



Faculty of Science and Technology

A Comparative Analysis between the United Kingdom against
the United States of America exploring the influence of
Forensic Evidence in Homicide Convictions.

A dissertation submitted as part of the requirement for BSc
Forensic Biology.

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Friday 26th May 2023

ABSTRACT

This investigation critically analyses the use of forensic evidence when applied to a criminal conviction and provides a recommendation for further exploration to be made. Analysis has been undertaken using a broad range of methods, both quantitative and qualitative. This Independent Research Project provides an understanding and awareness of the influence that forensic evidence has on homicide conviction rates by detecting trends and preferences in the results produced.

Individual case studies were analysed and compared to provide an insight into specific pieces of evidence which a consistently used to gain a conviction. This is achieved by sampling 50 distinct cases in both the United Kingdom and the United States of America. Exploration into the results of this provided further discussion as to whether the quantity of evidence also impacts a conviction. Statical analysis was conducted alongside individual cases to consider if patterns could be established against time and population.

The results produced together with further analysis conclude that forensic evidence provides a significant role in homicide convictions. However, it also demonstrates areas of improvement for sampling and presentation methods of forensic evidence. DNA is considered the “gold standard” of evidence at a crime scene and should be the future focus of advancement and developments for forensic science resulting in increased confidence and accuracy in its field. Differences between the relationship of recorded homicides and conviction rates were observed in both the United Kingdom and United States of America, alongside external influences beyond the control of forensics.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank my Unit Leader Samuel Rennie for his continued support throughout my final year, in particular, with my dissertation. He has been available to respond to my questions and queries, along with going above and beyond to guide and advise me throughout testing times.

I would also like to thank my Supervisor Sally Reynolds for keeping me focused on my goals and allowing me to explore the occasional “Rabbit Hole” before steering me back in the right direction. The completion of this dissertation would have not been possible without her, this is something I am entirely grateful for.

I also want to pay an acknowledgement to Nuffield Health Hospital for allowing me to prioritise my education and complete my work, most specifically my manager Jenny Dickens. I would not have been able to finish this without her support and flexibility.

I think it goes without saying that I would like to thank my family and friends for their ongoing support and sacrifices to ensure I remained motivated. They have been the greatest support system for the past four years, especially being so far from home, and during a worldwide pandemic.

Finally, I want to express my gratitude to my boyfriend Luke, who has been my emotional support throughout this journey, I would not have been able to finish this year without you.

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1.0 INTRODUCTION

1.1 Aim

The primary aim of this project is to explore the relationship between Forensic Evidence and Criminal Conviction rates in the United Kingdom, whilst evaluating the outcomes against the United States of America.

1.2 Objectives

The main objectives of this project are as follows:

1. To investigate any classification of evidence that, when used during Criminal Proceedings leads to a Homicide Conviction.
2. To measure whether the amount of Forensic Evidence introduced during Criminal Proceedings influences the Conviction Rate.
3. To establish any pre-existing patterns of Forensic evidence used in Criminal Convictions.
4. To consider the effects external factors may have on Homicide Conviction Rates.
5. To determine if findings of the results can be applied to the United States of America.

1.3 Research Questions

The questions this project aims to answer are as follows:

- 1.3.1 Research Question One: Are specific categories of Forensic Evidence found to exhibit higher levels of consistency when used in Court to gain a Criminal Conviction?
- 1.3.2 Research Question Two: Does confidence in a Criminal Conviction increase when multiple pieces of Forensic Evidence are used in Court?
- 1.3.3 Research Question Three: Has the continuing influence of Forensic Accountability affected the rate of Homicide Criminal Convictions?
- 1.3.4 Research Question Four: Can patterns determined from the results yielded by the United Kingdom be applied to the United States of America?

1.4 Hypotheses

Hypotheses have been developed in response to the research questions based on pre-existing literature and information.

1.4.1 Hypothesis One

When available, DNA and Biological evidence will be the most common evidence used during Criminal Proceedings.

1.4.1.1 Justification for Hypothesis One

The founding principle of Forensic Science is that every contact leaves a trace and when there is a point of contact between two elements there will be an exchange of material (Watts, D., 2023).

When applying this principle to Homicide, a perpetrator will leave something with the victim, and vice versa. Moreover, research into comparing DNA evidence against other modes evidence shows that DNA is 2.6 times for likely to lead to a Criminal Conviction than Fingerprints (Clancy, D. and Bull, R., 2014).

1.4.2 Hypothesis Two

A consistent increase will be apparent in Conviction Rate which will reflect the introduction of additional pieces of evidence. This increase will be most significant when a second quantity of evidence is introduced.

1.4.2.1 Justification for Hypothesis Two

Bayes' Theorem is the mathematical formula for determining the probability of an outcome, based on previous conclusion (Hayes, A., 2022). Previous research has utilised this theory to the probability that increasing the quantity of evidence will improve the likelihood of a Criminal Conviction.

A study into this theory has determined that the strength of evidence does increase the probability that a defendant is guilty, thus resulting in a Criminal Conviction

(Satake, E. and Murray, A., 2014). It supports the model that the outcome of Conviction will fluctuate based on the strength and quantity of evidence.

1.4.3 Hypothesis Three

Forensic Accountability will demonstrate a positive effect on Conviction Rate as time progresses. There will be specific external factors that will influence the level of accountability in Forensics' when used as a measure of conviction rate.

1.4.3.1 Justification for Hypothesis Three

An exploration into Forensic Accountability has produced results concluding that public confidence and consequently, a Juror's confidence to convict a defendant is contingent with the creditability of the Forensic Services used (Chin, J. and Ibaviosa, C., 2022).

When considering external factors that may influence the accountability level in Forensics it is important to consider the effect of Coronavirus. The Nationwide Lockdown in March 2020 has been reported to have a result on the Homicide Rate in the United Kingdom, and consequently due to the adapted way of working, had a further influence in the number of Homicides resulting in a Criminal Conviction (AbiNader et al. 2022).

The disbanding of the Forensic Science Service has been an area of controversy since 2012. Research into Forensic providers has shown that there is room for improvement in the effectiveness of such services (Maguire et al. 2012). This research will demonstrate an effect on the level of Forensic Accountability.

1.4.4 Hypothesis Four

Reflective trends in the results shown in the United Kingdom that will also be demonstrated in the United States of America. However, there will be external factors which will influence specific trends due to differences with in the two countries.

1.4.4.1 Justification for Hypothesis Four

By choosing the United States of America as a comparative factor to the United Kingdom due to similar Political, Economic and Scientific understandings, it is anticipated that the methodology will produce parallel results. Exploration into comparing such systems have publicised that both countries share the same approach to Scientific Procedure and Criminal Justice (Edmond, G., 2016). However, there are cultural and structural differences that are known to have a profound effect on the outcome that Forensic Science has on the Criminal Justice System.

2.0 BACKGROUND

2.1 History of Forensics

The first initial recording of forensic evidence was introduced in the United Kingdom in 1784, when a murder weapon wrapped in newspaper clippings matched the clippings found in the pocket of the perpetrator (Alibi., 2023). Since this documented event, the use of forensic evidence has continued to advance and evolve in accordance with scientific innovation.

A discovery was made in 1901 following the identification of latent fingerprints left at crime scenes (Leadbetter, M.J., 2005). This allowed police forces to consider the influence that forensic evidence has. The development of fingerprints as evidence has continued to progress and in 2001 a new standard was introduced to aid in identification which centred around fingerprints.

The establishment of blood grouping in 1915 was just the beginning. Advances in scientific testing allowed for DNA to be obtained from blood, bone, hair, saliva, and semen (EasyDNA., 2022). A standard for genetic testing was developed in the 1970's and applications of this were utilised by Dr. Alec Jefferys.

In 1991, the Forensic Science Service (FSS) was introduced, a government owned body which acted as a central hub for practitioners to continue to develop their skills and further educations (Alibi., 2023). The aim of the FSS was to ensure consistency in the collection, sampling, and analysis of forensic evidence. The introduction of this service accredited and regulated laboratories that followed protocol to guarantee consistency, and sanctioned laboratories that did not.

2.2. Arguments Against the Use of Forensics

Forensic evidence has long been considered a significant contribution to a criminal investigation. However, there is an increasing body of literature on the validity of

forensic evidence through methodological validity and its execution throughout criminal proceedings.

Criminal laboratories historically have not been required to meet standards (Haber, R.N. and Haber, L., 2013). A large proportion of laboratories have been involved in misconduct scandals, which inventively has long- term consequences on the accuracy and validity of future results. After the closure of the Forensic Science Service in 2012, a growing concern has been made about the regulation of laboratories. The question to be considered is the value of cost and ethics behind the lack of regulation, and the introduction of private laboratories and analysis companies.

