Celebrating the achievements of Sevenoaks students

Sevenoaks School was one of the first schools in the UK to introduce the International Baccalaureate, and the first UK school to move exclusively to the IB at Sixth Form. The school now enjoys world-class academic status, with an average IB score ten points above the world average.

The IB has rapidly established itself as the international gold standard of education. Its single vision is an attempt to prepare young people for a life of learning in an unpredictable future. While having a proven track record in its ability to prepare students better for undergraduate studies, its educational vision is premised on a notion of what being well-educated means: an 18-year-old school-leaver should be numerate, literate, able to apply rigorous scientific and mathematical thinking to the world, while being able to engage in foreign cultures. These are the basic requirements of living in the multifaceted world of the 21st century, regardless of the university destination or degree.

In this book, we have a collection of ten of our IB Extended Essays from our 2014 cohort of students – these typify the depth, breadth and subject nature of the studies that form an integral part of the IB.

We hope you enjoy reading them!
Introduction from John Sprague, Director of IB, Sevenoaks School

Every year in February each of our Lower Sixth students embarks on a journey which will be the one of the biggest challenges of their young academic careers: the IB Extended Essay. It is undoubtedly a daunting task: a 4000-word independently researched essay on a topic of their own choice, often in a subject that they’ve only been studying for six months. Every year, however, all of our students reach their goal having produced a remarkable piece of original research. I say ‘independent’ and genuinely mean it. The IB is pretty clear in its expectations: supervisors are to spend no more than five hours over a six-month process working directly with the student and at no point are we allowed to edit the student’s writing or compel them into any particular direction. The students choose and develop their ideas; we help them bring them to fruition. It is without a doubt the most difficult academic work in which they will have engaged to date. It is also the element of the IB which seems to most prepare them for the rigour and independence of undergraduate study.

Again and again we hear from our visiting alumni that it was the Extended Essay that prepared them most for university research and gave them a clear advantage among their undergraduate peers. The collection of essays contained in this, our first edition of Prized Writing, are genuinely that – prized. We, their supervisors and teachers, think they stand out solely on the basis of the originality of their topics, the levels of commitment and enthusiasm of the authors and the demonstrated ability of these students to overcome whatever difficulties they encountered in the research and writing process. The essays were purposely chosen before they received any external marks from IB examiners. We are, undoubtedly, proud of each of the 212 essays submitted to the IB in May 2014 and would stand by any one of them, but these seemed to be first among equals, so we share them with you.

They are included unedited, in exactly the way that they are submitted to the IB, so there may be some idiosyncrasies within, but this is what makes them so special. They’ve been written by real students doing their absolute best, and we applaud them.
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In what ways and to what effect do Emily Brontë and Homer portray their protagonists, Heathcliff and Odysseus, in *Wuthering Heights* and *The Odyssey*?
Tabitha Adams - English

The Extended Essay was an opportunity to produce a unique piece of work, on a topic that was entirely of my own choosing and using texts I had not studied in class. Writing an Extended Essay on English Literature presented an infinite option of texts and approaches, and so I found it difficult initially to narrow down a particular research question.

Since I was also studying ancient Greek, I enjoyed the fact that I could compare a text from my studies in Greek literature with a book I had enjoyed during my own private reading. It was both liberating and exciting to be able to learn a great deal about texts in which I had a genuine interest.

Filtering through the wide range of criticisms and analyses on the two texts was to begin with quite daunting, but to produce by the end an essay of my own individual design and perspective was very rewarding.

Supervisor: Charlotte Glanville

Tabitha’s research question immediately intrigued me as it sought to juxtapose two unlikely works spanning multiple centuries and the genres of poetry and prose. However, Tabitha’s underlying premise, namely that both authors pushed against the frontiers of the heroic tradition within the contexts of their time, was insightful and worthy of investigation.

As with any comparative essay Tabitha quickly recognised the danger of sandwiching two essays together and so a comparison of the literary techniques used by the two authors to generate such groundbreaking ‘heroes’, was woven into her essay plan. Moreover, she recognised that the naming of characters in her title could potentially invite too much character study and she cleverly countered this threat with her focus on the literary methods used in their creation.

Tabitha’s preliminary reading was extensive and provided her with a comprehensive understanding of the contexts within which the two works were written. She skilfully maintained a primary focus on literary analysis, whilst drawing on context to provide her argument with assurance and sophistication.
Abstract

This essay explores the research question; “In what ways and to what effect do Emily Brontë and Homer portray their protagonists, Heathcliff and Odysseus, in Wuthering Heights and The Odyssey?”. The essay focuses on the unconventional nature of the protagonists Heathcliff and Odysseus, touching on the nature of Achilles in The Iliad as a comparatively conventional Homeric hero to Odysseus. Odysseus is portrayed by Homer as guileful, cunning and able to exert great self-restraint, which separates him from other Greek heroes. Heathcliff is portrayed by Brontë as a morally abstruse and unrepentant character who nonetheless gains sympathy from the reader and defies both Victorian and Romantic literary conventions.

Both protagonists are depicted as outsiders and their status as an outsider is one of the main influential factors behind their unconventional characters.

Odysseus and Heathcliff are used by Homer and Brontë as literary devices to challenge the conventional social and moral values of their respective societies. They are also used as a challenge to literary convention in order to influence change and development of the concept of the hero. One point I am aware of, but was not able to cover in this essay, is that Homer wrote The Odyssey in verse and it might be interesting to look at whether the comparative genres of verse and novel reveal something else; Homer was using conventional heroic verse despite Odysseus not being a conventional hero, whereas Brontë uses the innovative technique of multiple narrators and moves back and forth in time which was unconventional for a Victorian novel.
Introduction

The *Odyssey* is the second known work of Western Literature, almost unanimously agreed to have been composed by the ancient Greek poet Homer, towards the end of the eighth century BC. Emily Brontë lived in West Yorkshire, England and published *Wuthering Heights* in 1847. I was interested in the idea of identity concerning the protagonists of these texts, Heathcliff and Odysseus, and I realized that each had a rather unique identity within their scope of contemporaries. Both Homer and Brontë seemed fascinated with the portrayal of an unconventional hero and although The *Odyssey* and *Wuthering Heights* appear two incongruous works, written thousands of years apart, I believe the authors of each text achieve a similar effect from the creation of their protagonists. In my essay I will discuss the research question; “In what ways and to what effect do Emily Brontë and Homer portray their protagonists, Heathcliff and Odysseus, in *Wuthering Heights* and the *Odyssey*?”

It took Brontë a year to publish *Wuthering Heights* and the novel was not initially well received. Victorian critics found it too morbid and violent, and Heathcliff as a character was regarded as demonic, even by Emily’s sister Charlotte. *Wuthering Heights* has subsequently become one of the most influential and keenly studied works of English literature.

Homer’s *Odyssey* depicts the hero Odysseus as unlike any hero from The *Iliad* or the rest of the ancient heroic tradition. Homer’s *Odyssey* influenced many Greek writers and philosophers from Sophocles to Plato and the epic poem is seen as one of the forefathers of all Western literature.

These two very different texts, both groundbreaking within the context of their time and subsequently very influential, present us with two unorthodox heroes. In my essay I endeavour to explain in what ways the heroes Heathcliff and Odysseus are unconventional and how an unconventional protagonist allows an author to challenge the conventions of literature and society.
The conventional Homeric hero is a great warrior; passionate, violent and ready to face death in order to achieve a glorious immortality, through the memory of his name for generations to come. In The Iliad, Achilles is the epitome of the Homeric hero. He is a mighty warrior described as the best of his race; “far the strongest of the Achaeans”\(^1\), furthermore he is a half god, the grandson of Zeus, tantalizingly close to immortality. The Homeric hero is often consumed by such fits of passion and glorious rage that he is reduced to bestiality. In The Iliad, having slain Hector, Achilles bores holes through the dead man’s heels and drags him behind his chariot. Apollo describes this behaviour of Achilles as that of a savage beast, “Achilles’ mind is unbalanced...his thoughts are wild, like a lion who gives in to his great force and overmanly heart”\(^2\).

From the very beginning of The Odyssey we can observe that Odysseus is an unconventional hero. The very first lines of the epic poem read, “Tell me, Muse, the story of that resourceful man”\(^3\), here Odysseus’ most important trait is revealed, he is ‘resourceful’ which can also be translated as ‘ingenious’. The actual name of the hero is not mentioned until line 21 whereas Achilles’ name is mentioned in the first line of The Iliad, demonstrating that The Odyssey is much more about the hero as a man with a personality, rather than the hero as an iconic legend, as with The Iliad.

There are numerous occasions where Odysseus displays his cunning or ‘ingenious’ nature expressed in the first line of The Odyssey. For example he is willing to disguise himself as a filthy beggar in order infiltrate the city of Troy, as described by Menelaus in Book 4, “He disfigured himself with appalling lacerations and then with dirty rags on his back, looking like a slave, he slunk into the broad streets of the enemy city... not detected by anyone.”\(^4\) The contrast between a hero and a ‘slave’ is very great, showing Odysseus is clearly willing to degrade himself, a very uncharacteristic behaviour of a noble Greek hero, but one which demonstrates his guile since it enables Odysseus to manipulate the unsuspecting society. He uses his cunning again in the Cyclops’ cave in Book 9, calling himself ‘No-body’ so that when Polyphemus cries out that ‘No-body’ is hurting him, the other Cyclops do not come to his aid. As a Greek hero, the hero’s name is of the greatest importance to him since it is his key to immortality, therefore for Homer to present Odysseus as literally calling himself a ‘No-body’, emphasizes the great self-restraint and moderation of this hero.

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\(^3\) Pg. 3, Homer, The Odyssey
\(^4\) Pg. 47, Homer, The Odyssey
These actions of disguise, degradation and self-restraint show a self-abasement which would never have been displayed by the proud and mighty Achilles, nor any other Homeric hero. With the creation of Odysseus, Homer has defied his own convention to produce a hero who must use not only brute-strength but cunning and guile to survive.

The conventional hero in the context of Emily Brontë and *Wuthering Heights* is much harder to define, predominantly because Brontë is not writing within a clearly defined heroic tradition unlike Homer. For example Heathcliff is often read as a Byronic hero like Mr. Rochester in *Jayne Eyre*. Heathcliff is, as typical of a Byronic hero, an outcast, a lonely soul with a mysterious origin. Nelly Dean speaking to Mr. Lockwood of Heathcliff’s history says “It’s a cuckoo’s sir - I know all about it: except where he was born, and who his parents were”\(^5\). Heathcliff also has the features of a Byronic hero, dark and brooding with hauntingly memorable eyes, which Nelly describes as “that couple of black fiends, so deeply buried... like devil’s spies”\(^6\). Furthermore Heathcliff is morally ambiguous, a central characteristic of the Byronic hero.

Yet in various ways Heathcliff deviates greatly from this category of hero. Usually a Byronic hero bears the burden of a terrible and mysterious crime, undisclosed to the reader till the end of the novel. However all Heathcliff’s offences are clearly laid before us: his leading of Hindley Earnshaw to perdition, his vengeful courting of Isabella Linton, his deliberate degrading of Hareton, his cruel treatment of his son Linton and his abduction of the young Catherine. Furthermore Heathcliff only exhibits the ‘melancholy habits’ characteristic of a Byronic hero after Catherine’s death, as a natural symptom of his bereavement and suffering, not as the “insufferable sorrow of the hero’s lot on earth”\(^7\). Therefore although Brontë has portrayed Heathcliff with many Byronic characteristics, he does not quite fit within this convention.

If Heathcliff fits only superficially within the convention of the Byronic hero, he is even more misplaced within the convention of the rigidly moral Victorian hero. Heathcliff is an orphaned gipsy- not initially wealthy or of a high-class background like the typical Victorian protagonist. Furthermore he has almost no moral regard and commits many cruel and sadistic acts. Cathy herself describes him in Chapter 10 as “a fierce, pitiless, wolfish man.”\(^8\), the strong suggestion of animal qualities in Cathy’s words very much distance Heathcliff from the refined gentlemanly behaviour of the typical Victorian hero.

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\(^6\) Pg. 39, Brontë, *Wuthering Heights*
\(^8\) Pg.74, Brontë, *Wuthering Heights*
Though it may not be possible to view Heathcliff as a hero from a moral perspective, or explain away his moral ambiguity by classifying him as a Byronic hero, I believe there is still justification for Heathcliff as the hero in *Wuthering Heights*. First of all he does gain some sympathy from the reader because of his upbringing, which is far from just and harmonious. *We are introduced to Heathcliff as a child, compliant and passive to the violence he receives, described by Nelly in Chapter 4 “he was as uncomplaining as a lamb; though hardness, not gentleness, made him give little trouble”*. The innovative use of a narrator’s perspective throughout the novel is an important technique employed by Brontë to gain sympathy for Heathcliff. Nelly’s narrative voice encourages us to observe and judge Heathcliff’s actions in a particular way; the image here of a ‘lamb’ portrays Heathcliff as particularly helpless. Additionally, we are able to admire Heathcliff as a hero for his innate intelligence and ingenuity, clearly demonstrated by his gradual rise to fortune and social status despite his meager beginnings. There is also something attractive about his rebellion and unrepentant self-assurance which makes him heroic. Although Brontë does not make a specific digression from an archetypal hero with Heathcliff, as Homer does with Odysseus, she is certainly breaking the conventions of stringent Victorian literature with her morally dubious protagonist.

Both Brontë and Homer depict their protagonists as outsiders. This is one of the main reasons why Odysseus and Heathcliff must adapt and break from convention. In The *Odyssey*, Odysseus encounters many strange lands where as an outsider he must adapt from conventional heroic behaviour, demonstrating self-restraint and guile. A key example of this self-discipline is shown in Book 9 when Odysseus is trapped in the Cyclops’ cave. Having witnessed the monster brutally devour several of his comrades and with Polyphemus now in a wine-induced sleep, it is the perfect opportunity for Odysseus to take his revenge. However he checks himself; “On first thoughts I planned to summon my courage... and stab him in the breast ...But on second thoughts I refrained ... because we would have found it impossible ... to push aside the huge rock with which he had closed ... the cave.” The conventional heroic action here would be to slay the Cyclops and perhaps a more passionate and impulsive hero would have done so. However Odysseus knows he must be patient and enduring, until he can use his cunning to escape.

The most poignant portrayal of Odysseus as an outsider, where he is forced to demonstrate remarkable self-restraint, is shown when he meets his wife again for the first time after 20 years. Disguised as an old man, Odysseus cannot reveal himself to Penelope nor even embrace her, he is forced to speak of himself as an acquaintance and when Penelope weeps for her husband whom she believes is dead, Odysseus’ venerable self-control does not falter, as

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9 Pg. 27, Brontë, *Wuthering Heights*
10 Pg. 118, Homer, *The Odyssey*
described in Book 19; “But though Odysseus’ heart was wrung by his wife’s distress, his eyes, as if made of horn or iron, remained steady between their lids, so guilefully did he repress his tears”\textsuperscript{11}. With the comparison of ‘horn’ and ‘iron’ to describe Odysseus’ eyes, Homer emphasizes Odysseus’ resilience; the simile almost portrays Odysseus as inhuman, as dispassionate as metal. This self-discipline which Odysseus must demonstrate as an outsider is unconventional behaviour for a Greek hero. It is however very admirable for Odysseus to be both a fearsome warrior and to command great self-control and Homer’s portrayal of Odysseus in this way makes him a more consummate hero than any other hero of his convention.

From the very start Heathcliff is an outsider in \textit{Wuthering Heights} and like Odysseus he must adapt his behaviour, however Heathcliff’s adaption is not as constructive as Odysseus. Nelly describes Hindley’s degradation of Heathcliff in Chapter 6, “He drove him from their company to the servants, deprived him of the instructions of the curate, and insisted that he should labour out of doors instead; compelling him to do so as hard as any other lad on the farm.”\textsuperscript{12} Inevitably this deprivation and treatment as an outsider leads to Heathcliff’s sullen and acrimonious behaviour, as Nelly explains in Chapter 8, “his naturally reserved disposition was exaggerated into an almost idiotic excess of unsociable moroseness; and he took a grim pleasure, apparently, in exciting the aversion rather than the esteem of his few acquaintance.”\textsuperscript{13} Heathcliff’s treatment in his youth and his status as an outsider are at least in part to blame for his twisted character when he grows up. It is this defense for his actions as an adult and his treatment as an outsider in his childhood which evoke sympathy for Heathcliff from the reader, enabling us to view him in a heroic light. The narrative voice of Nelly Dean is particularly integral in stimulating this sympathy, in Chapter 7 whilst remembering her old master Earnshaw who was partial to Heathcliff, she draws attention to Heathcliff’s suffering “I went on to think of his fondness for Heathcliff, and his dread lest he should suffer neglect after his death … and that naturally led me to consider the poor lad’s situation now, and from singing I changed my mind to crying.”\textsuperscript{14}

Heathcliff’s status as an outsider and the distinction in class between Heathcliff and Cathy leads to Cathy’s decision to marry Linton, one of the main reasons behind the terrible embittering of Heathcliff’s character. In Chapter 9 Cathy says that it would “degrade”\textsuperscript{15} her to marry Heathcliff; in class-fixated Victorian society Heathcliff is deemed an unsuitable husband for Cathy. I believe

\begin{itemize}
  \item \textsuperscript{11} Pg. 225, Homer, \textit{The Odyssey}
  \item \textsuperscript{12} Pg. 32, Brontë, \textit{Wuthering Heights}
  \item \textsuperscript{13} Pg. 48, Brontë, \textit{Wuthering Heights}
  \item \textsuperscript{14} Pg. 38, Brontë, \textit{Wuthering Heights}
  \item \textsuperscript{15} Pg. 57, Brontë, \textit{Wuthering Heights}
\end{itemize}
this is the height of Heathcliff’s anguish as an outsider, which mars and embitters his character forever.

Many of Heathcliff’s despicable deeds in his adulthood stem from a desire to assert himself as an insider, in a place where as a child he was excluded and deprived and so to take revenge on his enemies who afforded him this deprivation. He says in Chapter 20, “I want the triumph of seeing my descendant fairly lord of their estates: my child hiring their children to till their fathers’ land for wages”. Both Heathcliff and Odysseus seek revenge on those who have wronged them, and both succeed in taking revenge on the society which has deprived them. This triumph over the society in which they are cast as an outsider enables us to view them as the hero- Odysseus slaughters the suitors and regains his kingdom and Heathcliff, defies the oppression and constraints of Victorian society and is able to monopolize both Wuthering Heights and The Grange. Moreover, as an outsider both heroes endure a considerable amount of suffering, evoking admiration and sympathy from the reader and contributing to our view of them as heroes.

Through the literary device of their unconventional heroes, Brontë and Homer were challenging not only literary conventions but also the conventions of their contemporary societies. Odysseus, through his suffering, degradation and treatment as an outsider is forced to a base level of humanity. By making an example of Odysseus’ spiritual humbling, Homer is able to challenge flaws in both the heroic way of life and the Homeric society. Homer challenges the values of the contemporary society in Book 19 when Odysseus, disguised still as a beggar, is offered comforts at the palace by his wife. He refuses them declaring, “I have a dislike of blankets and gleaming rugs... So I will lie just as I have often lain ... For many’s the night I’ve spent in some wretched place... Nor does the prospect of having my feet washed appeal to me.” This former king, rejecting even the smallest luxuries, challenges the materialism and indulgence of his contemporary society and calls for a more basic lifestyle. Homer uses Odysseus, a hero and king, a person of the highest order, to look critically upon the ways of society by subverting Odysseus’ authority through disguising him as a beggar.

Homer makes an important defiance to heroic convention in Book 22 when Odysseus slaughters the suitors. At first Odysseus seems suddenly to exhibit the conventional bloody ferocity of a Homeric hero. He is described in Book 22 as “among the corpses of the dead, spattered with blood and gore, like a lion when he comes feeding”, this very vivid and animalistic image of Odysseus would relate him to a hero such as Achilles but crucially,

16 Pg. 151, Brontë, *Wuthering Heights*
17 Pg. 258, Homer, *The Odyssey*
18 Pg. 298, Homer, *The Odyssey*
Odysseus has experienced a moral grounding through the degradation he has suffered on his journey, becoming a hero of far more depth than a blood thirsty warrior. This is demonstrated in the moments after he has slain the suitors and he quells the exulting shouts of his maid servant Eurycleia, “Restrain yourself old woman... I’ll have no cries of triumph here. It is an impious thing to exult over the slain.” Here Homer displays Odysseus’ humanity, a trait uncommonly demonstrated by most heroes, which Odysseus has acquired from experiencing the deepest ignominy, often alone and an outsider. Therefore Homer is using Odysseus to point out the flaws of the conventional Greek hero, the lack of grounded compassion and humanity in many of the heroes who longed only for fame and bloody glory.

Brontë through Heathcliff also makes a challenge to her contemporary society and to the convention of the hero. Heathcliff strongly defies the usual expectations of a hero, especially a Victorian one, where the reader is clear on the moral and ethical stance of the hero. For example Charlotte Brontë’s hero Mr. Rochester commits a morally indecent action by his transgression with Jane, however his blinding in the fire at Thornfield can be seen as the righteous act of god to punish him. He is redeemed, with his eyesight being partly restored to him once he has repented and married Jane. Mr. Rochester, although a morally ambiguous character is punished for his sins and reaches a solid moral grounding, within social conventions. Heathcliff however goes through no such repentance or moral reconciliation for his evil deeds and so Brontë questions the Victorian convention that immoral characters must be punished.

Unlike most immoral characters or ‘villains’ Heathcliff is not vanquished but appears victorious at the end of *Wuthering Heights* and in this way too Brontë challenges convention. Furthermore Heathcliff even appears to be rewarded at the end of the novel: he dies smiling and is reunited with Cathy, his coffin is placed next to hers instead of Lintons. After Heathcliff’s death, many villagers report seeing his and Cathy’s ghosts together wandering the moors. By portraying Heathcliff and Cathy as reunited after death, Brontë seems to vindicate the love of Heathcliff and Cathy and depict their love as transcendent of the Christian ethics of their society.

Many early Victorian critics believed that Brontë had been far too humanizing of an evil character with Heathcliff, who was essentially no more ethical than an animal or a demon. Edwin P. Whipple in 1848 says of Ellis Bell’s (Brontë’s) creation of Heathcliff that “he aims ... to exhibit the action of sentiment of love on the nature of the being who his morbid imagination

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19 Pg. 298, Homer, *The Odyssey*
Tabitha Adams - English

has created"\(^{20}\). Sydney Dobell writing in 1850 says “The authoress has too often disgusted where she should have terrified and has allowed us a familiarity with her fiend”\(^{21}\). These Victorian critics suggest that Brontë’s character Heathcliff is a demon and therefore should be treated thus by the author and were clearly uncomfortable with Brontë displaying Heathcliff in many a natural and human manner, his deeds accounted for by motives rather than pure malicious intent. We can see from the punitive comments of these critics that with the creation of Heathcliff Brontë is contesting the dogmatic moral preaching of Victorian society.

Heathcliff is successful in obtaining his revenge and faces no retribution. He remains morally ambivalent till the very end and this is Brontë’s main defiance to the convention of a hero. However Dorothy Van Ghent says of Heathcliff in her essay on ‘Heathcliff as an archetypal Demon’; “It is because of his ambivalence that, though he is the ‘enemy’ ethically speaking, he so easily takes on the stature and beauty of a hero, as he (the archetypal Demon) does in the Satan of Paradise Lost”\(^{22}\). Van Ghent recognises that because Heathcliff appears to be his own free spirit with no conventions properly binding him, he becomes a creature of inspiration and admiration- integral properties of a hero. If his moral ambiguity authenticates Heathcliff as a hero, then Brontë has successfully transformed the convention of the hero.


Conclusion

From my research question “In what ways and to what effect do Emily Brontë and Homer portray their protagonists, Heathcliff and Odysseus, in Wuthering Heights and The Odyssey?” I can conclude that both authors have created a hero who is very much an individual, a character who is many ways an outsider. I believe the modernist view of identity that the identity of the individual is predominantly constituted from labels and definitions, imposed on the individual by society, is applicable to these texts. When an individual defies those labels and conventions - then it becomes interesting, as both Homer and Brontë demonstrate. This defiance of convention allows the author to challenge previously held values and beliefs. The humanity and humility acquired by Odysseus makes an example of those in Homeric society with materialistic values and those who immodestly glorify death. Heathcliff’s self-orchestrated empowerment from his initial position of degradation, and his unpunished immoral behaviour, draws attention to stanch Victorian class prejudice and strict moral orientation and inquires whether it is imperative for a protagonist to be moral in order to be a hero. It was the suppositions of society which embittered Heathcliff’s character and his nature rebelled under the constraints of that society. Homer and Brontë also contest literary convention with the creation of their heroes: Homer challenges the conception of a certain type of literary hero, while Brontë challenges the very concept of ‘the hero’. In this way both authors manage to prompt a progression in literary convention, Brontë’s is perhaps the greater leap, but she was writing two thousand years later with far more literary influence available and freedom of style than Homer. Homer and Brontë use this type of hero, an unconventional individual, to challenge literary and social convention. This suggests that no matter the genre or time period, the unconventional hero is an enduring literary device, which can be used by authors to challenge accepted values both social and moral.
Bibliography


How does the Final Current affect the Surge Current Time in a Filament Bulb?
Robert Cinca - Physics

I chose to do my Extended Essay in Physics, and the journey to complete my first ever piece of original research was very rewarding. The need to commit so much time was perhaps the greatest difficulty but also the greatest strength of the Extended Essay as it consolidated the Physics I had already learnt in class and furthered my general understanding of the subject. I started formulating potential research questions in March and handed in my final copy in late September; a long period of time but it was extremely fulfilling as it gave me a more mature approach to the subject.

Supervisor: Dr Steve Sharp

This Extended Essay ties together three aspects of Physics; theoretical, experimental and modelling. Robert’s enthusiasm for electrical physics, electronics and computer science fuelled interest in the essay, leading him to investigate the surge current time of a filament bulb. His positive and independent approach was exemplary. When difficulties occurred he was quite resourceful; such as when trying to measure the filament of a bulb, he was able to ask the Biology department and use their calibrated electronic microscopes. He also remained critical of any agreements or discrepancies between his predictions and experimental findings. Plus he was able to suggest possible improvements to his excel model. This was an outstanding piece of work.
Abstract

When a filament bulb is first switched on, its metal filament is cold and so has a relatively low resistance. This leads to a large surge current until the filament heats sufficiently to glow white hot with a steady electrical current. This essay investigates the research question: “How does the final current affect the surge current time in a filament bulb?”

The surge current time is the time interval between switching the bulb on and when the final steady current is first reached.

A logical argument suggests the surge current time is inversely proportional to the final current squared. This hypothesis is then tested using two different small filament bulbs. An excel spreadsheet is then used to see if the filament bulb can be effectively modeled as a hot body radiator. The experiments agree with the inverse square relationship predicted. The model also agrees. There are however some significant differences between the experimental results and the excel model. The surge current times with the spreadsheet are about a factor of three shorter than the experimental results. The maximum current is reached instantly in the model rather than after a short but constant delay with the bulb. These differences possibly arise as the model does not include any self-induction of the coil or thermal expansion of the filament.
Introduction

My research question was: "How does the final current affect the surge current time in a filament bulb?" The surge current time is the time interval between switching the bulb on and when the final steady current is first reached. A filament bulb’s resistance varies with temperature. When a filament bulb is switched on, it has a relatively low temperature, resulting in a low resistance. This phenomenon creates a 'surge current,' which can be several times the size of the final current and is why filament bulbs sometimes blow when switched on. The filament bulb quickly heats up (in a few milliseconds), increasing the resistance and lowering the current back to its normal, steady, operating level.

I chose this research question due to its applications to my day-to-day life: my house uses a lot of filament bulbs and understanding surge currents could help in finding solutions for avoiding the filament bulbs to blow. An NTC-thermistor, with high resistance at low temperatures and low resistance at high temperatures, could be used in order to protect the bulb from large surge currents¹.

In my research, a logical argument suggests an inverse square law relationship between the surge current time and final current. This was achieved using thermal energy theory². The thermal energy, $Q$, required to heat the filament is given by:

$$Q = mc\Delta T$$

(For a fixed mass, $m$, where $c$ is the specific heat capacity of tungsten and $\Delta T$ is the change in temperature).

Figure 1: Filament Bulb Experiment Circuit³

---


² “Thermal Physics”, Higher Level Physics (Hamper, 2009) p66

The relationship was tested experimentally with two different filament bulbs, using the circuit seen in Figure 1. By varying the resistance in the circuit, I adjusted the final current and was able to measure the surge current times for different final currents. I recorded all my measurements using a voltage and current data logger, and data studio (a computer program), which let me plot current against time, thus enabling me to measure the surge current time.

An excel spreadsheet was then used to see if the filament bulb can be effectively modeled as a hot body radiator. The power, $P$, radiated by the filament is given by:

$$P = e\sigma A T^4$$

(Where $e$ is the emissivity of tungsten, $\sigma$ is Stefan-Boltzmann’s constant, $A$ is the surface area of the filament, and $T$ is the temperature of the filament in Kelvin.)

---

4 “Emissivity”, Higher Level Physics (Hamper, 2009) p298
Methodology

This section is split into the following three categories:

- Part 1: Logical Argument: finding out the functionality of the relationship between the final current and the surge current time.
- Part 2: Testing the Filament Bulb: this section covers all the experiments done on measuring the surge current time.
- Part 3: Excel Modeling and Finding out the Properties of the Filament Bulbs: the specific properties of my two different bulbs (6.5V 0.15A and 6.5V 0.30A) are analyzed using a microscope and then used to model the rise in temperature inside the filament treating it as a hot body radiator.

Terminology Clarification

Before explaining all my experimental results and excel model, I would quickly like to clarify some terms:

- The surge current time: the time interval between switching the bulb on and when the final steady current is first reached.
- The maximum surge current: this is the size of the current at its maximum point.
- The time taken to reach the maximum surge current: this is the time taken as measured from when the filament bulb is switched on to when the maximum surge current is recorded.

There are three different conclusions which I have drawn from my experiments:

- The relationship between surge current time and final current (primary).
- The size of the maximum surge current in relation with the size of the final current (secondary).
- The time taken to reach the maximum surge current (tertiary).
Part 1: Logical Argument

Logical argument to find the functionality of the relationship between the final current and the surge current time:

For a filament bulb to emit light, the tungsten filament needs to be heated to a sufficiently large temperature for it to glow white hot.

The net energy, $Q$, required to raise the temperature of the filament to its equilibrium temperature is related to $Q = mc\Delta T \propto \Delta T$ for a fixed mass, $m$, where $c$ is the specific heat capacity of tungsten and $\Delta T$ is the change in temperature.

The resistivity of tungsten varies with temperature and the data is taken from "Resistivity of Tungsten" (see appendix for resistivity values)\(^5\) suggests:

$$\rho = \text{constant} + aT + \beta T^2 \approx \text{constant} + aT \quad \text{(as } a \text{ is much greater than } \beta \text{).}$$

Then $\Delta \rho = \rho - \rho_0 = a\Delta T \propto \Delta T$. \hspace{1cm} (where $\rho_0$ is the resistivity at room temperature).

Now the energy required, $Q$, is in the order of the product of the final power input, $P$, and the surge current time, $\Delta t$.

The final power, $P$, may be given by $P = I^2 R$, where $I$ is the final current and $R$ the final resistance at the equilibrium temperature.

So the energy required, $Q$, is: $Q = P\Delta t = I^2 R \Delta t \propto I^2 \rho \Delta t$

(as $R \propto \rho$ for a fixed length and cross-sectional area of wire)

From above, as $Q \propto \Delta T$ so $I^2 \rho \Delta t \propto \Delta T \propto \Delta \rho$

giving $I^2 \Delta t \propto \frac{\Delta \rho}{\rho}$.

Now $\frac{\Delta \rho}{\rho} = \frac{\rho - \rho_0}{\rho} = 1 - \frac{\rho_0}{\rho} = 1 - \frac{1}{f}$ \hspace{1cm} (where $\rho = f \rho_0$)

Experimentally $10 < f < 16$. The range is due to the final temperatures of the bulb being approximately between 2000K and 3000K\(^5\).

Taking $I^2 \Delta t \propto \frac{\Delta \rho}{\rho}$

$$I^2 \Delta t = k \left(1 - \frac{1}{f}\right) \quad \text{(where } k \text{ is a constant)}$$

Part 2: Testing the Filament Bulb

I tested the hypothesis of the surge current from the earlier logical argument using two different filament bulbs (6.5V 0.15A and 6.5V 0.30A).

