped torso

“Following narratives on masculinity throughout American history, it becomes clear that American men are haunted by a panic about how manly they are, while the media produces compensatory images for them to aspire to.”
labourer, even while many men suffered from malnourishment, which resulted in low eligibility for the draft. The 1940s had the powerful soldier, while mass media worried about the cowardice of conscientious objectors and shell-shock sufferers. In the 1950s and 1960s, the media was downright hysterical about mothers babying their children, and hippies and men protesting the Vietnam War. The 1980s and 1990s saw masculinity under siege by angry feminists and the rise of bodybuilding as a compensatory technique for the perceived cultural take-over by women.

“‘Their biceps are bigger than their heads, making it impossible for them to touch their armpit’”

A brief glance online today reveals that many men worry they are living in a time where white men are oppressed by Safe Spaces and equal rights for minorities. ‘If only we could go back to the good old days when men were men and women were women?’ But there were no good old days, and the toxic ideas and constraints of patriarchal hegemonic masculinity have always forced men into a state of panic for which they had to compensate. Superheroes offer a power fantasy in the face of that panic, as a way to purge anxiety about the state of masculinity.

Superheroes and Body Building

The superhero who really fits the narrative of bodily (re)construction is Tony Stark, first appearing as Iron Man in 1963. Stark relies on his intellect to construct a robotic suit as a stand-in for the grotesquely muscular and masculine bodies most male superheroes possess, such as Superman and Captain America. Whilst the initial versions of his suit were bulky, from the 1980s onwards, the Iron Man suits became increasingly detailed in both musculature and technological detail. These suits became more and more similar to the bodies that are increasingly encountered in American media following the popularity of bodybuilding action heroes in the 1980s, including Sylvester Stallone in Rambo: First Blood (1982) and Arnold Schwarzenegger in The Terminator (1985).

It seems ridiculous that a robotic suit of armour would require muscles, however during the 1980s especially, the Iron Man suit had oblique muscles, abs, and large pectorals. According to Harrison G. Pope, Katherine A. Phillips, and Roberto Olivardia in their book, The Adonis Complex, the hyper muscular body cannot be achieved by bodybuilding alone, but relies on the use of steroids. This is because “the male body simply cannot exceed a certain level of muscularity without the help of steroids or other chemicals”.2 The combination of bodybuilding and steroid use leads to the creation of the highly desired body shape with an inverted triangle shaped torso and exaggerated musculature. This body type is the most common style seen for male superheroes and it is pervasive in comic books.
Looking at recent comic books, such as Superman Unchained (2005) and Captain America Reborn (2011), there is something odd about the male bodies being depicted. Most superheroes seem to possess muscle groups that do not exist within the human body and their abdominal muscles are so pronounced that they cover the bellybutton. Their biceps are bigger than their heads, making it impossible for them to touch their own armpits. These kinds of bodies are blatantly ridiculous and unrealistic, yet they put enormous pressure on young men to emulate this kind of musculature. According to The Adonis Complex, young American men increasingly struggle with poor body image, eating disorders, addictions to steroids, and bodybuilding.

“Perhaps Superman, who is not human, possesses an alien physique that allows for the growth of additional muscle groups, but Captain America is fundamentally human.”

Perhaps Superman, who is a humanoid alien, possesses a unique physique that allows the growth of unusual muscle groups, but Captain America is still fundamentally human. The super-soldier serum is meant to transform its recipients into the perfect human, the peak of physical health, but it would not add completely new muscle groups to the human body. Whilst Iron Man does not require a pronounced physique, he continually builds himself one, constructing a powerful body that allows him to physically participate in combat, even though his intellect is his most defining characteristic, his super power.

Toxic Masculinity in Crisis

Comics reflect the way that the American media has reacted to the perceived crisis of masculinity by promoting the hypermasculine physique, especially in terms of the human body. Superheroes are a power fantasy attempting to purge anxiety about the state of masculinity. Focus on the overly muscled male body as a foundation for masculinity is toxic because it does not allow alternative masculinities to exist. It exaggerates what Western society considers to be dominant masculine traits as the only traits men should possess, supporting dangerous stereotypes that impact the health and wellbeing of young men.

Esther De Dauw attained a BA with a double major in English and Film, Theatre and Literature Sciences from the University of Antwerp and a Master’s in English Literature from Cardiff University. She is currently finishing her PhD in English at Leicester and is pursuing postdoctoral and other research opportunities.


Think you know mummies? Think again: Mummy stories

Angela Stienne is a third year PhD student at the School of Museum Studies researching engagements with Egyptian mummies in Paris and London between 1753 and 1855. Angela has worked at the Musée du Louvre in Paris and volunteered at the Petrie Museum of Egyptian Archaeology in London. Throughout her academic career, she has been involved in a variety of public engagement projects.

In 2014, I started my PhD at the School of Museum Studies on a cultural history of Egyptian mummies. This study was the natural outcome of years of academic research into Egyptian human remains in museums. What struck me was that most studies – and virtually every museum – seemed to corroborate this idea: Everyone loves mummies!

The project

In 2016, I launched Mummy Stories, a website to share the stories I had collected during my research. Rapidly, it became evident that it would be difficult to share data without compromising my doctoral research, as I was still in the writing up stage. More importantly, I wanted to give a voice to others. In short, I wanted to find out if everyone really loves mummies, and if everyone loves mummies the same way. This led to (Your) Mummy Stories, a participative project which invites individuals from any background, interest and opinion to share their story of encounters with Egyptian mummies.

‘Every mummy has a story to tell, and so do you’ is the leitmotiv of this project. I invite individuals to share the most fascinating story of mummies they have heard of, their feelings when viewing a mummy in their local museum, their passion, fear, curiosity, disgust or love for mummified specimens, and opinions on mummies in collections, museums, ethics, and other questionings. Any story works, as long as it’s their story.