Previous exploration of DNA evidence in homicide investigations has detected a decline in the relationship between evidence and conviction (Houck, M., 2019). When observing the progression of forensic evidence since its introduction, science continues to make advances, and so analysis and sampling methods should reflect these advances. A similar evaluation has been made in individual cases. When an error in results is noted, the resolution of this mistake is to simply rectify it. The concern with this is that no effort is made to correct the protocol, equipment or system that may have instigated this mistake.

There is a sufficient argument against cognitive bias in laboratory testing of forensic evidence. Scientists are provided with background information about the crime scene, victim, and possible perpetrator. The drawback from this extraneous information is that assumptions can be made which can ultimately affect how analysis is made (Ryan, M., 2001). An element of confirmatory bias can be present, without knowledge or intent. A forensic scientist may choose to focus on sampling resulting in positive identification, rather than contradicting evidence. The central issue of this is wrongful convictions are based on subjective data. An existing piece of literature supporting the argument against the use of forensic evidence examined that 63% of all wrongful convictions were associated with errors made in forensic analysis (Morgan, J., 2023).

2.3 Conclusion

The accuracy of forensic evidence in court is a subject that is relentlessly discussed within both a professional, and public standpoint. Without a continuing authority to regulate the standard and qualifications of those in the forensic profession, the margins of accuracy will continue to vary between individual laboratories and continue to raise concerns surrounding its practical application in convictions. Additionally, relationship between the police and forensic scientists has been known to question the accuracy of evidence analysis. The unconscious effect of cognitive bias also plays an integral role of the argument against the use of forensics in legal applications.

3.0 METHODOLOGY

3.1 Overview of Experimental Design

The principle of this research is concentrating on the influence that forensic evidence has on convictions, this requires secondary data to be the primary source of the investigations. Secondary data is research that has previously been collected for a different purpose but exists in a universal context (NCVO., 2021).

Within the data collection, there are two distinct subcategories of data, quantitative and qualitative. Quantitative data consists of data in numerical form, statistics, or measurements, whilst qualitative data is research that contains written text and analysis (Punch, F., 1998). Qualitative data is known to be much more diverse than quantitative data, However, it is significant to mention that a marked increase has been noted in mixed method research.

The objectives and research questions which highlight the purpose of this study, mention “Homicide” throughout. The experimental design of this research has defined the definition of Homicide to include First- and Second-Degree Murder, Voluntary Manslaughter, and Infanticide. The primary focus of case studies is emphasised on Single Acts of Killing. The interpretation of this definition is that each event results in one Homicide, with one victim.

For an act to be considered Murder, both *Actus Reus* and *Mens Rea* must be established. *Actus Reus* is the act of unlawfully killing another person, whilst *Mens Rea* is the intention behind this act (Monaghan, N., 2020). The distinction between First- and Second-Degree Murder is that First Degree Murder displays a clear intention to kill, whereas although Second Degree Murder does display intention, the *Mens Rea* behind this act can present an intention to cause serious injury yet is aware of the risk of potentially causing death (Monaghan, N., 2020).

Voluntary Manslaughter reflects the same definition as Murder with both *Actus Reus* and *Mens Rea* recognised. However, a partial defence can be exercised in Court to reduce the seriousness of the offence.

Infanticide bears the same classification as Murder but is a definition that is specific to a mother killing her child, who is under 1 year of age (Infanticide Act., 1938). *The Actus Reus* will be proved in its Conviction. However, the presence of *Mens Rea*, an Omission to care, or a disturbance to the mother presents its difference between Murder and Manslaughter.

A sample size of 50 Cases was chosen to fulfil the results for Research Question One and Two. Researching less than 50 cases triggers a risk of results not accurately reflecting the wider population, which causes an additional risk of making conclusions that are unable to be generalised. 50 cases satisfy a sample that can be applied to a wider audience, whilst considering the practical time allowances made for the gathering of research.

To ensure continuity, when measuring the effect the Forensic Accountability has throughout time, a period of 50 years was chosen. Statistical Analysis was chosen over 50 years to account for long-term patterns to be observed. This also presents changes that occur throughout generations and monitors the developments made to Forensic Analysis from 1970 to the present day.

3.2 Data Collection Methods

Within this scope of research, multiple approaches were taken to accumulate the data collection. The Advantages and Disadvantages of each approach are displayed in Table 1.

Table 1. The Advantages and Disadvantages of chosen data collection methods

Method of Data Collection	Advantages	Disadvantages
Case Studies	<ul style="list-style-type: none"> - Case studies are detailed and comprehensive data. - Provides an in-depth exploration of the chosen topic. This allows for deep qualitative analysis. - Offers a practical application for future investigations in a specific area that can be further applied to a wider audience. - Exhibits any previous research already conducted in the specific area needed. 	<ul style="list-style-type: none"> - Time consuming; as Case Studies are qualitative data, reading and understanding the findings can cause time constraints. - Studies are normally constructed by an individual or a group of individuals with a similar goal. This can lead to researcher bias as the information can be manipulated to match the goal of the study. - Not easily replicated
Court Transcripts	<ul style="list-style-type: none"> - Reliable record of Criminal Proceedings throughout a Trial as everything is on record. - As the primary foundation of data 	<ul style="list-style-type: none"> - Time Consuming; Criminal Proceedings can be extensive. This requires a time commitment to analyse the data.

	<p>from Courts, they are trusted sources of information.</p> <ul style="list-style-type: none"> - Disclosure and Expert Witnesses provide unbiased data that can be analysed without being influenced by external factors. - Allows for Access to direct information that is not always publicly available. 	<ul style="list-style-type: none"> - There is an added complexity of understanding Legal Terminology when evaluating transcripts. - Limited access: Court's do not allow access to every transcript due to the sensitivity and the nature of cases. Often only high-profile cases can be accessible.
Journalism	<ul style="list-style-type: none"> - A form of mixed method research; it contains both qualitative and quantitative data which allows for a more comprehensive piece of research. - Journalism is widely accessible to the public, making it a convenient method of data collection. 	<ul style="list-style-type: none"> - There is a larger opportunity for bias within Journalism as the author can be influenced to publish based on a specific perspective. - Inaccurate information and be factored into a piece of text to increase engagement. - Difficult to establish a stable piece of text. The

	<ul style="list-style-type: none"> - Extensive data compiled with multiple sources. 	<p>introduction of new information which changes the context of a piece of data can raise the question of reliability.</p>
Statistics	<ul style="list-style-type: none"> - As it is quantitative data, it is easier to analyse trends and evaluate the relationship between two variables. - Statistics cannot be influenced by a researcher. - Conclusions can be made and applied to a wider population which is time efficient. 	<ul style="list-style-type: none"> - They can identify a relationship between two variables, but do not demonstrate the reasoning behind this so further analysis is required. - Collection and displaying data can be time consuming. - Consideration of Human Error whilst interpreting.

3.3 Data Exclusions

The focus of the research is on single acts of killing, therefore specific acts of Terrorism were not included as they resulted in multiple victims. An identical principle was applied to mass killings and serial murderers equally as patterns and trends would be altered and produce non-reflective findings.

Involuntary Manslaughter was excluded from the definition of Homicide in this research as there is no element of *Actus Reus*, there is no intention of killing but an

omission in the standard of care a person requires to be kept alive (Monaghan, N., 2020).

Murder – Suicide Cases were excluded from the sample as they do not result in Criminal Convictions using Evidence. The reason for this is that a potential defendant would have committed suicide at the time of the killing, so it is not possible for Criminal Proceedings to occur in their absence, this scenario also overlooks Forensic Evidence and therefore is not suitable within the capacity of research.

Criminal Proceedings which involved an admission of guilt, or plea arrangements were rejected from the research as a Criminal Conviction was determined without Forensic Evidence being introduced.

3.4 Reasoning behind the Choice of Questions

The primary purpose of this research is focused on evaluating the influence that Forensic Evidence has on the rate of Criminal Convictions. By focusing on these influences, analysis can recognise ranges of Forensic Science that are well regulated and trusted. However, it can also identify areas for improvement in the collection and testing of Forensic Evidence.

Research question one measures the effect that Forensic Evidence Sub-Categories have on Conviction Rates. Therefore, by exploring this relationship, it allows for future considerations to be made regarding the validity and reliability of specific evidence types.

Research question two explores a potential relationship between the number of pieces of evidence used to achieve a Criminal Conviction and the Conviction Rates. The significance of this research is to understand whether there is a standard of Forensic Evidence that demonstrates a secure Criminal Conviction. This can provide an indication for Forensic Scientists to ensure multiple pieces of evidence are recorded and sampled to increase the reliability of their results.

Research question three investigates Forensic Accountability by measuring recorded Homicide Cases against Recorded Convictions. The purpose behind this question is to recognise whether the addition or removal of Forensic Standards and external influences do affect these variables.