In order to measure the surge current time, I first set up a potential divider circuit (as shown in figure 2).

The equipment used was as follows:
- two filament bulbs (6.5V 0.15A and 6.5V 0.30A)
- a variable resistor
- a powerpack (e.m.f. supply)
- a GLX data logger (voltmeter+ammeter)
- data studio (computer software)

In my experiment, the ammeter and voltmeter were part of the GLX data logger, a device used to record measurements and process them so they can be read by computer software. I used data studio as a computer program in order to record all my results.

During my experiment, I turned on the filament bulb and data studio recorded the current a thousand times per second. I turned off the filament bulb once the current

Figure 2: Setting up my experiment

Leaving $0.90k < I^2 \Delta t < 0.94k$

That is $I^2 \Delta t \approx k'$ (where $k'$ is a second constant)

or $\Delta t \propto \frac{1}{I^2}$

So, with several assumptions and approximations, it may be suggested that the surge current time could be inversely proportional to the square of the final steady current.
Part 2: Testing the Filament Bulb

I tested the hypothesis of the surge current from the earlier logical argument using two different filament bulbs (6.5V 0.15A and 6.5V 0.30A).

In order to measure the surge current time, I first set up a potential divider circuit (as shown in figure 2)

![Figure 2: Setting up my experiment](image)

The equipment used was as follows:

- two filament bulbs (6.5V 0.15A and 6.5V 0.30A)
- a variable resistor
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- a GLX data logger (voltmeter+ammeter)
- data studio (computer software)

In my experiment, the ammeter and voltmeter were part of the GLX data logger, a device used to record measurements and process them so they can be read by computer software. I used data studio as a computer program in order to record all my results.

During my experiment, I turned on the filament bulb and data studio recorded the current a thousand times per second. I turned off the filament bulb once the current
had been steady for a while. I then measured the size of the maximum surge current (using the software’s tracer function, which allowed me to look at each recorded point in detail). Measuring the time taken to reach the maximum surge current was also done using the tracer function; however, to measure the surge current time I had to judge where the final steady current was by eye (see below for comment on precision). By varying the resistance in the variable resistor, I was able to plot results for many different final currents. I then repeated my experiment with the second filament bulb I had.

Control Variables

During my experiment, I had to control some variables in order for my experiment not to be affected. Firstly, I used the same filament bulb for each experiment. In order for there to be a surge current, I waited two minutes (with the circuit turned off) between each measurement in order to let the filament bulb cool down. Whilst doing the experiments, apart from changing the filament bulb (from the 0.15A one to 0.30A one), I kept the same apparatus throughout.

Comment on Range Used

I used a range of final currents varying from 0.06A to 0.32A. I used the following range because: on the lower end of my results, the percentage uncertainties were becoming too great and the current was taking too long to reach a steady level. On the top end of my results, I was limited by my filament bulbs, which could only take a maximum potential difference of about 8 volts. Even so, my range was sufficiently large enough for me to take lots of readings and be able to plot a reliable graph.

Limitations of the experiment

On the whole, the experiment was very precise, helped by the use of data studio (which let me take readings every millisecond). The uncertainty in the final current is: ±0.01A. To improve this, I would use a more precise ammeter. The uncertainty of the surge current time was determined by the half range of the experimental results, which varied between ±0.004s and ±0.03s. Though precise, this could be improved further by measuring the changing gradient of the surge current with time. The start of the surge current is determined when the changing gradient of the surge current with time is zero.
Part 2.1: Processed Data Tables and Graphs for 6.5V 0.15A Filament Bulb

**Primary relationship:** *surge current time and final current*

The measurements taken during this experiment can be seen in Figure 3:

<table>
<thead>
<tr>
<th>Final Current, I/A</th>
<th>Surge Current Time, T/s</th>
<th>1/(Final Current)², I⁻² /A²</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.01A</td>
<td>±0.003s</td>
<td>Average</td>
</tr>
<tr>
<td>0.06</td>
<td>0.641 0.591 0.612 0.629 0.590 0.613</td>
<td>0.613</td>
</tr>
<tr>
<td>0.07</td>
<td>0.463 0.422 0.445 0.419 0.423 0.434</td>
<td>0.434</td>
</tr>
<tr>
<td>0.08</td>
<td>0.366 0.355 0.355 0.363 0.371 0.362</td>
<td>0.362</td>
</tr>
<tr>
<td>0.09</td>
<td>0.270 0.279 0.279 0.282 0.271 0.276</td>
<td>0.276</td>
</tr>
<tr>
<td>0.10</td>
<td>0.208 0.229 0.211 0.248 0.208 0.221</td>
<td>0.221</td>
</tr>
<tr>
<td>0.11</td>
<td>0.196 0.190 0.192 0.194 0.183 0.191</td>
<td>0.191</td>
</tr>
<tr>
<td>0.12</td>
<td>0.154 0.140 0.147 0.150 0.144 0.147</td>
<td>0.147</td>
</tr>
<tr>
<td>0.13</td>
<td>0.119 0.121 0.116 0.111 0.120 0.117</td>
<td>0.117</td>
</tr>
<tr>
<td>0.14</td>
<td>0.100 0.104 0.093 0.093 0.094 0.097</td>
<td>0.097</td>
</tr>
<tr>
<td>0.15</td>
<td>0.083 0.084 0.092 0.092 0.092 0.089</td>
<td>0.089</td>
</tr>
<tr>
<td>0.16</td>
<td>0.087 0.087 0.083 0.083 0.080 0.084</td>
<td>0.084</td>
</tr>
<tr>
<td>0.17</td>
<td>0.090 0.081 0.072 0.078 0.083 0.081</td>
<td>0.081</td>
</tr>
</tbody>
</table>

![Figure 3: Data Table for Primary Relationship](image)

The current value was limited by the precision of the data logger (±0.01A). The uncertainties of the average surge current time were determined by the half range value for each surge current time, or limited to ±0.003s by the meter precision.

To calculate the uncertainty of the inverse square of the final current, \(I^{-2}\), I used the following formula:

\[(\Delta I)^{-2} = \frac{2\Delta I}{I^3}\]

For example, using the above formula, to calculate the uncertainty for the value 278, I did: \((\Delta I)^{-2} = 2 \times 0.01 / (0.06)^3\), giving me an answer of 92.59, rounding it to 90 (one significant figure). I rounded all data table uncertainties to one significant figure.
My results indicate an inverse-square relationship between the final current and the surge current time (as seen in Figure 4):

\[
\Delta T = (0.002 \pm 0.001) I^{-2} - (0.004 \pm 0.061)
\]

where:

- the gradient = \(0.002 \pm 0.001 \text{sA}^2\)
- uncertainty in gradient, \(\Delta m = \frac{\text{maximum gradient} - \text{minimum gradient}}{2} = 0.001\text{sA}^2\)
- \(y\) intercept = -0.004 ± 0.061s
- uncertainty in \(y\) intercept, \(\Delta c = \frac{\text{maximum } y\text{ intercept} - \text{minimum } y\text{ intercept}}{2} = 0.061\text{s}\)

Analysis:

My line of best fit is very close to the origin, and taking the error bars into account, it could go through the origin, indicating a proportionality between the surge current time and \(1/(\text{final current})^2\).
Secondary relationship: the size of the maximum surge current in relation with the size of the final current

Figure 5 shows the results obtained from this experiment:

<table>
<thead>
<tr>
<th>Final Current, I/A</th>
<th>Maximum Surge Current, S/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.01A</td>
<td>±0.01A</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>0.06</td>
<td>0.16</td>
</tr>
<tr>
<td>0.07</td>
<td>0.20</td>
</tr>
<tr>
<td>0.08</td>
<td>0.24</td>
</tr>
<tr>
<td>0.09</td>
<td>0.31</td>
</tr>
<tr>
<td>0.10</td>
<td>0.36</td>
</tr>
<tr>
<td>0.11</td>
<td>0.43</td>
</tr>
<tr>
<td>0.12</td>
<td>0.50</td>
</tr>
<tr>
<td>0.13</td>
<td>0.56</td>
</tr>
<tr>
<td>0.14</td>
<td>0.66</td>
</tr>
<tr>
<td>0.15</td>
<td>0.70</td>
</tr>
<tr>
<td>0.16</td>
<td>0.73</td>
</tr>
<tr>
<td>0.17</td>
<td>0.68</td>
</tr>
</tbody>
</table>

For this set of data, my results indicate a linear relationship between the size of the maximum surge current and the size of the final current (as seen in Figure 6):

![Figure 6: Graph representing Maximum Surge Current and Final Current](image)
Equation of the trend line (as seen in Figure 6) with its uncertainties:

The equation that has resulted from the graph is: \( S = (6.3 \pm 1.8) \cdot I - (0.25 \pm 0.19) \) where:

- the gradient = 6.3 ±1.8
- uncertainty in gradient, \( \Delta m = \frac{\text{maximum gradient} - \text{minimum gradient}}{2} \)
  \( \Delta m = (8.4 - 4.8)/2 = 1.8 \)
- y intercept = -0.25A ± 0.19A
- uncertainty in y intercept, \( \Delta c = \frac{\text{maximum y intercept} - \text{minimum y intercept}}{2} \)
  \( \Delta c = (-0.07 + 0.44)/2 = 0.19A \)

Analysis:

Physically, this means that the size of the maximum surge current is significantly larger than the final steady current. This explains why filament bulbs sometimes blow when first turned on. The large current created damages the tungsten over time until it finally stops functioning.

My line of best fit does not suggest proportionality, even with its uncertainties, however, my results still give a good impression on the order of magnitude of the maximum surge current, when compared to the final steady current. The large uncertainties indicate that the maximum surge current occurs in such a small time interval that even 1000 readings per second is not precise enough to record it.

Tertiary relationship: the time taken to reach the maximum surge current

As can be seen from my results (below), the time taken to reach the maximum surge current is constant between about 0.004 and 0.005 seconds. My model (which I shall discuss in Part 3), indicated that the maximum surge current occurred almost instantaneously.

<table>
<thead>
<tr>
<th>Time Taken to Reach Maximum Surge Current After Filament Bulb is Turned On, t/s</th>
<th>±0.001s</th>
<th>Average</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>0.004</td>
<td>0.005</td>
<td>0.004</td>
<td>0.005</td>
</tr>
<tr>
<td>0.004</td>
<td>0.004</td>
<td>0.004</td>
<td>0.004</td>
</tr>
<tr>
<td>0.005</td>
<td>0.004</td>
<td>0.004</td>
<td>0.004</td>
</tr>
<tr>
<td>0.004</td>
<td>0.005</td>
<td>0.004</td>
<td>0.006</td>
</tr>
<tr>
<td>0.008</td>
<td>0.005</td>
<td>0.004</td>
<td>0.005</td>
</tr>
<tr>
<td>0.005</td>
<td>0.004</td>
<td>0.004</td>
<td>0.004</td>
</tr>
<tr>
<td>0.004</td>
<td>0.004</td>
<td>0.005</td>
<td>0.006</td>
</tr>
<tr>
<td>0.008</td>
<td>0.004</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td>0.004</td>
<td>0.003</td>
<td>0.004</td>
<td>0.005</td>
</tr>
<tr>
<td>0.005</td>
<td>0.005</td>
<td>0.004</td>
<td>0.006</td>
</tr>
<tr>
<td>0.005</td>
<td>0.005</td>
<td>0.004</td>
<td>0.006</td>
</tr>
</tbody>
</table>

Figure 7: Data Table for Tertiary Relationship
Part 2.2: Processed Data Tables and Graphs for 6.5V 0.30A Filament Bulb

The measurements taken during this experiment can be seen in Figure 8:

<table>
<thead>
<tr>
<th>Final Current</th>
<th>Surge Current Time, T/s</th>
<th>1/(Final Current)^2, I^{-2}/A^2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
<td>Uncertainty</td>
</tr>
<tr>
<td>I/A (±0.01A)</td>
<td>Run 1</td>
<td>Run 2</td>
</tr>
<tr>
<td>0.13</td>
<td>1.195</td>
<td>1.165</td>
</tr>
<tr>
<td>0.14</td>
<td>0.891</td>
<td>0.888</td>
</tr>
<tr>
<td>0.16</td>
<td>0.813</td>
<td>0.799</td>
</tr>
<tr>
<td>0.17</td>
<td>0.755</td>
<td>0.609</td>
</tr>
<tr>
<td>0.19</td>
<td>0.530</td>
<td>0.556</td>
</tr>
<tr>
<td>0.20</td>
<td>0.430</td>
<td>0.441</td>
</tr>
<tr>
<td>0.21</td>
<td>0.364</td>
<td>0.382</td>
</tr>
<tr>
<td>0.24</td>
<td>0.279</td>
<td>0.334</td>
</tr>
<tr>
<td>0.26</td>
<td>0.268</td>
<td>0.273</td>
</tr>
<tr>
<td>0.27</td>
<td>0.201</td>
<td>0.216</td>
</tr>
<tr>
<td>0.30</td>
<td>0.162</td>
<td>0.222</td>
</tr>
<tr>
<td>0.31</td>
<td>0.167</td>
<td>0.185</td>
</tr>
<tr>
<td>0.32</td>
<td>0.141</td>
<td>0.148</td>
</tr>
</tbody>
</table>

Figure 8: Data Table of 6.5V 0.3A Filament Bulb

The current values were limited by the precision of the data logger (±0.01A). The uncertainties of the surge current time were determined by the half range value for each final current, or limited to ±0.005s by the meter precision.

To calculate the uncertainty of the final column, I used the following formula:

$$(\Delta I)^{-2} = \frac{2\Delta I}{I^3}$$

For example, using the above formula, to calculate the uncertainty for the value 59.2, I did: $(\Delta I)^{-2} = 2\cdot0.01/(0.13)^3$, giving me an answer of 9.10, rounding it to 9 (one significant figure).

---

4 “Emissivity”, Higher Level Physics (Hamper, 2009) p298
Using the above processed data, I have come up with the following relationship between surge current time and final current:

**Primary relationship:** \( \text{surge current time and final current} \)

My results indicate an inverse-square relationship between the final current and the surge current time, which confirms the trend I got with my 6.5V 0.15A filament bulb:

**Analysis:**

My line of best fit is: \( \Delta T = (0.02 \pm 0.01) I^{-2} - (0.04 \pm 0.11) \). Taking into account my uncertainty in the y-intercept, my line of best fit suggests proportionality between the surge current time and \( 1/(\text{final current})^2 \). My results for the 6.5V 0.30A filament bulb give a similar trend discovered with my 6.5V 0.15A filament bulb, which is the inverse square proportionality between the surge current time and final current.
Part 3: Excel Modeling

In the second part of my project I attempted to create a model for my experimental results. In order to create the model (as seen in part 3.2), I first had to collect some data on the properties of the filament bulbs, which I shall cover in part 3.1.

Part 3.1: Measuring the Properties of the Filament Bulbs

In this section, I measured the following properties of the filament bulbs:

- The number of turns of the filament
- The cross-sectional area of the filament
- The thickness of the wire
- The length of the wire
- How the resistivity of tungsten varies with temperature.
- The Internal Resistance of the PowerPack

In order to measure the dimensions of each filament, I went to the biology department in order to use one of their microscopes, which had the ability to take pictures at a very zoomed-in level.

On first zooming in on the filament, I noticed that it was really hard to take any measurements because the image appeared to be blurry. The problem was caused by refraction from the filament’s protective outer glass. The solution was to break the glass. Immediately, it became much easier to work out all the measurements needed.

How I measured the number of turns of the filament

Due to the 3D aspect of the filament, I counted the number of turns by taking two pictures (as seen in Figures 10&11):

Figures 10&11: Counting the Number of Turns in the Filament
How I measured the cross-sectional area of the filament

I measured the cross-sectional area by zooming in into a single turn in the filament and measuring it using one of the measuring tools available in the software (see Figure 12).

![Figure 12: Measuring the cross-sectional area](image)

How I measured the thickness of the filament

To measure the thickness of the wire, I used a similar process as I did for measuring the cross-sectional area (see Figure 13).

![Figure 13: Measuring the thickness of the wire](image)
How I measured the length and uncertainty of the wire

To measure the length of the wire, I took the cross-sectional area, rearranged so I would get the radius, worked out the circumference, and then multiplied by the number of turns in the coil.

I have measured: \( \text{Cross-sectional area} = \pi r^2 \)
I can therefore work out that: \( \text{Circumference} = 2\pi r \)
Therefore: \( \text{Total Length of Wire} = \text{Circumference} \times \text{Number of Turns} \)

The uncertainty in the length, \( \Delta L \), is: \( \Delta L = L \left( \frac{\Delta N}{N} + \frac{\Delta A}{2A} \right) \)

My Results

<table>
<thead>
<tr>
<th></th>
<th>6.5V 0.15A Filament</th>
<th>6.5V 0.30A Filament</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Turns</td>
<td>30±1</td>
<td>50±1</td>
</tr>
<tr>
<td>Cross-Sectional Area</td>
<td>0.005mm$^2$±0.002mm$^2$</td>
<td>0.024mm$^2$±0.002mm$^2$</td>
</tr>
<tr>
<td>Thickness of Wire</td>
<td>0.005mm±0.002mm</td>
<td>0.029mm±0.003mm</td>
</tr>
<tr>
<td>Length of Wire</td>
<td>7.5 mm±1.8mm</td>
<td>27mm±2mm</td>
</tr>
</tbody>
</table>

Finding out the how the resistivity of tungsten varies with temperature

I researched on the internet how the resistivity of tungsten changes with temperature\(^5\). I then plotted the results on a graph and discovered a quadratic relationship of the form \( \beta T^2 + \alpha T + k \), where \( T \) is the temperature in Kelvin, \( \alpha \) and \( \beta \) are my thermal coefficients, and \( k \) is just a constant. The actual quadratic equation obtained from the graphing of the resistivity is: \( \rho = 0.000002T^2 + 0.0259T - 2.7975 \).

Finding out the internal resistance of the PowerPack

In my model, I also needed to work out the internal resistance of the PowerPack. I proceeded by setting up a standard\(^6\) electrical circuit and measuring different voltage and current readings. I then graphed my results and worked out the internal resistance as \( r = 0.20 \). I calculated this result by taking the negative of the gradient of the line of best fit. Please see the appendix for the details on the tables and graphs.

---

Part 3.2: My Excel Model

I used an excel spread sheet iteratively to see if a small filament lamp could be effectively modeled as a hot body radiator.

How the model works

I used the data for the 6.5V 0.30A Filament Bulb as the inputs for my excel model.

These were:
  - the wire diameter.
  - the length of the wire, \( l \), and the cross-sectional area, \( A \), which was used to calculate the wire’s volume, \( V \).
  - the density of Tungsten, as researched on the internet\(^7\), is 19250kgm\(^{-3}\).
  - the mass of the Tungsten filament calculated from the volume and density.

The model starts at room temperature (295K) and is iterated every 0.1ms.

Using resistivity to equal \( \beta T^2 + \alpha T + k \) (as defined in Part 3.1), I was able to work out the Resistance using the following equation: \( R = \rho \frac{l}{A} \) (where \( \frac{l}{A} \) is a constant from the length and cross-sectional area of the wire (as shown in Part 3.1).

The total energy into the filament, \( E_{in} \), is:
\[
E_{in} = P_{in} \Delta t = \frac{V^2}{R} \Delta t \quad \text{where } P_{in} \text{ is the power into the wire, } \Delta t \text{ is the time interval, } V \text{ is the potential difference and } R \text{ is the resistance.}
\]

To work out the changing potential difference, I used: \( V = \frac{R_{eff.}}{R_{total}} V_0 \)

The effective resistance is calculated to be: \( R_{eff.} = \frac{R_{lamp \times R_{total}}}{R_{lamp} + R_{total}} \)

The total energy out of the filament is defined treating it as a hot body radiator: \( E_{out} = P_{out} \Delta t = e\sigma AT^4 \Delta t \), where \( e \) is the emissivity of tungsten\(^8\) of 0.35, \( \sigma \) is Stefan-Boltzmann’s constant\(^9\), and \( T \) is the temperature of the filament in Kelvin.


\(^8\) Emissivity*, Montana State University [Online][Date Accessed 15/07/13] URL: [http://www.coe.montana.edu/me/faculty/sofie/teaching/me360/Pyrometry%20Emissivity%20Notes.pdf](http://www.coe.montana.edu/me/faculty/sofie/teaching/me360/Pyrometry%20Emissivity%20Notes.pdf) (Montana State University, 2006)

I then worked out the net energy flow into the wire: \( E_{\text{net}} = E_{\text{in}} - E_{\text{out}} \)

This lead to me finding out the temperature increase after each time increment, using the equation: \( \Delta T = \frac{E_{\text{net}}}{mc} \), where \( m \) is the mass of the filament (as worked out earlier) and \( c \) is the specific heat capacity of Tungsten\(^{10}\).

To work out the current at each time increment, I just used the equation: \( I = \frac{V}{R} \)

I continued this process until I reached a final steady current (please see Figure 15 for appearance of the model).

---

**Excel Model Results**

Running the excel model with various final currents, adjusted by altering the potential divider resistance, yielded a proportional relationship between surge current time and the inverse square of the final steady current. The equation of the trend line that has resulted from the graph is: \( \Delta T = (7.3 \pm 2.1) I^{-2} + (15 \pm 37) \).

---

My model had similarities with my experimental results but also some differences. They were similar, in that:

- The model showed a surge current.
- The model ended up with a reasonable temperature for a filament bulb\(^\text{11}\) (when the model was used to get the normal final current in the 6.5V 0.30A filament bulb, I recorded a temperature of 2850K±50K).

They were different, in that:

- The excel model reached the final current sooner than the experiment (the surge current times for my experiment are larger by a factor of three).
- The model had an instantaneous maximum current, rather than a short delay as seen in my experiment.

The possible reason for this difference is that in the model self-inductance of the filament, which would create a back electromotive force\(^\text{12}\) (e.m.f.) was not included. Another reason could be the possible expansion of the filament’s volume on heating. I have taken the length and the cross-sectional area of the filament as constant, with no consideration of volume expansion. Tungsten has a volume expansion coefficient


of 4.3\(^{13}\), so it could have played an important part, especially considering the large change in temperature (from room temperature to around 2800K). The third possible reason is that the emissivity of tungsten could have changed due to the changes in temperature: this may have resulted in a smaller net energy flow into the filament bulb and thus a longer surge current time.

To further improve my model, I would include a changing emissivity of tungsten value with temperature, a volume expansion coefficient and the idea of self-inductance.

Conclusion

My research question was: “How does the final current affect the surge current time in a filament bulb?” My results indicate that there is an inverse-square relationship between the final current and the surge current time, over the range I have used (0.06A to 0.32A). This is in agreement with the hypothesis reasoned in Part 1 of my essay (the Logical Argument). Through my experiment, I have also uncovered two other interesting relationships:

- the time taken to reach the maximum surge current was possibly as a result of self-inductance of the filament creating a back electromotive force.
- there was a linear relationship between the maximum surge current and the final current.

My experimental results are also supported by my hot body radiator excel model. The model has a surge current, similar final temperatures and shows an inverse square relationship between the surge current time and final current. Some differences arose: my experimental results took much longer to reach the final steady current than my model suggested. This may have been caused by the volume expansion of tungsten and due to a varying emissivity of tungsten with temperature. Another difference was that in the model the surge current happened instantaneously. In my experiment the maximum surge current was reached after about 0.005 seconds. This is possible due to the back e.m.f. produced by self-inductance of the filament.
Appendix

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### Data Tables for the 6.5V 0.15A Filament Bulb

<table>
<thead>
<tr>
<th>Final Current, I/A</th>
<th>Surge Current Time, T/s</th>
<th>1/(Final Current)² , I⁻² /A²</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.01A</td>
<td>±0.003s</td>
<td>Average</td>
</tr>
<tr>
<td>0.06</td>
<td>0.641 0.591 0.612 0.629</td>
<td>0.590 0.613</td>
</tr>
<tr>
<td>0.07</td>
<td>0.463 0.422 0.445 0.419</td>
<td>0.423 0.434</td>
</tr>
<tr>
<td>0.08</td>
<td>0.366 0.355 0.355 0.363</td>
<td>0.371 0.362</td>
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<td>0.09</td>
<td>0.270 0.279 0.279 0.282</td>
<td>0.271 0.276</td>
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<td>0.208 0.229 0.211 0.248</td>
<td>0.208 0.221</td>
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<td>0.154 0.140 0.147 0.150</td>
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<td>0.094 0.097</td>
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<td>0.092 0.089</td>
</tr>
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<td>0.087 0.087 0.083 0.083</td>
<td>0.080 0.084</td>
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<tr>
<td>0.17</td>
<td>0.090 0.081 0.072 0.078</td>
<td>0.083 0.081</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Current, I/A</th>
<th>Maximum Surge Current, S/A</th>
</tr>
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<tr>
<td>±0.01A</td>
<td>±0.01A</td>
</tr>
<tr>
<td>0.06</td>
<td>0.16 0.16 0.16 0.16 0.16</td>
</tr>
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<td>0.14</td>
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<td>0.16</td>
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<tr>
<td>0.17</td>
<td>0.68 0.70 0.70 0.65 0.72</td>
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## Time Taken to Reach Maximum Surge Current After Filament Bulb is Turned On, t/s

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<tr>
<th>±0.001s</th>
<th>Average</th>
<th>Uncertainty</th>
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<tr>
<td>2</td>
<td>0.004</td>
<td>0.001</td>
</tr>
<tr>
<td>3</td>
<td>0.004</td>
<td>0.001</td>
</tr>
<tr>
<td>4</td>
<td>0.004</td>
<td>0.001</td>
</tr>
<tr>
<td>5</td>
<td>0.005</td>
<td>0.001</td>
</tr>
</tbody>
</table>

### Data Tables for the 6.5V 0.30A Filament Bulb

<table>
<thead>
<tr>
<th>Final Current (±0.01A)</th>
<th>Surge Current Time, t/s (±0.005s)</th>
<th>Average</th>
<th>Uncertainty</th>
<th>1/(Final Current)², I²/A²</th>
<th>Average</th>
<th>Uncertainty</th>
</tr>
</thead>
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<tr>
<td>0.13</td>
<td>Run 1 1.195 1.165 1.168 1.148 1.190</td>
<td>1.173</td>
<td>0.02</td>
<td>59.2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>0.14</td>
<td>Run 2 0.891 0.888 0.974 0.941 0.924</td>
<td>0.924</td>
<td>0.04</td>
<td>51.0</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>0.16</td>
<td>Run 3 0.813 0.799 0.853 0.831 0.825</td>
<td>0.824</td>
<td>0.03</td>
<td>39.1</td>
<td>5</td>
<td></td>
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<tr>
<td>0.17</td>
<td>Run 4 0.755 0.609 0.669 0.698 0.674</td>
<td>0.681</td>
<td>0.07</td>
<td>34.6</td>
<td>4</td>
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</tr>
<tr>
<td>0.19</td>
<td>Run 5 0.530 0.556 0.548 0.582 0.492</td>
<td>0.542</td>
<td>0.05</td>
<td>27.7</td>
<td>3</td>
<td></td>
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<td>0.454</td>
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<td>3</td>
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<td>0.21</td>
<td>0.364 0.382 0.455 0.408 0.363</td>
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<td>0.05</td>
<td>22.7</td>
<td>2</td>
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<td>0.24</td>
<td>0.279 0.334 0.270 0.277 0.354</td>
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<td>17.4</td>
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<tr>
<td>0.26</td>
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<td>0.03</td>
<td>14.8</td>
<td>1</td>
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</tr>
<tr>
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<td>0.03</td>
<td>13.7</td>
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<td></td>
</tr>
<tr>
<td>0.30</td>
<td>0.162 0.222 0.186 0.167 0.161</td>
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<td>0.03</td>
<td>11.1</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>0.31</td>
<td>0.167 0.185 0.150 0.152 0.222</td>
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<td>10.4</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>0.32</td>
<td>0.141 0.148 0.150 0.190 0.106</td>
<td>0.147</td>
<td>0.04</td>
<td>9.8</td>
<td>0.6</td>
<td></td>
</tr>
</tbody>
</table>
Working out the Properties of the Filament Bulbs

This section contains the photos used to work out the properties stated in Part 3.1.

6.5V 0.15A Filament Bulb

Cross-sectional Area

Number of Turns in the Filament Bulb
6.5V 0.30A Filament Bulb

Thickness of Wire

Number of Turns in the Filament Bulb
Cross-sectional Area

Thickness of Wire
Testing the Internal Resistance of the PowerPack

Testing the Internal Resistance of the PowerPack was used for my excel model.

<table>
<thead>
<tr>
<th>Current, I/A</th>
<th>Voltage, V/V</th>
</tr>
</thead>
<tbody>
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<td>0.38</td>
<td>5.93</td>
</tr>
<tr>
<td>0.91</td>
<td>5.83</td>
</tr>
<tr>
<td>1.30</td>
<td>5.76</td>
</tr>
<tr>
<td>1.75</td>
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<tr>
<td>2.02</td>
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<tr>
<td>2.36</td>
<td>5.57</td>
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<tr>
<td>2.56</td>
<td>5.52</td>
</tr>
<tr>
<td>3.71</td>
<td>5.25</td>
</tr>
</tbody>
</table>

Finding the internal resistance, \( r \), of the power pack

\[ V = -0.20I + 6.02 \]

Finding the Resistivity of Tungsten with Temperature
The resistivity of tungsten with temperature along with its respective plotted graph. 

<table>
<thead>
<tr>
<th>Temp [K]</th>
<th>Resistivity μΩ·cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>5.65</td>
</tr>
<tr>
<td>400</td>
<td>8.06</td>
</tr>
<tr>
<td>500</td>
<td>10.56</td>
</tr>
<tr>
<td>600</td>
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<td>700</td>
<td>16.09</td>
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<td>800</td>
<td>19</td>
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<td>900</td>
<td>21.94</td>
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<td>1000</td>
<td>24.93</td>
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<tr>
<td>1100</td>
<td>27.94</td>
</tr>
<tr>
<td>1200</td>
<td>30.98</td>
</tr>
<tr>
<td>1300</td>
<td>34.08</td>
</tr>
<tr>
<td>1400</td>
<td>37.19</td>
</tr>
<tr>
<td>1500</td>
<td>40.36</td>
</tr>
<tr>
<td>1600</td>
<td>43.55</td>
</tr>
<tr>
<td>1700</td>
<td>46.78</td>
</tr>
<tr>
<td>1800</td>
<td>50.05</td>
</tr>
<tr>
<td>1900</td>
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<td>2600</td>
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<td>3500</td>
<td>111.1</td>
</tr>
<tr>
<td>3600</td>
<td>115</td>
</tr>
</tbody>
</table>

A graphic representation of the change of the resistivity of tungsten with temperature, along with its quadratic equation (which was used in my model).

\[ \rho = 2 \times 10^{-9}T^2 + 0.0259T - 2.7975 \]
Photos of my Excel Model

Attached are two photos from my excel model in Part 3.2.

| A       | B       | C       | D       | E       | F       | G       | H       | I       | J       | K       | L       |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0.00001 | 0.161   | 13.24   | 329.86  | 0.887   | 0.229   | 0.0000  | 0.016   | 0.0000  | 0.0000  | 0.016   | 0.0000  |
| 0.0001  | 0.206   | 12.74   | 321.05  | 0.841   | 0.216   | 0.0000  | 0.020   | 0.0000  | 0.0000  | 0.020   | 0.0000  |
| 0.0002  | 0.252   | 12.25   | 312.25  | 0.795   | 0.194   | 0.0000  | 0.025   | 0.0000  | 0.0000  | 0.025   | 0.0000  |
| 0.0003  | 0.297   | 11.75   | 303.75  | 0.749   | 0.172   | 0.0000  | 0.030   | 0.0000  | 0.0000  | 0.030   | 0.0000  |
| 0.0004  | 0.343   | 11.25   | 295.25  | 0.703   | 0.151   | 0.0000  | 0.035   | 0.0000  | 0.0000  | 0.035   | 0.0000  |
| 0.0005  | 0.389   | 10.75   | 286.75  | 0.657   | 0.130   | 0.0000  | 0.040   | 0.0000  | 0.0000  | 0.040   | 0.0000  |
| 0.0006  | 0.435   | 10.25   | 278.25  | 0.611   | 0.109   | 0.0000  | 0.045   | 0.0000  | 0.0000  | 0.045   | 0.0000  |
| 0.0007  | 0.481   | 9.75    | 270.75  | 0.565   | 0.089   | 0.0000  | 0.050   | 0.0000  | 0.0000  | 0.050   | 0.0000  |
| 0.0008  | 0.527   | 9.25    | 263.25  | 0.519   | 0.068   | 0.0000  | 0.055   | 0.0000  | 0.0000  | 0.055   | 0.0000  |
| 0.0009  | 0.573   | 8.75    | 255.75  | 0.473   | 0.048   | 0.0000  | 0.060   | 0.0000  | 0.0000  | 0.060   | 0.0000  |
| 0.0010  | 0.619   | 8.25    | 248.25  | 0.427   | 0.027   | 0.0000  | 0.065   | 0.0000  | 0.0000  | 0.065   | 0.0000  |

Diagram:

**Current, I/A**

- Time, t/ms
- Current, I/A

**Final current, I_A**
- Time, t/ms
- Final current, I_A

**Final resistance, Rf/O**
- Time, t/ms
- Final resistance, Rf/O

**Supply Voltage, V/V**
- Time, t/ms
- Internal resistance, Rf/O

**Room temperature, K**
- Time, t/ms
- Rf/O

**Final temperature, T_f/K**
- Time, t/ms
- Rf/O
Experiment Photos

I took two photos of my experiment (one of them can be seen in figure 2, part 2).
Bibliography


To what extent can our understanding of a Theory of Mind help its development within autistic children through training?
Megan Critchlow - Psychology

My Extended Essay gave me an opportunity to research an area of a chosen topic not necessarily explored within school. My main interest was psychology, yet I knew little about autism – an incurable mental condition that affects thousands of people around the world. I was equally interested in empathy, a factor I discovered autistic children struggled with. I decided to base my Extended Essay around the theory of mind of an autistic child, the natural interpretation of social behaviour. It gave me a chance to explore Autism to a greater depth than I would have in any lesson. Having to choose the appropriate information from multiple books, sites and people leads to your extended essay only being the start of the information you obtain within the process.