The response

What started as a small project very soon became a phenomenon. Individuals contacted me from across the world to share their story. What is most exciting in terms of this project, is the scope of opinions and the background of individuals. Our storytellers come from all ages, countries, knowledge background and communities, but they all have a thing in common: they have an opinion on mummies in museums. From studying human remains, to reading cartoons on mummies, engaging with ethical questions, or visiting local museums holding Egyptian human remains, individuals have different stories of encounters with Egyptian mummies. All the stories are fabulous, and incredibly enlightening, but three caught the public’s interest.

A young boy from Thailand named Bloom, aged 6, wrote that he liked mummies in comics, but when he came to visit the New Walk Museum in Leicester and saw the mummies, he found them terrifying and never wants to see them again! Another story, that received over 30 000 views online, was written by a woman who had set up a plan for a temporary exhibition of a mummy at Cairo Museum in Egypt, in collaboration with children. Her honest account of her encounter...
with a mummy, her ‘handsome prince’, really caught the public interest. Finally, the former minister of antiquities in Egypt, Dr Zahi Hawass, heard of the project and sent his story of the identification of the mummy of Hatshepsut at the Cairo Museum. These three stories celebrate the diversity of backgrounds and involvements with Egyptian mummies; importantly, they give a voice to the specialist and non-specialist alike.

The outcome

The project, which now counts over thirty stories, is an example of why public engagement is incredibly valuable to a PhD researcher. There are three main outcomes from (Your) Mummy Stories.

1. The diversity of stories, dependent on personal interest, geography, and many other factors, brings to light the multiplicity of definitions of what ‘the mummy’ means to us. Simply, it reveals that not everyone loves mummies, and those who do like seeing mummies in museums do not share the same reasons, interests and reactions. There is a diversity of engagements with Egyptian mummies which has not been considered by museums. This realisation has been useful in looking at the timeframe I am working on in my research.

2. The public needs a voice, and the public wants a voice. Participative projects which invite individuals from around the world to share their ideas about a topic that might usually be shaped by academic communities are incredibly important. The field of Egyptology and museums have been surrounded with an aura of intellectual superiority throughout history: Egyptologists seemingly hold the keys to lost knowledge, while museums would be restricted to the art erudite. These ideas are now outdated, the visiting public of museums deserves to have its opinion heard. I have learnt a lot from the community of storytellers around the world that has been taking part in this project.

3. From a doctoral perspective, online projects are a fantastic opportunity to develop skills and networks, expand your knowledge of the field, and at the same time to reach beyond what has been done: to make an original contribution.

What’s next?

This project – combined with my own research – has allowed me to deepen my understanding of my field of interest, and to present myself to the outside world as someone who is committed to changing the ways we look at Egyptian mummies in museums, while reshaping current knowledge in this field. (Your) Mummy Stories has been so popular this year, that next January I am opening the project to every category of human remains without geographical limitation, in order to explore more stories in museums worldwide. There is good hope that Mummy Stories will continue running far beyond my doctoral years in Leicester.

Website: www.mummystories.com
(Your) Mummy Stories: www.mummystories.com/yourmummystories
Facebook: www.facebook.com/mummystories
Twitter: www.twitter.com/angela_stienne

‘Mummy Stories, Unwrapping History, a project by Angela Stienne’, coffin of Penamunnebnesuttawy, EA6676, original photograph © British Museum.

‘Every mummy has a story to tell…and so do you!’. Mummy of Cleopatra EA6707, original photograph © British Museum.
Psychiatric Disorders: how can fish help us?

Psychiatric disorders result from a brain malfunction. Disruption of particular genes seem to account for behavioural abnormalities. However, this association between gene and disorder has to be demonstrated and the mechanism by which these genes act understood. Dr. Héctor Carreño, a post-doc in the Department of Neurosciences, Psychology and Behaviour, and tells us how his research with the small vertebrate zebrafish hopes to shed light onto this connection.

**Zebrafish in Neuroscience**

Zebrafish have been used as an animal model for more than three decades and yet most people are still surprised when I say, ‘I work in Neuroscience with fish’. They usually think, ‘Why? Fish and humans are very different, aren’t they?’ The answer is yes, at least at first glance, but there are many similarities to mammals that have established zebrafish as a remarkable model in virtually all fields of biomedical research. In the last few years zebrafish have also been used as a model to understand the genetic basis of psychiatric disorders.

“You can literally watch the first cell divisions occurring in a few minutes, see how the eyes, somites and tail appear after a few hours, and observe the heart beating in a freely moving animal at 24 hours post-fertilisation.”

There are some biological and technical advantages that have made this little fish very popular among the scientific community. Due to its reduced size, we can keep large stocks of different experimental groups at a relatively low cost. A single female can spawn hundreds of eggs per week that develop very quickly outside of the mother, permitting the study of developmental processes. You can literally watch the first cell divisions occurring in a few minutes, see how the eyes and tail appear after a few hours, and observe the heart beating in a freely moving animal 24 hours post-fertilisation.

At molecular, cellular and physiological levels, zebrafish have much in common with other vertebrates, including humans. Its genome has been sequenced and we know that it is remarkably similar to humans. In the central nervous system, which is formed by the brain and the nerves, the main brain regions, types of neurons, cell machinery, molecules and the way they work are similar in zebrafish and humans. The same type of signaling molecules, such as dopamine or serotonin, are active in both species.

In addition to these features, zebrafish display a large set of complex behaviours which have made it highly suitable to model human diseases affecting the brain, including psychiatric disorders.