Research question four directly compares results produced through research questions one to three against the United States of America. By comparing data this way will allow geographic trends to be highlighted and observe whether external factors will also influence the conviction rates. Analysing trends that are Country specific and understanding the rationale behind will allow for suggested improvements to be made to Forensic Science in the future.

The United States of America was selected as the foundation for results produced within this scope of research to be directly applied to a wider geographical location. The explanation for this is the United States of America reflects similar Political, Economic and Scientific views as the United Kingdom (Edmond, G., 2016).

4.0 RESULTS

4.1 Research Question One: Are specific categories of Forensic Evidence found to exhibit higher levels of consistency when used in Court to gain a Criminal Conviction?

A total of 50 Individual Cases were analysed and the results of this are demonstrated in Figure 1. The sum of each evidence type overall is higher than 50 as multiple pieces of evidence were introduced in some circumstances to lead to a Conviction. Blood Pattern Analysis presented as the most applied category of evidence, 78% of the Case Studies had used blood as evidence to gain a conviction. Figure 1 displays that 32% of the Case Studies evaluated had utilised CCTV and Fibre Analysis to form a Criminal Conviction. Entomological Evidence and Tyre Marks were not recorded as used evidence to gain a Criminal Conviction within the research.

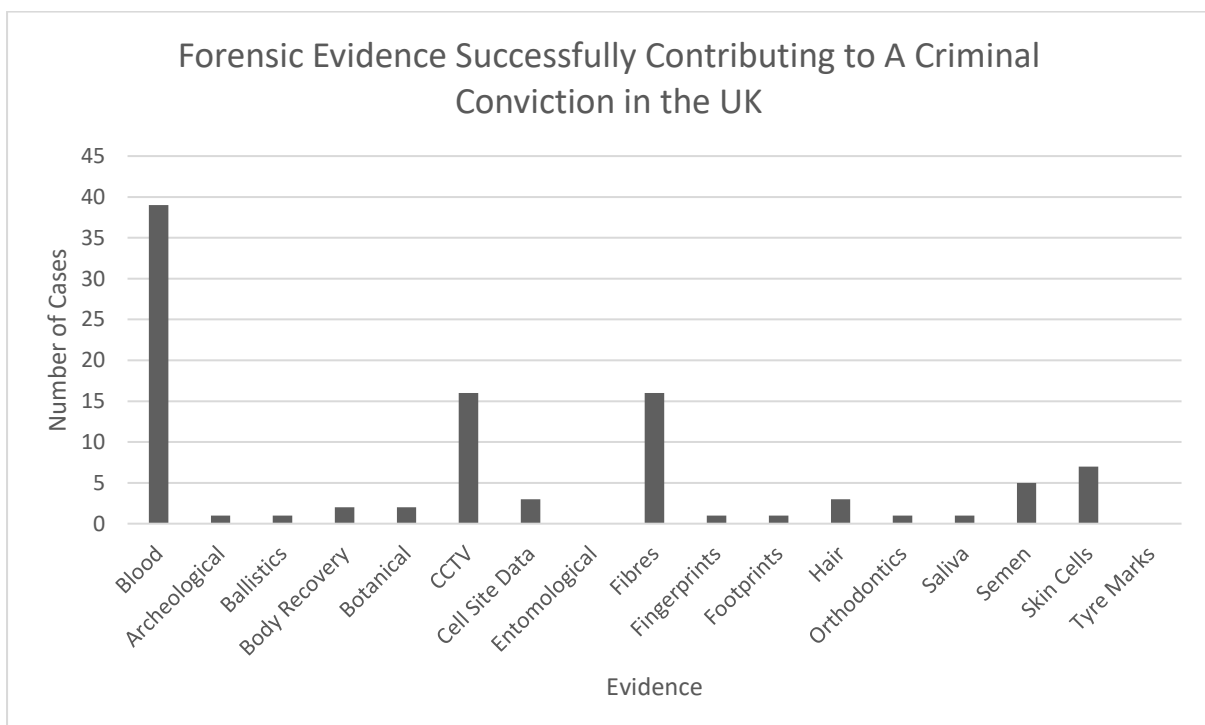


Figure 1. A Bar Chart Displaying the Results of Question One; Are specific categories of Forensic Evidence found to exhibit higher levels of consistency when used in Court to gain a Criminal Conviction.

4.2 Research Question Two: Does confidence in a Criminal Conviction increase when multiple pieces of Forensic Evidence are used in Court?

Figure 2 displays the measure of evidence utilised in Court to gain a Criminal Conviction. Across the 50 individual Case Studies researched, 24% of cases depended solely on a single piece of Forensic Evidence to aid Conviction.

An evident increase is displayed in Figure 2 when a second piece of evidence is introduced during Criminal Proceedings as the Conviction rate increases by 30% from one to two pieces of evidence. In the Studies investigated the cases that involved three or more pieces of evidence compensate for 22% of the overall number of cases researched.

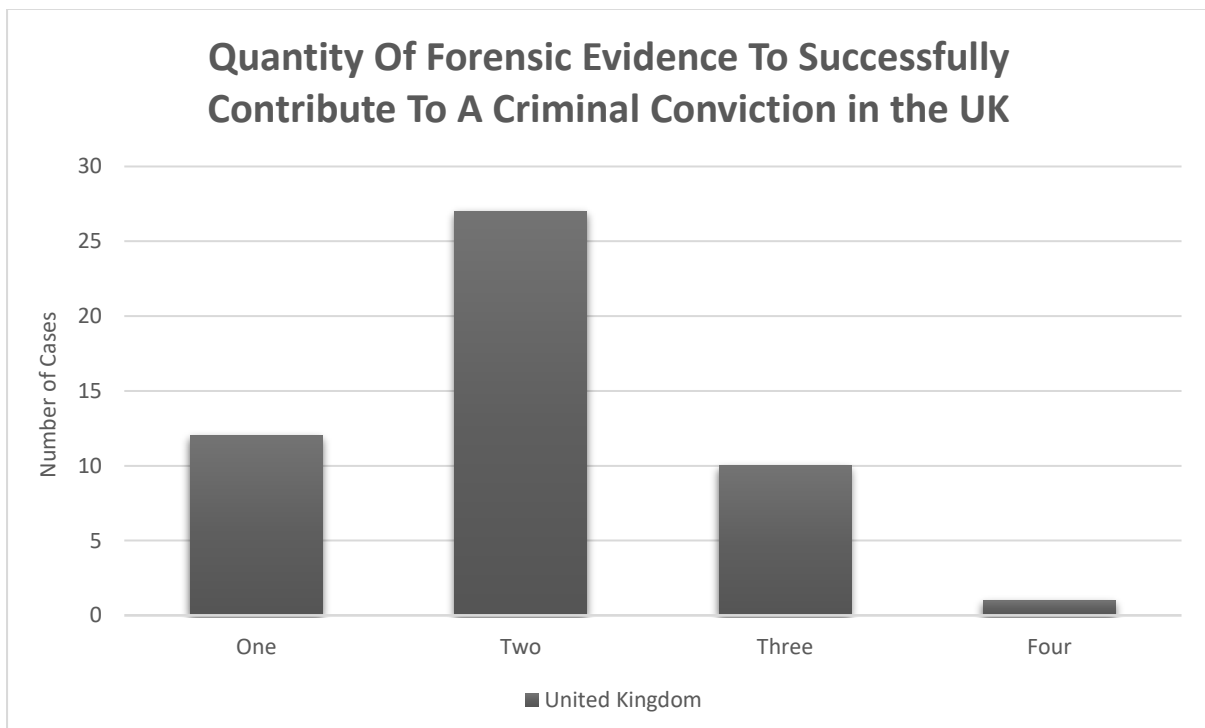


Figure 2. A Bar Chart Displaying the Results of Research Question Two: Does the confidence in a Criminal Conviction increase when multiple pieces of Forensic Evidence are used in Court?

4.3 Research Question Three: Has the continuing influence of Forensic Accountability affected the rate of Homicide Criminal Convictions?

Figure 3 presents the statistical data exploring the relationship between Homicide Cases and Conviction Rates. A peak is observed in the number of recorded Homicide cases in 2003, 64% of which resulted in Criminal Convictions. The prominent measure in the Conviction Rate is expressed in the year of 2022, with only 46% of Homicide Cases resulting in Conviction.

The Conviction Rate ranged from 91% to 46% with an expressed average of 88% across the sampled period. Across the years of 2020 to 2022 the average Conviction Rate reduced to an average on 65%. A decreasing relationship between the two variables is marked from 2012 to 2022.