A key challenge within the writing of the essay was contacting and not receiving replies from the necessary people to enhance and understand the topics I was covering further. However the responses I did receive were worth the effort. Although many people wonder how they are going to fill up 4000 words upon a chosen topic, my friends and I found issues with condensing our essays into fewer than 4000 words. Although there were many challenges in coming up with a suitable question for my Extended Essay, the satisfaction of completing it was worth all the hours put in.

Supervisor: Ian Campbell

What appealed to me about this essay were the clear applications in the real world offering hope to many struggling families with autism. Megan was passionate and fascinated by the topic and was determined to focus not only on these practical applications but to link therapy closely with a contemporary understanding of the ‘theory of mind’. She soon became aware that investigating the causes of autism was not going to get her very far as so little is still known, so she chose to focus on the known symptoms rather than causes as the basis for her exploration into applied therapies. She also became realistic about the limitations of therapy but remained upbeat and positive throughout the process. The final essay was clearly structured and thoroughly researched and a real testament to her abilities.
Abstract

My research question is “To what extent can our understanding of a Theory of Mind help its development within autistic children through training?” Autistic children have difficulties understanding people’s behaviours, desires and figures of speech. Therefore my aim is to construct an argument to show how the understanding of a Theory of Mind allows us to develop interventions aimed at improving an autistic child’s Theory of Mind.

Before we can explore how to develop a Theory of Mind the concept must first be understood with reference to a normal child. Therefore my investigation was undertaken by exploring the nature of a Theory of Mind within a normal child, and how it allowed us to develop the theory that it can be improved within autistic children. Studies by Swaggart et al 1995; Paynter J. and Peterson C.C; Golen et al 2009; Singh. et al 2006, supported the idea that a Theory of Mind can be developed to an extent that allowed autistic children to interact with less disruptive behaviour in environments such as school.

My conclusion is that promising interventions have been developed to improve an autistic child's Theory of mind that accordingly decreases their aggressive behaviour during social situations, and enables them to be able to interpret other people’s expressions. However some aspects cannot be developed and it is unlikely that there will ever be a cure. Therefore alternative methods have been created, this is demonstrated by Hulburt et al with the thought-bubble method, indicating autistic children can learn to imagine a picture in another’s heads, however they can not instinctively understand what another’s goals may be.
Introduction

Based on epidemiological surveys there are approximately 700,000 (Baird, G et al, 2006, cited by The National Autistic society, 2013) people in the world with autism. 1 in 88 children are affected by autism (Autism speaks, 2013). There is no medical formula for detecting Autism and it is an incurable mental condition.

Autism appears to be continuously on the increase within the population (Autism speaks, 2013). This could be due to improved diagnostic techniques and an increased awareness of the symptoms, allowing people with autism to receive beneficial help. However due to the increase of diagnosed autistic individuals, to know about the difficulties autistic children face and how we are able to minimise these struggles is becoming increasingly important.

For the purpose of my analysis I shall define a Theory of Mind as the ability to predict others behaviours, goals and desires, whilst understanding indirect figures of speech and gestures. Additionally I shall define mindblindness as the absence of a Theory of Mind.

This analysis investigates the mindblindness theory, the proposition that an autistic child will have a delay in developing a Theory of Mind. I will explore the innate skills in forming the basis of a Theory of Mind, and what can be done to improve these skills in autistic children. I will do this by exploring how effective training methods can be on improving an autistic child’s Theory of Mind, and how this translates into real life situations. Therefore my research question is “To what extent can our understanding of a Theory of Mind help its development in autistic children through training?” The potential applications of my essay are to help autistic children integrate more easily with others in society, and long-term benefits would include the ability to acquire a larger range of jobs.
To expand my knowledge I have used a range of approaches including essays, journals, books, emails, websites and search engines.

The area of psychology I will be exploring is developmental psychology. Developmental psychology is a branch of psychology that explores the progressive behavioural changes of an individual throughout their life. I will be focusing on the progression of an autistic child’s theory of mind.

Finally I have decided to focus my essay on the psychological factors devising a Theory of Mind, as apposed to any biological basis. Although it should be acknowledged that there are thought to be additional biological factors.
The normal development of a Theory of Mind

Before we can develop an autistic child’s Theory of Mind, we need to look at the development of a normal child’s and make a comparison. If we can demonstrate that a Theory of Mind can be developed, this will show it is necessary to train autistic children to help develop their Theory of Minds.

From 14 months to 9 years many social developments occur regarding a normal child’s Theory of Mind. By 14 months typical children develop “joint attention” (Baron-Cohen, 2008 p.58) where they look into others eyes and pay attention to what others are interested in. By 24 months they can engage in “pretend play” (ibid), by deducing what is going on in a game from the point of view of another child and therefore being able to join in. At these ages autistic children have a reduced frequency of joint attention and pretend play.

By 3 years old normal children are able to understand that seeing leads to knowing. For example if you saw your sister take a sweet whilst your mum wasn’t looking, you understand that you saw the action so you know that your sister took the sweet, but your mum did not see and therefore is unaware. Autistic children do not naturally pick up this concept.

Finally once typical children reach the age of 9 they are able to use tact (Baron-Cohen, 2008 p.60-61). Recognising what may hurt another’s feelings and how to avoid this, however this notion is delayed by 3 years for autistic children. Autistic children also struggle to interpret expressions from eyes and work out what someone may be thinking or feeling. Although typical 9 year olds have usually acquired this ability, people with autism often score low on more advanced expression reading tests into their adulthood, introducing further social disadvantages into their lives. This brief timeline into the growth of a typical child
accentuates the necessity to develop an autistic child’s Theory of Mind and therefore the importance of finding the correct intervention for this purpose.

**Breaking down a normal Theory of Mind**

To understand to what extent autistic children can develop their Theory of Mind through training, I am going to break down a normal Theory of Mind into sections. This will enable us to understand how far an autistic child’s Theory of Mind needs to be developed, to reach the same level as normal children.

Whilst Leslie (1994) and Premack (1993) propose alternative models (Baron-Cohen, 1995), I have decided to focus on the four components Simon Baron-Cohen proposes forms the human mindreading system. The reason for my choice is due to Simon Baron-Cohen’s extensive research in the area of autism and the Theory of Mind, along with his choice to separate the detection of eyes of an organism from shared attention. The four components consist of the intentionality detector (ID), the eye-direction detector (EDD), the shared-attention mechanism (SAM) and the Theory of Mind mechanism (ToMM) (Baron-Cohen, 1995, cited by Brooks Jamison, 2010).

Firstly the ID is the mechanism developed that allows us to be able to anticipate how others may feel. This is the mechanism in our brains that works out what others deliberate mental states of goals and desires may be, through their motional stimuli. (ibid)

Secondly the EDD detects the presence of eyes or eye-like stimulation, computing whether the eyes are facing them or an alternative direction and understanding that if eyes are directed at an object, they view that object. (ibid)
Thirdly the SAM’s key function is to build triadic representations. A triadic representation is the ability to recognise the associations between an agent, the self and a third object. It is the ability to identify that you are sharing a perception with another. (ibid)

Finally the ToMM completes the child’s development of a Theory of Mind. This allows a child to recognise mental states such as guessing, imagining, deceiving and understanding false belief. It helps an infant to understand that there are many mental states that are able to relate to each other. Without being able to recognise these mental states you become vulnerable to the people who do. (ibid)

In an interview Baron-Cohen theorises that “A Theory of Mind was so central to human social behaviour, that in all likelihood it had evolved to support social behaviour- and its impairment in autistics might just be the strand of neurological evidence to allow this evolutionary question to be tractable” (Gazzaniga et al, 2002, cited by Brooks Jamison, 2010). This statement plausibly implies that perhaps in the past there were many humans lacking a Theory of Mind, but as we evolved natural selection caused these individuals to be the minority, leading to the smaller group of people lacking a Theory of Mind being named autistic.

**The mindblindness theory**

Before we can look at what training methods can help develop a Theory of Mind, we have to look more directly at what it is Autistic children lack. To do this I am going to examine the mindblindness theory and highlight more directly the abilities autistic children lack relating to “mindblindness”.

For children to lack a Theory of Mind they essentially lack the ability to understand or predict others’ behaviours. For example if an individual were described as “the bees knees”, an autistic child, even if explained this was a phrase for an extraordinary person, would struggle to comprehend this. Instead they would continue to literally imagine a bee’s knees.

Developing this explanation to the limitations of mindblindness is a quotation by Kanner (1943) cited by Baron-Cohen (1995, p.62), describing what he saw when viewing an autistic child. “When a hand was held out to him so that he could not possibly ignore it, he played with it briefly as if it were a detached object”. This description accurately fits in with the Mindblindness theory. The autistic child acknowledges the hand as being present but treats it like an object, unaware of any intention behind the hands movement. Baron-Cohen and Bolton (1993) cited by Baron-Cohen (1995, p.62), recorded similar social dysfunction of an autistic child “he would look at them fleetingly or else not at all” this description accurately portrays the oblivion as to what being looked at means to an autistic child. The child may fleetingly look at a person but not take into account any feelings portrayed behind the persons expression, instead glancing at the person as if they were an object.

Therefore it is clear that the delay of autistic children’s development of a Theory of Mind is a huge disadvantage to them in social circumstances where they often misconceive actions and behave inappropriately. This social disadvantage is indicated by the national autistic societies statistics that over 40% of children with autism have been bullied at school (Batten, A. et al, 2006, cited by The National Autistic society, 2013).
The effectiveness of developing an autistic child’s Theory of Mind

I am going to be looking at 4 different training methods involved in the development of an autistic child’s Theory of Mind, with studies to demonstrate how effective they are.

Social skills teaching and mindreading interventions

The first method I will be evaluating is “Social skills teaching and mindreading”, which addresses the social awareness of an autistic child. This can be taught via methods ranging from role-play and drama therapy to directly teaching specific social behaviours and rules. One method created by Carol Gray (1991), cited by Baron-Cohen (2008), is social stories, providing typical social situations and teaching social scripts, with the aim of helping children predict what will happen in different circumstances. Swaggart et al. (1995), cited by Frank J. Sansosti et al (2004), studied the effectiveness of social stories using 3 autistic children, all with social deficits indicating impairments to their Theory of Minds. The first participant showed a significant increase in appropriate social greetings from 7% to 57%, additionally her aggressive behaviour decreased from 9% to 0%. The two other participants sharing behaviours increased by 22% and 35% respectively and aggressive behaviours decreased by 56% and 35% respectively. Developing a theory of mind includes gaining the ability to recognise how to avoid behaviours that may hurt another’s feelings. Therefore this decrease in undesirable social behaviours indicates an improvement of the child’s Theory of Mind. Additionally the increase in sharing behaviours shows that the participants have improved their ability to predict that others may also want to play with their toys. However this study has limitations, due to a previous training model it is unclear as to whether the improvements were solely due to social stories. Additionally due to the small sample size the study would be difficult to generalise to other autistic children.

Thought-bubble training

Secondly the thought-bubble method is used to improve autistic children’s ability to
understand others thinking patterns, therefore developing their Theory of Minds. Paynter J. and Peterson C.C. (2012) study, tests the thought bubble method, using a comprehensive assessment upon the children’s verbal and nonverbal skills with an additional delayed follow up test. The study included 24 children on the autism scale, aged 4-12 years old. Using the Theory of Mind scale that is out of 5, the 17 children that used thought-bubble method training along with other interventions progressed on the total Theory of Mind scale from 2.00 to 3.06 and in the post-test evaluation reached an average of 4.11. The control group that were involved in no other intervention improved from 2.71 to 2.86, with a mean follow-up score of 3.33. The results additionally showed that there were benefits for Theory of Mind concepts beyond false-belief, such as complex concepts like “people feel happy if they think they are getting what they want”. Additionally improvements could be maintained for at least 3 weeks, however due to being a comprehensive assessment the study had a low ecological validity.

**Mindreading DVDs**

Thirdly mindreading DVDs are now available as a teaching mechanism for autistic children. These DVDs include hundreds of emotions displayed on actor’s faces and within their voices, with no gender bias. The child must recognise the emotion displayed by the actor.

For autistic pre-schoolers an animation “The transporters” has been created. It is based on vehicles appealing to the child’s systematic interest, where facial expressions of different emotions have been placed onto the animated vehicles. Golen et al (2009) demonstrated the effectiveness of The Transporters DVD. The study included 3 groups of 18 participants, the first group were autistic children whose parents showed them 3 episodes of the Transporters per day for 4 weeks, the second group were autistic children involved in no interventions and the final group were normal children. Each group was tested at 4 different levels, the first
level tested the participant’s emotional vocabulary and the other 3 tested the participant’s ability to match socio-emotional situations to the appropriate facial expression. At the start of the 4 weeks the autistic participants were shown to have significantly lower scores compared to the normal children. However after 4 weeks the two control groups remained the same, and the autistic group who had been watching the transporters scores improved to the same level and to a more advanced level as the normal children. These improvements indicate the successful nature of the intervention, developing the autistic children’s ability to read others expressions and therefore improving their Theory of Mind. Although the study could easily be replicated, the small sample size and low ecological validity makes the study difficult to generalise from.

**Mindful parenting**

By email a member of the autism expert alliance (S. Wilcox, pers. comm. 23rd August 2013) informed me of what she has discovered from her personal findings and experiences with her son. Contrasting to previous studies she believes that vision therapy, counselling and other interventions do not always impact an autistic child in the intended way. However working upon the attitudes of family, relatives, teachers and therapists is what makes the largest difference. Autistic children are often viewed as unresponsive, however usually they are merely overwhelmed “from over stimulation, chemicals and other environmental input to be reachable” (ibid). She informed me that autistic children are especially sensitive to the energy that someone brings to a situation, therefore ways are being found to manage their energy. Accordingly a residential school in New Hampshire for autistic children has created the new curriculum “Energetic mindfulness”(ibid).

A study by Singh, N. et al, 2006 demonstrates the effectiveness of mindful parenting upon
decreasing aggression and noncompliance in autistic children. 3 autistic children’s mother’s collected data on their child’s behaviour and rated their own parenting before the study. Fathers additionally collected data for 5-10 hours each week and a comparison between the parent’s observations was made to increase the study’s reliability. The mothers were then trained for 12 weeks, implementing the mindfulness skills they were learning upon their children. After training they continued the mindfulness practice for 52 weeks. Over this period there was a significant decrease in the children’s negative behaviours. For example participant 1’s aggressive behaviours decreased by 88% from training to practice and noncompliance behaviours per week showed a 68% decrease. This decrease in aggression demonstrates an increase in the understanding that aggression may hurt another’s feelings, which resultantly demonstrates a development of the Theory of Mind. Due to being a field experiment the ecological validity is high. This study successfully shows the effectiveness of mindfulness, however there is no indication for the studies I have evaluated previously being less effective. Therefore from the studies I have looked at it, it appears that there are multiple ways of improving a child’s Theory of Mind.

**Evaluation of all the training methods**

From the evidence of each training method the transporters DVD appears to be the most successful. The autistic participants who had watched 3 episodes of the DVD per day over 4 weeks improved their emotional vocabulary and ability to match socio-emotional situations to the appropriate facial expression to the same level or a more advanced level as the normal children. However due to being a lab experiment participants may have become used to interpreting expressions on screens as apposed to real life, so the validity of the study could be questioned. Additionally this type of training does not cover all areas of a Theory of Mind such as interpreting another’s behaviour and reacting appropriately, but only approaches the emotional recognition and application side of a Theory of Mind. Therefore mindful parenting
appears to be most successful in improving appropriate behaviours. Applying mindful parenting (Singh, N. et al, 2006) to autistic children over a period of 64 weeks improved participants' behaviours significantly for example one participant's aggressive behaviours decreased by 88% as opposed to social stories intervention’s decreasing aggressive behaviours by 56% and 35% respectively (Swaggart et al. (1995), cited by Sansosti et al (2004)). During both these studies a small sample size was used therefore it is difficult to accurately claim that mindful parenting is more successful at reducing aggressive behaviour than social stories. Finally the using thought-bubble training appeared to be the worst for improving autistic children’s Theory of Mind. Using a Theory of Mind scale out of 5, Paynter J. and Peterson C.C. (2012) found that autistic children only improved from 2.71 to 3.33 at a follow up test. However they additionally studied autistic children also involved in other interventions who managed to increase from 2.00 to 4.11 in a post-test evaluation. This is a prime example of where synthesising training methods is the best option, as in this case other interventions are evidently complimentary to the thought-bubble method.

Overall it appears that all the interventions I have looked at would benefit from synthesising with other training methods. For example autistic children involved with the transporters, which only focuses on the ability to recognise and apply emotions, would benefit from social stories training which targets decreasing negative behaviours. This synthesising approach would improve a vaster range of areas of the Theory of Mind, to a greater extent than one training method is able to achieve.

**A developed Theory of Mind improving real life situations**

I am now going to be looking at how the empirical evidence of the effectiveness of the three different interventions, social stories, thought-bubble training and mind reading DVDs such as the transporters, can translate into real life situations. This will
demonstrate whether autistic children can be trained to develop their Theory of Minds outside of a lab. If their Theory of Minds can be developed it will additionally demonstrate how an improved Theory of Mind can benefit their lives. I will not be looking at mindfulness training due to the high ecological validity and indication of how the children acted within real life circumstances in the study I previously looked at.

The first intervention I looked at was social stories (Carol Gray, 1991, cited by Baron-Cohen, 2008). Scattone et al (2002), cited by Mohr, (2013), study further demonstrates the effects of social stories on autistic children in a classroom situations. Social stories were used to discourage 3 autistic boys from chair tipping, staring at girls, and shouting at the teacher. All participants showed a decrease in these disruptive behaviours, indicating an acknowledgement of the discomfort these actions may cause to others and therefore demonstrating an improvement of there Theory of Mind. This study is particularly ecologically valid due to the study being held within an active classroom, therefore demonstrating the effects the development of an autistic child’s Theory of Mind has upon their actions in a real life situations.

The second intervention I looked at was the thought-bubble method of training. A report from Hulburt et al (1994) cited by Wellman et al (2002), demonstrated 3 autistic individuals inner experiences, via descriptions from the participants of their perceptions and actions or inner speech. These were described in the form of pictures in their heads. This study indicates that thought-bubble training allows autistic children to be able to view other people’s thoughts and emotions. Although they may not be able to instantaneously predict how someone will behave, it is an alternative method that allows autistic children to understand social situations to a greater extent.
The final training method I looked at was mindreading DVDs such as “The Transporters”. Although Golen et al’s (2009) study lacked ecological validity, the experiment indicated improvements of the autistic children within real life situations. The children were able to generalise from the expressions on the animated trains to recognise expressions on human faces from the photographs they were tested with. This demonstrates the autistics child’s ability to transfer the developed method to recognise emotions shown by humans. Which resultantly benefits the children in social situations. For example without this ability the child may fail to recognise an acquaintance’s emotional state and therefore ignore any signs of distress or upset unaware of the circumstances.

Overall I have found all four interventions results translate to real life situations with a positive effect. The development of a Theory of Mind allows the autistic children to improve their behaviour within class resultantly improving their chances of better grades. The decrease of aggressive or disruptive behaviour and increase in awareness of others emotions improves the likelihood of successful relationships. These findings demonstrate that an autistic child’s Theory of Mind can be developed to an extent during real life situations, even if it is by alternative methods to normal children.
Conclusion

My research question was “To what extent can our understanding of a Theory of Mind help its development in autistic children through training?” Through the course of my analysis I have gained a clear understanding of the development of both autistic and normal children’s Theory of Mind. It’s became evident that often autistic children have the ability to learn social developing skills, however the majority do not acquire them naturally at the rate of a typical child.

During my research I have found there are some individuals who manage to build up a Theory of Mind, for example being able to pass seeing leads to knowing tests. However even with some of the most remarkable individuals who develop their Theory of Mind to the point where they can pass these tests, to some extent they still lack and find aspects of a Theory of Mind confusing. However with the benefits of education and therapeutic interventions Mindblindness seems to partially alleviate as the child ages.

The interventions I have analysed reiterate the effectiveness of developing a Theory of Mind. Firstly the use of social skills teaching and mindreading has been shown by Swaggart et al. (1995) to be effective in Carol Gray’s (1991) social stories. Swaggart et al (1995) demonstrates how social stories can decrease socially undesirable behaviours, indicating an understanding of what is inappropriate to others. Secondly Paynter, J. & Peterson C.C. (2012) showed thought-bubble training was found to be beneficial to autistic children’s Theory of Mind, thirdly mindreading DVDs such as the transporters have been shown by Golen et al (2009) to improve autistic children’s ability to interpret the emotion behind facial expressions. Finally with guidance from S. Wilcox I have found through a study made by Singh, N. et al, 2006, that mindful parenting has been found to be potentially more beneficial
than social stories. These four methods portray a Theory of Mind can be developed, however they do not always benefit every child which brings me to the unanswered questions; why do some autistic children benefit from training whilst others do not? Is it dependant on how severely autistic they are? The effectiveness of mindful parenting demonstrates that the attitudes of the people around you may be the reason that some children benefit from training whilst others do not.

The overall conclusion I have came to as to whether a particular intervention is most effective or whether a mixture would benefit an autistic child most, is that synthesising interventions would benefit an autistic child in the largest range of areas of a Theory of Mind. This is demonstrated by Golen et al (2009) study on the thought-bubble training method, which shows an increase in effectiveness for children taking part in other interventions along with the thought-bubble method.

These interventions all appear to have benefits in the real life situations. They enable autistic children to become less aggressive and increasingly pro-social, allowing them to feel less bewildered by other people’s behaviours. Although autistic children may not be able to generate the ability to predict what others may be feeling, methods such as the thought-bubble method allows them to use an alternative route to understanding the same concept.

Overall, despite the unanswered questions, I believe that autistic children can be helped to develop their Theory of Mind through the right amount of encouragement, training and persistence. Interventions are continuously being invented and although it is not instantaneous, there is an improvement to the majority of autistic children’s Theory of Minds due to these interventions. This indicates that although it may not be possible to cure their
mindblindness to the entirety, it is possible to develop their Theory of Minds to an extent that allows them to live an increasingly normal life.
Bibliography


A comparison of depictions of the *Birth of Venus* by Sandro Botticelli, and the painting of the same name by Alexandre Cabanel.

To what extent do the artists’ manipulation of the formal elements of painting assist them in achieving their aims?
What was so important for me about my Extended Essay was finding and choosing one topic that I truly wanted to know everything about. From there, reading what seemed like hundreds of books and essays, making pages of notes, and writing thousands of words, wasn’t a chore because I cared about the topic I was writing about. Although some people might see the minute details of these two paintings and what they meant hundreds of years ago as fairly irrelevant, I think of it as an incredible insight into the minds of two amazing artists, and am amazed at the difference 400 years can make between two paintings of identical subject matter. Therefore, although my Extended Essay was an acquired taste to read, I can say it was written with the most important thing: real passion for the subject.

Supervisor: Charley Openshaw

Zoe’s essay blends a personal interest with a ruthlessly analytical art historian’s eye. She takes two artists’ depictions of the same subject and considers their merits against a structured set of criteria. The decisively contrasting approaches disguise hidden links and shared preoccupations that surprised and challenged assumptions in equal measure. Whist an analytic Visual Arts essay will necessarily lack the precision of data collection possible in other subjects, this essay argues for and successfully implements a rigorous format for assessing evidence gathered through first-hand observation and a thorough understanding of historical context. This rigour does not stifle creativity and the structure provides a launching point for independent insight into visual sources. Indeed it is hard to read without gaining a sense of the excitement and intensity with which the investigation was carried out. This enthusiasm spilled over into Zoe’s own creative practice and her final Visual Art exhibition drew on many of the themes uncovered and explored within the essay.
Abstract

The aim of this essay is to investigate how the formal elements of painting were manipulated in order to help achieve the intentions for the painting. The paintings in question are “The Birth of Venus” by Sandro Botticelli, and the painting of the same name by Alexandre Cabanel. I combined reading books, web pages and essays with a trip to the Musée D’Orsay in Paris to view the Cabanel painting. The subject matter of the paintings is almost identical, yet the criteria for the aims of each painting led to them being very different in appearance. The components of colour, composition, pictorial space, light and tone, materials and technique, and scale are used to answer the question of whether the artists achieved their aims, at two very different times in art history.

In the investigation, I explore the aims that might have been set by the artists when choosing to paint the Birth of Venus at these two times. The limitation of the essay is that the artists’ intentions are speculative, as they have not been formally documented. However through my combination of research and viewing of the paintings, I decided upon three aims for each of the paintings. Comparing the formal elements, and the aims chosen for the two paintings led me to understand the impact of the manipulation of these elements upon how successful the paintings were. This essay concludes that Cabanel’s manipulation of the formal elements definitely helped him to achieve one of his aims, whilst evidence shows mixed answers to the success in the other two. Similarly, it shows that Botticelli’s use of the formal elements aided him in achieving his aims, yet the extent to which they helped is minimal.
A comparison of Depictions of the Birth of Venus by Sandro Botticelli, and the painting of the same name by Alexandre Cabanel. To what extent do the artists’ manipulation of the formal elements of painting assist them in achieving their aims.
A comparison of Depictions of the Birth of Venus by Sandro Botticelli, and the painting of the same name by Alexandre Cabanel.

- To what extent do the artists’ manipulation of the formal elements of painting assist them in achieving their aims.

Introduction

The Birth of Venus is a subject that has been revisited multiple times over the centuries of art. It’s fascinating how a difference in century could affect two paintings that are the same in subject matter. The intentions behind the paintings are what differentiated the way they were painted, and these intentions, and how they were accomplished, is what I want to discover. Venus has been a popular subject in art for as long as 40 thousand years, starting with the German ‘Venus of Hohle Fels’, [Appendix 1] [1] Since then, thousands of pieces of art have been made of the Goddess. Two of the most famous of these paintings are depictions of her ‘birth’, made by Sandro Botticelli in 1486, and then by Alexandre Cabanel in 1863. Both artists will have had aims to achieve with these paintings. For Botticelli, patronage led him to aspire to fairly simple aims. In his time, art was a matter of completing the tasks given to the artists by their patrons. However in the 19th Century Paris, being successful came through the Paris Salon, requiring paintings to be liked by the public
and the critics. Botticelli and Cabanel therefore had different aims when creating their depictions of ‘The Birth of Venus’. The two paintings are consequently very different in appearance. What interests me is the link between how the manipulation of the formal elements aided the artists in achieving their aims, during the time in which they worked. The formal elements I have chosen to consider are colour, composition, pictorial space, light and tone, materials and technique, and scale. I came to an informed decision on 3 of the artist’s aims, based upon research on the artists, and the time and place in which they were working.

Due to the nature of the Paris Salon, Cabanel was under pressure to gain approval from the public as well as the critics, and needed to improve his career with every painting. Simultaneously, from reading critics’ opinions, it is clear that depicting beauty in his Venus was important to Cabanel. Therefore, the aims I have decided to focus on are: to achieve critical acclaim and success, to capture the ideal of beauty, and to further his career. Botticelli did not have the same career pressure, 400 years prior. He did, however, have the burden of pleasing his patrons. Also intrigued with beauty, Botticelli focused upon representing the neoplatonic ideal of beauty. Thus, the aims I will focus on are: to meet the requirements of the Medici, to faithfully depict the narrative as told in ‘The Birth of Venus’ by Angelo Poliziano, and to incorporate the Medici’s religious views into the painting of classical myth.
Chapter One: The effect of the manipulation of materials and technique, colour, and composition on Cabanel’s aims.

Alexandre Cabanel was born in Montpellier, France in 1823. At the age of 21, Cabanel exhibited at the Paris Salon for the first time. From then on, his art frequented the Salon, and he was "elected regularly to the Salon jury" [2] The art produced by his students (Cabanel was also a professor at the Ecole des Beaux-Arts) was also exhibited in multitudes at the Salon [ibid]. The Paris Salon, during the time that Cabanel was painting, was a place reserved for unforgiving judgment. Many Parisians took matters of artistic taste very personally, and were incredibly intolerant. The visitors would stand inches from the paintings and scrutinize each brush stroke. [3] Also, the salon, by 1863, had become about business. Ingres said, "artists are driven to exhibit there by the attractions of profit, the desire to get themselves noticed at any price." [ibid]. Thus, there was huge pressure on a famous Parisian artist such as Cabanel to produce art worthy of the Salon, and, according to Ingres, to make money from his painting.

Aim One: To Achieve Critical Acclaim and Success

The Birth of Venus [Appendix 2] was painted in 1863, the year in which Cabanel was accepted as a member of the Paris Salon. During the painting of this piece, Cabanel was striving to achieve critical praise, hoping to be noticed by the critics, and the salon. The painting shows Venus reclining upon the waves, both hands above her head, eyes half closed, surrounded by cherubs. The painting is done with oil paint on canvas, materials that were not uncommon at the time. However the
application of the paint on the canvas was what distinguished Cabanel's Venus from the other paintings in the 1863 Salon. My trip to Musée d'Orsay in May allowed me to see how the paint is clearly thinned and glazed using mineral spirits to provide an image without brushstrokes, like a photograph, which showed me what made the painting so unique. Whilst other artists of the impressionist movement at the same time used oil paint thickly on the canvas to create busy paintings full of texture, Cabanel's technique employed much finer, precise mark making, and an effect that almost seemed photographic. This attention to detail is what made Cabanel so popular with the critics in the 19th century. Philip Hamerton was one of the critics in awe of Cabanel's talent and style. [The limbs of the Goddess had a] "kind of rhythmical, musical motion" [4]. This quotation from Hamerton illustrates the appeal of Cabanel's soft, graceful mark making, and summarizes the critical acclaim that was held to Cabanel's way of painting.

Cabanel’s paintings displayed the qualities in the lack of obvious mark-making that the critics were looking for. Combined with the common but well approved use of the basic materials, canvas and oil paint, Cabanel’s classical style rewarded him with critical supporters. However, the sensual image of Venus lying naked in the waves took many away from him. Thought of as “indecent” [Ibid], his wildly voluptuous and seductive Venus displeased the conservative critical eye, and detracted from the beautiful techniques and materials employed to paint it. This takes me on to my next investigation: whether Cabanel succeeded in capturing an ideal of beauty at the time, or if instead the sensual painting was merely viewed as an erotic appeal to desire.