**From Human Disease to Fish Models**

Psychiatric disorders are a mixture of diseases that affect all aspects of mental function. Unfortunately the treatments available are limited, in part because we know little about the genetic alterations and neurobiology underlying them. Novel and powerful DNA sequencing techniques allow researchers to link genetic variants to human traits, but this association and the pathways and mechanisms altered by these mutations need to be examined in animal models first. This is where fish play a prominent role. Over 80% of the genes associated with human diseases have also been identified in zebrafish. We can use several genetic tools to induce mutations in the genes we want to examine, and assess the alterations that may occur in behaviour. When these alterations mimic some aspects of a specific human disorder, the insight we glean from studying the fish brain is invaluable in understanding the mechanisms leading to the disease. We just require reliable means to measure behaviour in these mutants.

“`At molecular, cellular and physiological levels, zebrafish have much in common with other vertebrates, including humans.‘”

Zebrafish species belonging to the minow family of the order Cypriniformes
Recording zebrafish: fishing for answers!

In 2016 alone, more than 300 papers on zebrafish behaviour were published in peer reviewed scientific journals. Here in Leicester, my research combines neurochemistry and molecular biology using a platform of behavioural tests to study novel mutant lines and search for novel compounds affecting behaviour. In this platform we use a number of different setups, cameras and automated tracking systems to gather as much information as possible.

We can measure the cohesion of groups of fish in a large tank as a readout of social behaviour, quantifying the distance between the individuals in a shoal.

We can quantify aggression levels using the mirror induced stimulation protocol, in which we place a mirror outside the experimental tank and record the reaction of the fish towards its own reflection. Fish are smart, but like the majority of vertebrates they do not recognise their own reflection, and they attack thrashing the tail, erecting the fins and biting against the mirror as if an intruder were present.

The fish react to novel or threatening environments with anxiety. To measure behavior we can use the novel tank diving test. When we put a fish in this setup, the first reaction we observe is swimming exclusively in the bottom third of the tank, where they alternate between zig-zagging movements and freezing, both being indicative of stress. After a few minutes they get used to to the new tank, become bolder, and increasingly explore the rest of the tank reaching the top third.

Another way to investigate social behaviour is measuring the preference of the fish for another, since they prefer company. If we put a fish in a tank half white and half black, we will see a clear preference for the black side, which can also be used as a readout of anxiety induced by white avoidance. These are only some examples of the type of tests we can do in the lab, and the usual responses we see in animals, but there are many more tests, which we can perform to examine sleep, impulsivity or learning.

Recording a large number of individuals, collecting different behavioural outcomes, and carrying out thorough statistical analysis enables us to determine the type of alteration in behaviour, comparing the performance of fish carrying mutations in specific genes with the fish expressing the most commonly found gene used as a reference.

In my research, I am studying the alterations in the behaviour of fish carrying mutations in genes known to be linked to aggression, hyperactivity and depression, to find the changes in the brain underpinning these disorders. These genes have been previously associated with human psychiatric disorders, but the mechanisms by which they operate are not well known.

"Will Norton’s lab combines neurochemistry and molecular biology using a platform of behavioural tests to study novel mutant lines and search for novel compounds affecting behaviour."

The knowledge we gain from fish, combined with mice and human data, has the potential to improve our understanding of the human disease aetiology."

Examples of zebrafish tests
The mystery of the gene...

To determine the mechanisms through which target genes cause disease effects we have to develop mutants for these genes and test them through our behavioural platform. When we find a clear effect of the mutation on behaviour, we use different techniques to look into the brain of these mutants to try and find alterations that could explain the connection between the gene and the psychiatric disorder.

One of the things we can do is slice the brain with an instrument called a microtome and label specific types of neurones to see if they have changed in number or shape. We also split up the brain in different regions, then we mash them up to inject them into a machine that is able to quantify the amount of signaling molecules present in each region with high precision.

To assess the expression and release of some hormones such as estrogens or cortisol we can use commercial kits specially made to detect these molecules, and we can examine the level of expression of virtually any gene using molecular biology techniques. For example we want to test the effect of a particular substance in fish behavior to try and rescue the abnormalities seen in the mutants, we just have to dissolve the compound in the tank water prior to the testing. Thus, we investigate changes in the brain at different levels to try and get an insight about the mechanisms that connect our genes to our behaviour.

With emerging cutting-edge technologies such as genome editing, optogenetics, or calcium imaging, and the development of new and more refined behavioural tests, the approaches to study the brain are always increasing. The knowledge we gain from fish, combined with mice and human data, has the potential to improve our understanding of the cause of human diseases, which is the key to discovering new treatments and to improve the existing ones.

Héctor Carreño is a post-doctoral researcher in Will Norton’s lab at the University of Leicester. Héctor focuses on the genetic basis of behaviour by using zebrafish to understand the brain alterations underpinning human psychiatric disorders.
Time for a change? Legalising Assisted Dying in the UK

What if you were told your last days would be spent in suffering and pain? Should you be able to avoid this, if you choose? In this article, Nataly Papadopoulou discusses controversial medico-legal questions on assisted dying.

Assisted dying refers to the situation where an individual is provided with the means, typically a lethal medication, to bring an end to his or her own life. The individual must be physically able to end his or her life with minimum, if any, third-party assistance. Whilst assisted dying is part of the broader and more common term ‘euthanasia’, meaning ‘good death’ (from Greek eu ‘good’ and thanatos ‘death’), the two are distinct, as the latter involves a third party directly bringing about the death.

This research explores the law on assisted dying in England and Wales, and argues that the UK Parliament should legalise some form of assisted dying. There are two practical reasons that support this argument: the ever-increasing number of citizens travelling abroad for assisted dying, and public views favouring legalisation.