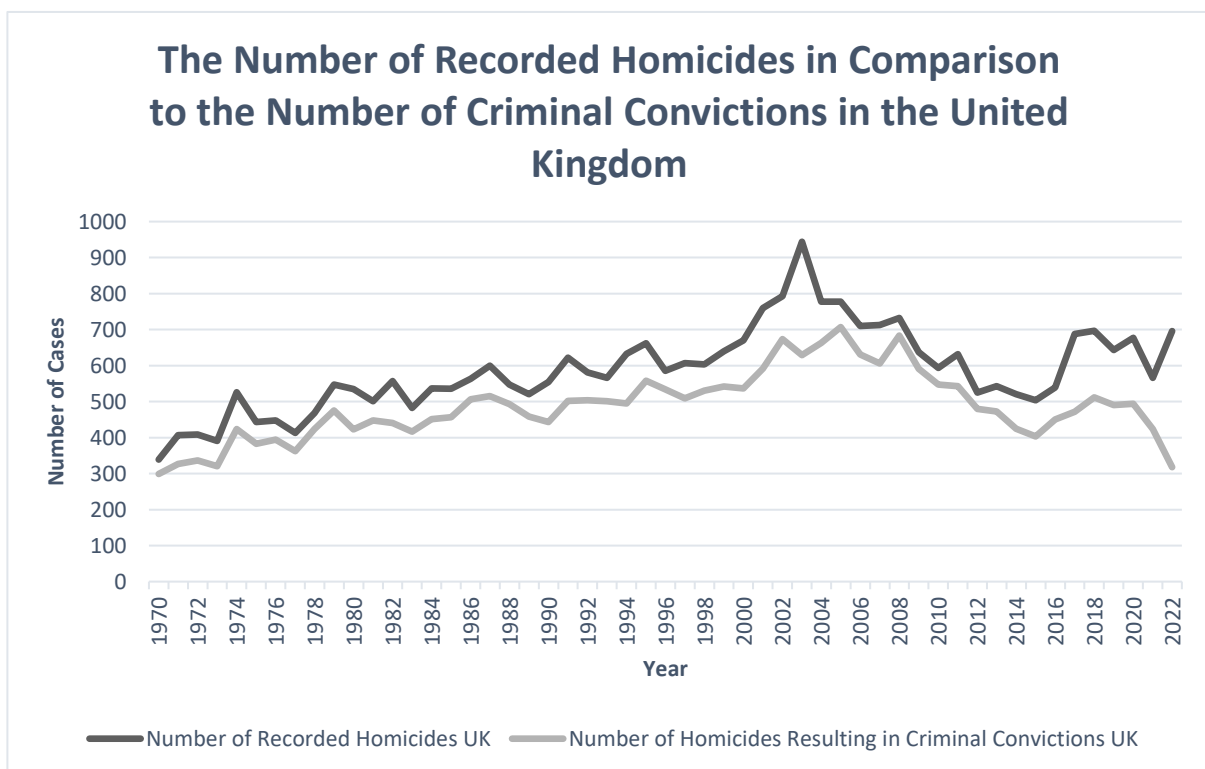


Figure 3. A Scatter Graph Displaying the Results of 4.3 Research Question Three: Has the continuing influence of Forensic Accountability affected the rate of Homicide Criminal Convictions.

4.4.1 Research Question Four – Part 1: Can patterns determined from the results yielded by the United Kingdom be applied to the United States of America?

By comparing the data from Research Question One against the United States of America an observable difference is displayed in the evidence used to gain a Criminal Conviction. Out of the investigated 50 cases, 39 were Convicted using Blood evidence in the UK, whereas in the USA Blood evidence was used 13 times successfully. Figure 4 reveals that the USA has used Semen as the most recurring evidence category with a Conviction Rate of 38%. An observable absence can be seen in Ballistics, Body Recovery and Botanical evidence used in the USA to gain a Criminal Conviction.

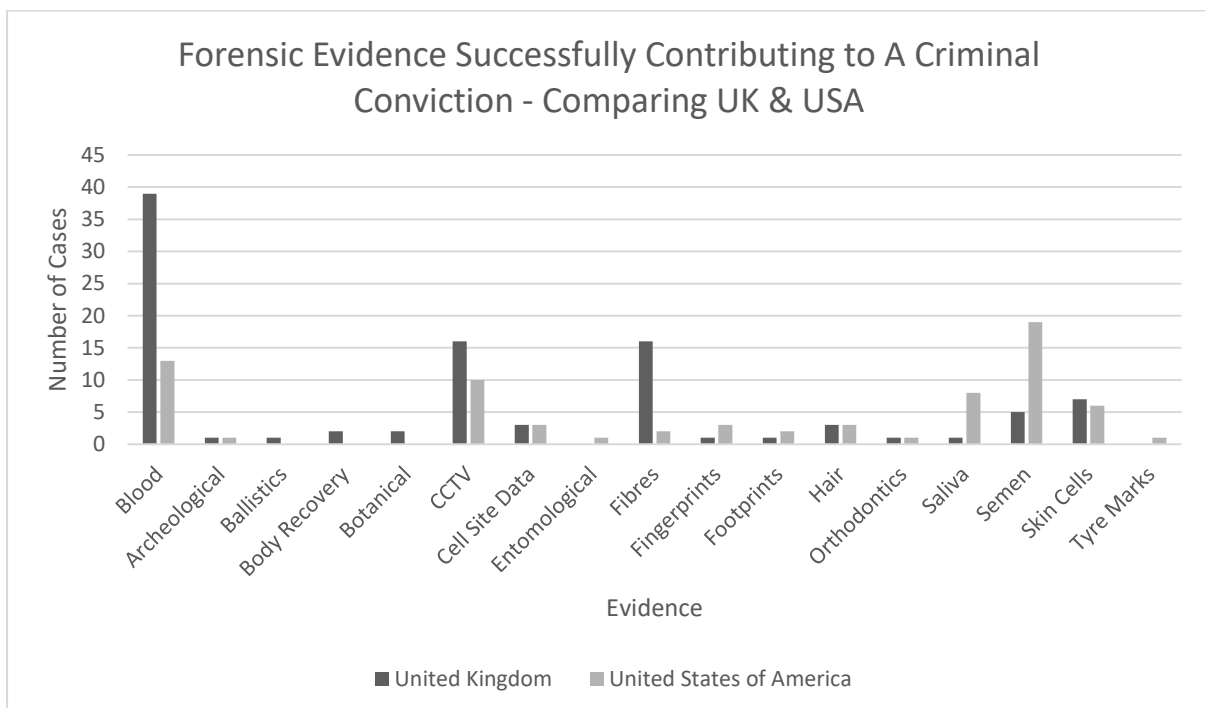


Figure 4. A Bar Chart Comparing the Results of Question One; Are specific categories of Forensic Evidence found to exhibit higher levels of consistency when used in Court to gain a Criminal Conviction and comparing these results to Research Question Four: Can patterns determined from the results yielded by the United Kingdom be applied to the United States of America?

4.4.2 Research Question Four – Part 2: Can patterns determined from the results yielded by the United Kingdom be applied to the United States of America?

Out of the Case Studies investigated, 64% of cases in the USA resulted in Criminal Conviction with a single piece of Forensic Evidence in comparison to 24% of cases in the UK. This displays a 40% difference between the two Countries. There is a marked decrease between the two variables in the USA; The number of cases resulting in Conviction decreases by 38% when a second piece of evidence is introduced and decreases a further 10% a third piece of evidence is introduced. No Criminal Convictions were executed when four pieces of evidence were used during Criminal Proceedings in the USA. However, a Criminal Conviction was made in the UK with this quantity of evidence.