**Aim Two: To Capture the Ideal of Beauty**
The image of the Goddess, lying exposed in the waves is, to me, a beautiful vignette of her 'birth.' Capturing the ideal of beauty, however, is more than simply painting a beautiful painting, or capturing a beautiful woman. The colour chosen for the painting is a formal element that is key to capturing beauty, and portraying the pure, perfect Goddess of love. The light, cool colour used in The Birth of Venus introduces the air of peace and serenity that surrounds the goddess, amplifying her equable demeanor and alluding to the enlightenment of rest and enjoyment. Cabanel intended to show the viewer, through the painting’s lightest hues, how relaxation purifies Venus, as though she has been in a long sleep and is awakening well rested and beautiful. The pale colours and use of whites and peachy pinks suggest virginity, and the purity that was identified with beauty at the time. In 1863, having pale skin was associated with the aristocracy, as poor people that worked outside in the sun were the only ones with tanned skin. This explains why Venus is portrayed with pale white skin, as though her skin had never seen the sun. The deep red of Venus’ hair is used to symbolize lust and passion, as redheaded women are believed to be more libidinous than those with more subdued hair colours. This use of bold red, orange and gold hues highlights that Cabanel associated the Goddess of love with not only romantic love, but also a passionate, lustful one. This alludes to the idea that Cabanel was using mythological trappings to hide the blatant eroticism of the reclining nude. This was a popular opinion amongst critics at the time. One critic stated, 'The painter’s attitude is of inconceivable vulgarity.' There were, nonetheless, critics who supported Cabanel, and saw in his painting the ideal beauty that he was trying to convey. Critic Claude Vignon said that the nude was “ideal beauty embodied in a woman” [7], while the Revue Des Races Latines (a journal that critiqued the salon)
appreciated the simultaneous purity and eroticism, writing that the Goddess was “everything the imagination can dream of” [8].

Whether Cabanel succeeded in capturing ideal beauty is subjective. Although many critics considered the painting vulgar, members of the general public and Napoleon III, who bought the painting, thought otherwise. This proved that despite mixed critical views on the piece, it was a very popular painting, which gave Cabanel both money and fame. This leads on to the third and final aspect I will be looking at: Cabanel’s career prospects in 1863, and how this painting furthered them.

Aim Three: To Further his Career

By the mid 19th century, the Paris Salon was not simply a place for artists to exhibit their hard work and look upon the achievements of others. It was a place for business. By the time Cabanel was showing The Birth of Venus, there was a certain profitable goal. Therefore in producing the painting, creating a composition that would be popular with the male viewers and would draw spectators was highly important. The nude figure is reclining on the ocean, a graceful twist in the body, with the theatrical swoop of an arm over her face. The way her body curves, opening up and baring her chest, allows the spectators a view of her entire voluptuous body, while the arm thrown across her face gives a sense of coyness and vulnerability. This contradiction appealed to the male audience, as, unlike a real-life woman, the Venus portrayed in the painting could simultaneously be considered a passionate and sexual woman, and a pure, vulnerable and ‘respectable’ woman. This theory is known as the Madonna-Whore complex, created by Sigmund Freud [Appendix 3]. As Paul Mantz said, the Venus in the painting was “wanton and lascivious…but harmonious and pure” [9]. The face of the figure is hidden partially by her hand, leaving an air of
mystery to the woman. Art historian, Robert Rosenblum wrote "the ambiguity of her eyes, that seem to be closed but that a close look reveals that she is awake ... A nude who could be asleep or awake is specially formidable for a male viewer" [10]. A sleeping nude gives the appearance that one can look without their acknowledgement, however when realizing that the figure is awake, there is an added excitement and thrill at looking upon the painting. The buyer, Napoleon III, was a famously promiscuous president of the French Republic. Known for his insatiable sexual appetite and for legalizing prostitution, it is no surprise that the lustful painting appealed to the emperor. Cabanel’s manipulation of the composition of the painting goes beyond the pose of the nude, however. The cherubs, poised over the Goddess' body, are placed in a tight collection of bodies. Spaced close together, the closest cherubs to Venus stare lovingly at her in a caring way. This gives an immediate sense of importance to the main figure of Venus, drawing the viewer’s eyes back to her.

When The Birth of Venus was on show, Napoleon III bought it immediately. This alone gives us the knowledge that the painting was well liked: an emperor would not buy a painting that was not popular. The Cabanel was thought of as the clear winner, in terms of crowd pulling prowess at the 1863 salon [11]. The careful composition of the figure, positioned in a classical reclining pose but with an erotic air gave the painting an exciting quality that made it popular with both the public, and Napoleon III himself. After buying The Birth of Venus, the emperor made Cabanel his preferred artist, and bought multiple paintings from him in the coming years.
Despite having a mixed critical reception, the painting was incredibly popular with members of the public, and Napoleon III. His manipulation of the materials and his technique gained him many of the critical supporters that he held, while his use of colour helped him to convey the ideal of beauty. The composition of the painting, particularly the pose of the model was one of the key features for making the painting so popular, and for its sale to Napoleon III. Thus, his manipulation of the formal elements of painting helped him at least partially in achieving his aims. The composition and handling of the subject matter led to him not achieving the first aim, critical acclaim and success, due to its controversial nature.

Chapter Two: The effect of the manipulation of scale, pictorial space, and light and tone upon Botticelli’s aims.
Sandro Botticelli was born in the Italian town of Florence in 1445, as Alessandro di Mariano di Vanni Filipepi. Having trained as a goldsmith in his early life, he was taught the practice of painting by Fra Filippo Lipi, apprenticed to the artist sometime around 1462. By 1470, Botticelli had his own workshop, and, even at this early stage, was beginning to paint figures as if seen in low relief, drawn with clear contours, and reducing strong contrasts of light and shadow that would have shown a more modeled figure, a characteristic that he later became known for. In the 15th century, artists were creating works for commissions. Known as patronage, an artist would be asked to produce a piece of art based upon the criteria given to them by their commissioner. One of Botticelli’s many commissioners, the Vespucci family, introduced Botticelli to the Medici family, the most powerful family of 15th century Florence. The Medici commissioned artists such as Donatello and Leonardo da Vinci, and, while Lorenzo the Magnificent ruled, Botticelli. The time of Lorenzo de Medici was known for its multitude of festivities and carnivals, and his interest in art made him an excellent commissioner. It was said that he ‘understood’ the artists he employed, and rather than giving them too strict rules for their paintings, he encouraged them to excel in their own ways. It was suggested that Botticelli was his favourite artist, and in 1485, Lorenzo the Magnificent commissioned Botticelli to paint the Birth of Venus.

Aim One: To Meet the Requirements of the Medici

The Birth of Venus [Appendix 4] by Botticelli was painted for Lorenzo de Medici, commissioned the painting to decorate a country villa, due to its size and materials.
It is 1.72 by 2.78m, quite a large painting, and is done on canvas. Painting on canvas was cheaper, and thus it tended to hang in country villas, where social events and functions were less significant than those in the city palaces. This suggests that when painting the Birth of Venus, Botticelli had been specifically instructed to paint upon canvas \(^{[15]}\). The scale of the painting is large, however it is not as sizable as some of those he painted for the Medici’s city houses, such as the Primavera (1482) \(^{[Appendix 5]}\). This tells us that Botticelli was aware of where the painting would be placed, and chose the scale of the piece in order to maximize the pleasure of the Medici family. Being placed in a country villa, Botticelli would not have wanted the painting to seem offensive in its size, as a house in the country would have been used for relaxation, and the artwork should fit that mood. The scale and size of the painting also helps to make Venus the main subject of the piece. She is depicted as being life-sized, which means standing up against the painting would make the viewer feel as though he could look into her eyes, allowing her beautiful face to awe the audience, and create a sense of wonder for the Goddess. It is probable that Botticelli was instructed to create an impressive painting that they could show off to their guests and Botticelli used the scale to do this.

Lorenzo de Medici commissioned Botticelli due to his talent and skill. With the intention of having an impressive art collection, he gave Botticelli the task of creating a large and magnificent painting, which was done through its size. Another of the criteria that the Medici would have specified when commissioning the painting was its subject matter, which brings me onto the second investigation of the Botticelli: it’s literature inspiration “The Birth of Venus” by Angelo Polizan.

**Aim Two: To depict the Narrative as told in “The birth of Venus” by Angelo Polizano**
In Florence during the 1470s and 80s, it was not unusual for intellectuals and artists to meet to discuss topics such as history, philosophy, literature and art. It is suggested that daily, Lorenzo the Magnificent organized such meetings, in which the group interpreted the works of Virgil, Homer and Hesiod. [16] Ideas were formed, and then realised by the artists, goldsmiths and musicians. The Birth of Venus was one of the works that followed this routine. Lorenzo de Medici introduced the theme of the birth of Venus with verses from an ode by Hesiod. Angelo Poliziano, known as one of Lorenzo’s favourite humanist poets, wrote the story in verse, and later, Botticelli translated the poem into the painting. The Birth of Venus. [ibid] Botticelli, when creating the painting, therefore had a narrative to follow, which will have had a large impact on the way that it was conceived and painted. The pictorial space of the painting was important in telling the narrative. The poem [appendix 6] says, “A young woman with nonhuman countenance, is carried on a conch shell, wafted to shore by playful Zephyrus.”[17] This quotation tells us that the God of the west wind, Zephyrus, should be set behind Venus, blowing her to shore. However, Venus is fundamentally the same size as Zephyrus and his nymph Chloris. Also “she was received in the bosom of the three nymphs and cloaked in a starry garment”[ibid] suggests that the nymph Pamona, welcoming Venus to the shore, should be stood in front of her, receiving her. This would make Zephyrus and Chloris in the background of the painting, Venus in the mid-ground, and Pamona in the foreground. However, all three are placed in the foreground of the painting. This, and much of the background of the painting, is not in tune with the general rules of linear perspective either. The waves, if restricted to the universal rules of perspective, would diminish from the foreground to background, however they are all roughly the same size. The
reason for this could have been for clarity of narrative, as having all of the characters in the foreground allows for a clear telling of the story, or perhaps for decoration.

The poem by Angelo Poliziano gave Botticelli the ability to paint a picture translating the story of the birth of Venus into painting. Botticelli followed the details of composition, for example the quotation “You could swear that the goddess had emerged from the waves, pressing her hair with her right hand, covering with the other her sweet mound of flesh” [ibid] led to Botticelli arranging the figure with her hands covering herself. However he appeared to have left out the use of perspective, ignoring words such as “wafting” and “receiving” [ibid] that could have informed him of the placement of the characters. This tells us that although the small details in the narrative are ignored, he understood the narrative to be more comprehensible without traditional use of perspective.

Aim Three: To Incorporate The Medici's Religious Views Into The Painting Of the Classical Myth.

Due to the family’s religion, almost all of the paintings done for the Medici by Botticelli before 1482 were Christian images. Venus, as a classical Goddess, did not fit into Christian or Pagan religion, leaving questions as to what she signified to Botticelli and his patrons. This can be discovered, primarily in The Primavera, painted in 1482, for Lorenzo di Pierfrancesco de Medici. Before the painting was done, Marsilio Ficino, a famous Italian philosopher, wrote to Pierfrancesco about Venus and her significance to them. “Venus stands for humanity” he wrote, followed by “Her soul and mind are love and charity, her eyes dignity and magnanimity, the
hands liberality and magnificence, the feet comeliness and modesty. The whole, then, is temperance and honesty, charm and splendor.” Far from being the goddess of lust, Venus to Ficino is a “moralized planet” [ibid] signifying a virtue. His list of virtues are similar to the “children” of the planet Venus, bringing in astrological conception. This description has “fused the two traditions by which the middle ages had transformed the ancient Olympus- the moral allegory and the astrological lore” [18].

Fundamentally, the message that was passed on from Ficino to Pierfrancesco was Venus as a notion of beauty as a gateway to the divine. [ibid] This neoplatonic ideal can be used to interpret Botticelli’s Birth of Venus also, as it came not long after, to a member of the same family. The Medici were a strong Christian family, and the neoplatonic interpretation allows the idea of the Christian divine to merge with classical mythology. This would have given Botticelli an ‘excuse’ to paint the Goddess for a family who’s commissions were usually Christian based. This neoplatonic mixture of pagan virtues, moral parables, and astrological knowledge is hidden in the meaning of the painting; yet there is not a multitude of evidence within the painting for this. The lights and tones of the painting present a pale Venus, with hair (created using gold leaf) gleaming in a heavenly way. This perhaps suggests birth, the woman arriving shining and perfect as though untouched by the world, glimmering with light tones and minimal shadow in the way that beauty would look untouched, as it was born.

Although, according to E. H. Gombrich, and other art historians, there is neoplatonic symbolism amongst the painting, it is not necessarily obvious when standing in front of it at the Uffizi gallery. The question as to the symbolism of Venus, and her significance as more than the goddess of love, is an interesting one, though it is not clear to me whether Botticelli succeeded in presenting this philosophical
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concept in his painting. Although his manipulation of the light and tone of the painting adds to the paintings overall image of pale goodliness and the shining, perfect image of birth, it does not seem to have added greatly to the image of Venus as the birth of beauty.
Conclusion

The Cabanel and the Botticelli depictions of the Birth of Venus are not only very different in appearance, but also in intention, creation and reception. Cabanel used his manipulation of the formal elements of painting as a tool to capture attention at the Paris Salon. Cautiously choosing the colour, composition and materials and technique allowed Cabanel to impress his audience, intending to attract both critical and public success. While the critics view on his piece were mixed, the fame and success of the painting show us that not only did his careful manipulation of the formal elements catch the attention of the Paris Salon in 1863, they also turned the painting into a critical piece of the art of the 19th century. Botticelli, 400 years previously, had very different uses for his manipulation of the formal elements of painting. His employment of the pictorial space, the scale, and the light and tone in the painting allowed him to please his patron, in multiple different ways. The narrative given to him by the patron was faithfully depicted in the painting, with the pictorial space allowing him to portray the characters with clarity. The imagery of Venus, and her birth signifying beauty as a link between us and the Christian divine, allowed a Christian interpretation of the myth, although the light and tone do not appear explicitly to blame for this interpretation. The Medici, presumably for a country home, commissioned the painting and the scale of the piece was ideal for this use. Therefore, we can assume that he succeeded in the aims I investigated, with the help of his manipulation of the formal elements.
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Appendix

[1] The Hohle Fels Venus (32,990 bc)

Written in Über die allgemeinste Erniedrigung des Liebeslebens” [The most prevalent form of degradation in erotic life] Sigmund Freud explains the Madonna-whore complex as a man longing lustfully for an exciting, experienced prostitute, but longing for a wife or love interest who showed chaste and respectable values. This is based on a boy-child’s admiration of his mother, and her apparent domestic qualities and a later difficulty to be attracted to a woman like ones mother, whilst still yearning for the company of such a woman. Cabanel's Venus provided these men with a beautiful Goddess who could be considered as either, or even both types of women.

The Birth of Venus (1485) Sandro Botticelli

Primavera (1482) Sandro Botticelli
Excerpt from Angelo Poliziano's *Stanze di messer Angelo Politiano cominciate per la giostra del magnifico Giuliano di Pietro de' Medici*. (1475-8)

XCIX 99

In the stormy Aegean, the genital member is seen to be received in the lap of Tethys, to drift across the waves, wrapped in white foam, beneath the various turnings of the planets; and within, both with lovely and happy gestures, a young woman with nonhuman countenance, is carried on a conch shell, wafted to shore by playful *zephyrs*; and it seems that heaven rejoices in her birth.

C 100

You would call the foam real, the sea real, real the conch shell and real the blowing wind; you would see the lightning in the goddess's eyes, the sky and the elements laughing about her; the *Hours* treading the beach in white garments, the breeze curling their loosened and flowing hair; their faces not one, not different, as befits sisters.

CI 101

You could swear that the goddess had emerged from the waves, pressing her hair with her right hand, covering with the other her sweet mound of flesh; and where the strand was imprinted by her sacred and divine step, it had clothed itself in flowers and grass; then with happy, more than mortal features, she was received in the bosom of the three nymphs and cloaked in a starry garment.
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What curves are generated by the Octopus Ride?
Nina del Ser - Mathematics

The Octopus ride fascinated me from the very moment I read about it in a homework question, so it was great to be able to dedicate time to it by choosing it as my Extended Essay topic. I went through many difficulties as well as small, but deeply satisfying moments of elation, when I finally found answers to long-pondered questions. My advice to anybody who also opts for a research, rather than literature-based, Extended Essay would be primarily to keep believing in yourself and resist the temptation of giving up at moments of particular lack of inspiration, because the joy felt after solving a problem more than compensates for all these hours of toil and uncertainty!

Supervisor: Dr Shari Levine

Nina’s approach to a known mathematical project is both novel and beyond her years as a student. Her explanations and diagrams are succinct and approachable, understandable by younger students and those without mathematical expertise. The problem, and her subsequent explanation, shows how mathematics can be fun, interesting, and widely applicable. Anyone who enjoys rides at theme parks, has an interest in planetary movement, or enjoys the visual explanations of difficult mathematical concepts will find something to appreciate in this essay.
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Abstract

This essay takes a relatively simple original problem—which involves working out the mechanics and mapping the motion of a funfair ride known as the “Octopus”-and then tries to expand on it by changing parameters such as the speeds, lengths and even the number of rotors which compose it. Experimenting with these parameters produces an infinite range of curves, which are not only beautiful to look at, but were also very helpful in formulating several sets of “rules” for how any “Octopus”-generated curve should look (for instance, how many axes of symmetry it should have), given its basic parameters (rotor length and speed).

A range of conclusions were reached; for instance: given that the speed of the primary rotor is 1 rad/s, it is the highest common factor of all the rotor speeds, irrespective of the number of rotors, which defines the rotational symmetry of the curve generated. Another conclusion involves the velocity and acceleration vectors and their role in defining whether an Octopus curve will have loops, spikes, and concave or convex lines. Thus, even curves that look completely random are actually following a very strict set of rules and patterns, which we can understand.
Introduction

This project was originally inspired by a homework problem, in which a series of questions were posed about the motion of a funfair ride known as “the Octopus”. The Octopus is composed of a total of five cross-shaped rotors: one primary rotor (shown in red in the graphic below), with a radius of 1 meter, which rotates anticlockwise at speed of 1 rad/s and four smaller rotors, each 0.5 meters in radius (in blue), spinning in the clockwise direction at 2 rad/s about each of the four ends of the primary rotor. The passenger seats (depicted as orange squares) are located at the ends of the smaller rotors.

Figure 1, which was drawn using Mathematica, shows the basic setup of the Octopus:

The question originally posed was to plot the path of one of these seats over time. Once the path performed by one seat in particular was known (in this case, the seat S was chosen), its behaviour could be generalised to the rest of the points because, by symmetry, they should hypothetically all form the same curve.

I became particularly interested in this problem when I started experimenting with changing parameters such as the lengths of the rotors and their angular speeds, and the first aspect of the resulting observations that drew me in was the aesthetic beauty and sheer diversity of curves that could be generated using such a simple set-up. Further modifications, such as adding on extra pairs of rotors on the ends of the arms of the secondary rotors led to even more intricate and interesting curves.

Another interesting aspect of this topic is that it is not just confined to amusement parks, but also manifests itself in other fields. For example its application is evident in astronomy, where a mechanism very similar to that which operates the Octopus can be used to model the motion of moons revolving around planets, themselves revolving around the sun.

The principal aim of this project is to gain better understanding of the curves generated (e.g. being able to predict their rotational symmetry based on information about the rotors and their speeds). Throughout the investigation, illustrations of different types of curves generated by the Octopus will be used very extensively both to gain a better intuitive understanding and to test any hypotheses, once they have been formulated.
Solving the original problem

In the following simplified diagram (also made using Mathematica) all of the seats except for seat S have been ignored in order to make the explanation of its motion in time clearer:

An x-y system of coordinates has also been established. The motion of seat can be worked out from the following steps:

1. We know that the speed of the primary rotor is 1 rad/s anticlockwise, therefore after time \( t \), point \( P_0 \) will have moved \( t \) radians anticlockwise relative to the origin to point \( P_t \), as can be seen on the diagram.

2. If the secondary rotor were fixed, point \( S_0 \) would move to point \( S_{fixed} \) after time \( t \). The angle between the secondary rotor and a line going through \( P_t \) that is parallel to the x-axis would be \( t \), because it corresponds with angle \( \angle P_t O P_0 \). However, we know that it moves clockwise at 2 rad/s, which is twice the magnitude of the angular velocity of the primary rotor. Therefore the seat will actually be at point \( S_t \), \( 2t \) radians clockwise (or \(-2t\) anticlockwise) from point \( S_{fixed} \), relative to the point \( P_t \). The final angle between the seat at \( S_t \) and the parallel line mentioned earlier will therefore be \(-2t+t=-t\).

3. The position vectors of point \( P_t \) relative to the origin, \( O \), and point \( S_t \) relative to point \( P_t \) can now be summed to give the position vector \( \mathbf{r} \) of the seat as a function of time.

Thus,

\[
\text{the x-component of } P_t = \cos t, \\
\text{the y-component of } P_t = \sin t.
\]

Similarly,

\[
\text{the x-component of } S_t = 0.5 \cos(-t) \\
\text{the y-component of } S_t = 0.5 \sin(-t).
\]

4. By adding the vectors \( P_t \) and \( S_t \) together, we obtain a position vector, \( \mathbf{r} \), for the passenger seat as a function of time:

\[
\begin{align*}
  r_x &= \cos t + 0.5 \cos(-t) = 1.5 \cos t \\
  r_y &= \sin t + 0.5 \sin(-t) = 0.5 \sin t
\end{align*}
\]

In the next section we will look at the graphical representation of these vectors.
The ellipse

Influence of the length of rotor on the basic elliptical shape

When this set of parametric equations is plotted using Mathematica the following interesting shape is observed:

The curve traced out by a seat under the conditions set out in the original problem seems to be an ellipse. Let’s see, therefore, if we can manipulate this set of parametric equations in order to try to arrive at the Cartesian equation of an ellipse, \( \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \).

As can be seen from the manipulations performed above, this curve is, indeed, an ellipse. In addition, we realise that the elliptical shape is not constricted to this specific set of primary and secondary rotor lengths, since equation (1) can be generalised to include any ratio of lengths. For the sake of simplicity, we keep the length of the primary rotor constant at 1 meter, and only change that of the secondary, denoting its length as \( b \) (the degree of freedom in the ratios of lengths is not diminished in any way). Therefore our generalised set of parametric equations becomes:

\[
\begin{align*}
  x &= (1+b)\cos t \\
  \frac{x^2}{(1+b)^2} &= \cos^2 t \\
  \frac{x^2}{(1-b)^2} &= \sin^2 t \\
  \frac{x^2}{(1+b)^2} + \frac{y^2}{(1-b)^2} &= \cos^2 t + \sin^2 t \\
  \frac{x^2}{(1+b)^2} + \frac{y^2}{(1-b)^2} &= 1 
\end{align*}
\]  

\( (2) \) shows that the curve will preserve its elliptic character, irrespective of the value given to \( b \), as long as \( b \neq 1 \). When \( b = 0 \), it is clear that (2) generates a unit circle (which is therefore simply a special case of the ellipse, in which the two foci lie on top of each other), centered at the origin. Figure 4 shows what happens when the lengths of the primary and secondary rotors are identical (i.e. \( b = 1 \)).
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Since the \(y\)-component of the position vector of the seat is always equal to zero, the seat will only move along the \(x\)-axis.

Thus, if the lengths of the primary and secondary rotors were equivalent, people would just travel back and forth in a straight line, which might be of some relief to nervous passengers!
The original position of the seat does not influence the shape of its path

In the introduction it was mentioned that the initial position of the seat was considered to be unimportant since a different set of coordinate axes could be constructed for each individual seat. Now that we know the parametric equations for the seat, we can test this hypothesis by investigating the shapes of the curves produced by seats which are not necessarily at (1.5,0) when their path starts to be tracked.

Figure 5 shows the setup of a seat which is located with an offset angle $\alpha$ to the horizontal. It may be seen from the diagram that the vector of the secondary rotor to the horizontal is $0.5\cos(\alpha-t)+0.5\sin(\alpha-t)$. Here is a plot of the path of a seat when $\alpha = \frac{\pi}{7}$:

As we predicted, the curve maintains its elliptical shape and the only effect of the offset angle $\alpha$ is rotation about the origin which, had we set up our coordinate system taking into account $\alpha$, would not have occurred. By investigating further we can show that the angle by which the ellipse is rotated is $\frac{\alpha}{2}$. The most obvious way to do this is to find an expression for the magnitude of the seat’s position vector, which will then enable us to find the time $t$ when $|\mathbf{r}|$ reaches its maximum value. Since we know that for the case when $\alpha=0$ the
ellipses semi-major axis coincides with the x-axis (i.e \(t=0\)), the value of the new time \(t\) at which \(|r|\) is at a maximum will also correspond to the rotation of the original ellipse about the origin. From figure 5:

\[
\begin{align*}
  r_x &= \cos t + b \cos(\alpha - t) \\
  r_y &= \cos t + b \sin(\alpha - t)
\end{align*}
\]

\[
| r |^2 = (\cos t + b \cos(\alpha - t))^2 + (\cos t + b \sin(\alpha - t))^2
\]

\[
| r |^2 = \cos^2 t + \sin^2 t + b^2 \cos^2(\alpha - t) + b^2 \sin^2(\alpha - t) + 2 b \cos(\alpha - t) + 2 b \sin(\alpha - t)
\]

\[
| r |^2 = 1 + b^2 + 2 b \cos(\alpha - 2t)
\]

From (3) we can conclude that the maximum values of \(|r|\) occur when \(\cos(\alpha - 2t) = 1\), at \(t = \frac{\alpha}{2} + \frac{\pi}{2}\) and \(t = \frac{3\pi}{2} + \frac{\pi}{2}\), whilst its minimum values occur when \(\cos(\alpha - 2t) = -1\), at \(t = \frac{\alpha}{2} + \frac{\pi}{2}\) and \(t = \frac{\alpha}{2} + \frac{3\pi}{2}\). Also, because of the oscillating nature of the cosine function, we know that \(|r|\) will decrease and increase at exactly the same rate from one maximum to the next (since it is periodic with a time period of \(\pi\)). These ideas suggest that a path generated by a seat with any offset angle \(\alpha\) will have two axes of symmetry at \(t = \frac{\alpha}{2}\) and \(t = \frac{\alpha}{2} + \frac{\pi}{2}\) respectively, which corresponds with the image generated in figure 6. We can now use a rotational matrix which rotates the seat with any offset angle \(\alpha\). These ideas suggest that a path generated by \(\Pi_{\text{min}}\) to the next (since it is periodic with a time period of \(\pi\)).

\[
LHS = \begin{pmatrix}
\cos(\alpha - t) + b \cos(\alpha - t) \\
\sin(\alpha - t) + b \sin(\alpha - t)
\end{pmatrix}
\]

\[
LHS = \begin{pmatrix}
\cos(\alpha - t) \\
\sin(\alpha - t)
\end{pmatrix}
\]

(4) can be now be converted into a Cartesian equation using the same method as what was used to obtain (2):

\[
\begin{align*}
  x &= (1 + b) \cos(\alpha - t) \\
  y &= (1 + b) \sin(\alpha - t)
\end{align*}
\]

\[
\frac{x^2}{(1+b)^2} = \cos^2(\alpha - t) \\
\frac{y^2}{(1+b)^2} = \sin^2(\alpha - t)
\]

\[
\frac{x^2}{(1+b)^2} + \frac{y^2}{(1+b)^2} = \cos^2(\alpha - t) + \sin^2(\alpha - t)
\]

\[
\frac{x^2}{(1+b)^2} + \frac{y^2}{(1+b)^2} = 1
\]

This confirms our belief that the shape observed in figure 6 is, indeed, an ellipse.

**Conclusion**

In this section, it has been shown that changing both the ratio of the rotor lengths (except when the lengths are equal) and the size of the offset angle \(\alpha\) has very little influence on the basic elliptical shape produced by a seat on the octopus ride. In the next section we will therefore assume that these parameters are relatively insignificant and start looking instead at whether changing the ratio of the speeds of the primary and secondary rotor produces any interesting effects.
Changing the angular speeds of the rotors

The same method as that used to solve the original problem (see page 2) may be generalised in order to take into account changing the ratios of the angular speeds of the primary and secondary rotors. We will simplify the task further by keeping the speed of the first rotor fixed at 1 rad/s anticlockwise and change only the angular speed of the secondary rotor (just like for the ratio of lengths, this will not diminish the range of possible ratios in any way). Therefore our generalised set of parametric equations becomes

\[
\begin{align*}
    r_x &= \cos t + b \cos((1 + \omega) t) \\
    r_y &= \cos t + b \sin((1 + \omega) t)
\end{align*}
\]

where \(\omega\) is the angular speed, in rad/s, of the secondary rotor (the offset angle \(\alpha\) has been removed from the equation because its importance has been shown to be secondary).

Simple cases

In this small interlude we will look for any simple cases, where the figure generated by changing \(\omega\) is relatively obvious. The figures below display the curves produced when \(\omega=-1\) and \(\omega=0\).

These shapes are easily explained simply by looking at the parametric equations which define them. The parametric function which defines figure 7, a circle with radius 1 and centre \((b,0)\) is \(r = i(\cos t + b) + j\sin t\), while figure 8 is defined by \(r = 1.5i\cos t + 1.5j\sin t\), simply a circle centered about the origin with radius 1.5.

Integer values of \(\omega\)

In the following section we shall try to investigate and find patterns for what happens when the angular speed of the secondary rotor is an integer number.

Both rotors spin anticlockwise

The following images are some of the curves generated by the octopus when both rotors spin in the same direction (anticlockwise):
Secondary rotor spins clockwise

Here are curves with corresponding values of $\omega$, only this time they are negative. An exception was made for figure 15 because $\omega=-1$ would have simply repeated one of the simple cases discussed above.

Closer inspection shows that the curves all seem to be following a trend: the number of axes of symmetry in any given curve is defined by the angular speed of the secondary rotor (e.g. the curve generated when $\omega=9$ shows rotational symmetry of order 9). What follows is a simple mathematical explanation for this behaviour.

Square and add together the $x$ and $y$ components in equation (5) to obtain an expression for $|r|^2$: 
\[ | \mathbf{r} |^2 = \cos^2 t + \sin^2 t + b^2 \cos^2 ((1 \pm \omega) t) + b^2 \sin^2 ((1 \pm \omega) t) + 2 b \cos (1 \pm \omega) t \]

From (6) we may conclude that $|\mathbf{r}|$ is periodic with a time period of $\frac{2\pi}{\omega}$, which implies that any curve generated with positive integer values of $\omega$ will also have $\omega$ axes of symmetry. It is also interesting to note the difference in the shapes of corresponding values of $\omega$: for instance, figure 13 has four axes of symmetry, just like figure 9, but looks “inverted”.

**Rational values of $\omega$**

The following curves were all generated using rational values of $\omega$.

![Figure 17: $\omega = -\frac{3}{2}$](image)

![Figure 18: $\omega = -\frac{4}{5}$](image)

![Figure 19: $\omega = -\frac{58}{25}$](image)

![Figure 20: $\omega = -\frac{13}{4}$](image)

Once again, a pattern emerges from these curves—the numerator of $\omega$ corresponds exactly to the number of axes of symmetry in a given curve. The method used to obtain (6) need only be changed slightly to be extended to all rational values of $\omega$:

\[
\omega = \frac{b}{q}, \quad p, q \in \mathbb{Z}, \; q \neq 0, \; p \quad \text{and} \quad q \quad \text{are in their lowest terms}
\]

\[ | \mathbf{r} |^2 = \cos^2 t + \sin^2 t + b^2 \cos^2 \left( \left(1 \pm \frac{b}{q} \right) t \right) + b^2 \sin^2 \left( \left(1 \pm \frac{b}{q} \right) t \right) + 2 b \cos \left(1 \pm \frac{b}{q} \right) t \]

\[ | \mathbf{r} |^2 = 1 + b^2 + 2 b \cos \frac{p}{q} t \quad (7) \]

From (7), we conclude that for any curve generated by a rational value of $\omega$, $|\mathbf{r}|$ will have a time period of $\frac{2\pi q}{p}$ seconds which means that it will have $p$ different, evenly spaced axes of symmetry and that it will take $2\pi q$ seconds for the seat to complete one entire cycle. For example, a seat revolving at $\omega = \frac{8}{35}$ rad/s will have rotational symmetry of order 8 and take $35 \cdot 2\pi \approx 219$ s to complete one full cycle. Figures 21-24 shows the evolution of the curve trace by a seat with $\omega = \frac{4}{9}$ rad/s over time:
The curve has rotational symmetry order 4 and as predicted, it does not evolve anymore after when \( t > 18\pi \) because it is just going back over its original path.

**What happens when \( \omega \) is irrational?**

Intuitively I believe that the full area between the external and internal circles will be covered and given enough time and rotations, every point in the that area will be reached. All of the points \((x, y)\) would be located in a “donut” area between two circles so that

\[
1 - b < x^2 + y^2 < 1 + b.
\]

However, this proof is outside the bounds of this paper.