The Law around the World

In England and Wales, suicide and attempted suicide were only decriminalised in 1961, before which they were punished by religious, civil, and legal penalties. In failed suicide attempts, the common law imposed severe sanctions on the individual, the most common being imprisonment and hard labour. The law not only failed to support and advise individuals who attempted and failed to commit suicide, but also required that they undergo trial. In successful suicides, the law imposed sanctions directed to what the deceased left behind: reputation and fortune. As with cases of failed suicides, the law’s response lacked compassion, and had an impact on the family of the deceased.

In 1961, the Suicide Act decriminalised suicide and attempted suicide, however assisting or encouraging suicide remains a criminal offence punishable by up to 14 years imprisonment. Examples that may fall under the offence include providing pills to a dying relative or friend, to relieve their suffering or for financial gain, or publishing suicide information online and encouraging users to commit suicide. In practice, however, individuals who provide assistance to individuals who desire and request assistance are not prosecuted under the 1961 Act. This is because under prosecutorial guidelines, which are not law, non-professional compassionate assistance is sometimes excused.

Mr Noel Conway and his wife. Mr Conway is terminally ill and currently seeks a change of the law in England and Wales.
Outside of England and Wales, several countries and states permit some form of assisted dying. In 1997, the first physician-assisted dying law was enacted in the US state of Oregon, followed by a number of other US states, including Washington (2009), Vermont (2013), California (2015), Colorado (2016), and Washington D.C. (2017). Other Western countries have also enacted laws legalising assisted dying and/or euthanasia, including the Netherlands (2002), Belgium (2002), Luxembourg (2009), and Canada (2016). Switzerland has also permitted assisted suicide since 1942, but not under an official legal framework.

**“Assisting or encouraging suicide or attempted suicide remains a criminal offence punishable by up to 14 years of imprisonment”**

**Law Reform Attempts in England and Wales**

Several statutory reform bills, which are proposals introduced through and discussed in Parliament, have been proposed since 1961, yet all have been unsuccessful. The latest attempt, the Assisted Dying Bill 2013-14, was proposed in Parliament in May 2013, but eventually rejected by the House of Commons on 11 September 2015. Some members of the House of Commons were concerned about the value and sanctity of human life, and how this would have been affected by a potential legalisation of assisted dying.

Conversely, concerns were raised with regards to the financial and emotional pressure on ‘vulnerable groups’ (such as the elderly or the disabled) that may lead to requests for assistance in dying in order to relieve the ‘burden’ on relatives, friends, or the healthcare system and its resources.

Still others were concerned that assisted dying would break the Hippocratic Oath taken by doctors. Although several reform attempts have been made since 1961, I argue that further debate is needed and that legalisation of assisted dying should be pursued.

**Two Practical Justifications for Further Debate**

The first justification is the increasing number of Britons travelling abroad to be assisted in dying, a practice called ‘suicide tourism’. The most common destination is Switzerland, as at present, it is the only jurisdiction that permits assisted dying for non-nationals. Whilst euthanasia is a criminal offence in Switzerland, assisting or inciting suicide is prohibited only if carried out for ‘selfish reasons’. Doctors are not directly involved, but they need to prescribe the necessary lethal drugs and to assess the mental capacity of the individual. Non-profit right-to-die voluntary organisations set their own requirements, and carry out most of the assisted suicides in Switzerland, with EXIT and Dignitas being the two largest. Data from Dignitas reveal that a high number of Britons have used the service, and that many others are members but have not yet used the service.

Under the law on assisted suicide in England and Wales, individuals who assist their loved ones to travel to Switzerland to die are not, in practice, prosecuted. This is despite the fact that their actions (e.g., booking plane tickets, acquiring the relevant medical records, or helping the individual to travel to Switzerland) fall under the 1961 Act offence. The first example in the UK of a Dignitas suicide that did not result in prosecution was the case of Daniel James in 2008. Applying the prosecutorial guidance and discretion, the decision was made that no sanctions would be imposed on his parents for assisting in his travel to Switzerland to die. Therefore, although ‘suicide tourism’ is generally excused under domestic law, simply excusing ‘suicide tourism’ and exporting the problem is an insufficient solution.

**“Simply excusing ‘suicide tourism’ and exporting the problem is insufficient”**

The argument of some individuals who wish to die – the most recent example being the legal cases of Noel Conway and Omid T – is that to travel abroad one needs to be physically and financially able, but also willing to die abroad in another country, away from one’s family, friends, and home. The most important consideration, in my view, is that some individuals travel to Switzerland too early, before their mental or physical condition becomes such that may inhibit the journey, and as a result, their life is further shortened. These individuals need to be in a position to receive the medication unaided, and of course be able to travel to Switzerland. Thus, it can be argued that the
current law not only forces suffering individuals to go early, but also maintains the fear of prosecution for individuals who provide compassionate assistance to these individuals.

The second justification for further debate is the public views favouring legalisation in the United Kingdom. A number of sources report that public opinion supports the legalisation of some form of assisted dying. In 2015, Ipsos MORI reported that 70% of the participants believed that doctor-assisted dying should be legal in the United Kingdom.

This reflected on the findings of a YouGov 2012 report, which found that 69% of Britons felt that the law should allow doctors to assist the terminally ill to die, and 46% even in cases where illness is not terminal. A Populus poll of 5,000 people in 2015 found that assisted dying is supported by 82% of the population, with 47% strongly supporting a legalisation proposal.

Two main points of concern need to be raised in relation to public views. First, it should be acknowledged that this is subjective evidence. Public opinion polls, questionnaires, and surveys can be biased due to many factors, including how the questions are asked and the background of the respondents. Therefore, these should be treated with caution. The second point is that, even assuming that we accept the validity of public opinion, this does not necessarily establish the need for change. However, the argument here is that public opinion shows the controversy and public attention around the issue of assisted dying, and highlights the need for further debate.