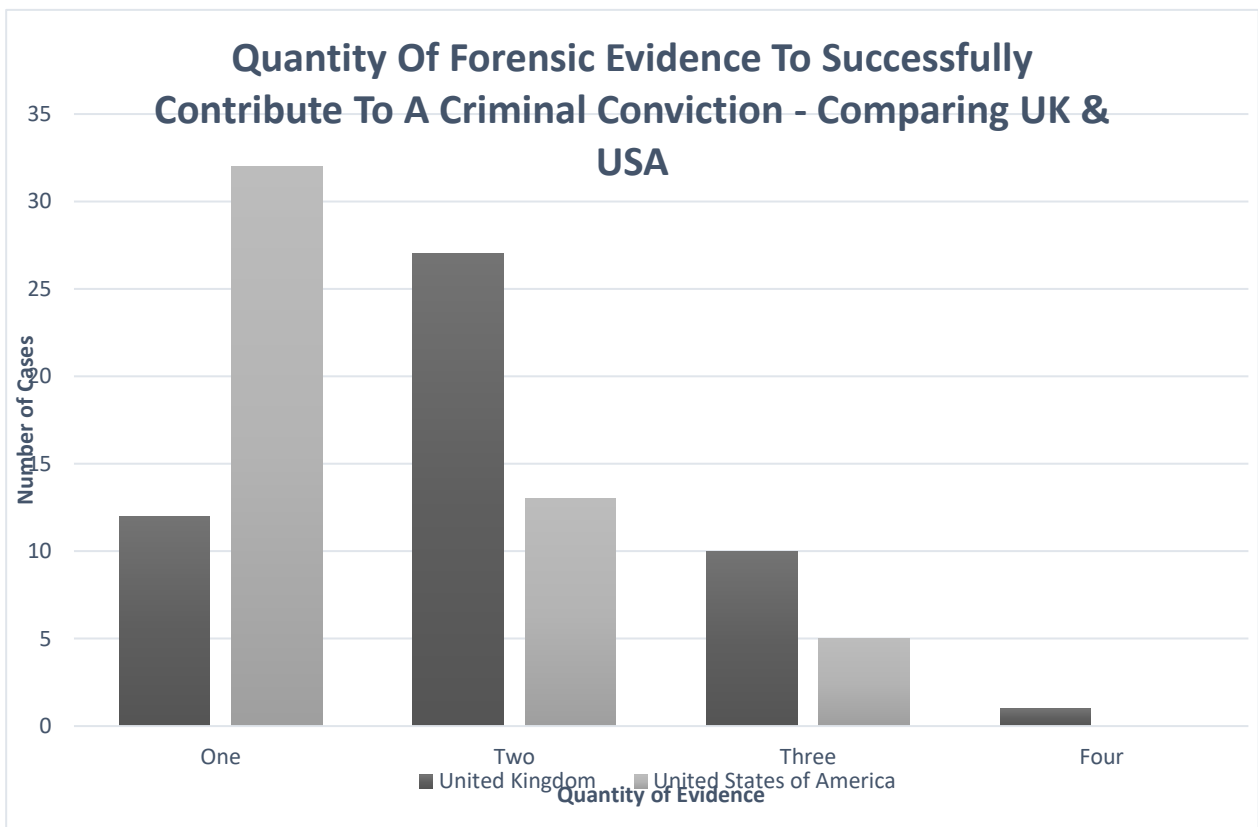


Figure 5. A Bar Chart Comparing the Results of Question Two: Does the confidence in a Criminal Conviction increase when multiple pieces of Forensic Evidence are used in Court and comparing these results to Research Question Four: Can patterns determined from the results yielded by the United Kingdom be applied to the United States of America.

4.4.3 Research Question Four – Part 3: Can patterns determined from the results yielded by the United Kingdom be applied to the United States of America?

Figure 6 displays the highest recorded Homicide Rate within the period investigated to be in 1993, the Criminal Conviction Rate for this year was calculated to be 64%. The weakest relationship between Homicide and Conviction Rate in the USA is shown in the year of 2020, with only 53% of Homicide Cases resulting in Conviction. The Conviction Rate expressed from 81% to 53% with an expressed average of 65% across the sampled period in the USA. Throughout the period of 2020 and 2022, the average Conviction Rate reduced to an average on 58%. When Comparing Forensic Influence on Conviction Rate, a 23% variance between the UK and the USA is highlighted.

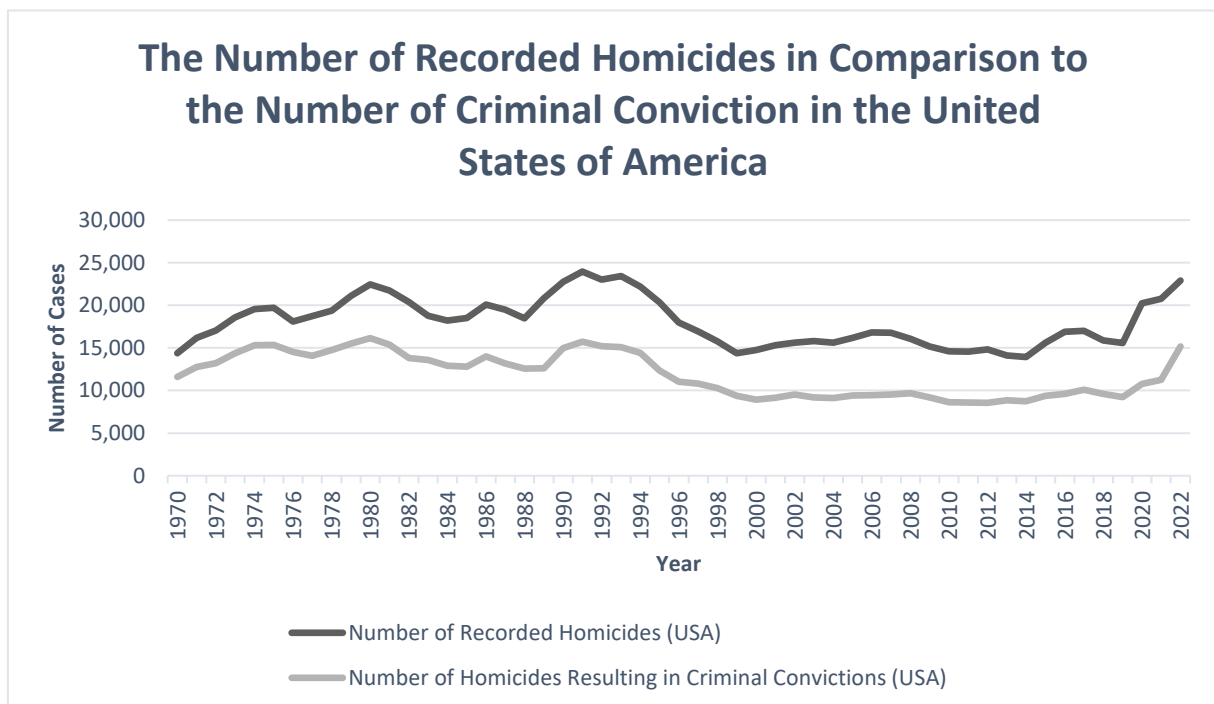


Figure 6. A Scatter Graph Displaying the results of Research Question Three: Has the continuing influence of Forensic Accountability affected the rate of Homicide Criminal Convictions and applying this question alongside Research Question Four: Can patterns determined from the results yielded by the United Kingdom be applied to the United States of America?

5.0 DISCUSSION

5.1 Research Question 1

5.1.1 The most consistent form of evidence used to gain a conviction.

Blood was consistently shown to be the evidence that supported a Criminal Conviction throughout this research. The results displayed that 78% of the sample of cases researched had used blood as a source of Forensic Evidence. Blood contains biological markers which can be analysed to identify who the sample belongs to (McNevin, D. and Padula, M., 2023) The reason blood evidence was recognised more than any other type of evidence is because previous research has indicated that 70.5% of Homicides are committed with sharp/ blunt trauma, or shooting (Fischer et al, 1994). As a result of these methods of killing, blood is readily available at a Crime Scene, this would support Hypothesis 1; stating that DNA would be a prevalent category of evidence which would lead to Criminal Convictions.

The results also displayed that CCTV was prevalent in 32% of cases. The presentation of this accounting for such a proportion of the results was unforeseen. There has been research to counteract this result. There is a belief that CCTV footage alone does not have the power to be seen as conclusive evidence (IDS., 2023). However, the results of the research undertaken in this project has shown that in the 16 cases which used CCTV as evidence, 14 of them had used additional pieces of evidence used alongside CCTV to form a Conviction. The unforeseen observation from this research provides an interesting standpoint that CCTV can be a reliable piece of evidence, except not on its own.

The use of Fibres as evidence mirrored the same results as CCTV. Fibres are a form of Trace Evidence, the definition of this is the sample of a substance resulting from contact. The significance of Fibres as evidence is highlighting the potential for cross-contamination. By applying Locard's principle, fibres can be exchanged following every interaction and should be obtainable at the scene of every Crime, either by the victim or the perpetrator. However, it is significant to mention that there is a variance

in the amount of time a fibre will remain on a surface. Therefore, fibres may exist at the scene of a crime, but there will always be an interval between the occurrence of a Homicide, and the collection of evidence. This could account for the 32% of cases using fibre evidence to gain a conviction.

5.1.2 The least consistent form of evidence used to gain a conviction.

Tyre Marks has been used in previous cases to lead to a Conviction, it is a form of impression evidence. However, there is an argument that it is subjective, due to the probability of more than one vehicle having the same design and size of tyre (Khushi, M., 2020). Another contest of tyre marks being used as evidence in Court is its suitability, for them to be used as evidence, they must be sampled at the Crime Scene. Not every Homicide Case will illustrate tyre marks at the Crime Scene and so if they are absent, they cannot be used. This will explain the absence of tyre marks being used as reliable evidence in the results.