Also, \( \pi \) may be written as a continued fraction and thus approximated as a rational number (the most common one being \( \frac{22}{7} \)). In order to increase the accuracy we need to increase the size of both the numerator and denominator, so that other fractions which are better at approximating \( \pi \) are \( \frac{333}{106} \) (accurate to 5 decimal places) and \( \frac{355}{113} \) (accurate to 6 decimal places). The next rational which is accurate to more than 6 decimal places has... a denominator greater than 30,000. A time period as big as this would be too much for *Mathematica* to handle! It also probably would not bring us any closer to the actual value of \( \pi \). Figures 25-27 show the progression of the Octopus when \( \omega = \pi \):
The ratio of speeds is the only determining factor

At the beginning of this section it was mentioned that keeping the speed of the primary rotor fixed at 1 rad/s would not in any way diminish the number of curves which could be generated. This is because the only important factor is the ratio of the primary:secondary rotor angular velocities- not the velocities themselves. $\beta$ and $\omega$ are the angular velocities of the primary and secondary rotors respectively. Consider the following figures:

Despite travelling at different speeds, the rotors in all three illustrations share a common primary:secondary rotor speed ratio of 1:7 and generate the same curve. This is not what we would expect from equation (6), which suggests that the number of axes of symmetry corresponds to $\omega$. However, what we have not taken into account is that the graphical display of time changes as the value of $\beta$ changes (when $\beta=1$ the value of the time and angle which displays it correspond exactly). Figures 31-32 explain the graphical significance of this:

In figure 32, from (6) there should be an axis of symmetry every $\frac{2\pi}{14} = \frac{\pi}{7}$ seconds, whereas in figure 31 this should occur every $\frac{2\pi}{7}$ seconds. However, since the seat sweeps out a circle twice as fast in figure 32, this will “stretch” the time angle twice its size, so that the graphical representation of these axes of symmetry will be equivalent in both cases. The value of $T$ in figures 28-30 is the time when the full shape of the curve is achieved (after which it starts to repeat itself).
Loops, spikes, or smooth curvatures?

The velocity vector

So far, the investigation we have conducted has led us to a position in which we are able to predict how many axes of symmetry any curve generated by the Octopus will have, given the value of \( \omega \) (see the “Changing the angular speeds of the rotors” section above for further reference). We know, for instance that when \( \omega \) is set to 5 rad/s (and \( \beta = 1 \)), the shape generated should have five axes of symmetry and look somewhat like this:

![figure 33](image)

However, how can we be sure whether the shape will have loops, spikes or a smooth curvature? By this, I mean the following conditions respectively:

![figure 34: loops](image)  ![figure 35: spikes](image)  ![figure 36: smooth curvature](image)

One way to answer this question is to look at the velocity vectors of the individual primary and secondary rotors, whose positions vectors can been worked as shown in the “Solving the original problem” section for a given set of rotor lengths and speeds. Since the individual rotors both sweep out circles we know that the velocity vectors are perpendicular to their respective position vectors. In addition, their magnitudes may simply be worked out via the relationship \( |v| = r \omega \), where \( r \) is the magnitude of the position vector (in this case, simply the length of the rotor), whilst \( \omega \) is the angular speed of the individual rotor vectors. Note that the angular speed for the secondary rotor vector, \( \nu_s \), is the sum of the angular speeds of the primary and secondary rotors (see figure 2 for reference). Figure 37 illustrates this concept with a set-up in which both rotors are rotating anti-clockwise; the position vectors are shown as solid lines, whilst the velocity vectors are shown as dashed:
At some point in time, the two velocity vectors \( \mathbf{v}_p \) and \( \mathbf{v}_s \) will inevitably be parallel to each other, either pointing in the same direction or in opposite directions to each other. In the first of these cases, the seat will be traveling at maximum speed, whilst in the second, it will be going at minimum speed.

In order for loops to occur, the seat must, in a sense, travel “backwards”, since it needs to return to a position (the point of intersection) in which it was several moments prior to that. This is only achievable when the net velocity is negative, which can occur at the minimum value only when \( |\mathbf{v}_s| > |\mathbf{v}_p| \). If \( |\mathbf{v}_s| = |\mathbf{v}_p| \) the seat will “freeze” in space momentarily when the two vectors oppose each other, resulting in a “spike”. The last case, in which \( |\mathbf{v}_p| > |\mathbf{v}_s| \) should therefore produce curves that don’t loop or spike, instead follow smooth lines.

The following tests, in which angular speeds have been kept constant but rotor lengths have been altered in order to increase or decrease the values of the velocity vectors, appear to support this hypothesis (Note that these pictures are not at the same scale):
Convexity

The acceleration vector

Just like the velocity vectors discussed above, the acceleration vectors of the Octopus’ two rotors play an important role in defining the shapes of its curves. The net acceleration vector, \( \mathbf{a} \) (the sum of the two individual acceleration vectors \( \mathbf{a}_p \) and \( \mathbf{a}_s \)) defines whether the curve generated will be concave or convex. Figures 47 and 48 illustrate what I mean by concavity and convexity:

\[
\text{figure 47: } y = x^3 \text{ concave} \quad \text{figure 48: } y = x^2 \text{ convex}
\]

Convexity is defined by the fact that the second derivative is always either positive or negative, but cannot be vary between the two. The moment at which an Octopus curve stops being concave and becomes convex is defined in a similar way: the net acceleration vector \( \mathbf{a} \) must be greater than or equal to 0 at all times (it cannot be negative because there is only one direction-towards the center- in which an octopus can be convex, unlike figure 48, since \( y = -x^2 \) is just as convex as \( y = x^2 \)). We can show that this occurs when \( |\mathbf{a}_p| \geq |\mathbf{a}_s| \) by comparing vectors physically, just like in the section on velocity vectors, however, there is another way which uses the net \( |\mathbf{a}| \) derived from equation (5):

Let us call the lengths of the primary and secondary rotors \( B \) and \( b \),
and their angular speeds $\beta$ and $\omega$ respectively. (5) can therefore be modified to:

\[
\begin{align*}
  r_x &= B \cos \beta t + b \cos ((\beta + \omega) t) \\
  r_y &= B \cos \beta t + b \sin ((\beta + \omega) t)
\end{align*}
\] (8)

We now differentiate once to obtain the parametric equations for velocity ...

\[
\begin{align*}
  \mathbf{v}_x &= -(B^2 \beta^2 \sin \beta t + b (\beta + \omega) \sin ((\beta + \omega) t)) \\
  \mathbf{v}_y &= B \beta \cos \beta t + b (\beta + \omega) \cos ((\beta + \omega) t)
\end{align*}
\]

... and again to obtain those for acceleration :

\[
\begin{align*}
  \mathbf{a}_x &= -(B^2 \beta^2 \cos \beta t + b (\beta + \omega) \cos ((\beta + \omega) t)) \\
  \mathbf{a}_y &= -(B^2 \beta^2 \sin \beta t + b (\beta + \omega) \sin ((\beta + \omega) t))
\end{align*}
\]

We can now find an expression for $|\mathbf{a}|^2$ by squaring and adding $\mathbf{a}_x$ and $\mathbf{a}_y$:

\[
|\mathbf{a}|^2 = (B^2 \beta^2) \cos^2 \beta t + (B^2 \beta^2) \sin^2 \beta t + (b (\beta + \omega))^2 \cos^2 ((\beta + \omega) t) + (b (\beta + \omega))^2 \sin^2 ((\beta + \omega) t)
\]

\[
\begin{align*}
|\mathbf{a}| &= \sqrt{(B^2 \beta^2) + (b (\beta + \omega))^2} - 2 B^2 \beta^2 b (\beta + \omega)^2
\end{align*}
\] (9)

Now we know that the minimum value of $|\mathbf{a}|$, which occurs when the cosine term is negative, must be greater than or equal to zero for the curve to be convex, therefore we can establish the following inequality:

\[
\sqrt{(B^2 \beta^2) + (b (\beta + \omega))^2} - 2 B^2 \beta^2 b (\beta + \omega)^2 \geq 0
\]

\[
\sqrt{(B^2 \beta^2) - b (\beta + \omega)^2} \geq 0
\]

\[
B^2 \beta^2 - b (\beta + \omega)^2 \geq 0
\]

\[
B^2 \beta^2 \geq b (\beta + \omega)^2
\] (10)

$B^2 \beta^2$ and $b (\beta + \omega)^2$ are the acceleration vectors of the primary and secondary rotors respectively, therefore from (10) we know that the Octopus will generate convex curves when $|\mathbf{a}_p| \geq |\mathbf{a}_s|$. Therefore, if we set $\beta = 1$, $b = 0.5$ and $\omega = 3$, the curves generated will start being convex for values of $B \geq 8$. Figures 49-51 show that this principle, indeed, works:

\[
|\mathbf{a}_s| > |\mathbf{a}_p| \quad |\mathbf{a}_s| = |\mathbf{a}_p| \\ |\mathbf{a}_s| < |\mathbf{a}_p|
\]

For the curves to be convex, the net acceleration $\mathbf{a}$ must always point toward the origin, (hence $|\mathbf{a}_p| \geq |\mathbf{a}_s|$). 

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Nina del Ser - Mathematics
Extra arms for the Octopus

Now that we have to some extent understood the mechanism for an Octopus with two sets of rotors we can start to experiment with adding another set of miniature arms at the ends of the secondary rotors. The new “Dodecapus” ride will look a bit like a fractal version of the Octopus:

Note that only one seat out of sixty four is shown so as not to crowd the illustration. The position vector for seat S can be obtained using the same method as that explained in figure 2 and the accompanying text. Let us set the angular velocity of the primary rotor to 1 rad/s (we can do this without in any way diminishing the number of possible arrangements) and call the angular velocities of the secondary and tertiary rotors \( \Omega \) and \( \Gamma \) respectively. Although in figure 52 the lengths of the primary, secondary and tertiary rotors are set to 1, 0.5 and 0.25 m, these can be changed for more variety. Again, we will keep the length of the primary rotor fixed at 1 m and call those of the secondary and tertiary rotors \( b \) and \( c \) respectively. The set of parametric equations which describes the position of seat S is therefore:

\[
\begin{align*}
x &= \cos t + b \cos ((1 + \omega) t) + c \cos ((1 + \omega + \gamma) t) \\
y &= \sin t + b \sin ((1 + \omega) t) + c \cos ((1 + \omega + \gamma) t)
\end{align*}
\]  

(11)

Below are some curves generated using these parametric equations (the values of \( b \) and \( c \) have been kept at 0.5 and 0.25 meters respectively):
Although these shapes look rather more complicated than those generated by the Octopus, we can utilize the same trick as that used to obtain (7), extending it only to include the tertiary rotor, to understand how the symmetries in these curves arise:

\[
\omega = \frac{p}{q}, \quad \gamma = \frac{m}{n} \quad p, q, m, n \in \mathbb{Z}, \quad q, n \neq 0, \quad p, q \text{ and } m, n \text{ are in their lowest terms}
\]

\[
|r|^2 = \cos^2 t + \sin^2 t + b^2 \cos^2 \left(1 \pm \frac{p}{q} \right) t + c^2 \sin^2 \left(1 \pm \frac{m}{n} \right) t + 2 \cos \theta \left(1 \pm \frac{p}{q} \right) t + 2 \cos \left(1 \pm \frac{m}{n} \right) t
\]

\[
|\vec{r}|^2 = 1 + b^2 + c^2 + 2 \left( b \cos \pm \frac{p}{q} \ t + c \cos \pm \frac{m}{n} \ t + bc \cos \left( \pm \frac{p}{q} \ t \pm \frac{m}{n} \ t \right) \right)
\]

(12)

As can be seen from (12), the maximum \( |\vec{r}| \) occurs when all of the cosines are equal to 1 simultaneously. We have also established that the number of axes of symmetry for one cosine function depends only on the numerator of the fraction, whilst the denominator defines the time period, \( T \), for the curve. For there to be a maximum on a curve generated by the Dodecapus all three cosines need to coincide with their maximum values, so that the value which defines the number of axes of symmetry is the highest common factor of the three numerators: \( p, q \) and \( pm-qm \). Figures 59-61 illustrate this principle:

- **Figure 59**: \( \beta=4, \gamma=6 \)
- **Figure 60**: \( \beta=-5, \gamma=10 \)
- **Figure 61**: \( \beta=\frac{2}{5}, \gamma=\frac{9}{4} \)

The maxima due to \( \beta \) and \( \gamma \) are shown as red and purple respectively (please note that the red lines hide any purple lines underneath them). Also, it is not necessary to include the lines due to \( pm-qm \) because we know
that this value will be a multiple of the highest common factor, for the following reason:

\[ \beta \text{ and } \gamma \text{ can be re-written as multiples of their higher common factor, which we shall call } k. \text{ Therefore,} \]
\[ \beta = mk, \gamma = nk, \text{ where } n, m \in \mathbb{Z} \]
\[ \therefore \beta - \gamma = (m-n)k \]

\[ \therefore \text{ the term } pn - qm \text{ is simply a multiple of the highest common factor and does not need to be considered.} \]

**Conclusion**

We have shown that it is possible to determine the rotational symmetry of any curve generated by a Dodecapus, provided we are given the speeds of its rotors and that these speeds are rational numbers. The method we have used to do this could also be extended further and applied to any Multipus (an Octopus with any number of extra arms). Below are some figures generated by Multipuses; you can see that finding the highest common factor of the numerators of the speeds yields the rotational symmetry of the curves:

- **figure 62**: Hexadecapus with $\omega = -3, \gamma = -6, \delta = 9$
- **figure 63**: Duodecapus $\omega = -4, \gamma = \frac{8}{9}, \delta = 12, \epsilon = -16$
- **figure 64**: Duotetradecapus $\omega = 8, \gamma = -16, \delta = 24, \epsilon = -40, \zeta = 32$
- **figure 65**: Durooctadecapus $\omega = 6, \gamma = 9, \delta = 18, \epsilon = -15, \zeta = \frac{3}{4}, \eta = 12$
Conclusion

The most important conclusions we have arrived at can be formulated as three points:

1. Given that the angular velocity of the primary rotor $=1$, the highest common factor of all the other rotor speeds (there can be any number of rotors) defines the rotational symmetry of any Multipus curve.

2. The velocity vectors of the primary and secondary rotors of the Octopus define whether the curves generated will have loops ($v_i>v_p$), spikes ($v_i=v_p$) or smooth lines ($v_i<v_p$). The velocity vector is equal to the product of the rotor length and speed, therefore we can make any Octopus curve have loops, spikes, or smooth lines by simply changing the rotor lengths ($B$ and $b$), whilst keeping the angular velocities constant.

3. The acceleration vectors of the primary and secondary rotors of the Octopus define whether the curves generated will be convex ($a_p \geq a_s$) or concave ($a_p < a_s$). The acceleration vector is the product of the rotor length and the square of the rotor speed, therefore, in a similar way to point 2, we can make any Octopus curve convex by changing the rotor lengths whilst keeping their angular velocities constant.

I really enjoyed working on this project, particularly when I started see that I could understand the mechanism behind some of the beautiful Octopus and Multipus generated curves. The only downside was probably not being able to solve the case when $\omega$ is irrational- although this was-and still is- an interesting problem to ponder. Although this has not been included in the present paper due to lack of space, it is possible to construct a 3D version of the Octopus ride, in which the primary and secondary rotors do not necessarily rotate in the same plane. This produces even more interesting curves.

Bibliography

- http://commons.wikimedia.org/wiki/File:Surprised_Octopus.png
Jusqu’à quel point et comment les événements et les personnages dans le film « La Haine » reflètent-ils la réalité dans la banlieue parisienne ?
**Jack Ferguson - French**

When I was thinking of a possible focus for my Extended Essay, I took the best part of ten seconds to decide what I wanted to write about. *La Haine* is my favourite film, and I jumped at the opportunity to study it and the reality it is based on. So began a summer of searching through endless archives and newspaper articles, of watching and re-watching, and of trying to put what was in my head on paper. I was very lucky to have had the opportunity to write about something I loved, and despite having now watched *La Haine* 50 times over, it is still my favourite film.

**Supervisor: Alison Maynard**

Giving himself the huge challenge of writing 4000 words in French, Jack combined his passion for French cinema and his interest in contemporary France in the choice of his Extended Essay. He looked at the film *La Haine*, a film he had loved and seen many times, not only from the artistic point of view but also as a representation of the difficulties of life in the Parisian banlieue, areas he had been familiar with as a child. Jack’s main challenge was to limit the extent of his question and to plan the essay, but once he had a clear structure he worked independently and enthusiastically, reading widely around the subject and analysing the film in detail. Although his French is not perfect, he expresses himself fluently and with clarity. He showed all the best qualities of a supervisee: curiosity for his subject, independence and enthusiasm.
Abstract

La Haine est un film que j’adore, et il aborde le sujet polémique de la banlieue, et les banlieusards qui y habitent. Il soulève les tensions entre les races, et entre les jeunes et l’autorité. A la suite des émeutes en 2005 qui ont gagné d’ample couverture médiatique, et qui ont attiré l’attention du monde, ce sujet est plus pertinent que jamais. A cause de cela, J’ai décidé de poser la question : jusqu’à quel point et comment les événements et les personnages dans le film « La Haine » reflètent-ils la réalité dans la banlieue parisienne ?

J’aurais aimé parler des banlieues dehors d’Île-de-France comme Vaulx-en-Velin prés de Lyon. Pourtant, il fallait que je me concentre sur la banlieue où le film se déroule pour soutenir la pertinence. J’ai consulté des autres sources pour trouver des idées et pour nuancer mes propos.

J’ai trouvé que La Haine reflète en part la réalité dans la banlieue parisienne de 1995 quand le film a été crée. Les personnages, les tensions, les événements et la présentation de la vie dans la banlieue montre une ressemblance très forte à la vérité. Malgré cela, il est devenu clair que La Haine reste une pièce de cinéma, et cela n’est pas un documentaire. Le directeur a trouvé une équité entre un film qui montre les problèmes réels de la banlieue, et un film qui gagne l’argent.
Jusqu’à quel point et comment les événements et les personnages dans le film « La Haine » reflètent-ils la réalité dans la banlieue parisienne ?

Introduction

Depuis toujours j’adore « La Haine » comme un film artistique, et comme un film choquant. Pourtant, il convient de se demander s’il est une bonne représentation de la réalité de la vie dans la banlieue parisienne. Le problème du crime dans la banlieue est un sujet qui est souvent répercuté aux médias françaises, est cela est très courant, particulièrement à la suite des émeutes en 2005. La banlieue est définie par Le Lexis, le dictionnaire érudit de la langue française comme un «ensemble des agglomérations situées tout autour d’un centre urbain, et qui ont une activité en relation étroite avec lui ».

Selon cette définition, Versailles, ce qui est un des plus riches endroits en Île-de-France, est une banlieue. Malgré cela, le terme « banlieues » est souvent utilisé pour les quartiers plus défavorisés, qui contient beaucoup de chômage et un taux de criminalité élevé. La Haine montre la banlieue dans la même manière, comme un endroit désespéré et sans espoir. Ceci est notre perception de la banlieue parisienne, est alors je voudrais demander jusqu’à quel point et comment les événements et les personnages dans le film « La Haine » reflètent-ils la réalité dans la banlieue parisienne ?

La Haine raconte l’histoire d’un jour dans la vie de trois jeunes, Saïd qui est arabe, Vinz, juif, et Hubert, un black, qui vivent dans une banlieue « sensible ». Quand Abdel, un jeune ami arabe du groupe, devient une victime de la brutalité policière, les émeutes se déroulent et Vinz trouve un pistolet perdu par un policier. Il jure que, si Abdel meure, il touera un policier. La Haine parle de la lutte de la groupe pour survivre dans la banlieue avec un système qui, aux yeux des jeunes, les ignore. La Haine donne une perception de la vie dans la banlieue, les personnages qui y habitent, les tensions raciales et religieuses qui sont très répandues, les événements qui caractérisent la vie dans la banlieue et l’avenir de cela.

Avant la création de “La Haine”, le directeur Mathieu Kassovitz a déménagé à la banlieue de Chanteloup-les-Vignes avec l’équipe de production afin qu’ils puissent se faire une impression de la vraie banlieue pour eux-mêmes de première main. Ils voulaient que les gens du coin fassent leur

connaissance pour qu’ils sentent moins suspectes. Le fait que Kassovitz a déménagé à cette banlieue antérieur à production signifie qu’il a expérience de ce qu’il montre. Il n’a pas créé ce film comme un étranger ou voyeur, mais comme un banlieusard. Une grande variété des techniques cinématiques étaient employées par Kassovitz avec l’intention de donner un sens de réalité. L’utilisation de métage actuel des émeutes dans la première scène qualifie ce qui va se passer dans les scènes qui viennent comme fiction avec les racines dans la réalité. Le film a été tourné dans la vraie banlieue en noir et blanc qui donne l’effet d’un documentaire, venant en plus du fait que cela n’est pas un film de tout feu tout flamme. Cela n’est pas plein à ras bord d’action, en fait il surligne la monotonie de la vie quotidienne. Les acteurs ont gardé leurs propres noms, une décision qui les mette dans la situation actuelle. Ils étaient largement inconnus, et l’équipe comportait même non-acteurs. Cette production n’apparaît pas comme un film typique d’Hollywood, et sans vedettes, parce qu’une distribution très fameuse diminuerait inévitablement la crédibilité du film. “La Haine” apparaît plus comme une explication de la vie dans la banlieue parisienne, comme une journée dans la vie de trois banlieusards normaux, qui, en fin de compte, se termine avec une tragédie.

A Clichy-sous-Bois, une banlieue à l’est de Paris, le taux de chômage en 2009 était 22,3%, en comparaison, la moyenne des villes était 8,8%.

Evidemment, il existe un manque du travail et dans La Haine cela est montré par le fait que les personnages principaux sont sans emploi et ne vont jamais à un travail. A cet égard, le film représente le fait que plusieurs jeunes dans la banlieue sont sans travail. Malgré cela, le taux de chômage en actualité n’est pas cent pour-cent, et par conséquence on peut dire que le film dénature l’actualité. Il est possible que l’absence d’un lieu de travail dans ce film ait été une exagération utilisée pour se concentrer sur les thèmes de désespoir et de l’ennui. Ces thèmes sont revisités dans La Haine quand Hubert annonce à sa mère « J’en ai marre de la cité. Je vais partir » et « Il faut que je parte d’ici ».

La Haine montre que sans travail, la vie dans la banlieue peut être ennuyeuse, et par conséquence, on voit des méthodes communes de passer le temps. Cette lutte contre l’ennui est

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démontrée pendant le film. Souvent, les personnages sont vus en prenant ou en achetant des drogues pendant le film, et cela peut être perçu comme une représentation juste des événements qui se sont déroulés dans la banlieue. En novembre 2012 un homme a été arrêté en Goussainville dans la banlieue parisienne du nord, après 1,9 tonnes de la résine de cannabis a été prise.3 Dans le tournage, les drogues, douces et dures, sont souvent référencées. On peut trouver un exemple de cela quand Hubert joue avec les aiguilles dans le parc qui ressemblent ceux qui sont utilisés pour se piquer à l’héroïne.

En addition il existe une scène où il s’agit de la préparation méticuleux et ensuite le fumer d’une drogue par Hubert. Néanmoins, la drogue n’est pas la seule méthode de passer le temps. La recreation existe dans les formes de musique, danse, et sport, et cela est démontré pendant La Haine. Les chansons d’hip-hop sont souvent jouées, et il y a une scène où on voit un groupe qui fait le break dance. Le sport aussi est important, ce qui est montré dans La Haine comme la première fois on voit Hubert il cogne un punch bag, et en tant que boxeur il était propriétaire d’une gym jusqu’au moment que cela a brûlé par les casseurs dans les émeutes. Plus tard Vinz va à un combat avec un ami. Malgré la joie que les jeunes trouvent dans le sport, ce qui peut être considéré comme un moyen de focaliser leur frustrations et colères, Hubert ne croit pas que les jeunes veuillent plus faire le boxe comme “c’est plus dans des sacs qu’ils ont envie de cogner”, et à l’évidence il est correcte comme son gym a été brûlé.

D’autres formes d’illégalités existent dans la banlieue, comme partout. Dans La Haine on montre Saïd en train de voler dans un magasin. Ce qu’il vole est petit et il prend quelques plus avant que le commerçant se rend compte, mais il simplement dit « Je t’ai vu » et il ne demande pas les produits, comme si cela est lieu commun. Plus tard dans le film Vinz, Hubert et Saïd essaient et échouent de démarrer en faisant se touche les fils de contact et voler une voiture. Cela est justifié par les chiffres comme « en 2007, le nombre de délits contre la propriété pour 1 000 habitants était de 71,5 en Seine-Saint-Denis, contre 40,5 à l’échelle nationale. »4

Le groupe, particulièrement Vinz, glorifie la criminalité à cause du fait qu’elle peut être considérée comme un moyen de

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lutter contre le système et de gagner le respect, ils ont une aspiration de vivre la vie de gangsters. Ils regardent les films et ont des héros qu’ils veulent émuler. Dans une scène on voit Vinz à travers le miroir, et il joue le rôle de Travis Bickle de “Taxi Driver”, il se sert de ses doigts comme pistolet. Plus tard, on voit un groupe de jeunes qui se disputent entre eux le marc du pistolet utilisé dans le film “Arme Fatale”. Cela montre un besoin d’un modèle et quelqu’un pour qui ils ont le respect, en addition cela renforce le sens de réalité, car on voit que les banlieusards sont des jeunes normaux. Cela est fortifié par le manque d’une figure du père démontré dans les ménages de tous les caractères principaux. Leur respect pour les aînés est bien démontré quand Saïd accepte qu’il faille aller quand son frère lui dit de sortir, et ainsi que le groupe écoute à une histoire d’un vieil homme. Cela est très clair que Kassovitz décrit les jeunes comme des gens qui sont foncièrement bons, mais la société les a abandonnés.

L’architecture de la banlieue, aussi, présente un problème. Le Goaziou et Rojzman déclarent que « Les architectes et les urbanistes sont responsables du mal des banlieues »5 La plupart des immeubles dans la banlieue sont des tours d’habitation. Le spectateur voit la simplicité et la matité des bâtiments, qui étaient fournis aussi tôt que possible après la guerre pour servir à tout le monde. Vivant dans une proximité immédiate peut mener a un sens de claustrophobie et souvent les gens n'ont pas les coudées franches. Un exemple de cela peut être trouvé dans le film quand Saïd hurle de la cour de l'immeuble à la sœur de Vinz, qui est dans quelques étages plus haut, « dis à ton frère de descendre! ». Elle répond « Pour quoi faire? » Ils se disputent entre eux, et un homme qui est dans un autre immeuble s'y mêle dans l'argument, disant « Vous n’avez pas assez gueulé cette nuit ? »

Dans La Haine la banlieue est juxtaposé contre la Paris romantique que les touristes visitent quand le groupe fait un voyage à la ville, et Kassovitz veut que le spectateur croie que l’épreuve de la vie quotidienne est complètement différent de la vie à Paris, où on voit la pièce de luxe d’Astérix, et Saïd est stupéfait par la courtoisie d’un policier après avoir demandé les directions, il fait remarque «Ils sont polis, les keufs ici! Il m’a dit “vous” et tout! »

Aussi, Kassovitz montre que les banlieusards sont souvent dédaignés, visible dans la manière de la propriétaire de la galerie qui a regardé le groupe dérange son exposition, disant

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simplement « les banlieues ». Cela se reflète le Ministère de l’Intérieur (Nicolas Sarkozy) qui a dit que les banlieusards qui ont fait partie de les émeutes en 2005 « sont des voyous, des racailles, je persiste et je signe ».6

Dans La Haine les personnages principaux sont un arabe, un juif et un black. L’utilisation de ses minorités ethniques et le manque d’un français de souche reflète le taux d’immigration dans la banlieue. Il existe un quartier à la banlieue de Clichy-sous-Bois qui est « composé à plus de 70% d’immigrés ».7 Une grande proportion des immigrants qui vivent dans la banlieue sont d’origine maghrébine, comme Saïd dans La Haine. Les stéréotypes qui sont liés à l’origine des jeunes sont incorporés dans le film, par exemple on voit Vinz qui fait une danse juive. L’utilisation des stéréotypes provoque la question de la réalité. Est-ce que Mathieu Kassovitz est parti avec l’objectif de créer un film qui montré sa croyance profonde du thème que le comportement stéréotypé était réellement présent dans la banlieue? Ou est-ce qu’il s’est servi de ces stéréotypes pour alimenter et garnir son film? L’utilisation de ces stéréotypes aussi indique des racines culturelles fortes liant les personnages clés du film à leurs pays d’origines. A cet égard, Kassovitz nous tire l’attention aux affiches des grands sportifs blacks dans la chambre d’Hubert comme Mohammed Ali. Parallèlement, chaque fois que quelqu’un raconte une blague à Vinz, il le corrige en disant « Je la connaissais mais avec un rabbin ». Le déploiement du Verlan partout dans le film ajoute une aire de vérité. Verlan est un argot utilisé essentiellement entre les jeunes dans la banlieue. Le verlan est « un langage de fermeture, une langue du secret »8. On entend le verlan à plusieurs reprises pendant le film, pour citer un exemple Vinz dit « têma la vache » au lieu de mater, ou on entend « keuf »


à la place de flic (ou policier).

Ce film montre qu’il existe beaucoup de malaise et tension dans la banlieue parisienne. Souvent on voit des tensions entre les différentes bandes ethniques, ou entre l’autorité et le public. Le titre La Haine est une réflexion de cela, et vient de la citation d’Hubert « la haine attire la haine ».

La Haine montre la malaise entre quelques Français de souches et les bandes ethniques, par exemple la scène où un groupe de skins attaque Saïd et Hubert, jusqu’à quand Vinz arrive avec son pistolet et fait fuir les skins, sauf un, et Vinz vise le pistolet à ce skins frénétiquement, il menace qu’il va tirer, mais Hubert le pousse à tirer, car il sait que Vinz n’est pas le gangster qu’il fait semblant, et Vinz se rend compte aussi et il baisse son arme. Le Pen et Le Front National aussi sont fréquemment cités. Le Front National est une partie politique d’extrême droite. Pascal Perrineau déclare que « Le terrain des inquiétudes urbaines a été le réceptacle idéal du discours sécuritaire et xénophobe du FN. »9 (1997, cité dans Les Banlieues, 2001, p.81). On voit Saïd qui hurle « a bas Le Pen! » à le groupe de skins, qui il s’associe aux les politiques d’extrême droite et le racisme.

La ville de Paris a une histoire de tension entre les bandes ethniques et la police; le 17 Octobre 1961 la police Française a attaqué une manifestation de supporteurs Algériens du Front de Libération Nationale d’Algérie dans une suppression sanglante, qui était responsable pour un nombre de morts inconnus. Pendant le film il existe un sens de tension très fort entre la police et les jeunes, particulièrement les bandes ethniques. Dans une scène Saïd dit à un policier que « un arabe dans un commissariat il tient pas plus d’une heure ». On écoute DJ Cut Killer qui joue le hip-hop de son fenêtre, avec les paroles « assassin de la police, nique la police ». Pourtant, le ressentiment n’est pas réservé pour la police, toutes les formes d’autorité sont détestées, comme un très jeune banlieusard raille le maire de la ville. Mais l’intolérance est égal dans les deux camps, comme Hubert aussi est abusé racialement et physiquement par deux policiers, et un dit « dans ton pays, on ramasse avec les pieds ! » Sans doute La Haine montre que le racisme est un facteur primordial du malaise. Malgré cela, le film aussi montre qu’il existe des policiers bons; le groupe est proche d’un policier dans la banlieue, qui aide les jeunes d’éviter des situations problématiques. Malgré son équité, Vinz reste inconsolable.

9 op. cit.
dans sa haine pour les autorités, et il refuse de serrer la main, tout simplement, parce qu’il est policier, et il est bouleversé que ses amis lui ont serré la main, en disant « Tu lui serres la main? » L’incapacité de faire la distinction entre les policiers qui abusent leurs autorités et ceux qui sont des gens innocents qui font simplement leur travail est montré quand Vinz s’imagine dans l’acte de tuer un contractuel.


Darty annonce que sa voiture a été brulée par les casseurs et on voit des jeunes dehors qui donnent des coups de pieds à la carrosserie de sa voiture incinérée. Darty est visiblement énervé mais Hubert lui dit, en souriant, « C’est qu’une voiture » [sic], tout en impliquant que les émeutes ont provoqué des problèmes beaucoup plus graves.