Conclusion

The argument put forward in this article is that the UK Parliament should engage in further debate on the potential legalisation of some form of assisted dying in the United Kingdom. The article discussed two practical justifications for this: the high number of individuals already travelling abroad to die, and the public views favouring legalisation.

It is time for the United Kingdom to act on the matter of assisted dying by using the experience of other countries and states that currently permit some form of assisted dying, in order to create a safe, workable, and appropriate framework. Certainly, there is the need for further research on the various practical and procedural aspects of assisted dying, as well as the need for a careful study and review of the cultural, political, and practical differences of the UK legal and policy approach in comparison with other jurisdictions that permit some form of assisted dying.

“It is time for the United Kingdom to act on the matter of assisted dying by using the experience of other countries and states that currently permit some form of assisted dying, in order to create a safe, workable, and appropriate framework”

Nataly Papadopoulou is a final-year PhD student in the School of Law, researching assisted dying and human rights. She is happy to be contacted about any aspect of this article written for Frontier at np224@le.ac.uk.
Doctoral Writing Needs Style and Substance

Stylish writing is often sidelined in favour of academic seriousness. Yet in an age where research must seek to connect with those it serves, Dr Melanie Petch argues that writing well has never been more important for doctoral researchers from all disciplines.

In the dystopian fiction Submission, the speaker makes an interesting observation on the nature of academic study: it exists, he says, “solely to replicate itself”. Within many academic domains, there are rules for writing that all good researchers are expected to absorb and replicate. Stylish writing is often swept aside in favour of perceived academic seriousness. Can doctoral writing be academically sound – relevant, interrogative, analytical – and still beautiful? In an age of impact, stylish writing is vital, if only to connect with the public audience it must also serve.

Learn the art of storytelling

Could you relate a prick on the finger in Sleeping Beauty to immunology and fighting infection? Could current news stories lead you into a discussion of your own research? Used appropriately, stories have the potential to connect research with a wider audience and draw the reader in.

Have “something to talk about (the topic) and something to say about it (the point)”

The topic provides focus for your discussion, whereas the ‘point’ becomes the discussion itself. Ask ‘Why is this topic significant to my area of research?’ and ‘How will this topic inform, or shape my research?’.

Build pace and rhythm

Have you ever found yourself racing to read a text, your heart thumping with excitement? If so, your author has managed to create energy in the sequencing of their ideas. One way of creating pace is to finish chapters with the most innovative areas of your work. In The Pleasure of the Text, Roland Barthes argues that concealing is more seductive than revealing. Your writing should create energy in the suspense that the best is yet to come.

Build rapport with your reader

Clear and Simple as the Truth discusses the need for a ‘symmetrical relationship’ between reader and writer. Knowledge of the research topic should be unfolded by reader and doctoral writer. Useful phrases to evoke symmetry are “As we considered earlier…” or “Let us now turn to the idea that…”. All in all, we aim for a compassionate relationship with our reader that evokes transparency and a generous spirit.

Avoid unnecessary meta-narrative

By meta-narrative, I mean those clunky sentences that so often litter writing to ‘help’ the reader. Agreed, doctoral writing requires some signposting as the thesis is a long document: for example, “Chapter Two also refers to…” However, signposting is not necessary in every other paragraph, as this endangers the natural flow of your argument.

Show enthusiasm

There is something endearing about a writer who shows genuine excitement for their research. Look at the following example: “We might argue that all researchers are highly confident writers. This is all well and good, but are we making vast assumptions here? Let us turn to the evidence.” The question adds interest, and demonstrates curiosity. With each sentence, the reader moves forwards rather than halting to take in each idea.

Stylish writing is a skill that can be mastered with practise, and much can be learned from deconstructing the language of the writers you enjoy. What makes it so enjoyable? What stylistic tips can you borrow? Give these ideas a go. Let me know how you get on.

Melanie Petch has worked in researcher development supporting PhD students for nearly ten years, and specialises in doctoral writing. She has published on writing in the arts, the experience of being a PhD student, and the connection between philosophy and writing practices.
Striving to Be a Balanced Researcher?

Being a postgraduate researcher can often be an emotionally taxing business. In this article, **Martin Coffey** provides tips on how to cope with the stress, challenges and potential mental health issues that PhD students from all disciplines have to face along the road.

The Health & Safety Executive (www.hse.gov.uk) defines stress as “the adverse reaction people have to excessive pressure or other types of demand placed on them”. There are a many sources of pressure one can experience and a myriad of ways in which it can impact on a person. However, what is central is the individual’s perception of their circumstances.

Arnold et al (2005), page 402, suggests that workplace stress is caused by “job insecurity, information overload and a management style that punishes rather than praises”. As a PhD researcher you may identify with some or all of these, faced with what may at times appear to be an overwhelming environment full of information, or perhaps lack of information.

The Mental Health Foundation (www.mentalhealth.org.uk) state “the pressure of an increasingly demanding work culture in the UK is perhaps the biggest and most pressing challenge to mental health of the general population”. For a truly balanced life, work (read PhD research) should be an integral part of how someone perceives their life. Associating fully with what we do means that our work/research is not viewed as a separate entity on some continuum, with work at one end and life at the other.

Approaches such as Neurolinguistic Programming (NLP) and Cognitive Behaviour Therapy, include cognitive re-framing as a key tool. They suggest we do not have to just react to our circumstances but instead we can always choose our response to the “slings and arrows of outrageous fortune”.