Forensic Entomology is the using insects and arthropods in Criminal Investigation by assisting in the estimation of minimum post-mortem interval (Joseph et al., 2011). They provide a time estimate of the length of time an individual has been deceased. It is justifiable that entomological evidence is not a consistent, or reliable source of evidence to link a defendant to a Homicide. However, it is a dependable basis to estimate time elapsed since death and when linked with another piece of substantial evidence, it has been shown to lead to a conviction. The Jigsaw Murders Case demonstrates that entomology can be used to gain a conviction alongside fingerprints (Rinaldi, G., 2023)

5.2 Research Question 2

5.2.1 The impact one piece of evidence has on a conviction.

Out of the sample researched, only 24% of cases were convicted using a single piece of forensic evidence. When considering this further, the evidence used unaided was DNA based. The majority consisted of Blood and Semen; both can be

traced back to an individual which may provide an explanation for how one piece of evidence successfully contributes to a criminal conviction. The result of Research Question One demonstrates that Blood is a reliable source of evidence producing a positive effect on conviction rate. Preceding research displays that the quantity of evidence can be affected by strength (Devine et al., 2009) However, there has also been a large amount of support for the argument that convictions should not be based on a single piece of evidence. (Sangero, B. and Halpert, M., 2007) articulates how even a minor probability of error can affect the confidence of a conviction. If a decline in the confidence of a conviction occurs, there is a potential that this decline is reflected overall in forensic evidence.

5.2.2 The impact two pieces of evidence has on a conviction.

A noticeable increase is presented when the quantity of evidence increases. This result supports the hypothesis that the confidence in a conviction will increase together with the quantity. The conviction rate increasing by 30% from one to two pieces of evidence is a significant difference between the two quantities and supports hypothesis two. Investigation into the effectiveness of volumes of evidence demonstrate that it is more effective to have multiple pieces of evidence (Wüllenweber, S. and Giles, S., 2021).

5.2.3 The impact three pieces of evidence has on a conviction.

The measurement recorded of the cases leading to conviction using three pieces of evidence displayed a 30% relationship between the two variables. It should be noted that jurors hold varying evidentiary value depending on the category of evidence (Schweitzer, K. and Nunez, N., 2018). Further examination of the results of this could provide an insight into the type of evidence that contributed to these specific cases. Research into the outcomes different types of forensic evidence produce, together with the results of Research Question One demonstrate that biological evidence and DNA displays higher levels of confidence than Impression Evidence (Leadbetter, M.J., 2005). This may be the explanation for the unexpected result provided in the results.

5.2.4 The impact four pieces of evidence has on a conviction.

Only 1 case in the sample investigated resulted in a criminal conviction. This was an unexpected result produced by the research and was contradictory to the hypothesis. A 2016 study explained that “too much” evidence can have the reverse effect and in fact weaken the credibility of the material (Business Standard., 2016). It is significant to consider that this result may have been manipulated by the sample size and could produce a different outcome if a larger sample of cases were researched.

5.3 Research Question 3

5.3.1 Factors influencing the strongest relationship between recorded homicides and conviction rate.

The strongest relationship between Homicide and Conviction occurred in 1978, with 91% of cases resulting in convictions, this was a 3% increase on the average calculated across the 50-year period. The production of this result was most likely shown as the effect of the introduction of DNA Testing. Human Identification became possible using DNA testing in the mid 1970's. Scientists were able to isolate Human Leukocyte Antigen (HLA) and use this to provide a basis of identification from this (DDC., 2023). The discovery and application of this testing would be expected to take a few years to be detected in the conviction rate as it would reflect the time delay taken from the event of the Homicide to Criminal Proceedings.

5.3.2 Factors influencing the weakest relationship between recorded homicides and conviction rate.

The weakest correlation between conviction rate and homicide was displayed to be in the year 2022, where only a 46% relationship was recorded. The Crown Prosecution Service published its annual statistics regarding the year 2022,

explaining that the number of cases resulting in criminal proceedings increased by 6.9% (CPS., 2023). The organisation of Bar Strikes in addition to the increased time taken for a criminal investigation to take place during 2022 provides a justification for the reason conviction rate was 42% less than the average for this year. The subject of the impact Coronavirus had on homicide and conviction rates should also be considered.

5.3.3 The influence of Coronavirus on the relationship between recorded homicides and conviction rate.

The United Kingdom began to see the effects of Coronavirus in early 2020 and was placed into a national lockdown to aid in the reduction of the spread of the virus. The consequence of this provided alterations on the way forensic scientists were able to work, reducing equipment and personnel working at crime scenes and in laboratories (Almazrouei et al., 2020). This led to an increase in errors and judgements throughout the collection and sampling of evidence. The average conviction rate for homicides dropped from 88% to 65% throughout the period of the pandemic.

Another influence that Coronavirus had on this relationship is that there was a marked increase in the number of homicides throughout the lockdown period (Meyer et al., 2022). The “stay at home” order led to a rise in domestic abuse, and in turn, increased the number of female homicides (Castillo, J. and Moscoso, B., 2022). A significant rise in homicides, alongside the increase in errors made in investigation demonstrated a substantial influence on the relationship between homicide and conviction rate.

5.3.4 The influence of forensic accountability on conviction rates.

A stable decreasing relationship is exhibited between the two variables from 2012 to 2022. By studying potential factors that would have had a profound effect on this relationship, research suggests the reason for this was the closure of the Forensic Science Service (FSS) in 2012. The FSS was a government owned provider that was responsible for ensuring standards were met and provided support and training

for forensic scientists (GOV.UK., 2006) The importance of the FSS was to maintain accuracy, impartiality, and integrity of forensic evidence. However, its closure in 2012 has removed the regulation of forensics, with private providers increasing, there have been several investigations into laboratories manipulating data, resulting in overturning convictions (Laboratory News., 2019).

The consequence of disbanding the FSS has ultimately led to a decrease in the ability to provide accurate and reliable evidence consequentially to convictions.

5.4 Research Question 4 – Part 1

5.4.1 The most consistent form of evidence used to gain a conviction.

Semen was recorded to be the most consistent form of evidence in the United States of America, with 38% of cases studies resulting in conviction. Research into sexual assault cases dependably demonstrates that semen analysis is crucial to the outcome (McGregor., 2002).

Comparing the results found between the United Kingdom and the United States of America provides a curious outcome. Both countries deemed DNA evidence to be the primary, and most consistent form of evidence used to gain a conviction. This information entirely supports hypothesis one.

However, there is a 40% difference in the quantity of cases observing DNA evidence. Analysis into the most consistent method of killing in both counties highlights blood/ sharp trauma and shootings (ACSH., 2018). This explains the expected result provided by the UK. It should be noted that both countries share such similarities, yet the results are so dissimilar.

Discussion of external factors which may affect the results is the presence and absence of the evidence. Blood is a form of DNA present in every individual. However, Semen is only present in a male. If a form of sexual exchange has not

taken place, there can be no semen evidence. Further research into the gender of perpetrators and victims would provide an explanation for the variance in results.

5.4.2 The least consistent form of evidence used to gain a conviction.

The least consistent evidence types in the data displayed by the United States of America were botanical, body recovery, and ballistics. All these categories were not used to gain a conviction in any of the 50 case studies. This result was unexpected as the American Council of Science and Health confirmed that firearms are responsible for the largest number of homicides per year (ACSH., 2018).

When viewing the results of the UK against the USA, there is an observable difference between the evidence used the least. The reasoning behind that can be a potential effect of the methodology and sample size.

5.5 Research Question 4 – Part 2

5.5.1 The impact one piece of evidence has on a conviction.

The investigation into research question two displayed that 64% of cases were convicted based on a single piece of evidence in the United States of America. This observation is noted to have a 40% variance to the United Kingdom. When further investigation into the evidence categories noted to lead to a conviction; they are all a form of DNA. These findings reflect the results found in the UK that a single piece of evidence can be enough to secure a conviction. However, the focus is on DNA evidence. This finding, in addition to the findings of research question one, indicates that DNA is the most consistent form of evidence, and is influential enough alone to lead to a conviction.

5.5.2 The impact two pieces of evidence has on a conviction.

The addition of a second piece of evidence resulted demonstrated a decrease in the results produced in the United States of America by 38%. This result challenged hypothesis two, and the results produced by the United Kingdom.

The categories of evidence compiled together to produce a conviction in 26% of cases were predominantly digital and impression evidence. Digital evidence is an emerging category of evidence. However, it is important to consider that the case examples studied ranged from 1970 to 2022. Digital evidence was first used in the 1990's (OpenLearn., 2023) which may produce hesitancy in its reliability as admissible evidence.

5.5.3 The impact three pieces of evidence has on a conviction.

Results obtained in research question three displayed that 10% of cases in the United States of America resulted in conviction comprised of three pieces of evidence. In comparison to the United Kingdom, which totalled 20% of cases, there is an evident discrepancy between the two countries.