La violence urbaine dans le film semble impliquer les bandes ethniques dans la majorité. On peut se demander si cette présentation cinématique est basée sur la réalité ? Le 7 novembre 2005 lors des émeutes nées à Clichy-sous-Bois, le journaliste de The New York Times a déclaré que “a majority of the youths committing the acts are Muslim, and of African or North African origin” (un majorité des jeunes qui commettent les actes sont des Musulmans, et d’origine Africaine ou Africaine du nord) mais aussi le journaliste a ajouté que “even some children of native French have taken part” (Mêmes des enfants des Français de souches ont fait partie).11

Le 6 avril 1993, un jeune Zairois de 17 ans qui a habité à Paris, a pris une balle dans la tête de policier dans un commissariat. Il était présumé que le policier lui tenait son arme à la tête afin de lui faire peur, et son arme a déchargé à but portant tuant le jeune accidentellement.12 Cet accident était l’inspiration de Kassovitz pour le film, et on retrouve les échos du Zairois à la fin du film. On y retrouve Vinz intimidé par un policier lui tient son arme à la tête. Vinz a déjà passé son arme à Hubert. Le policier tire sur Vinz au but portant accidentellement dans la tête. Vinz est mort sur le coup. Kassovitz s’est exprimé sur cette scène par la suite. Il a clairement fait le lien entre la mort du Vinz et le Zairois. Kassovitz a expliqué que cette scène a été le fait générateur de son histoire que l'idée de son film a été né dans sa tête avec la mort du Zairois et donc la mort du Vinz. Kassovitz a fait illusion à la mort du Zairois, nommé Makomé M’bawole lors de la première scène du film. On voit du graffiti qui dit « que justice soit faite pour Mako ». Au même temps à l'écran on constate les paramédicaux tentant à réanimer le corps de Malik Oussekine qui était une autre victime d'une bavure policière.


Malik a été bousillé par la police lors d'une manifestation d'étudiant. Pour finir sur ce thème la caméra se fixe sur une affiche déclarant « n'oubliez pas, la police tue ». Les bavures policières sont sans doute la pierre angulaire des thèmes du film. Cela est difficile d'argumenter que la présentation ne soit pas légitime. Depuis 1981, environ 300 bavures mortelles ont été enregistrés en France.13 Cela est intéressant à noter que lors de la présentation du film dans la salle à Cannes, les policiers y présent ont tous tourné le dos à l'écran comme une geste de protestation contre les sentiments anti-police qu'ils y trouvaient et qu'ils croyaient injuste.

Partout dans le film, il y a du graffiti sur les murs proclamant des slogans tels que « l'avenir, c'est à nous », mais cela représente quoi, cet avenir? La citation du film « jusqu'ici tout va bien » est considérée comme une métaphore pour la chute libre sociale de la banlieue. Ainsi que « L'important c'est pas la chute, mais l'atterrissage ». Kassovitz a écrit ces mots en 1995. Il montrait bien avant les émeutes subséquentes des années 2000, de Clichy-sous-Bois de 2005, et même encore les problèmes qu'on voit aujourd'hui, que le destin et la chute de la société urbaine ethnique est incontournable comme un homme qui tombe d'un immeuble. Quand un homme tombe d'un immeuble finalement cela est son destin d'heurter la terre. Kassovitz voulait montrer que le destin des jeunes dans la banlieue était pareil. Pour la partie majeure l'actualité soutienne pleinement cette thèse qui reste centrale au film.

**Conclusion**

Il est indéniable que le film reflète la réalité de la vie dans les Banlieues de Paris en 1995, la lutte des jeunes d’ethniciété minoritaire et leur désespoir quant à l’abîme vaste entre leur vie quotidienne et les vies fréquentées par leurs voisins au centre-ville parisien. Plus surprenant encore, le metteur en scène a su prévoir le destin de ce peuple en quelque sorte perdu comme l’on peut constater par

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les émeutes des années 2000 et la tension qui règne encore
dans les banlieues.

Reste à savoir le mobile Kassovitz et l’objectif réel de ce
film. Kassovitz était encore très jeune à la sortie du film,
n’ayant que 27 ans. Ces acteurs principaux étaient tous les
inconnus, jeunes et peu expérimentés. Dès la sortie de la
Haine, ils se sont retrouvés dans un tourbillon médiatique.
Ils ont du se défendre contre les attaques et critique du
grand public, les autorités et même la police. L’équipe de
production a été considérée comme des anarchistes et traitées
comme telle. Cette réaction, même lors du festival du film à
Cannes, ou le film a remporté la médaille d’or, a servi de
renforcer l’image de la lutte de la Haine et son équipe et
donc la Banlieue contre le monde.

Mais enfin, c’est là qu’on perçoit la réalité des banlieues
et la fiction cinématique. Depuis la sortie du film, les
trois acteurs principaux ont connu un succès énorme. Vincent
Cassel (qui joue le rôle de Vinz) est devenu un des comédiens
français le plus connu et réputé dans le monde avec un
palmarès de films très commerciaux tels que « Black Swan » ou
« Ocean’s Twelve ». Kassovitz baigne encore dans la notoriété
lui emporté par La Haine mais s’est orienté par la suite dans
une série de films encore très commerciales et a même fait des
apparitions personnelles dans les publicités pour les produits
de peau. Pas très loubard, pas très skins dans son
comportement depuis 1995.

Alors en conclusion, les événements et les personnages dans le
film reflètent la réalité de la banlieue parisienne dans le
sens que Kassovitz a représenté fidèlement cette vie, vu qu’il
s’est servi d’une situation réelle pour aider avec sa création
de l’intrigue.

Le sujet est tristement réel, mais le film reste un produit.
Certes on peut dire un produit à la fois de beauté et de
brutalité, comme la vie dans les Banlieues, mais le film reste
de la fiction. On ne peut jamais nier la qualité de l’histoire
que Kassovitz nous présente avec ses trois camarades lors de
leur descente ultime. Kassovitz a pu confronter la France avec
le désespoir et désenchantement de ses jeunes d’origine outre
mer et son travail de fiction a pu ouvrir leurs yeux sur ce
problème.
Bibliographie


How does Virginia Woolf’s understanding and appreciation of Shakespeare combine with her individual talent in *Mrs Dalloway*?
Hanna Jay - English

I was always aware of William Shakespeare’s influence on other playwrights but I was curious to see if a Modernist writer like Virginia Woolf would also have been influenced by Shakespeare. I found that in her novel *Mrs Dalloway* she had directly quoted words from Shakespeare’s *Cymbeline* and this led me to investigate if she had also used his techniques and literary themes in her own work. During the research process I discovered that she did not just use his techniques but she built on his tradition, using the words of the world’s greatest playwright to her own purpose.

Supervisor: Paul Harrison

Hanna Jay had a very clear idea of, and enthusiasm for, the topic she wanted to write on; and had chosen something which could be handled effectively within the limits of an Extended Essay. I was concerned at first that there might not be enough to explore here, but Hanna’s early detailed examination of the text reassured me on this point. From a supervisor’s point of view, Hanna was a model pupil. She spent the summer exploring the background to her topic and looking at the views of other critics, and devised a very clear argument to structure her comments. Her calm and methodical work left time for revision and the odd supplementary addition, so that the whole process was completed without panic!
Abstract

In this Extended Essay I attempt to answer the question: “How Virginia Woolf’s understanding and appreciation of Shakespeare combine with her individual talent in Mrs Dalloway.” T.S Eliot’s essay “Tradition and the Individual Talent” argues that an awareness of past literature is crucial for any writer and Mrs Dalloway provides evidence of Virginia Woolf’s appreciation of William Shakespeare. Prompted by Eliot’s essay, I consider the evidence of the playwright’s influence both thematically and formally in Woolf’s novel. I found similarities in the use of doubles, the use of multi-viewpoint perspective and the use of flower imagery.

The idea that a deathlike experience leads to new life is an idea clearly shared by Woolf and Shakespeare and Mrs Dalloway puts forward the view that beauty inevitably comes from death. Virginia Woolf sets her tragedy of life against a backdrop of a comforting regeneration in nature, as Shakespeare does this also. Nature is central to the works of both writers, acting as a comfort. I conclude in my essay that Woolf was herself consoled by the words of Shakespeare, and her novel offers a reassurance of rebirth and renewal. Virginia Woolf builds on tradition, using the words of William Shakespeare for her own purpose: to create solace where tragedy seems imminent.
Introduction

Virginia Woolf’s Mrs Dalloway (1925) is often referred to as a seminal modernist novel. Thematically, it deals with life in the modern city; with art; post-war trauma; and the incipient decline of the British Empire. Formally, it experiments with new literary techniques and ways of evoking a modern reality: multi-viewpoint perspective; stream of consciousness; symbolism and - not least - new ways of building on the literary tradition.

In 1919, T.S Eliot published an article entitled “Tradition and the Individual Talent”. Virginia Woolf was undoubtedly familiar with its argument as she worked on her novel about the London socialite Clarissa Dalloway.¹ For Eliot, awareness of past literature was crucial for any writer. He argues: “(n)o poet, no artist of any art, has his complete meaning alone”.² This knowledge of the literary tradition must be combined with an individual talent, however, allowing the poet to create new works of art, relevant to its own time and circumstances.

Virginia Woolf was extremely well read in the English literary canon. Her diaries reveal how she daily revisited the works of Bunyan, Chaucer, Milton and, most importantly, the works of William Shakespeare. Woolf was also an avid literary critic and one of the most prominent figures in what is often referred to as “first wave feminism”. Also here, her affinity with Shakespeare is evident. Her essay “A Room of One’s Own” (1929) includes a passage on “Shakespeare’s sister”, a female potential writer, as talented as the famous playwright but with a set of very different circumstances influencing her ability to become acknowledged and respected for her art.

In this essay I will provide an answer to the question “How does Virginia Woolf’s understanding and appreciation of Shakespeare combine with her individual talent in Mrs Dalloway?” I will demonstrate how Virginia Woolf uses her individual talent to develop the themes and techniques evident in Shakespeare’s own work. I will argue that Woolf in Mrs Dalloway endeavors to pass on a certain comfort that she finds in Shakespeare’s “Green World”. The importance given to nature and the

¹Virginia Woolf recalls a meeting with T.S Eliot in her diary on Monday 20 September, 1920 saying: “There is much to be said about Eliot from different aspects-for instance, the difficulty of getting into touch with clever people.-& so forth-anaemia, self-consciousness; but also, his mind is not yet blunted or blurred”

²The Norton Anthology, Theory and Criticism, page 1092
promise of regeneration generally found in Shakespeare’s dramas, and in the romance *Cymbeline* in particular, are echoed in her own novel in an attempt to provide solace for the reader.

**Fear of Sexuality - “The Heat of the Sun”**

Elaine Showalter writes in her introduction to the Penguin edition of *Mrs Dalloway*:

“Throughout the day Clarissa is haunted by the dirge from *Cymbeline*: "Fear no more the heat o’ the sun / Nor the furious winter’s rages." The heat of the sun, Showalter argues, stands for sexuality: “for a kind of feminine blossoming and ripening which peaks in the heat waves of the June day and of the reproductive cycle, and ends in the furious winter of old age.” According to Showalter, Clarissa Dalloway has a troubled relationship with her own sexuality, a fear, possibly, of what would have happened if she had given in to her youthful passions.

I will first consider Showalter’s argument more closely and see how this “fear” possibly can be traced back to an influence from Shakespeare. While the words “the heat of the sun” (*Cymbeline*, Act IV, Scene II) specifically apply to his character Innogen in *Cymbeline*, critics have also detected in Shakespeare’s work a notion of sexuality as disgusting and loathsome. In her article “Sexuality in the reading of Shakespeare: *Hamlet* and *Measure for Measure*”, Jacqueline Rose argues that “Gertrude’s impropriety (her ‘o’erhasty’ marriage) and Isabella’s excessive propriety (her refusal to comply with Angelo’s sexual demand) produce an image of sexuality as something unmanageable which cannot be held in its place.”

As such, it comes to represent that which is horrible in the play, a kind of disorder that causes chaos and death.

Just as Shakespeare’s different characters express the “horror” of uncontrollable passion on stage, so does Woolf use the dynamics of a multi-viewpoint perspective in her novel to emphasize Clarissa’s own difficult relationship to sexual passion. Peter Walsh thinks that “there was always something cold in Clarissa” (p. 53) and Sally Seton wonders how Clarissa - whom she “still saw all in white walking about the house with her hands full of flowers” (p.207) - could have married Richard Dalloway. Her innocent flowering somehow did not seem to fit in with the stern, controlled, politician.

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3 “Sexuality in the reading of Shakespeare: *Hamlet* and *Measure for Measure*, Jacqueline Rose, from *Alternative Shakespeares*, John Drakakis p.97
Clarissa’s troubled attitude to sex is paralleled and exaggerated in Septimus Smith’s disgust and fear of sexuality, eventually driving him mad. Interestingly, Woolf has chosen Shakespeare as Septimus’ inspirational figure:

“How Shakespeare loathed humanity - the putting on of clothes, the getting of children, the sordidity of the mouth and the belly! This was now revealed to Septimus; the message hidden in the beauty of words.” (pp.97)

Septimus finds a loathing of sexuality “hidden in the beauty of (Shakespeare’s) words”, and he becomes led by his interpretation of Shakespeare, believing that his own ideas reflect those of the playwright. Septimus sees intercourse as a filthy act, and claims that the playwright shares the same opinion to strengthen his argument. Woolf relays Septimus’s fierce loathing for humanity and also conveys a suggestion about heterosexual relationships: they lead to an obligation to reproduce, an act that is repulsive.

“Love between man and woman was repulsive to Shakespeare. The business of copulation was filth to him before the end. But, Rezia said, she must have children. One cannot bring children into a world like this. One cannot perpetuate suffering, or increase the breed of these lustful animals, who have no lasting emotions but only whims and vanities, eddying them now this way, now that.” (pp. 97)

For Septimus, those who reproduce are merely “lustful”. He proposes that sex has little to do with the want of a child, but is simply the result of the contemptible sexual desire of the individuals. These individuals (women) are described as having only “whims and vanities”. Interestingly, Jacqueline Rose points out the same tendency in Shakespeare:
“It is the woman who provokes a crisis which overturns the sexual identity of the central male character of the drama.”

Suicide and Death - “The harsh winter’s rages”

It is important to point out that Septimus Smith’s experience of the war is a contributing factor to his unwillingness to reproduce, and something which ultimately leads to his suicide. Also here, Woolf uses Shakespeare to reveal the transformation in Septimus following the sufferings of the war - his loss of emotion results in a loss of appreciation of Shakespeare’s work. Before the war, Shakespeare was such an inspiration to him that he wanted to become a writer himself, Shakespeare was something worth defending England for: “Septimus was one of the first to volunteer. He went to France to save an England which consisted almost entirely of Shakespeare’s plays and Miss Isabel Pole in a green dress walking in a square”. (p. 94). Once faced with the horrors of the war, Septimus loses his idealist view of Britain - and his appreciation of Shakespeare’s beauty. As a result, his shell shock spirals into madness and thoughts of suicide.

Virginia Woolf uses Septimus and his suicide in such a way that the other characters - and the reader - can appreciate the beauty of life. Woolf puts forward an idea that death can bring revelation - an idea that is also detectable in Shakespeare’s plays. The natural healing space, or “Green World”, that is a common setting in the plays lets characters “gain a new perspective” on life, and it seems that this perspective may, rather paradoxically, result from an awareness of nature’s cyclical regeneration and inevitable death. The idea that deathlike experience leads to new life is central to Cymbeline - and, in turn, to Mrs Dalloway, through the clear intertextual references. The play conveys the idea shared by Woolf and Shakespeare that life and beauty inevitably come from death. It is demonstrated by the words of Jupiter: “The more delayed, delighted. Be Content” (Act V, Scene III) These words are explained in a footnote in The Oxford Shakespeare edition of Cymbeline: “This suggestion that happiness is only achieved after enduring great trials, thus making it more appreciated,

4 “Sexuality in the reading of Shakespeare: Hamlet and Measure for Measure”, Jacqueline Rose, page 97
5 “Rebirth and Renewal in Shakespeare’s King Lear” by Gary Ettari, Rebirth and Renewal, Harold Bloom, page 147
might be a summary of the action of the play.” King Lear may be also be used as an example again: Gloucester is tricked by his son Edgar into thinking he has jumped off a cliff and yet miraculously survived, and this causes him to reconsider suicide. So, like Lear, who is humbled by nature and the storm which provokes his remorse, Gloucester “has been humbled by his circumstances and now sees his life in a different light.”

Gary Ettari argues that “because of the play’s tragic undertone, there can be neither rebirth nor renewal without loss. Many critics have argued that this recognition of loss’s necessity is one of the chief features of Shakespeare’s late plays, and Lear is no exception.” Ettari therefore confirms a link between the two writers as Woolf uses this tragic element of regeneration in Mrs Dalloway - it is not until Septimus’s death that Clarissa recognizes the importance of life.

However tragic, Clarissa sees his suicide as a heroic act of defiance, and death becomes strangely aesthetic. In her introduction to the novel, Showalter convincingly defines Septimus as a double to Clarissa, a double who could function in the novel to both widen and deepen all that is significant about the main character and her time. The two characters are not linked solely by their fear of reproduction, but also by their “anguish about mortality and immorality” and their “acute sensitivities to (their) surroundings”.

Similarly, Shakespeare’s use of doubles is also indisputable and equally “related to a concern with questions of identity, sameness, and the union of separate selves – joined opposites”. In Hamlet, the use of doubles is very obvious and almost seems unnatural, but the intensified use of the device works to emphasise the concerns of the characters, as in Mrs Dalloway. There are obvious pairings between characters: Cornelius and Voltemand, two ambassadors who speak (together) only ten words: Rosencrantz and Guildernstern. The players who perform the ‘mousetrap’ create a double to Hamlet’s dilemma, and the role of the revenger is doubled by Laertes and Fortinbras, and though these doubles lack subtlety and may delay the action in the play, they raise an awareness of human nature and the concerns of the writer.

In an explicit way, Virginia Woolf also lets her characters define themselves according to whether or not they appreciate Shakespeare. This technique creates yet another link between Clarissa and Septimus. Both these characters live with a spouse

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6 “Rebirth and Renewal in Shakespeare’s King Lear” by Gary Ettari, Rebirth and Renewal, Harold Bloom
7 “Rebirth and Renewal in Shakespeare’s King Lear” by Gary Ettari, Rebirth and Renewal, Harold Bloom
8 Introduction to Mrs Dalloway, xxxvi, Elaine Showalter
9 Shakespeare’s Language, Frank Kermode, p.101
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8 Introduction to Mrs Dalloway, xxxvi, Elaine Showalter
9 Shakespeare’s Language, Frank Kermode, p.101
Clarissa Dalloway's decision as equally uplifting for the characters in the novel, and for the reader.

**Regeneration - “Fear no more”**

I will now look at how Virginia Woolf - like Shakespeare - sets her tragedy of life against a backdrop of a comforting regeneration in nature. Shakespeare’s plays often use flower imagery in the portrayal of female characters, explicitly linking them to nature, fertility and reproduction. Similarly, *Mrs Dalloway* focuses on one June day in 1923 - a time span relating to one cycle around the earth’s axis - and the female characters span seven ages of women. Elizabeth, Clarissa Dalloway’s daughter, is just beginning to mature sexually; Lucrezia Smith is emotionally and physically ready for reproduction, longing to bear children; Clarissa and Sally are about to leave their reproductive years behind; Milly Brush and Doris Kilman both past forty, Millicent Bruton, sixty two, Miss Helena Parry, past eighty and the old woman Clarissa sees in the room across the street is at the very end of her life, in physical and mental decline and approaching death. Woolf makes the parallel with the reproductive cycle clear by making repeated references to nature: Clarissa wears a different green dress during the day and in the evening, evoking thoughts of nature’s fertility and regeneration. She describes individual moments of happiness as “buds on the tree of life” (pp. 31) and notices that the “earth seemed green and flowery” (p. 89). Elizabeth is literally and figuratively her mother’s seed for the future: first described as “very serious; like a hyacinth sheathed in glossy green, with buds just tinted, a hyacinth which has had no sun.” (p. 134) Woolf’s description of Elizabeth as a hyacinth is used to portray her as approaching the peak of her fertility; this flower has often been used in literature as a phallic, sexual, symbol.11 Septimus also describes his wife as a “flowering tree” (p. 162), alluding to her readiness for reproduction and childbirth. This type of nature symbolism is clearly inspired by Shakespeare - many of his plays often substitute plants for humans creating an underlying connection between individuals and nature. *Cymbeline* is a good example of

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11 In T.S Elliot’s “The Wasteland” the first section “Burial of the Dead” includes a dialogue with a young woman who says: “They called me the hyacinth girl.” (*T.S Elliot Selected Poems, p.42*) It is possible to suggest that T.S Eliot was inspired by the tale by Ovid of a young boy named Hyacinthus who is hit by the God Phoebus’ discus and dies. Phoebus transforms Hyacinthus into a flower “the shape of a lily: but it was purple in colour, where lilies are silvery white.” (*Ovid’s Metamorphoses, p. 230*)
this: when Guiderius considers Innogen dead in Act IV, Scene II, he proclaims she is the “sweetest, fairest lily!” The white flower is used to symbolize purity and chastity, and, simultaneously, the audience is made aware of a natural process of life and death, which symbolically allows Innogen to continue to live on as a flower in nature.

Woolf builds on this Shakespearean tradition by exploring nature’s regeneration from the perspective of a woman who is past the fertile period of her life. Clarissa Dalloway and Sally Seton both represent the post-menopausal woman in the novel’s age range of female characters. While Sally Seton appears fulfilled by her role in life as the mother of five sons, Mrs Dalloway expresses an acute awareness of her ageing. Woolf accentuates the emptiness felt by the menopausal woman, as she leaves behind the joys of youth and is left only with thoughts of death. Virginia Woolf uses Clarissa’s stream of consciousness to voice the concern that women must accept the shedding of sexuality as they leave middle age and enter their postmenopausal years. Clarissa thinks:

“There was an emptiness about the heart of life; an attic room. Women must put off their rich apparel. At midday they must disrobe. She pierced the pincushion and laid her feathered yellow hat on the bed. The sheets were clean, tight stretched in a broad white band from side to side. Narrower and narrower would her bed be.” (pp. 33-34)

Clarissa considers the midpoint of her life as she pauses in the attic room “at midday” (p. 33). Her thoughts convey Woolf’s suggestion that at this stage in the female life cycle the woman is left empty and fruitless, all “rich apparel” discarded, leaving only thoughts of mortality as death approaches quickly, ‘narrower and narrower’ her life’s cycle becomes now that she no longer serves to regenerate and serve nature. The white sheets on the bed stretched in this way create an image of a gravestone. This passage also illustrates a clear parallel with Shakespeare. The idea of one single day as an analogy of a whole life is strikingly similarly expressed by “the Fool” in Shakespeare’s King Lear in his last appearance in the play. King Lear declares: “We’ll go to supper i’ the morning” (3.6.77) - echoing the confusion of the natural order in the
play, and the Fool replies, “And I’ll go to bed at noon” (3.6.78). The Fool’s words and Clarissa’s thoughts both convey the idea that life is over once midlife - and potential reproduction - are left behind. After “noon”, the middle of his life, one must accept the redundancy of life and “go to bed” or, embrace death.

By letting Clarissa remember her time at Bourton, where she was enjoying the vitalities of life at the peak of her youth, Virginia Woolf provides a comfort for Clarissa and the reader. This comfort may be compared to the feelings of those characters in Shakespeare’s plays who experience the effect of the “Green World”, as critic Northrop Frye called it. This green space, found in plays such as A Midsummer Night’s Dream, Twelfth Night and As You Like It, acts as a healing environment for the characters who enter it. As Gary Ettari says:

“It is a familiar pattern in Shakespearean comedy to place characters from a more “civilized” world into a forest or other green space in order that they might gain a new perspective and return to civilized society changed for the better.” \(^{12}\) (p 147.)

Once he has placed his characters into a green space, isolated and removed from their normal environment, Shakespeare reveals a transformation in all those who are dislocated, before he returns them to their society, changed for the better. The sense of a ‘Green World’ is very much at the heart of Mrs Dalloway. It is at Bourton that Clarissa is liberated; she begins to understand her sexuality and recognize her affections for Sally Seton. We may distinguish it by its green environment so different from the streets of London where Mrs Dalloway walks as a middle-aged woman. The colour green is itself a motif of the novel, used to allude to fertility and regeneration. Septimus remembers Miss Pole in a green dress and Miss Kilman wears a green mackintosh coat. The colour more specifically provides a subtle sexual undertone to the scene where Peter is questioningly “tilting his pen-knife towards her green dress”. (p. 44) At Bourton, Clarissa is confronted with her feelings for a woman and finds solace as she

\(^{12}\) As Gary Ettari points out in “Rebirth and Renewal in Shakespeare’s King Lear” Shakespeare’s Green World is not just evident in his comedies. The theme of nature is central to the tragedy of King Lear, the wilderness which many of the characters enter has a clear effect on them. Lear himself reaches an understanding of his mistakes as he welcomes a storm rather than seek shelter with his Fool.
wonders the natural space. Here, Woolf uses Shakespeare’s Green World in her own individual way:

“(…) ‘if it were now to die, ‘twere now to be most happy.’” 13

That was her feeling - Othello’s feeling, and she felt it, she was convinced, as strongly as Shakespeare meant Othello to feel it, all because she was coming down to dinner in a white frock to meet Sally Seton.” (p. 38)

Woolf uses Shakespeare’s words - “if it were now to die, ‘twere now to be most happy” - to her own purpose. Whilst the feeling is meant very much the same - so contented she feels ready to die for no feeling could be greater - Woolf uses his words to divulge her own ideas. Clarissa’s love for a woman means she needn’t fear the process of regeneration, her emotions are spiritual, and the lack of physicality becomes a comfort. Her homosexual feelings are made quite clear “(she) could not resist sometimes yielding to the charm of a woman...she did then undoubtedly feel what men felt”. (p. 34)

The white dress which she wears symbolizes innocence, as the love between two women may continue without the necessity of troublesome sexual reproduction. So whilst Bourton is a natural setting where the cycle of life is evident all around, somewhat ironically Clarissa is released from her fears of sexuality and regeneration.

Conclusion:

To answering the question “How does Virginia Woolf’s understanding and appreciation of Shakespeare combine with her individual talent in Mrs Dalloway”, I propose that ultimately Woolf’s talent is her ability to take Shakespeare’s words and use them to her own purpose. Ultimately, Shakespeare’s words are used by Woolf to provide comfort, arguably for herself as well as the reader. Although Woolf’s novel explores the life of the middle-aged woman Clarissa Dalloway, it is possible that there is an autobiographical element to her work. The promise of regeneration reverberates throughout the novel, to provide solace where tragedy seems imminent, and this

13 Othello Act II, Scene I, Othello is reunited with Desdemona his great love, and expresses his thoughts that he could die right then, for he would never again feel as happy as he is at this moment.
promise comes from the words of William Shakespeare. Woolf’s use of flower imagery mirrors that of William Shakespeare, and the importance of nature is central to her novel, particularly regeneration in nature. Part of the refrain from Cymbeline: “Fear no more” is repeatedly brought back as a reassurance - that the cycle of life will continue, as in nature. The characters in Mrs Dalloway are comforted by the words of the playwright, with the promise that the past is forgotten in the rebirth of nature, and I believe that Woolf was herself consoled by Shakespeare. Her novel provides the reader with the comfort which she finds in the words of the playwright as she combines her individual talent with Shakespearean tradition.
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Growth or Displacement: 
An assessment of the impacts of the redevelopment of Princesshay

To what extent has the redevelopment of Princesshay shopping centre in Exeter had positive impacts?
Fenella Keevil - Geography

Writing an Extended Essay in geography is a daunting task particularly as the format is something completely new to me. Choosing a pertinent topic and title is key and is one of the hardest parts of the process. Collecting relevant data was the next hurdle, involving huge amounts of research, the Office for National Statistics website, plus I used social media, telephone interviews, letters and emails, to provide new information. Once I had my data, I found the writing actually quite enjoyable and the skills I developed, including the formatting of all the data, have been really useful. Geography coursework was easy in comparison! I felt a huge sense of accomplishment completing the essay and it really is great preparation for university.

Supervisor: Alex Patton

Fenella chose to analyse the impacts of a major regeneration scheme, and in keeping with her allied interest in Economics (which she also studied at HL), she chose a large retail development in Exeter which was expected to bring additional jobs, incomes and visitor benefits to the city. Analysing redevelopment impacts is a typical area for research but, while it might seem straightforward, she had to deal head-on with some difficult conceptual and epistemological issues. Most notably these were:

- To what extent can improvements in a variable such as unemployment be attributed to just one scheme?
- What should the impacts be compared against, ie what is the base-case scenario?
- Does a spatial zero-sum game where expenditure and employment are shifted around between different areas really result in any net ‘benefits’ overall?

In tackling these issues, Fenella had to learn how to use and interpret recent census data and read academic and professional literature on how to conduct such economic and geographical evaluations. That she managed to raise such a study from the mundane to the fascinating and intricate, as well as assessing impacts in a far more holistic manner than many professional studies, is hugely to her credit.
Abstract

This essay examines the impacts of the retail-led redevelopment of Princesshay shopping centre in Exeter. It does this by assessing to what extent the project achieved the three main aims of urban regeneration; creating additional employment, stimulating economic growth and enhancing and improving the environment. Various sources of data were used and analysed, including recent census data, information recorded by the local council and provided by the developers and articles on the area. The data is displayed in different formats using maps, photographs, tables and graphs to effectively analyse the impact of the project.

The key focus was to examine the additional impacts the redevelopment created relative to a ‘base case’ which assumes that the previous shopping centre had continued to operate with no refurbishment or redevelopment. Some local retailers and environmentalists expressed concerns about the detrimental effects of the scheme on existing high street shops and congestion, and these have been assessed. However, overall, the essay concludes that Princesshay did have net positive impacts on the surrounding area. It was able to create additional employment, rather than substituting or displacing employment from other areas of Exeter. It also stimulated economic multiplier effects across the region, creating a new economic ‘core’ within the city centre. The redevelopment also achieved the goal of enhancing and improving the environment, by making large investments in public transport infrastructure to combat the increased congestion that the project caused and by improving the aesthetics of the area. From the data analysed, it can be seen that the development managed to successfully achieve each of the goals of urban regeneration. Therefore, although the data used may not be completely conclusive due to limited funding and lack of access, the analysis allowed within the scope of this essay indicates that Princesshay has created positive impacts.
Research question: “To what extent has the redevelopment of Princesshay shopping centre in Exeter had positive impacts?”

Introduction

Urban regeneration schemes strive “to enhance and improve the environment and the economy of an urban area” (Tallon, 2010), through the careful planning and rebuilding of an area. In 2005, Exeter City Council (“Exeter Council”) launched an urban regeneration scheme, in partnership with Land Securities plc (“Land Securities”), to redevelop Princesshay Shopping Centre (“Princesshay”) (Land Securities, 2007). Princesshay is an example of retail-led urban regeneration, designed to create high quality shopping outlets. The other basic types are ‘cultural’, ‘leisure’ and ‘housing led’ regenerations (Tallon, 2010). Retail-led projects do not preclude the introduction of other uses, although its primary focus is on improving the shopping offer. Combined anticipated impacts of regeneration are shown in the diagram below.

Exeter Council hoped Princesshay would assist wider regeneration of the City, generating employment, stimulating economic activity, and enhancing and improving the environment. However, Princesshay was controversial. Concerns from local shop keepers and environmentalists focused upon whether Princesshay would create new ‘additional’ employment and economic activity or simply displace it from existing shopping areas within or beyond Exeter. They also worried it would increase traffic congestion thereby having a negative impact.
Six years after Princesshay’s redevelopment, its impact can begin to be assessed. The complex nature of the whole scheme makes its total evaluation beyond the scope of this essay, therefore, it focuses on the retail-led rebuilding of Princesshay. The essay explores Princesshay’s success in achieving Exeter Council’s primary aims and seeks to answer the question “to what extent has the redevelopment of Princesshay shopping centre in Exeter had positive impacts?”

**Background to the development**

Maps 1 & 2 below show Exeter’s location from a national and regional perspective (Google maps, 2013)
In 1949 the original Princesshay shopping centre was planned by Thomas Sharp following extensive war damage. Sharp’s master plan was to create the first pedestrian shopping area, with modern buildings, incorporating views of Exeter Cathedral while conserving the Roman City walls (Exeter Memories, 2011).

The resulting development did not fulfil Sharp’s vision. Exeter Council’s community strategy report Vision 2020 (2000, p2), later criticised Princesshay as the “worst in mundane post-war architecture” Another report observed that “post-war urgency to commence development of Princesshay may have resulted in lasting negative implications in terms of both quality of designs and materials.” (Exeter Council, 2008, p5).