On May 24th the Researcher Development Team put on a “Health and Wellbeing day” for PhD researchers. There was an opportunity to learn about a range of tools and techniques to manage the challenges of life and research. The focus was managing our perceptions of challenges. There were opportunities to learn techniques from NLP and to learn skills from current research on resilience. There were experiential sessions on meditation, mindfulness and stress management.

Whilst completing a PhD over three to six years is a daunting task, it pales into insignificance when compared to the 27 years Nelson Mandela spent in prison. Did I mention that perspective is also a key coping tool? Apparently, one of Mandela’s sources of strength during that time was the following poem, the last two lines seem particularly apt:

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**Invictus**

**BY WILLIAM ERNEST HENLEY**

Out of the night that covers me,  
Black as the pit from pole to pole,  
I thank whatever gods may be  
For my unconquerable soul.

In the fell clutch of circumstance  
I have not winced nor cried aloud.  
Under the bludgeonings of chance  
My head is bloody, but unbowed.

Beyond this place of wrath and tears  
Looms but the Horror of the shade,  
And yet the menace of the years  
Finds and shall find me unafraid.

It matters not how strait the gate,  
How charged with punishments the scroll,  
I am the master of my fate,  
I am the captain of my soul.

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As part of the Researcher Development Team at Leicester, Martin Coffey currently provides expert Career Management and Employability support to all PhD researchers across the University of Leicester. He can be contacted about the topic of this article or indeed for career advice via e-mail: mgc5@le.ac.uk.
Establishing the Identity of the Dead

Although “death investigation” is quite a clinical and detached term, forensic anthropologists know better than to ignore or push aside the human aspect of this kind of work. How we deal with death is part of what makes us human, from a philosophical and societal point of view. For that reason, whenever we deal with the dead, we remember the living.

Legally, a death investigation is mandated when an individual has died in suspicious or unnatural circumstances. The point of such an investigation is to determine the cause of death, and this task is usually given to the coroner, who works with a forensic pathologist. But sometimes, there is more to a death investigation – what if we don’t know who the person was to begin with? The identity of the deceased is crucial for many reasons – enacting the will of the deceased, contacting family members and loved ones, and if there is a criminal aspect involved, reconstructing the events surrounding the death.

Establishing this can be problematic if the body has decomposed, or if there were attempts at disfiguring and hiding the identity. In these cases, the most robust piece of evidence left is the skeleton. Bone is tough and persists throughout time even if it has been subject to harsh conditions, this is where forensic anthropologists come in.

From bone, forensic anthropologists build the “biological profile” by analyzing the skeleton to produce assessments of biological sex, age, and ancestry, in the hopes that missing person profiles can potentially match, and the dead can be identified. Forensic anthropologists analyze the shape and form of bone, both visually and through measurements. Then, based on population-specific knowledge of how the skeleton grows and degenerates throughout life, and how these changes are different between males and females, it is possible to understand the identity of the deceased individual.

Using Computer Programs to Analyze Data

As with anything humans do, there is bias, and to date there has not been a single skeletal assessment method that can be replicated with 100% reliability and accuracy. This is because people tend to see things differently, even if the same bone is analyzed. For example, bones may be measured differently because analysts...
understand or choose bony landmarks in slightly different ways. This is problematic, because the results may differ considerably. As scientists, we want to ascertain the absolute truth. As a judge or a jury member, we want to be reassured that the methods used in a criminal investigation are reliable. This is where computer programs come into play.

Computer programs are reliable in the sense that if you input the same things, you will always get a consistent answer (unless randomization is built into the computer’s algorithm). This is both an asset and a weakness – it certainly solves the issue of reliability and repeatability, but humans also distrust answers from “black boxes”, which simply means, if you input something, you’ll get an output. What happens in the “black box” in order to get the answer is not verified. An example of this is a program that takes inputted measurements and creates an equation that says how likely the measured bones belong to a male or a female, and from which population. The program will still give an answer even if the group that the individual actually belongs to is not one of the available options. By forcing the individual into one of several pre-defined groups, the program itself shows bias.

There is a need for humans to check over answers to ensure that the outputs from programs make sense. Society also needs to understand how humans can learn from programs, and how programs can complement a human’s analysis. This is what my research focuses on. I am creating a database of 3D models of skulls and writing a program that can automatically define the important features for identifying the biological sex and population from which the individual comes. The program I am creating may identify patterns that humans have not yet recognized, and if this is the case, then we have a lot of new and exciting avenues of research to pursue in order to understand the theories underlying these patterns.

There is also an important social aspect to human work in death investigations, which is why, from this point of view, computers should not be taking over the entire task of identifying the dead. Human interaction with the dead is a concept that is strongly prevalent in all societies across time and space, although the nature of this interaction differs remarkably. By preserving this human component in death investigations and using programs to augment this work, the task of identifying the dead can become more robust while remaining an important part of society.

Jessica Lam is completing her PhD as part of the INTREPID Forensics Programme.
Feelings and Psychosis: A Cross College Studentship

Developing innovative methodological strategies to explore combinations of feelings, Katie Melvin discusses her project on experiences described as psychosis.

“Feelings involve the embodied states we experience but don’t always notice as we go through our daily lives…”

What is Psychosis?

Psychosis is a medical term used to describe experiences where our understandings and perceptions of reality differ from those held by people around us. Experiences described as an episode of psychosis often involve disruptions to thinking, speech, emotion, and behaviour. This tends to involve experiences called delusions, where we strongly believe things which are almost certainly untrue. It can also involve hallucinations, with sensory experiences seemingly without an external, material cause, such as hearing voices. Such episodes can be associated with traumatic experiences, lack of sleep, stress, neurological conditions (e.g. dementia or Parkinson’s disease), drug and alcohol use, socio-economic disadvantage, and many other causes. Some people who experience an episode described as psychosis are given a psychiatric diagnosis such as schizophrenia or bipolar disorder.