5.5.4 The impact four pieces of evidence has on a conviction.

No cases studied within the United States of America consisted of four pieces of evidence. When comparing this to the United Kingdom, which had a 2% incidence of four pieces of evidence to gain a conviction, there is a calculated difference. However, taking the sample size, and generalisability of the results it would be understandable that although the results are not identical, they share a degree of similarity.

The overall results of research question three challenge its hypothesis and oppose previous research referenced throughout this study regarding the relationship between the quantity of evidence and its strength against conviction rate.

Understanding the difference between the two sets of results in figure 2 and 5 may be consistent with cultural differences. The United Kingdom applies the "innocent

until proven guilty principle” which constitutes part of the Human Rights Act 1998 (HRA.,1998). This provides an explanation for why the number of convictions increase with quantity of evidence. Analysis of this relationship articulates that there is a threshold where too high a quantity can affect the outcome (Watts, D., 2023).

Reflecting on the results and research may provide a future baseline for investigators to consider the quantity of forensic evidence presented in court as 2 pieces of evidence.

5.6 Research Question 4 – Part 3

5.6.1 Factors influencing the strongest relationship between recorded homicides and conviction rate.

The highest conviction rate presented in the United States of America was in the year of 1970, 81% of homicide cases resulted in a criminal conviction. Upon further analysis, the Federal Bureau of Investigation (FBI) devised its National Crime System (NCS) in 1967 with the objective of assisting law enforcement by providing information on missing persons, wanted persons, violent persons, and stolen vehicles (GOV.UK., 2016) A comparative time difference is noted between the establishment of the NCS in 1967 and the peak in convictions displayed in 1970. Further study in the intervals from crime scene to court describes an approximate time of two years between the two events (The McKinney Law Firm., 2023). This provides a justification for the interval between the formation of the NCS and the increase in conviction rate in 1970.

Although there is a difference in the year noted to produce the highest conviction rate between both countries, it is reasonable to conclude that a significant event had occurred to initiate the increase in conviction rate. This result supports hypothesis four and expresses the differences that each country has influences the conviction rate.

5.6.2 Factors influencing the weakest relationship between recorded homicides and conviction rate.

The lowest conviction rate was calculated in the year 2020, where only 53% of cases resulted in a criminal conviction, an expressed 12% decrease on the average from 1970 – 2022. The United States of America was placed in a quarantine on 12th March 2020 following the spread of Coronavirus (Jacobsen, G. and Jacobsen, K., 2020).

A variance between the UK and USA is noted, though the reason for this can be explained by differentiation between legal systems, and not a reduced accuracy in Forensic Accountability. The UK produces an 88% average whereas the USA displays a 65% standard. The variance between the two figures could be explained by significant events which differ between the two countries. Another significant finding is that the UK expresses a wider range in its conviction rate than the USA.

These observations conclude that the USA has a much more consistent trend in its conviction rate, though it is a notably lower rate than the UK. The UK produces a higher level of convictions in homicide cases but defines a wider variance in its figures.

5.6.3 The influence of Coronavirus on the relationship between recorded homicides and conviction rate.

Throughout the period between 2020 and 2022, the average Conviction Rate reduced to an average of 58%. Various research discussed the influence of Coronavirus on the use of forensic science throughout this time and determined an alteration to the method of examinations of biological tissues and fluids (Schroeder, D. and White, M., 2009). The results of the research, and the addition of the discussion of research questions provide a response that explains this decrease in conviction rates. DNA evidence is most consistently used to gain a conviction, and the modifications to collection and sampling of this inevitably produced ineffective results with a higher risk of errors.

5.6.4 The Influence of forensic accountability on conviction rates.

The homicide of George Floyd by an American police officer in May of 2020 depicted an evident damage to the confidence between the public and the criminal justice system in the USA. The “Black Lives Matter” protests and riots following this significant event led to a reduction in 911 calls, subsequently leading to a decline in the public trust in the effectiveness in the criminal justice system (Howard, P., 2022)

This event triggered further investigation into an apparent disparity between the treatment of Black, Asian and Minority Ethnicities (BAME) against Caucasians by the USA Police and Legal Systems, a Black person is 80% more likely to be wrongly convicted and receive a prison sentence of approximately 7 years longer than a Caucasian person on average (Death Penalty Information Centre., 2022).

Although this event does not produce an effect on Forensic Evidence and its use in Court to gain a Conviction, it is reflective of the reduction in confidence overall for the Police and Criminal Justice System in the USA by Black Americans to only 19% (Washburn, E., 2023).

Comparing Forensic influence on Conviction Rate shows a 23% variance between the UK and the USA. The analysed trends in the UK can be reflected in the USA, particularly following the negative effects of Coronavirus.

There is also significant support within the results that the introduction of a governing service has a positive effect on conviction rates in homicides, and that the termination of these governing facilities has a reduction in the strength of conviction rates, both in the UK and the USA. The NCS and FFS are specific to each country but have provided reflective results which support hypothesis four.

6.0 CONCLUSIONS

6.1 Conclusion

This study has produced overwhelming support about the strength of forensic evidence, through analysis of national crime statistics, individual case studies and existing literature. The debate concerning the reliability of forensic evidence has extensive evidence to support each argument, nonetheless, the findings of this investigation consistently corroborate the positive effect forensics has on the outcome of a conviction.

DNA was consistently shown as the preferential category of evidence, both in the United Kingdom and the United States of America, despite the variations in specific types of DNA. It can be concluded that this is a highly reliable and accurate source of evidence and has a positive effect on conviction rate. One of the focal justifications for this is the impartial role forensic science holds within the policing and criminal justice systems as used equally to acquit a defendant should competing evidence become available. The results provided by the research question fully support hypothesis one.

As predicted in hypothesis two, the probability of a conviction increases when additional evidence is introduced. The level of accuracy in the first piece is further reinforced by the addition of a second piece of supporting evidence. Further analysis into the combinations of evidence which when placed together provide greater strength in the reliability of evidence, more specifically, when DNA is used in conjunction with CCTV or Fibre analysis, the probability of conviction increases greatly.

Upon analysis of the statistics regarding the connection between recorded homicide and conviction rates it is evident that the introduction and removal of regulatory services has a profound effect on the relationship between the two. Coronavirus displayed a negative effect overall, but other external factors, such as the homicide of George Floyd, and Bar Strikes, provided country-specific differences in the

conviction level. These findings provide substantial support for hypothesis four and previous literature.

When the findings from the United Kingdom were compared against the United States of America, there were many factors that reflected against the two. However, the United Kingdom showed a higher level of reliability by using mostly DNA evidence, a larger quantity of evidence and a higher average conviction rate. These figures do not consider whether forensic evidence was present at every crime scene as opposed to impression or digital evidence, but it does demonstrate it was obtained and used in most cases.

The closure of the Forensic Science Service in 2012 demonstrated the most consistent decrease in the relationship between homicides and convictions in the United Kingdom and has provided a source of controversy since its closure in 2012. The need for a UK Governing Service is supported by the results of this study.

The conclusion of the analysis is that there is an underlying inherent relationship between the production of forensic evidence and the overall outcome of a criminal conviction, whether on a national, or worldwide level.

6.2 Limitations

There are notable limitations regarding the methodology of this investigation which may have an unintentional influence on the results. This project had a limited time frame and available resources, meaning there were restrictions to the quantity of research that could be undertaken. Only 50 cases were studied, which does not give an accurate reflection of the number of homicides recorded each year. If a larger number of cases were reviewed, the results produced may have been different.

A limitation on how applicable the results produced are to a wider population is potentially affected by the period researched. The study included statistics from 1970 to 2022. However, further analysis over a larger time may produce different results

and trends. The time available in this investigation did not allow for exploration into this, and it may have produced different results.

It is important to consider the availability of court transcripts in this research as due to the nature of homicide cases, the families of victims do not want the details of their loved ones accessible to the public. The availability of the research used predominantly came from the use of journalism. When journalists report details from homicide cases, they do so by exaggerating information to provide a headline that increases engagement, this reduces the accuracy and reliability of journalism as a research source (Ryan, M., 2001)

It is also conceivable to consider the effects of cognitive bias when making decisions. Cognitive bias is an unconscious thought that ascends from previous experiences and memories. There is a possibility that a juror may adhere to confirmation bias; by looking for conforming evidence to convict a defendant. Furthermore, a forensic scientist may also unconsciously manipulate a result if they are aware of a specific expectation (Haber, R.N. and Haber, L., 2013).

6.3 Recommendations

An extensive volume of research has been produced surrounding Forensic Evidence, however previous literature approaches evidence from a single viewpoint. There is now a variety of forensic companies, and laboratories around the United Kingdom that may approach collection and sampling of evidence with different protocols. The distinctions between the approaches taken by two different laboratories, one piece of evidence may inevitably produce different results in two different environments. It would be beneficial for further research to be investigated in this area to understand where protocol and procedures for forensic scientists must be streamlined to ensure consistency.