By 1993 it was clear that the commercial units were not suitable for modern retail needs and criticism was made “that covered elements of the scheme were dark and unsafe” (Exeter Council, 2008, p5).

Further feasibility studies and reviews were commissioned, including Vision 2020. The conclusions advocated an accessible City centre, with improved pedestrian access and a sustainable shopping area that would create jobs, enhancing the local economy. Additionally, Exeter needed to become more attractive to visitors whilst being sympathetic to the historic buildings and addressing the need for affordable housing in the area.

Below are pictures of the site prior to the redevelopment. (Jenkins, N. 2009) (Smith D. 1979).

“For early 2001, Land Securities and Exeter Council commissioned a Conservation Area Appraisal and an Urban Design Analysis in order that Key Development Principles could be established” for a wider regeneration scheme (Land Securities, 2007, p4). “In November 2001, [these principles were established] and a master plan for the 13 acre site” created. (Land Securities, 2007, p4) The Council sought to create a new state of the art shopping centre, new private and social housing, as well as generally enhancing Exeter High Street, for example, by the introduction of public art (Land Securities, 2007). “Planning consent for the scheme was obtained in May 2003 and the redevelopment of the Princesshay area commenced in January 2005.” (Land Securities, 2007).
Princesshay is now a state of the art shopping, leisure and residential centre with a floor space of 400,530 sqft (Land Securities, 2007). The pictures below illustrate its modern nature, architecture and improved public realm (Land Securities, 2013).

This image shows the sitemap of Princesshay post development. (IFO Apple Store, 2008)
Princesshay’s central location, (as shown by Map 3 below), close to rail and road links, makes it easily accessible. With no major competition within Exeter, it is the core of retail purchasing. Hubs such as Exeter University, local business parks, such as Pynes Hill and major employers, such as the meteorological office, also help attract potential shoppers, along with visitors to the area.

Map 3 below, shows the good transport links and business parks and industrial estates in and around the city of Exeter (Google Maps, 2013) (Exeter City Council, 2013)

Key
1. Innovation Centre – University of Exeter
2. City Centre – location of Princesshay
3. Pinhoe Industrial Estate Trading Estate
4. Exeter Business Park
5. Skypark - a new development (Proposed)
6. Park Five, Sowton Industrial Estate
7. Apple Lane, Sowton Industrial Estate
8. Sowton Industrial Estate
9. Peninsula Park
10. Pynes Hill
11. Woodwater Park
12. Matford Business Park
13. Marsh Barton Trading Estate
14. Exeter Science Park (Proposed)
Analysis

The graph below from the English Partnerships Additionality Guide (2008, p5) illustrates how, when assessing a regeneration project, such as Princesshay, it is important to examine what would have happened without regeneration, known as the base case. To do so, one needs to assess whether the redevelopment created additional benefits above those already existing.
The diagram below shows the key positives and negatives that Princesshay might have had. It shows how the net benefits could be calculated.

- New Jobs
- Economic Multiplier effect
- Increases in investor confidence
- Increase in the number of visitors and dwell time
- Creation of an evening economy

Net Benefits

- Jobs in old development (Base case)
- Jobs in other shops in Exeter and further afield (Displacement)
- Money generated by Princesshay spent elsewhere (Leakages)
- Vancy rates and footfall surveys of other areas of Exeter (Substitution)
- Impact on congestion
1. Generating Employment

A principal aim of Princesshay, and arguably of any retail led regeneration scheme, was to create employment in the area, directly through the building and development programme and indirectly by stimulating additional economic activity.

The old fashioned pre-development architecture, lack of modernisation and un-inspiring decor caused a decline in visitors and jobs in Exeter. This is why Vision 2020 highlighted a need for “indigenous growth and job creation in the City”. In particular “new and refurbished business premises to create these jobs and meet the emerging needs of a local growth economy” were core aims.

Land Securities estimate that 1,500 jobs were created directly as a result of the development (2007). To put this statistic in context one needs to look at the number of jobs existing before and after the redevelopment. The old Princesshay development employed circa 600 people, currently around 1,500 are employed there (Land Securities 2007/2013). The economic stimulus of Princesshay also created new jobs indirectly. John Lewis opened a new store “creating 300 new jobs” in 2012 (BBC News, 22nd July 2011). Located near to Princesshay it was attracted by the investment and redevelopment in the area.

Table 1 and Graph1 below show the number and percentage of people claiming benefits from August 2005 to May 2013. (Nomis, 2013)
Princesshay opened in September 2007. Graph 1 (above) shows a marked decrease of circa 20% in the number of people in Exeter claiming benefits from August 2007 to November 2007. In the rest of England the rate only decreased by around five percent (table 1, p11). With a strong correlation between employment levels and people claiming benefits, the timing suggests that Princesshay was instrumental in creating jobs. However, Graph 1 suggests the benefits were short lived, due to the 2007/8 financial crisis, nevertheless the percentage of people seeking benefits in Exeter still remains below the national average. Princesshay’s redevelopment may therefore have played a part in this resilience.
The Choropleth maps (figure 1) show the number of people employed in retail in Exeter in 2007 and 2008 (Nomis, 2008) (Google Earth, 2013) and Princesshay’s role in creating employment.

Figure 1 Choropleth maps over time of people working in retail jobs via super output areas – lower layer

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<td>&gt;1500≤1750</td>
<td></td>
</tr>
<tr>
<td>&gt;1750≤2000</td>
<td></td>
</tr>
<tr>
<td>2000+</td>
<td></td>
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</tbody>
</table>

Small increases seen in areas near to Princesshay

No major changes in the rest of Exeter

Area of industrial estate saw overall no change
Additionality, as defined by the English Partnership Additionality Guide, “is the extent to which something happens as a result of an intervention that would not have occurred in the absence of the interventions.” (2008, p1). Creation of additional employment is key to determining whether a development has truly created its own benefits rather than displacing them from another area.

The maps only reflect a small change in the aggregate number of people working in retail jobs in Exeter and regionally. However, surrounding Princesshay (Exeter 008C) jobs increased from 1,707 in 2007 to 1,991 people in 2008. While boosting retail jobs in the immediate region, Princesshay’s wider impact was limited, as may be expected within a short time period.

Although generating short-term employment, it is uncertain whether Princesshay genuinely provided significant sustainable new jobs, benefiting the local population. Land Securities acknowledges that of 1,500 jobs created only 900 were new (2007). The remainder being substituted jobs from the old shopping centre. However, under the base case scenario, with the diminishing shopping centre and resultant lack of demand, the number of jobs in the old centre may have decreased.

With regeneration, it is not enough to create new jobs, if they are taken by people already employed or living outside of the local area. To counter this, a local employment drive was co-ordinated by Princesshay, on behalf of incoming businesses, to encourage local unemployed people to be employed (Exeter Council). With good public transport links Princesshay attracted locals to work there. Additionally, Exeter Council and Land Securities sought to ensure local people had priority with job allocations; Wayne Pearce from Land Securities, “the majority of employees are from within the city’s catchment. Unemployment rates within Exeter are relatively low, and Princesshay helped to reduce these further.” (July 2013).

Employee training for locals without the necessary skill sets was also provided. Pearce confirmed that, “we currently work with Exeter College and local charitable organisations to facilitate work experience and are currently, with the assistance of our security cleaning and mechanical and engineering contractors, looking at ways in which apprenticeship schemes can be implemented.” (July 2013).

However, Princesshay was blamed for some job losses. An Exeter food retailer closed with 60 job losses, blaming Princesshay (BBC News, 2007). Consequently, the number of jobs truly created may have been lower than 900.

This raises the related issue of substitution and whether Princesshay created new jobs or displaced them. Substitution occurs when somebody already employed in Exeter gives up their existing job to accept one in Princesshay, due to, for example, ease of location, rather than creating employment for an unemployed person. Although six retail units replaced same use retailers, with over 70 shops located within Princesshay, the vast majority created new economic activity (Princesshay Exeter website, 2013).

Additionally, some business closures may not be entirely the fault of Princesshay. One store closure was a carbon neutral market, being expensive and niche it may not have survived in any event.
Despite positive claims by the Council, in the long term the graph shows a reduction in total employment of which retail is a part. However, it is very difficult to separate out the causal factors and determine if this decrease is due to the financial crisis or the failure of Princesshay to create new employment. Without Princesshay’s redevelopment the number of jobs may have dropped even more dramatically, as the area deteriorated. Looking at the evidence from this graph the redevelopment clearly did not create hundreds of new jobs generally, but suggests it counteracted the effects of the recession by reducing job losses, which the old centre might have not.
2. Stimulating economic activity

Another principal aim of retail led urban regeneration and Princesshay was to stimulate economic activity in Exeter. The economic multiplier effects, as defined by the Additionality Guide, is “further economic activity (jobs, expenditure or income) [generated by] additional local income, local supplier purchases and longer term development effects” created by the scheme (English Partnerships, 2008, p4). Exeter Council and Land Securities clearly believe that a positive economic multiplier effect was generated by Princesshay. Land Securities, asked if Princesshay created an economic multiplier effect responded robustly “Yes there was and still is” (2013). However, it is difficult to quantify an economic multiplier. We are forced to rely on case studies rather than tangible data.

An economic multiplier effect will undoubtedly have been created in the construction industry and supply chain associated with the redevelopment. Land Securities stated Princesshay, “represents a £215m investment into Exeter which will be a catalyst for further economic growth to the city” (Land Securities 2007). However, it is difficult to quantify the real economic multiplier effect, given so many different components. Diagram 2, shows the potential economic multiplier effect that was created.

Investment also creates new opportunities for businesses. Businesswoman, Li Case, was able to expand her business by opening in Princesshay, one of twelve entrepreneurs who were given premises in one of the ‘starter units’ allocated by Land Securities to independent retailers. The growth following the opening led to Case winning an award for the best independent retailer in the South West (This Is Exeter, 2008) (Land Securities, 2007).

As well as providing expansion opportunities for small independent retailers, the new shops may have encouraged the population to spend a larger proportion of their disposable income in Exeter, increasing profits for the stores, boosting the local economy and potentially increasing income generated in Exeter. However, longer term, these economic multiplier...
effects may not be sustainable. Given existing high levels of consumer debt in the UK it is questionable whether there will be significant increases in the amount spent in shops. This yet again brings up the crucial issue of whether the economic activity created is new, or whether there has been a spatial rearrangement of activity, with spending from another nearby location. The economic multiplier effect created may also not take place for some time. The less tangible elements, such as an increase in the number of tourists or increases in investor confidence, will only be seen in the long run.

Land Securities believes that Princesshay “has been a catalyst for the city” by improving investor confidence in the area, (2013) as demonstrated by the new John Lewis store near to Princesshay opening in 2012, creating 300 new jobs (BBC, 2007). City Centre Manager, John Harvey, attributed this to Princesshay, saying, “I don’t think we would have attracted John Lewis, Waitrose and other stores without the redevelopment of Princesshay.” He added that, “Marks and Spencer’s refurbished their store prior to the opening of Princesshay and Boots spent several millions of pounds in the period immediately after the opening, none of this extra investment would have been made without the redevelopment of Princesshay.” (2013). Although it would be expected that the city centre manager would have a positive opinion, his views remain relevant. Assessing the base case scenario John Lewis would not have been attracted to the Exeter area, with a deteriorating, old fashioned and diminishing shopping centre.

Graph 2 (p18) shows an increase in median full-time annual earnings from when the records Exeter Council provided began, in November 2011 to February 2012 (Economy Unit at Exeter City Council, 2012). This coincides with the opening of John Lewis, perhaps suggesting the ongoing multiplier effect. Furthermore, Exeter’s higher levels of median income compared to the surrounding area, shows its potential as an investment centre for retailers in the South West.
Whilst Princesshay undoubtedly attracted investment, it led to a higher demand for premises and rental increases. Due to the high rents some stores were forced to move out, such as Quiksilver, which left a year after the opening. Furthermore, the focus on Princesshay may have led to the neglect of other areas of Exeter, for example the old Debenhams building was still vacant in 2009 (Jenkins, N., 2009).

This raises the issue of displacement, the idea that instead of creating new economic activity Princesshay merely took it away, or ‘displaced’ it, from other areas (English Partnerships, 2008). Vacancy rates assist examination of whether Princesshay reduced existing activity from within or outside Exeter. Graph 3 (p19) shows vacancy rates in Exeter over time from 2007 to 2013 (Economy unit at Exeter City Council, 2012).
Exeter City Centre Manager, John Harvey confirmed (25th June 2013) that there were “various people who claimed a negative effect as a result of various shops closing because of the project... However this is only a short term issue and these negative impacts are necessary for the greater good.”

The economic crisis, which coincided with the opening of Princesshay in 2007, caused vacancy rates across England to soar. Exeter followed the national trend, making it difficult to fully assess Princesshay’s impact. Both its opening and the crisis probably caused an increase in vacancy rates, at least in the short term. However, the rates are now recovering and are forecast to fall below 2007 levels. This suggests that, as Harvey claims, increased vacancy rates were only a short term negative impact.

Harvey also confirmed “the City’s vacant unit rate is 6.96%, a drop from 7.10% in July 2012. The figure remains significantly lower than the national average, currently standing at 12.5% – 14.5% according to Local Data Company statistics... Against a national backdrop that remains challenging, the latest Exeter vacancy figures are very encouraging.” (Economic Trends Report, 2013, p5). It suggests that Princesshay created an economic hub which led to more activity, not reducing existing activity from within or outside of Exeter. In the long term Princesshay did not cause much displacement helping maintain relatively low vacancy rates in Exeter in the shorter term.
One way retail-led regeneration helps low vacancy rates is by causing an increase in the number of visitors and dwell time. This can lead to an increased market for the retailers to sell to, helping create business. This, in turn, may result in an economic multiplier effect for retailers.

Currently Exeter does not have any formal statistics on tourism for the City Centre. However, Land Securities figures state, “Princesshay attracts 10 million visitors per annum. At the heart of the recession numbers fell close to 9 million, but has seen a recovery over the last 2 years. Visitors stay on average for 80 minutes.” (Land Securities, 28th July 2013). However, this is not supported by the data contained in Graph 4 (below) from footfall surveys conducted in the years immediately after the 2007 opening, which show that footfall changed very little over this period (Exeter City Council, 2009).

The minimal increase in footfall numbers in the Princesshay area illustrated by Graph 4 is to be expected, after the high initial numbers recorded after the opening is factored in. The graph also shows a relatively large percentage increase in footfall in the High Street and Fore Street. These other main shopping areas lead on to Princesshay, suggesting that increased footfall due to Princesshay led to increased visitors to surrounding areas. However, Sidwell Street, South Street and Guildhall all saw a small decrease in footfall numbers, suggesting some displacement because Princesshay and Guildhall have very similar uses, but Princesshay is bigger and freshly developed.
Map 4, below shows the location of each Graph 4 area in relation to Princesshay. (Google maps, 2013)

One of the ways Princesshay aimed to create new economic activity was to encourage an evening economy. By increasing spending, due to the longer operating hours, Princesshay has generated ten additional restaurants within the City (Pearce, W., 28th July 2013), although the Council believes this is only the start. When asked if Princesshay had successfully promoted an evening economy, Exeter responded, “Princesshay has certainly been a benefit in terms of the evening economy but neither Princesshay, John Lewis or any retailer on their own can change the way in which the centre functions. The city centre management partnership continues to work to improve the evening offer. This is one of the key elements in the new city centre strategy currently being prepared.” (Howard, S., 28th July 2013) This suggests that although Princesshay may have helped start to promote an evening economy there is still a lot more to do.

In conclusion, based on this limited evidence and adjusting for the effects of the economic crisis, it appears that Princesshay did stimulate new economic activity. Princesshay also seems to have increased investor confidence in the area, attracting major retailers such as John Lewis, who were key to keeping vacancy rates low in the long term. This retail-led urban regeneration scheme does therefore seem to have created some economic multiplier effects.
3. Enhancing and improving the environment

a. Public Realm

Another principal aim of retail led urban regeneration schemes is enhancing and improving the environment and use of public space. Below is an image of Princesshay pre development in 2004, the need for redevelopment was clear. (Jenkins, N. 2009)

The next page shows Princesshay post development in 2008, the images highlight the key improvements made to the public realm in Exeter which were a large part of the success of the project. (Evans, B. 2008) (Land Securities, 2013)
Enhancing and improving the environment

**Public Realm**

Another principal aim of retail led urban regeneration schemes is enhancing and improving the environment and use of public space. Below is an image of Princesshay pre-development in 2004, the need for redevelopment was clear. (Jenkins, N. 2009)

The next page shows Princesshay post-development in 2008, the images highlight the key improvements made to the public realm in Exeter which were a large part of the success of the project. (Evans, B. 2008) (Land Securities, 2013)
b. Congestion

Due to the space constraints of this essay, assessment of the main environmental concerns will be examined by looking at the impact Princesshay has had on congestion and whether measures were put in place to minimise it.

There is currently no data for Exeter City in terms of traffic counts, however the number of people parking their cars in Exeter City Centre increased by 70,000 people in the five years following Princesshay’s opening. (Pearce, W., 28th July 2013) Increasing demand for car parking can also be seen by the increased cost. Before redevelopment the cost was £1.20 per hour, currently the charge is £1.80 per hour. These statistics suggest increased congestion.

However, Exeter Council sought to counteract congestion stating that, “as well as contributing to highway network improvements, a comprehensive Section 106 package [developer financial contributions] has provided contributions towards the upgrade of the park and ride scheme (£68K), public transport (£65K) and car park management systems (£130K) in order to maximise the effective use of the city’s existing stock.” (Smith, H., 28th July 2013) These investments should in the longer term have benefits. Critically, the new park and ride scheme operated by Stagecoach successfully allows easy access to the City without increasing congestion.

Overall, the photographs show Princesshay’s redevelopment success aesthetically, encouraging visitors to Exeter. Pollution may have increased but the negative impact locally may have been offset by pollution reductions elsewhere.
## Traffic Light Summary

Table 2, a ‘traffic light’ system to summarise the extent of success Princesshay had in achieving its main aims

<table>
<thead>
<tr>
<th>Aim</th>
<th>Factor examined</th>
<th>Success?</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generating employment</td>
<td>Direct Employment Impact</td>
<td></td>
<td>Princesshay was successful in creating 1500 jobs and reducing the claimant count in Exeter, however the number of new jobs is difficult to evaluate.</td>
</tr>
<tr>
<td></td>
<td>Leakages</td>
<td></td>
<td>A large effort was made to give jobs to unemployed locals and one of the main reasons for the development was that the levels of leakages out of Exeter were already very high. The project was successful in lowering this.</td>
</tr>
<tr>
<td></td>
<td>Substitution</td>
<td></td>
<td>A small level of substitution would have taken place. However, unemployment rates in Exeter are low and the majority of employees are from within the City’s catchment.</td>
</tr>
<tr>
<td>Stimulating economic activity</td>
<td>Economic Multiplier Effect</td>
<td></td>
<td>Although there is limited data, the large investment which Princesshay represented suggests that an economic multiplier effect must have occurred.</td>
</tr>
<tr>
<td></td>
<td>Increase investor confidence in the area</td>
<td></td>
<td>Princesshay acted as a catalyst, attracting John Lewis and Waitrose to the area. Marks and Spencer’s spent large amounts of money refurbishing before the opening of Princesshay and Boots invested a lot of money post opening.</td>
</tr>
<tr>
<td></td>
<td>Increase the number of visitors and dwell time</td>
<td></td>
<td>Due to the economic crisis it is difficult to know why levels changed. Princesshay nevertheless helped to maintain levels of visitors.</td>
</tr>
<tr>
<td></td>
<td>Displacement</td>
<td></td>
<td>Princesshay helped vacancy rates to recover post the economic crisis, and created a new economic hub in Exeter.</td>
</tr>
<tr>
<td></td>
<td>Creation of an evening economy</td>
<td></td>
<td>Princesshay brought additional restaurants to the area, however this is only the beginning of the promotion of the evening economy for the council.</td>
</tr>
<tr>
<td>Enhancing and improving the environment</td>
<td>Impact on congestion</td>
<td></td>
<td>Increase in car parking tickets and demand for car parks show an increasing number of cars in Exeter.</td>
</tr>
<tr>
<td></td>
<td>Measures to combat increased congestion</td>
<td></td>
<td>Large investments were made into public transport, a park and ride scheme and car park management systems.</td>
</tr>
<tr>
<td></td>
<td>Improvements to the public realm</td>
<td></td>
<td>Creation of public squares, the incorporation of the old city and general aesthetic improvements have allowed the redevelopment to show a radical improvement compared to the original Princesshay.</td>
</tr>
</tbody>
</table>
Conclusions

Aggregating the ‘traffic light’ summary of findings in table 2 (page 26) Princesshay had an overall positive impact upon Exeter.

Princesshay succeeded in creating employment, having an immediate positive impact after opening. Although creating circa 1,500 jobs, they cannot all be classed as additional applying the four factors (substitution, displacement, extent of economic multiplier effect and leakages) behind Additionality. However, measures were put in place to ensure that the jobs created became additional jobs.

Princesshay created an expanded economic hub in and around Exeter, resulting in economic multiplier effects and lowering the degree of leakage. Further investigation would be needed to quantify these impacts numerically.

Investor confidence improved, leading to a positive feedback loop of investments, keeping vacancy rates low and footfall counts high during a recession. The initial negative effect on vacancy rates was only short term. Longer term, improvements in investor confidence will outweigh short term negativity.

Princesshay has enhanced the central environment in Exeter. Creation of new public squares and general aesthetic improvements, incorporating the old City, was successful, increasing visitors longer term, counteracting the declines that would otherwise have occurred.

Although the local environment may have been impacted detrimentally by congestion, measures to combat this have been effective. Any negative impacts of congestion are outweighed by the positive economic impacts and the mitigating measures that have been taken, such as the Park and Ride scheme. They have also led to improvements in public space and the public transport infrastructure in Exeter.

It is always difficult to research the actual impacts of a project, compared to looking at theories because it is difficult to identify how a single variable factor can affect so many other variables in the long term. The financial crisis which took hold in 2008 affected all of the data and so made it more difficult to assess the extent to which the faster recovery rate of Exeter in relation to the rest of the country was purely due to Princesshay. The sources used are reliable, as each piece of data is derived from the census or the Council. Because Land Securities want a successful commercial project all of the statements they release could depict Princesshay in a positive light, however the data used to corroborate their points has also been obtained through independent sources.

To fully answer the question, “to what extent has the redevelopment of Princesshay in Exeter had positive impacts?” more data would need to be analysed over the longer term, including surveys of local people and shop keepers, further information on vacancy rates and footfall counts. However, in summary, although the data used may not be completely conclusive, the analysis allowed within the scope of this essay indicates that Princesshay did manage to achieve the three main goals of retail-led urban regeneration, as defined by this essay, creating largely positive impacts for Exeter.
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Pearce, W., Land Securities (28th June 2013) email interview
Smith, H., counsellor (28th July 2013) email interview
To what extent did the Nazi consolidation of power during 1933-1934 constitute a legal revolution?

An exploration of Hitler’s subversion of the Nazi legal system and a consideration of whether his consolidation of power during 1933-1934 constituted a revolution that was brought about through legal and democratic means.
Eliza Parr - History

As I was interested in reading Law at university, and was studying Nazi Germany for History HL, looking at the Nazi legal system provided an interesting and accessible perspective for me. Watching the film, *Judgement at Nuremburg* provided a useful introduction to legal positivism, which I discussed in my Oxford interview. I think it is important to choose a topic that you are interested in, and one of the key challenges is keeping the essay focused when reading a wide range of sources. In addition, researching your topic as soon as possible is key, because it is helpful to discuss it with your supervisor before the summer holiday.

**Supervisor: Neil Tetley**

Eliza wrote on ‘To what extent did the Nazi Consolidation of Power during 1933-1934 Constitute a Legal Revolution?’. It was a superbly researched essay in which Eliza synthesised a tremendous volume of material into a clear and persuasive argument. She argued that while the Nazi consolidation of power gave an appearance of legality, this view places too much emphasis on the constitutional validity of the Enabling Act. Nazi legislative acts and decrees in fact undermined the fundamental principles of the Weimar Constitution which included the separation of powers, the rule of law and the protection of individual rights.

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Abstract

This essay aims to answer the question: “to what extent did the Nazi consolidation of power during 1933-1934 constitute a legal revolution?” In addressing this issue, the nature of a revolution is considered before the components of a legal revolution are identified as being to bring about by legal and democratic means fundamental changes to the values of a state similar to those that would have occurred through the use of illegal force. The legal and constitutional framework within which Hitler’s consolidation of power takes place is then considered, in order to form a benchmark against which the legality of his actions can be measured.

The first half of the essay considers the apparently legal means by which Hitler’s consolidation of power could be characterised as constituting a legal revolution, in particular the adoption of the Enabling Act, the creation of the Gestapo and the People’s Court. The views of commentators supporting the suggestion that the consolidation of power was legal, including A.J.P. Taylor and the positivist legal theorist H.L.A. Hart, are evaluated. The constitutional validity of the Enabling Act is then considered, before analysing whether Hitler’s actions can reasonably be described as “legal” by reference to the key principles underlying the Weimar Constitution. Contemporary sources from the Nuremberg “Judges” Trial and the essays of a Jewish legal professor who fled from the Nazi regime are reviewed, although the rulings of the Nuremberg Trials are not examined extensively.

It is concluded that whilst Hitler’s consolidation of power was revolutionary in its outcome as it overthrew the existing legal and political systems, the seemingly legal acts and decrees which he used so undermined the fundamental principles of the Weimar Constitution and any generally accepted notion of “legality” that it cannot reasonably be described as a legal revolution.
To what extent did the Nazi Consolidation of Power during 1933-1934 Constitute a Legal Revolution?

Introduction

Following the failure of the Munich Putsch in 1923, Hitler changed his tactic of using violence to gain power to using legal means and the ballot box. In less than two years after he was appointed Chancellor in January 1933, following the death of President Hindenburg on 2 August 1934 Hitler was also appointed President and combined both offices to become the Supreme Leader (Führer) of Germany. During this short period, in the absence of coup d’état,1 the system of democratic rule in Germany was effectively dismantled, despite the Nazi party failing to achieve a majority in the Reichstag election of 5 March 1933. It was achieved through a number of measures, in particular by the Enabling Act of 23 March 1933, but also by others, which overrode the Weimar Constitution and fundamentally undermined the German legal system. The concept of a “legal revolution” is not a well-defined term, despite having been used by some commentators such as DG Williamson.2 It is therefore necessary to consider its meaning before going on to assess the extent to which Hitler’s actions in consolidating power constituted a revolution which was legal because it took place within the existing legal framework of the Weimar Constitution, or whether, notwithstanding Hitler’s attempts to preserve a “veneer of legality,”3 the principles of legality were so fundamentally undermined that the outcome cannot reasonably be described as a “legal” revolution. Assessing whether Hitler’s consolidation of power constituted a legal revolution is important in understanding how a civilised democratic country such as Germany in the mid 20th Century could, apparently through legal and democratic means, become a dictatorship characterised by the complete breakdown of individual rights and basic political freedoms and ultimately lead to the Holocaust.

Definition of a Legal Revolution

A “revolution” can be defined as “the overthrow or repudiation of a regime or political system by the governed.”4 An alternative definition emphasises the speed of these events: “a sudden, tumultuous, and radical transformation of an entire system of government, including its legal and political components.”5 HJ Berman has defined a “total revolution” as involving not only “the creation of new forms of government but also…new structures of law, as well as new visions of the community…and new sets of universal values and beliefs.”6 He also refers to the use of “illegal force exerted by individuals and groups against established authority.”7 Therefore, in considering whether Hitler’s consolidation of power during 1933-1934 constituted a legal

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7 ibid
revolution, it is necessary to assess whether it brought about fundamental changes to the values of the state and the political and legal systems similar to those that would have occurred through the use of illegal force, but did so by legal and democratic means.

Main Body

Constitutional Framework

In exploring whether Hitler's consolidation of power constituted a legal revolution, it is necessary to consider the existing legal framework within the context of the Weimar Constitution. The Constitution provided for democratic government, the independence of the judiciary, the rule of law and the protection of fundamental individual rights. Under Article 68, laws were proposed by members of the Reich government and passed by the Reichstag, and Article 76 provided that the Constitution could only be amended by a two-thirds majority of the Reichstag and Reichstrat. Article 102 specified that "judges are independent and subject only to the law," and Article 105 stated that "extraordinary courts are inadmissible." As regards the protection of individual rights, Article 109 provided that "all Germans are equal in front of the law" and Article 114 provided that "the rights of the individual are inviolable." In relation to religious freedom, Article 135 provided that "all Reich inhabitants enjoy full freedom of liberty and conscience." The Weimar Constitution therefore appears to have been a model for the protection of democracy and individual rights. However, many of the rights could be suspended by Article 48 which provided that "in case public safety is seriously threatened or disturbed, the Reich President may take the measures necessary to reestablish law and order..." As a result, the President had the power to rule by decree and to pass laws without the consent of the Reichstag. The Constitution therefore contained the seeds of its own destruction by enabling its own provisions to be used to undermine the key rights which it sought to protect.

Article 48 and the Enabling Act

The importance of Article 48 as a legal and democratic means to fundamentally change the values of the state was realised by Goebbels as early as 1928 who, in a speech as a Reichstag deputy, stated that: "We go into the Reichstag in order..."
acquire the weapons of democracy from its arsenal….We’ll take any legal means to revolutionise the existing situation.”¹⁶ This strategy was adopted by Hitler who, after having been appointed Chancellor on 30 January 1933, exploited the Reichstag Fire on 27 February 1933 by persuading President Hindenburg that the threat of a communist revolution constituted a state of emergency.¹⁷ Consequently, Hindenburg used Article 48 to pass the Decree for the Protection of the People and State, which “suspended civil liberties”¹⁸ as well as increasing the power of the state by enabling the Cabinet to take any necessary measures.¹⁹ Following the Reichstag election on 5 March 1933, in which the Nazis won 44% of the vote and joined with the National Conservative German People’s Party in order to obtain a majority by democratic means,²⁰ Hitler further consolidated his power legally by using President Hindenburg’s state of emergency to convince the Reichstag to pass The Enabling Act on 23 March 1933. The Enabling Act allowed Hitler to “pass budgets and promulgate laws, including those altering the constitution, for four years without parliamentary approval.”²¹ Similarly, the Act “made Hitler’s cabinet decrees the supreme law of the land”²² and so “removed any doubts the civil service or the judiciary had as to the legality of the Nazi take-over.”²³ The appointment of Hitler as Führer following the death of President Hindenburg on 2 August 1934 meant that Germany became a dictatorship, the Weimar Constitution had been fundamentally undermined, and the Reichstag had lost all its democratic power. As Michael Burleigh states: “The Reichstag no longer debated anything, since the only speaker was Hitler; the uniformed delegates were there to assent with enthusiasm.”²⁴ The passing of the Enabling Act was therefore one of the key legal means by which Hitler consolidated power and is central to the argument that the Nazi consolidation of power constituted a legal revolution.

Views of Commentators

Against this background, it is arguable that the Nazi consolidation of power was obtained by legal means. For example, A.J.P Taylor has argued that Hitler “destroy[ed] legality in Germany by legal means,”²⁵ which is consistent with the views of positivist legal theorist H.L.A Hart that “The existence of law is one thing; its merit or demerit another.”²⁶ When applying this principle to the Nazi legal system, Hart suggests that the legal system was valid despite the immoral nature of its laws and that no purpose is served by refusing to “recognise evil laws as valid for any purpose.”²⁷ The views of these two commentators suggest that the legal means used

²⁴ ibid
²⁷ ibid
by the Nazi party were valid and therefore that Hitler's consolidation of power did constitute a legal revolution.

**Other Legal Steps in Consolidating Power**

An important step in consolidating the Nazis' grip on power by legal means was the creation of the Gestapo by Goering on 26 April 1933.28 The Gestapo had the ability to “take any person into ‘protective custody’ and hold them indefinitely without any right to trial.”29 This enabled Hitler to deal with opponents rapidly and effectively by arresting anyone who disagreed with the Nazi Party's views. Similarly, the Law against Malicious Attacks on State and Party of 20 December 1934, 30 enabled the Nazis to imprison people if they spoke against the state. As Richard Lawrence Miller observes, these and similar legislative acts and decrees enabled “officials...[to] do almost anything they believed would promote the public good,”31 which allowed the Nazis to further consolidate their power using legal means.