What do we mean by feelings?

Feelings involve the embodied states we experience but don’t always notice, as we go through our daily lives, navigating our material and social world. The term ‘feelings’ broadly includes three types of embodied experiences: emotional feelings, extra-emotional feelings, and feelings of knowing (Cromby, 2015). Emotional feelings regard the bodily experience of emotional states such as uplifting happiness or sinking sadness. Extra-emotional feelings are broader states not always associated with emotion, such as hunger or sleepiness. Feelings of knowing, often referred to as gut-feelings, tend to be experienced in social relations and decision making, such as a sense of reluctance or certainty. This research about feelings forms part of social science’s affective turn; an academic shift towards considering emotive and embodied aspects of experiences.
Feelings are formed within an environmental context, with flowing and fluxing sensations throughout the body as we occupy a material, social, and relational space. Due to the breadth of this experience and its constant interrelationship with our experience of an environment, feelings can be difficult to research. Physiological measures can't always capture them, they can't always be expressed in words, and they can be difficult to quantify. This presents a methodological challenge but also an opportunity for interdisciplinary research. By looking across the boundaries of different subject areas, we may be able to develop innovative methods to optimise our understanding of feelings and their part in psychosis.

“[the project] will support people who have experienced episodes described as psychosis.”

Why is this research important?

Lived experiences such as feelings and emotions are often neglected in research. Personal accounts and clinical understandings of psychosis tend to involve descriptions of people experiencing a sense of distress alongside other cognitive, functional, and interpersonal difficulties. Little is known about how feelings may play a role in experiences described as psychosis. This project therefore aims to explore what feeling states are present in experiences described as psychosis. More specifically, I hope to understand how feelings may co-occur and catalyse one another and what this lived, embodied experience is like.

Since this is a novel area of research without established methods, the project will most likely take a qualitative approach. Subsequent to a more thorough literature review, the project will develop an empirical methodological strategy to support people who have experienced episodes described as psychosis. This will hopefully allow them to share what those felt, embodied experiences were like. This provides an opportunity for people to share and talk through their experiences in a space where they are welcomed to do so. The project also provides a platform for people to contribute to the current academic discourse where their lived experiences are not often considered. This may support developments in academic, clinical and public understandings of these experiences, such that clinical practice and therapeutic interventions can be improved.

Katie Melvin is finishing her first year of a PhD within the School of Business and School of Psychology at the University of Leicester. Katie aims to employ her clinical and academic skills to further understand the role of feelings in experiences described as a first episode of psychosis.
Enduring Pasts: The Intersections of the Past and Present

A central component of Donald Trump’s campaign to become President of the United States was the promise to restore America to greatness. Using this as an example Phil Hughes, a PhD student in the School of Archaeology and Ancient History, explores engagements with the past both ideologically and materially to reveal how the past is a deeply-inscribed element of our being in the present.

‘We swim in the past as fish do in water and cannot escape it’...

...wrote eminent Marxist scholar Eric Hobsbawm (1972). It is a saying I have recalled repeatedly during the course of the United States Presidential elections and the early stages of Donald J. Trump’s presidency. Indeed, Trump’s supporters chanted a mantra emblazoned on kitschy crimson caps: ‘Make America Great Again’. As we shall see, this is an idealisation of a perceived purer past, and it is a motif of human history. It goes far beyond wistful nostalgia; it can also be ideological. Make Rome great again

Whilst Trump’s lack of specificity is glaring, other cases evoking an idealised past can be more explicit. We can observe such a scenario in Roman history, (c. 59 BCE–17CE). According to Livy, a historian of the early Roman Empire, an aristocrat named Lucius Quinctius Cincinnatus having already served in the Roman Senate as Consul, the highest political office in the Roman Republic, refused to illegally stand for a second term and instead retired to work on his farm.

However, in a series of political crises which subsequently threatened the survival of the Roman state and the fabric of Roman society, Cincinnatus was pleaded with to abandon his pedestrian life on his agricultural estate and return to public life. Agreeing, he was twice granted the office of emergency dictator in 458 and 439 BCE. Successfully fending off the challenges engulfing Rome, Cincinnatus nobly relinquished his powers, foregoing personal glory and opting instead to return to his humble farming existence. As a result, Cincinnatus was revered for placing the Roman state above his personal ambitions.

Most ancient historians are naturally dubious of the historicity of this tale. However, its authenticity is largely irrelevant; crucial is the fact that Livy utilised the story hundreds of years later for the purposes of legitimising the rule of Augustus, who had ascended to the role of Emperor after the bitter civil wars of the 1st century BCE, which resulted in the collapse of the Roman Republic. In fact, the story of Cincinnatus tells us much more about Roman society in the age of Augustus than it does about the time of Cincinnatus. As part of his many legal and religious

‘Idealising and promulgating a perceived purer past is a well-worn motif of human history’

But in Trump’s case it is constructed, vague, and no evidence of exactly when America was great in the first place has been offered. Is Trump referring to the era of Reagan and financial deregulation? Is he perhaps longing for the days of the liberal optimism, sexual revolution and the counter-culture of the early 1960s? Is he asserting a desire to return to ‘traditional family values’ of the 1950s and the ideal of the post-war domestic housewife? We have not been told, and this is deliberate. Rather, Trump is emphasising that, in his view, America has entered a period of decline, and his rhetoric represents an attempt to cement this idea as an accepted narrative in public consciousness.

‘...in Trump’s case... no evidence of exactly when America was great in the first place has been offered’

“A version of a past can also be deliberately forgotten as well as collectively remembered”
reforms, Augustus advocated a moral agenda of virtue and piety, explicitly wishing to return the Republic to greatness and restore *mos maiorum* (the tradition of the ancestors). In this context, Livy’s reflection on Cincinnatus is no coincidence; the narrative of Cincinnatus’ story is deliberately woven to create a link between these two figures, uniting past and present. Like Cincinnatus, Augustus is presented as the humble saviour of the Roman Republic, mitigating the fact that he had essentially assumed the role of dictator for life.

**An invented Tradition**

We might note that Cincinnatus’ legacy has a longevity beyond the Romans, lingering in US political consciousness. Following success in the Revolutionary War (1775-1783), George Washington, a farmer from Virginia, elected to surrender his position as General of the Continental Army and, like Cincinnatus, return to life on his farm. Prior to Washington’s Presidency (1789-1797), in 1788 a statue of him designed by Jean-Antoine Houdon was erected in the Bicentennial Commons, Cincinnati, Ohio, USA. Constructed in 1988, it reflects the deliberately constructed association between the United States and the political ideals of Classical Antiquity.
in the statehouse of Richmond, Virginia. It depicts Washington standing in front of a plough. To his right are the fasces, - a bound bundle of wooden rods sometimes with an axe - the Roman symbol of political and military power. Through this monument the audience, who will have had a knowledge of ancient history and literature, is invited to make the connection between Cincinnatus and Washington.

“...events of the past can be appropriated in order to ascribe political legitimacy in the present”

As Carl Richard has demonstrated, this reflects a carefully constructed narrative where the fledgling United States, freed from the shackles of British imperial rule, was consciously defined as the natural successor to the political ideals of Greco-Roman society (2009). For instance, in 1988 a statue depicting Cincinnatus and his plough was erected in Bicentennial Commons in the aptly named Cincinnati, cementing the deeply-embedded nature of Cincinnatus’ narrative in American consciousness and highlighting how events of the past can be appropriated in order to ascribe political legitimacy in the present.

The selection and dissemination of a specific narrative of the past can, therefore, be overtly ideological. Eric Hobsbawm and Terence Ranger termed the process the Invention of Tradition (1983). It is employed widely to ensure the cultural acceptance of and establish a continuity with an appropriate past which reflects agendas of the present. Like Augustus, Trump’s campaign team cynically, but successfully, exploited an old rhetorical device appealing for a return to a glorious age which may be fictitious, exaggerated or vague. Washington, like Augustus through Livy’s works, orchestrated a conscious link between himself and Cincinnatus communicating that he embodied Cincinnatus’ values in the present.

Living in a Material World

We have been interested so far on specific narratives or events of the past used in later periods through the lens of political ideology. It is important, however, to recognise the capacity of material things to be integral in the construction of the present. Recent archaeological debates have focussed on returning objects to the front of our discussions. Arguably relegated to the role of passive materials merely representative of social behaviours, archaeologists now recognise the ways that materials act. This extends to discussion of the past in the present because material things are not confined to the same linear time as human lives or events. As Bjornar Olsen suggests: ‘the past is pressing against the present, and we cannot conceive of it without things’ (2010: 120).

This is a useful way of considering the intersection of ideology and materiality. Take, for example, the ancient city of Palmyra in Syria, a UNESCO World Heritage Site, occupied on and off by Daesh forces since 2015. Daesh have destroyed some ancient monuments within the city, such as the 1st century CE Lion of Al-lā. Indeed, Abu Laith-Al Saoudy, the assumed named of a Daesh military commander, stated in a radio interview ‘[we will] break the idols that the infidels used to worship’. For Daesh, we see the opposite process of Trump and Augustus’ idealisation of the past; here a perceived impure past, encoded and expressed materially, is eradicated as part of a fundamentalist agenda.

But the destroyed monuments have an importance and capacity to act beyond their obliteration. Western outrage at the annihilation of parts of Palmyra resulted in a 3D technology-inspired reconstruction of Palmyra’s destroyed Roman Triumphal Arch made by the Institute of Digital Archaeology, unveiled in Trafalgar Square In April 2016, before making its way to New York and Dubai.

Here, the arch has been appropriated as a powerful symbol contrasting the barbarity of Daesh and its destruction of the past with the enlightened West and its emphasis on preservation and heritage. The arch of Palmyra shows us that separate ideologies are contesting and negotiating the same ancient monuments.

“...destroyed monuments have an importance and capacity to act beyond their obliteration...

...The Arch of Palmyra shows us that separate ideologies are contesting and negotiating the same ancient monuments.”

However, because the recreated arch is removed from its original archaeological context, an attempt at attaining authenticity of how the monument would have been experienced in the past is avoided. Whilst some purists may sneer at an out of place replica, considering it nothing more than further evidence for the commodification of the past bounded with the heritage industry, we miss a wider point taking this view. The reconstructed monument is as much a living object as the annihilated original. Consequently, the two monuments are dependent on one another; the meanings and memories are indexed in both the destroyed and reconstructed monument. This leads us to perceive that events are not moments of time that happen to objects but, rather, meanings in time that emerge with and through them. In this way, we learn that whilst historical time is linear and sequential, objects of the past are always in the present, exerting an influence, and that their ‘pastness’ is central to how this process operates.

“The past is not remote and unchanging but in a continuous state of flux”

All this suggests, as Raphael Samuel famously argued, the past is not remote and unchanging but in a continuous state of flux, living in practice and reinvented constantly for the multiple competing needs of the present (1994).
Phil Hughes undertook both his undergraduate and Masters degree here at the University of Leicester. His research focussed on the archaeology of Roman Britain. Phil’s doctoral research investigates Romano-British engagement with the materials of the prehistoric past, with the aim of understanding how people of the period fostered a cultural consciousness of time and a sense of the past.

References