The creation of the People’s Court on 24 April 193432 was a further way in which the Nazis used legal means to consolidate power and to ensure the prevalence of Nazi ideology by “exterminating... the enemies of the Third Reich.”33 The purpose of the Court “was not to dispense impartial justice,” but instead “to annihilate the enemies of National Socialism.”34 The Court sought to “try all cases of treason”35 and acted as a “task force for combatting and defeating all attacks on the external and internal security of the Reich.”36 The formation of the People’s Court was a key step in undermining the legal system and, in the absence of the Enabling Act, would have been a clear breach of Article 105 of the Weimar Constitution, which outlawed the use of extraordinary courts. However, due to the existence of the Enabling Act, the creation of the People's Court was technically a legal act assisting in the Nazis' consolidation of power.

The Nazis also used legislative acts and decrees to limit the freedom of lawyers to represent their clients and to undermine the independence of the judiciary.37 As Lord Bingham has emphasised, “a truly independent judiciary is one of the strongest safeguards against executive lawlessness; it thus becomes a victim of authoritarian governments.”38 The view expressed by President Leupolt of the Dresden Bar Association that “an attorney’s duty towards his client “is limited by his

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33 ibid
duties...towards society”\textsuperscript{39} epitomized the Nazi view that the legal system should operate according to the interests of the state and not the individual. The Civil Service Law of 1933 ruled that “judges whose political beliefs conflicted with Nazism lost their positions,”\textsuperscript{40} and “lawyers had to be members of the Nazi Lawyers Association”\textsuperscript{41} and to swear an oath of loyalty to Adolf Hitler. The German Civil Service Law of 26 January 1937 provided that “civil servants could be compulsorily retired if they could not be relied upon to support the State at all times.”\textsuperscript{42} These measures meant that “the judiciary was increasingly reduced to the status of a mere administrative agency of the Ministry,”\textsuperscript{43} with the result that the independence of the courts and therefore justice in Nazi Germany was completely undermined, further consolidating the Nazis' power through a range of apparently legal means.

Although the key anti-Semitic laws were adopted by the Nazis after 1934, including the “Law for the Protection of German Blood and German Honour,” passed on 15 September 1935 which provided that Jews “were now officially second-class citizens”\textsuperscript{44}, they were facilitated by the Enabling Act and completely undermined the Weimar Constitution and are therefore a relevant consideration. In particular Article 135, which provided that “Undisturbed practise of religion is guaranteed by the constitution and is placed under the protection of the state”\textsuperscript{45} was nullified by the Nazis' anti-Semitic legislation and led to the extreme revolutionary outcome of the Holocaust, again seemingly by legal means.

The Revolutionary Outcome

The outcome of the Nazis' consolidation of power through the ostensibly legal and democratic means summarised above was the emergence of a fascist, amoral state with values completely inconsistent with the Weimar Constitution. Ingo Müller, who is a former Law professor and official in the Justice Department of Bremen, states that “there was...no area of the law which National socialist ideas failed to permeate eventually...[all areas] were “fertilized” with Nazi legal thinking.”\textsuperscript{46} Although his book (translated from German) was published in 1991, a significant length of time after the Nazis came to power, Müller's legal background means that he is likely to have a greater legal insight than most historians into the validity of the Nazis' use of legal measures. The Nazi Party's use of legislative acts and decrees was an essential tool in fundamentally undermining the legal and political systems and obtaining complete control over Germany, in particular because it enabled them to persuade the German people that their actions were legal and should therefore be supported. In addition, by using apparently legal means, the Nazis were able to commit “the most

\textsuperscript{39} Müller, I., 1991. \textit{Hitler's Justice}. 1st ed. Harvard, USA: Harvard. Translated from German by Deborah Lucas Schneider, p. 64


\textsuperscript{41} ibid


\textsuperscript{43} ibid

\textsuperscript{44} Müller, I., 1991. \textit{Hitler's Justice}. Harvard: USA: Harvard. Translated from German by Schneider, D.L., p. 34


serious crimes up to and including political assassinations”\(^{47}\) whilst escaping punishment and justifying them as being in the “defence of the state.”\(^{48}\) As stated by F.L. Neumann, as a result of the Nazi consolidation of power, “German democracy committed suicide and was murdered at one and the same time.”\(^{49}\) It is therefore clear that the dramatic shift from the values of the Weimar constitution to a “gangster state”\(^{50}\) in a period of around two years was a revolutionary outcome. The evidence considered above suggests that this was achieved by legal and democratic means and could therefore be described as a legal revolution. This view is supported by A.J.P. Taylor and H.L.A. Hart.\(^{51}\) However, their views are arguably too narrow and do not consider Hitler's use of intimidation and violence at key moments in the legal and democratic process. In addition, it is important to consider the provenance of the sources: both A.J.P. Taylor and H.L.A. Hart were not German and Hart in particular, as a legal philosopher, does not refer to any historical works and relies upon other legal philosophers when commenting upon the Nazi legal system.\(^{52}\) Similarly, they do not consider the possibility that the key principles of legality (the separation of powers, the rule of law, non-retroactivity of legislation and the protection of individual rights) were so fundamentally undermined that Hitler's use of apparently legal measures was no more than a façade for criminality. These reasons as to why Hitler's consolidation of power cannot properly be described as a legal revolution are now discussed.

**Hitler's Use of Intimidation**

An obvious reason why the legality of Hitler's consolidation of power may be questioned is that violence in the form of pressure and intimidation were used in order to threaten citizens into supporting the Nazis at the Reichstag election. Similarly, the Nazis' use of violence to intimidate the members of the Reichstag into passing the Enabling Act shows that although the Act seemed legitimate, potentially illegal methods were used to gain the necessary majority for it to be passed. This view is supported by D.G. Williamson, who states that “the Enabling Law[']s... constitutional validity was debatable,”\(^{53}\) which casts real doubt on the legality of the Nazis' consolidation of power.

**The Undermining of the Separation of Powers**

A further reason why the legality of the Nazi consolidation of power may be doubted is because it undermined fundamental elements of the legal system. In many western democratic states, the separation of the three bodies of power: the legislature, the judiciary and the executive, constitutes a sensitive balance or “fundamental


\(^{51}\) See p. 5-6 above


which should be maintained if a state is to remain objective, just and impartial. Once the “intermingling of the Nazi party with the state” had been completed and Hitler vested all three sets of powers in himself as legislative leader and “Supreme Judge” of Germany, the key principles of legality including the separation of powers were undermined, with the consequence that the entire legal system was subverted. This is shown by the fact that “the SS police [began] increasingly to interfere in the judicial process itself [by] ignoring verdicts...or intervening to have the verdicts changed.” As a result, Germany became a police state whose legal system was twisted and perverted as the Nazis “emptied legal ritual of meaning” but kept the skeleton of the Weimar Constitution the same.

The Use of Retroactive Legislation

Hitler’s use of retroactive legislation, both by making his own past actions legal and by making previously legal actions of citizens illegal, was another way in which the principles of legality were so undermined that it may be doubted whether the Nazi consolidation of power can be described as a legal revolution. For example, the Law Concerning Measures for the Defence of the State was passed on 3 July 1934 “whereby Hitler legalized dozens of murders he had ordered...during the ‘Night of the Long Knives’”, when Hitler and the SS arrested and shot Ernst Röhm and other SA leaders, as well as 400 other SA members, who were perceived to be a threat to Hitler’s grip on power. Similarly, a decree passed in 1933 permitted capital punishment for various acts even though the acts had been legal at that time. The passing of these decrees was clearly inconsistent with the Weimar Constitution which states that “An action can only be punished if the action has been described as punishable by law, before the action was undertaken” as well as with the established Western democratic legal principle, nulla poena sine lege (no punishment without law). Franz L. Neumann, a German Law Professor who fled Nazi Germany in the 1930s, writing in 1937 stated in relation to retroactive Nazi laws that “Retroaction is the most evil assault which the law can commit....Retroaction deprives the law of its real legal character. A retroactive law is no law at all.” As is the case with I. Müller, F.L. Neumann’s legal background and German nationality suggest that he might be a more reliable legal commentator than some historians, such as D.G. Williamson who,

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59 ibid
60 ibid
although discussing the topic of a 'legal revolution', does not define the term. Conversely, Neumann considers the legality of the Nazis' key revolutionary measures by considering their impact upon the principles of legality. The fact that Neumann "reached intellectual maturity [in Germany] during the Weimar Republic's final, crisis-ridden years," and witnessed the Nazis' consolidation of power before fleeing Germany, emphasises the reliability of his essay as a source, particularly given that it was first published in 1937.

The Destruction of Individual Rights

Hitler's consolidation of power also undermined the constitutional protection of individual rights. The concept of the state being more important than the individual was the essence of Nazi ideology and became the overriding principle which applied across the legal system. As Führer, Hitler placed himself at the centre of the legal system, stating in a speech to the Reichstag on 23 March 1933 that "the nation rather than the individual must be regarded as the centre of legal concern." As R.L. Miller has stated, the "Nazis believed law was intended to protect the state," with the consequence that any person who did not act in the interests of the Nazi regime should be punished. Wilhelm Frick (Minister of the Interior) captured the Nazi belief when he stated "Everything which is useful for the nation is lawful, everything which harms it is unlawful." Through the pursuit of these ideological goals, the German legal system was moulded into a bureaucratic, unjust structure which forfeited the rights of the individual: "any doubts in a case must be settled in favour of the state." The following rights were undermined: "the freedom of the individual, the inviolability of the home from unwarranted search...freedom of speech and assembly...and even the right to own property," even though Articles 114 and 135 of the Constitution stated that "The rights of the individual are inviolable" and "All Reich inhabitants enjoy full freedom of liberty and conscience." As Hitler's destruction of individual rights was inconsistent with key provisions of the Constitution, the legality of the Nazi consolidation of power may be doubted.

A Veneer of Legality

Through the Nazis' destruction of the separation of powers and individual rights and by the use of retroactive legislation, all of which conflicted with the provisions of the Weimar Constitution, the legality of the Nazi revolution can reasonably be doubted, contrary to the view of A.J.P. Taylor. Whilst on the surface, Hitler was eager to

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make his actions legal and was “fastidious about following legal requirements,” his real objective was to deceive Germany and ultimately to consolidate power by constructing a “camouflage of legality.” As a result, Hitler was able to subvert the legal and political systems to Nazi ideology: it seems likely that at no point during 1933 - 1934 did the majority (or even a significant minority) of the German people realise that a revolution was taking place through the apparently legal means applied by the party. The construction of a “civilised veneer” of legality appeared so genuine that it “inhibit[ed]...and confuse[d]...all but the most clear–sighted opponents of the Nazi regime” and simply provided a “camouflage of legality.” This is consistent with the view reached by the Tribunal in the Nuremberg “Judges” trial that the Nazis engaged in “the prostitution of a judicial system for the accomplishment of criminal aims.” Moreover, Hart's positivist view that whatever legislation passed by Hitler was “valid” is arguably too narrow; it is important to consider the fact that the core legal principles and values of the Weimar Constitution were fundamentally undermined. F.L. Neumann states that “...if the leader can have political foes killed without legal trial...then one can no longer speak of law in a specific sense.” This view is supported by Brian Bix who states that the rules of the Nazi regime were “so evil and procedurally flawed that the rules of the regime did not create moral obligations to obey them, in the way such rules do in just regimes.” Therefore, when considered in light of the values of Western democratic states, it is difficult to conclude that Hitler's consolidation of power and its associated revolutionary outcomes, was achieved by legal means.

**Conclusion**

Whilst it is clear that in consolidating power during 1933-1934 Hitler produced a revolutionary outcome in that he became supreme leader of Germany and overthrew the existing legal and political systems, thereby creating an amoral and fascist state, it is questionable that he did so by legal means. A.J.P. Taylor's analysis that Hitler “‘destroy[ed] legality in Germany by legal means’” places too much emphasis on the claimed constitutional validity of the Enabling Act pursuant to Article 48 of the Weimar Constitution and makes insufficient reference to the destruction of the principles of legality. In this respect, the view of F. Neumann is more accurate, that “German democracy committed suicide and was murdered at one and the same time.” Not only was the validity of the Enabling Act debatable, but the Nazis'
legislative acts and decrees undermined the fundamental principles of the Weimar Constitution. These include the separation of powers, the rule of law, non-retroactivity of legislation and the protection of individual rights. As a consequence, Hitler's consolidation of power cannot be described as a *legal* revolution as the Nazis wished the German people to believe. A potential further area of research would be to examine the judgments of the Nuremberg Tribunals which considered the defences of legality put forward by the Nazis who were charged with war crimes. The focus of this essay on Hitler's consolidation of power during 1933-1934 limited the scope of potential research; however, it seems likely that the Nuremberg judgments may have provided a useful primary source supporting the view that many Nazi legislative acts and decrees were invalid.
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To what extent are acts of individual rebellion necessary for social progress?
Emma Rixhon – Philosophy

When choosing what to write my Extended Essay on, I had initially been interested by the extent to which individuals – people willing to step out of the norm of their contextual society – affected the growth and development of a society and its culture. This however proved to be much too broad a topic to tackle and with the support of my Extended Essay supervisor and JS Mill’s *On Liberty*, I narrowed my attention down to individual acts of rebellion and their influence on social progress. By comparing Mill’s high regard for individuals, whom he calls ‘geniuses’, with contrasting and complementary views from the likes of Camus, Nietzsche, and Marx, I explored how individuals and their rebellions can lead to positive social change. Though I never reached a conclusive answer to my essay question, I perused various philosophical thinkers and their essays which had reflected on its various implications. I thoroughly enjoyed researching the topic and then arranging my reflections into a somewhat cohesive argument, as well as the challenge of deciding exactly what, and in what way, to write about in the subject of my choice.

Supervisor: Andy Waldron

Emma addresses a particularly urgent question that is familiar to students of political philosophy: what exactly is our obligation to ourselves, and how much do we owe to our society? Emma’s essay is unusual in that she combines two very different approaches – the Victorian liberalism of JS Mill, and the existentialism of Camus and Nietzsche. Both are concerned with the role of the solitary, exceptional individual and the impact such individuals have upon society, and Emma uses the essay to clarify these concepts of individualism and rebellion in perhaps unexpected ways. The essay therefore offers a conceptual model which allows us to understand modern acts of rebellion – from Rosa Parks to the naked rambler – as effective but not necessary conditions for social progress.
Abstract
The research question I chose for my Extended Essay in Philosophy is “To what extent are acts of individual rebellion necessary for social progress?” Mill argues that individuals are the building blocks of society, and therefore each person should flourish in order for their society to do so. He also claims that we need higher individuals, geniuses, to think and act against the norm in order to develop our society. Camus emphasizes the importance of individual rebels to further social progress, however also introduces the possibility of rebellion as an undermining of “the very conception of the individual.” This leads to the Communitarian idea of the community as a whole being more important than the individuals who form it. The greatest argument for Communitarianism is that people define themselves and are conditioned by the society they live in. This means that individual acts of rebellion cannot spring from nowhere, and therefore may not even be necessary as gradual reformation may take place. However, historically there have been individual rebellions at the forefront of each social development. The most that can be confidently said of these acts is that they are catalysts for social improvement. However, individuality or a sense of identity other than solely being a functioning part of society must be present for one to bring about social progress. The implication of this conclusion is that what is necessary for development is not individual acts of rebellion rather than a prominent sense of self-worth in individual members of society.
Introduction

Societies and their ideals change radically over time, usually in a primarily positive manner. These changes however cannot arise out of nowhere, therefore there must be fundamental reasons for social progress. Social progress is a loose term that can range from any improvement in society whether it be economic, educational, health, or regarding civil rights. For the sake of this essay, I will focus on how far individual acts of rebellion are necessary for social progress directly attributed to civil rights and the acceptance of all people. Comparing Mill’s adamant attribution to individuals’ importance in society, Camus’ somewhat contrasting attitudes to rebels’ need for self-importance, and Marx’s rejection of the importance of the individual leads to the conclusion that individual acts of rebellion are neither necessary nor sufficient for social progress, though they are historically present in every civil rights movement and the individual rebels involved are undeniably the catalysts of progress.

In order to be able to use the term rebellion with clarity, it must be defined. For the purpose of this argument, rebelling will be considered as conscientiously acting or speaking out against the norm in order to generate a change in one’s society’s actions or attitude which one is dissatisfied with. This means that solely breaking the rules for the sake of it or any act of mundane teenage rebellion are not considered as rebellions in the same sense of the term. It is simple to break a rule because one doesn’t agree with it, or because one simply doesn’t care to follow it, but this cannot be regarded as the same action as those who earnestly refuse to conform because they want to see a change in their society. In Camus’ text, the term rebel is assigned to a man who “think[s] for himself”¹ as opposed to a person who is a slave to their society. Mill refers to these non-conformist beings as “exceptional individuals”² throughout his text.
Throughout this essay, both the terms rebel and individual will be somewhat interchangeable.

The Liberal View

Mill goes as far as romanticizing the necessity of individuals within a society when he writes about geniuses as rare beings who along with their close environment must be nurtured in order to preserve and cultivate their brilliance. He declares these geniuses to be the ultimate individuals, and that they are incapable of fitting into societal norms. These extreme original beings however need not fit into society, as their existence would struggle to be comfortable in the moulds of the generic mass. If they shut down when forced into a mould, they will lose their precious genius; if they fight back and break the mould, they will be considered uncontrollable, “erratic”, and therefore unfit for society. Their brilliance therefore must be admired and taken for what it is, without a desire to fit it them into society.

Mill directly claims that there are only a few individuals whose ideals could lead to social progress when writing that “there are but few persons... whose experiments, if adopted by others, would be likely to be any improvement on established practice.” These extraordinary individuals may be the geniuses that Mill otherwise mentions. What separates these individuals from others is that their theories would not simply change society, as this can be somewhat done by anyone with intelligence or power, but would develop it further. In order to bring about a positive change to society, one cannot be a static follower of the “established practices,” as going along with these fully implies an acceptance of them. Once one blindly accepts the social norms, it is impossible to consider why one would want to break or change them, let alone go about doing so. Original people are therefore necessary for the growth of society as a means to avoid civilization ever becoming “a stagnant pool.” These original individuals

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3 ibid. p74
4 ibid. p74
5 Mill, JS. 2006 p73
6 ibid. p73
are the only ones who can inform the herd-people of the inadequacies of society, and bring about a positive revolution. However, Mill emphasizes that there are few persons whose experiments would be improvements on society; there are therefore a whole other number of individuals whose views would result in social regression, or possibly stagnation. The actions of these key individuals are not focused on however, and it is the presence of their original ideas which Mill admires.

However the importance of individuals is not only reserved to those with originality. As Mill believes society should primarily be viewed as an entity made up of humans acting as individual building blocks, it follows that "when there is more life in the units there is more in the mass which is composed of them." This means that each person must flourish in order to bring about a greater flourishing to their society. The threat however is that "individuals are lost in the crowd" and that society enforces so much emphasis on the majority’s view that individual people and minorities become insignificant. The majority is viewed as "the public" and their opinion is frequently considered the right one. By bestowing power on to the greatest number of agreeing individuals, we are simply giving the power to the people who fit into the current mould of society. These people who fit simply into the mould cannot therefore be the geniuses and original individuals who inspire social progress, and are simply a “collective mediocrity.” This ties in to Nietzsche’s ideas as the philosopher named all followers of society “herd-men” just as sheep are in herds, humans flock together when they blindly follow their society. His choice of the word “herd” also implies that the non-individual members of society have a level of consciousness closer to animals than the individuals. Nietzsche also writes that “the herd-man in Europe today makes himself out to be the only permissible kind of man” saying that these herd-men admire peaceful, calm, and agreeable people rather than those who outwardly rebel. There is a direct correlation with

7 ibid. p72
8 ibid. p75
9 ibid. p75
10 Tanner, M. 2000 p40
11 Tanner, M. 2000 p40
Mill’s view that “originality is the one thing which unoriginal minds cannot feel the use of.” This reinforces the point that only original individuals can bring about more individuality, and consequently more progress to society, as they are the only ones who feel the importance of it. The unoriginal units of society are content with following the mass, whereas the individuals want a breakthrough. Nietzsche continues to write in direct agreement with Mill when declaring that governments are only an “adding-together of clever herd-men.” This also means that governments can be made up solely of unoriginal minds who consent to the way their society is. For fear that Mill’s exceptional individuals find themselves entering mediocrity, they “should be encouraged” even by the general mass to keep their originality in order that they may bring about a certain change. In this case, it is not individual acts of rebellion that are key to social progress, but individual people who can bring about an awareness of society’s need to improve.

The Existentialist View

Albert Camus, the absurdist philosopher and Nobel Prize winner, writes in *The Rebel* an essay on human revolution and greatly concurs with Mill’s view that individuals are responsible for social progress. Camus defines these individuals as rebels rather than geniuses and therefore their progressive acts are rebellions. The importance of self-worth and originality are explored throughout as necessary to rebellion however he contradicts himself when writing, “rebellion… undermines the very conception of the individual.” Since a rebel may die when acting out against the mass, there is a possibility that they will be condemned or persecuted for their ideas, and therefore they act in sacrifice for the greater good. This would seem to place rebellion as a communitarian action rather than an individualistic one, and though it seems an incongruous argument in relation to the rest of *The Rebel*, this passage introduces the possibility of communitarian social progress, which Mill

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12 Mill, JS. 2006 p74
13 Tanner, M. 2000 p41
14 Mill, JS. 2006 p76
15 Camus, A. 1971 p21
completely disregards. Communitarianism is the idea that society as a whole needs to be at the centre of our concern rather than the individuals who form it. Individuals are therefore not building blocks or units of society rather than an interlinked mass whose relationships form society. Marx agreed with this theory, and claimed that humans could only be seen as labourers whose efforts benefitted society. Therefore, it may be possible that social progress cannot be attributed to acts of individual rebellion rather than to a series of events deeply engrained in humans’ desire to promote the good of their community.

Stephen Gough, more commonly known as the Naked Rambler, has been imprisoned over twenty times due to his choice to not wear clothes. However, he continues to walk nude in public and carries on being fined and imprisoned for indecency because he believes it is a human right to be naked. Whether or not public nudity is a human right, Gough definitely experiences “revulsion at the infringement of his rights [and] complete and spontaneous loyalty to certain aspects of himself.”16 Camus claims that this is present in every act of rebellion, meaning that each rebellious act implies a strong sense of self-worth in the rebel. They are not acting out of concern for someone else’s rights, but because they feel their own have been breached. In this case, a strong sense of individualism is also required in order to rebel, as one who blindly follows the crowd will not see their importance as any greater than that of another member of the crowd’s, nor will they desire to see a change in their treatment. In addition to being a clear example of Camus’ notion of rebellion, Gough’s naked rambling brings up a flaw in Mill’s argument. Throughout *On Liberty*, Mill advocates allowing people to act freely as long as they do not harm others. However, he also declares, “There are many acts which, being directly injurious only to the agents themselves, ought not to be legally interdicted, but which, if done publicly, are a violation of good manners, and coming thus within the category of offences against others, may rightly be prohibited.”17 Discreet as he is, it is clear Mill is writing about ideas such as the difference between marital sex at home and say, having sex in public. Though this may make others uncomfortable, it comes in no way closer to

16 Camus, A. 1971 p19
17 Mill, JS. 2006 p110-111
harming them than free speech may. In addition, racist, misogynist, or homophobic insults may well be “a violation of good manners” yet Mill is not at all opposed to them. In other words, Mill is adopting here a Victorian attitude towards public indecency, which isn’t in keeping with the rest of his text. Regardless of Mill’s judgements, Gough can be viewed as a successful individual who has increased awareness of human body rights, and would therefore be seen as a rebel by Camus. However he does not fulfil the criteria of having brought about social change, as the attitude towards public nudity has not developed greatly since his involvement. On the other hand, if the government ever approved of his theories and the general public embraced them, we would undeniably attribute to him some sense of liberating revolution.

The idea that it is the masses that determine the success of a revolution brings about a further point. There are many individuals who believe their ideas to be progressive and ameliorative for society, yet are generally agreed upon to be wrong. This poses a problem though: as all rebels will meet against opposition, what criterion can we apply to decide who is rebelling for a good cause and who is rebelling for a bad cause? Rebellions which occurred in the past demanding rights for women, homosexuals, and other minorities are now praised because we have evolved as a society to accept that gender, sexuality, and the colour of skin should not define us as lesser or greater beings. Though this view is still not held by all, it is undeniable that it is infinitely more widespread amongst our societies today than even eighty years ago. Nevertheless, there have been individuals with a strong indignation against certain states of affairs who have not successfully rebelled. Donatien Alphonse François, the Marquis of Sade, was a revolutionary Frenchman who believed in extreme freedom of choice. He was strongly inclined towards violence and criminality, and wrote many philosophical texts entwined with violent eroticism. However, his views were not popular and he was settled in an insane asylum for much of his life. The success of certain individualist rebellions and failures of others brings about the problem not of the importance of the rebel, but of the society around them. Social progress happens not only when one speaks out against an injustice, but when the society concerned is ready to make the change.
For example, gay marriage has only been approved legally in England this year, which is a revolutionary act in itself, but the build-up to this decision has taken dozens of years. This decision is not only social progress in itself, but evidence that there is a general progress in society’s view towards homosexuals – therefore social progress must be a gradual process and not limited to one definitive action. The individual rebels can only succeed when there is a larger general consensus for their actions; Gandhi was the figurehead of the movement for India’s independence, but he was not acting as a radical individual, rather he was voicing the opinion of his oppressed people.

The Communitarian View

Gandhi’s willingness to sacrifice himself for the good of his people can be seen as a communitarian act. Communitarianism is the ideology that accentuates the importance of communities and an individual’s relationship to their community rather than individuality and individual flourishing. Contrary to Mill’s individualist notion that each person is defined by their individuality, communitarians believe that humans are defined by their relationships to other people. The greatest benefit to communitarianism is that by biological human nature, we are social beings and therefore it would make sense that our identities are intrinsically linked to our relationships with others and our society. Julian Baggini writes, “In some weak sense, most people, liberals included, accept that we are all “situated selves”, products of time and place.”¹⁸ This statement ties with the previously mentioned idea that social progress cannot rely solely on strong individual minds, but also the readiness of the society they belong to. Social progress has never been attributed to solely one person, the American civil rights movement has leaders such as Martin Luther King Jr., Rosa Parks, and Malcolm X – all of whom had radically different ideals and strategies but were part of the same movement. Other than Parks, who may have simply wanted a seat on the bus, these three people definitely acted for the greater good of their community rather than solely for their own rights. The combination of what Camus describes as “a feeling of revulsion at the

¹⁸ Baggini, J. 2011
infringement of his rights” and the loyalty to others in one’s community seem to be the necessary factors in successful rebellion. This means that a combination of strong self-importance and communitarian loyalty need to be present in order for social progress to ensue. However, since communitarianism dismisses the importance of an individual’s self-worth and originality, it cannot attribute any social progress to individuals’ actions or original thoughts.

If a more radical approach is applied to the theories of communitarianism, they quickly develop into communist ideas. Communists believe that each person making up their society is not important in themselves but as a unit of labour which can benefit the society as a whole. Marx held the view that a strong sense of individuality would not only be unnecessary to social progress, but furthermore be counter-productive. He believed that individuals should be more concerned with the flourishing of their society than their own personal freedom. A society made up of individuals concerned with their own success and liberty rather than that of the community as a whole would only “encourage each individual to view others as limitations to his or her freedom.” According to Marx, a liberal individualist society would degenerate into an egotistical collection of individuals, rather than progress or benefit from each individual’s flourishing. These individuals would end up oppressing each other as a mode of increasing the possibility of their own liberty, as they would only see each other as competition. The only way in which nobody would be threatened by a competitor would be where everyone was viewed as equal. Therefore a truly liberated society would be one where all the individuals function and view themselves as “fully co-operating members of a community of equals.” This would enable people to work together to progress rather than work against each other, resulting in a more efficient society.

Although rebellion seems impossible as a means of progress in a society of equals working for each other, Camus mentions the idea of a community-
focused rebellion. He writes that rebellion “undermines the very conception of the individual”\(^{22}\) by placing greater importance on the progress of the community than on the life of the individual. However, this is only the case when society is viewed as a collection of communities, and not as a large community in itself. If one rebels in a liberal country still very aware of communities determined, for example, by ethnicity, gender, or sexuality, a self-sacrificing rebel would still be able to be viewed as communitarian. They would not be rebelling simply for their own personal rights, but for the rights of everyone in their community, and therefore a loyalty to their community is more important than a sense of self-worth. However, if an individual rebelled in a communist country, where everyone truly is viewed as equal and simply valued for their labour, they would be seen largely as counter-productive for the progress and efficiency of the society. In a way, a communist society can be seen as a machine and the people who make it up are simply cogs and nails that permit it to function. The importance of each cog is that it is there and does its designated job, not that it fulfils itself and its desires, as it simply needs to support the engine as a whole. One who attempts to rebel in a society where the community is placed before the individual is seen as a threat to the functioning of the machine, and therefore must be gotten rid of. This means that within a society where equality is emphasized, rebellion would be an unsuitable means of gaining social progress. Individual acts of rebellion are not needed in order to pursue social progress in a non-liberal society, nor can they provide the sort of social progress that is valued in one. The social progress that is valued in fully community-focused society is the success of society as a whole, and therefore arguing with the general population is not desirable. Ideally, harmony and total acceptance of each other and the society is the ultimate social goal, and further progress is not necessary.

However, in practice, societies that have valued the community as a whole as more important than the individuals who made it up have become far more oppressive than liberal societies. Rather than each individual being motivated to succeed for their own personal gain and therefore ameliorating society

\(^{22}\) Camus, A. 1971 p21
indirectly, as Mill suggests, people are viewed as a collective unit with worth only being attributed to what they produce as a whole. When people’s achievements are measured by their success as a collective group and not by each individual’s success, people’s self-worth decreases. Some people may work more than others, and rather than receiving more rewards, they receive the same amount as a person who may work much less than them. This leads to motivation decreasing over time and therefore society degrading as a whole. On the other hand, if everybody continually works at the same level and for the same gain, the society may be efficient economically, but there is no possibility of pride or flourishing. The whole community ends up being made up of herd-men who simply follow their duty but have no individual motivation. This may result in a successful society when it comes to productivity and equal rights for all, though in no way can it be said to be one where humans are actually valued. In this case, not only does a communitarian or communist approach to individual acts of rebellion not lead to social progress, it also completely disregards the possibility of any development inspired by an individual mind.

Conclusion

In determining to what extent acts of individual rebellion are necessary for social progress, it is important to note that there have been acts of individual rebellion at the forefront of each civil rights and independence movement. Rosa Parks’ refusal to stand up for a white man in a bus is an example of this, just as Gandhi’s hunger strikes and Emmeline Pankhurst’s suffragette speeches are. However, these individual acts did not directly result in any progress, rather they provided a foundation to inspire more aware members of the masses to act. Mill valued geniuses as those who would provide the ideas for social improvement, not necessarily as those who would undertake it. Following with this, the individual acts of rebellion were incitements to lead others into action. Parks, Gandhi, Pankhurst, and other figureheads of civil rights movements are the geniuses who inspired the further action and progress that were available to society through its gradual acceptance of their ideas. For this reason, it is undeniable that revolutionary individuals are limited by the society
they belong to and its willingness to progress. This means that the specific progress the rebel is hoping to attain must already be a concern of the society they belong to in order for the rebellion to be successful. If individual acts of rebellion do not directly result in social progress, and they require a certain prior acceptance from their society, then it is impossible to say that they are either necessary or sufficient for social progress. The most that can be confidently said of these acts is that they are catalysts for social improvement. However, individuality or a sense of identity other than solely being a functioning part of society must be present for one to bring about social progress. The implication of this conclusion is that what is necessary for development is not individual acts of rebellion rather than a prominent sense of self-worth in individual members of society.

Nevertheless, according to Rousseau’s General Will “a sense of common interest”23 is necessary for the development of society as it facilitates the government to act for the good of “the community of citizens”24. In this way, a society of herd-men is positive as it enables the government to further their development in a way which supports the grand majority of people. This is only possible in a population which has conformists desiring the same goals for their society, and therefore may be an adequate counter-argument for individualism, where governments are struggling to satisfy multiple individuals’ demands for progress. Kierkegaard, however, refutes this concept by declaring that “the crowd is untruth”25, meaning that individual truthful thought can only be true in its individuality. As soon as truth is brought into a group, even by individuals who each “possess the truth in private”,26 it is turned into untruth by giving the inauthenticity of collaboration importance. This would mean that social change brought about in any way other than individual rebellion would be inauthentic, as it would be fuelled by “untruth”. Furthermore, this suggests that progress, possibly getting closer to the truth, needs to be an organic process individually.

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23 Foisneau, L. 2010
24 ibid.
25 Kierkegaard, S.
26 ibid.
achieved by each person, rather than something possible through society's gradual change.

Bibliography


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