If this research project were to be repeated, comparing sampling methods of forensic evidence could provide an interesting perspective on whether the variance of sampling methods results in different outcomes.

Another way to consider whether results found Nationwide can be applied Worldwide would be to compare other countries with similar scientific values as the United Kingdom. Australia, New Zealand, and South Africa all reflect similar scientific, economic, and political standpoints. Sampling a wider range, and the number of countries may provide an insight into whether the findings of this study are applicable to a wider audience.

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8.0 APPENDICES

8.1 Appendix A – Raw Data

Table 2. The Results of Evidence Used in Court.

Evidence	Times Used - United Kingdom	Times Used - United States of America
Blood	39	13
Archaeological	1	1
Ballistics	1	0
Body Recovery	2	0
Botanical	2	0
CCTV	16	10
Cell Site Data	3	3
Entomological	0	1
Fibres	16	2
Fingerprints	1	3
Footprints	1	2
Hair	3	3
Orthodontics	1	1
Saliva	1	8
Semen	5	19
Skin Cells	7	6
Tyre Marks	0	1

Table 3. The Results of the Quantity of Evidence Used in Court.

Number of Pieces of Evidence	Cases Used United Kingdom	Cases Used United States of America
One	12	32
Two	27	13
Three	10	5
Four	1	0

Table 4. The Results of Statistical Analysis of Homicide Rates and Criminal Convictions from 1970 to 2022.

Year	Number of Recorded Homicides UK	Number of Homicides Resulting in Criminal Convictions UK	Number of Recorded Homicides (USA)	Number of Homicides Resulting in Criminal Convictions (USA)
1970	339	299	14,361	11,605
1971	407	327	16,173	12,776
1972	409	337	17,042	13,197
1973	391	321	18,569	14,377
1974	526	424	19,558	15,332
1975	443	383	19,716	15,350
1976	448	394	18,101	14,519
1977	413	362	18,740	14,077
1978	468	424	19,366	14,738
1979	547	475	21,093	15,507
1980	535	423	22,454	16,147
1981	501	448	21,733	15,406
1982	557	441	20,392	13,800
1983	482	417	18,758	13,603
1984	537	451	18,202	12,894
1985	536	457	18,510	12,795
1986	563	506	20,103	14,019
1987	600	515	19,492	13,167
1988	547	493	18,481	12,588
1989	521	458	20,855	12,602
1990	554	443	22,771	14,963
1991	622	502	23,961	15,722
1992	581	504	23,024	15,203
1993	566	501	23,424	15,084
1994	633	495	22,189	14,417
1995	662	558	20,362	12,358
1996	586	534	17,987	11,048

1997	607	509	16,932	10,794
1998	603	530	15,756	10,297
1999	640	542	14,358	9,396
2000	670	537	14,733	8,939
2001	760	592	15,322	9,144
2002	793	674	15,620	9,524
2003	944	629	15,819	9,207
2004	778	663	15,612	9,135
2005	778	707	16,177	9,406
2006	710	631	16,828	9,443
2007	713	606	16,769	9,515
2008	732	683	16,063	9,667
2009	637	591	15,168	9,185
2010	594	547	14,584	8,644
2011	632	543	14,561	8,608
2012	525	480	14,832	8,555
2013	543	473	14,111	8,847
2014	521	425	13,933	8,724
2015	504	403	15,606	9,368
2016	539	450	16,904	9,606
2017	688	472	17,012	10,087
2018	697	512	15,893	9,600
2019	643	490	15,571	9,224
2020	677	494	20,246	10,753
2021	566	424	20,746	11,256

Table 5. The Results of Case Study Research into Evidence Used to Achieve Convictions – United Kingdom

Case (United Kingdom)	Evidence
Alice Ruggles	Blood, Cell Site Data
Ann Maguire	Blood
April Jones	Blood, Archaeological
Becky Godden	Fibres, Semen
Ben Kinsella	Blood
Billie Jo	Blood
Breck Bednar	Blood, Cell Site Data
Celine Figuard	Blood, Fibres, Semen
Claire Perry	CCTV
Collette Aram	Blood, Fibres
Damien Oldfield	Blood, Skin Cells
Damilola Taylor	Blood, Fibres
Danny Pearce	Blood, CCTV, Ballistics
David Amess	Blood, CCTV
Ellie Gould	Blood, Skin Cells
Faye Williams	Blood, CCTV
Gary Cunningham	Blood
Gemma McCluskie	Blood, CCTV
Georgina Symonds	CCTV, Body Recovery, Cell Site Data
Hannah Foster	Blood, Fibres
Helen Gorie	Blood, Skin Cells
Helen McCourt	Blood
Hilda Murrell	Blood, Semen
Hollie Gazzard	Blood, CCTV
James Bulgur	Blood, Fibres
Jessica Chapman	Fibres, Hair, Botanical, Footprints
Jo Yates	Blood, Fibres, CCTV
Joan Albert	Fibres
Kriss Donald	Blood, Fibres, CCTV

Leanne Tiernan	Blood, Fibres, Hair
Lee Rigby	Blood, CCTV
Louise Kam	Fibres, Skin Cells
Marion Crofts	Semen
Matthew Mason	Blood, CCTV, Fibres
Mee Kuen Chong	Blood, CCTV
Molly McLaren	Blood, CCTV
Paige Doherty	Blood, Skin Cells
Richard Everitt	Blood
Rikki Neave	Fibres, Skin Cells
Ross Parker	Blood, Fibres
Sabina Nessa	CCTV
Sally Ann Bowman	Blood, Fingerprints, Orthodontics
Sarah Everard	Blood, Semen
Sian O'Callaghan	CCTV, Body Recovery
Stephen Lawrence	Blood, Fibres
Thomas Roberts	Blood, CCTV
Valerie Graves	Blood, Skin Cells
Victoria Climbie	Blood
Wendy Knell	Semen
Zoe Nelson	Blood, Saliva

Table 6. The Results of Case Study Research into Evidence Used to Achieve Convictions – United States of America

Case (United States of America)	Evidence
Alexis Murphy	Blood, Hair, Fingernails
Alianna Defreeze	Fingerprints, Skin Cells
Amber Creek	Saliva
Ann Harrison	Semen, Hair
Anna Kane	Saliva
April Tinsley	Semen
Betty Gore	Blood
Brianna Denison	Semen
Carla Walker	Saliva, Semen
Carol Bowne	CCTV
Christina Williams	Semen
Faith Hedgepath	Blood, Semen
George Floyd	CCTV
Hannah Mack	Semen
Holly bobo	Archaeological, Skin Cells
Imette St. Guillen	Blood
Jacob Wetterling	Semen, Footprints, Tyre Marks
Jayna Murray	Blood
Joey Fisher	CCTV, Footprints
Karina Vetrano	Fingerprints, Skin Cells, Cell Site Data
Kristine Fizhugh	Blood
Krystal Bestanowitch	Blood
Laura Dickenson	Semen
Leandro Feliz	CCTV
Lindy Beicher	Saliva
Lisa Ann French	Hairs
Lori Ann Anker	CCTV, Entomology
Lynda Mann	Semen
Makenzie Lueck	CCTV, Cell Site Data

Marcia Trimble	Semen
Mary Quigley	Semen
Megan Kanka	Blood, Fibres, Orthodontics
Michella Marchenko	Blood
Mollie Olgin	Saliva, Semen
Mollie Tibbetts	Skin Cells
Nancy Marie Benna	Blood
Odin Lloyd	CCTV, Saliva, Cell Site Data
Patricia Beard	Semen
Pete Shrum	CCTV
Rita Curran	Saliva
Robert Reed	Blood
Sandra Cantu	Blood
Sara Ann Wineski	Semen
Shauna Howe	Saliva
Sherri Herrera	Semen
Suzanna Bombardier	Semen
Sylvie Cachey	Semen, CCTV
Tina Harmon	Fibre Analysis, Skin Cells
Tracie Hammerberg	Blood, Semen
Vanessa Marcotte	Skin Cells

8.2 Appendix B – Learning Contract



LEARNING CONTRACT:

INDEPENDENT RESEARCH PROJECT

The learning contract is an agreement between student and supervisor: it should clearly indicate what is expected from both sides. The text in Sections 2 and 3 provides guidance and can be modified to give more details reflecting what has been agreed, such as deadlines for submission of drafts and provision of feedback, word count limits/exclusions and number/timing of meetings.

Importantly, the document checklist helps students to follow the required procedures (e.g. ethical approval and risk assessment) and communicate what has been done to the supervisor.

The student should submit a draft of the completed form to the supervisor and request a meeting to discuss and finalise the content. Both the student and the supervisor are responsible for keeping a signed copy of this document and following what has been mutually agreed.

1. YOUR DETAILS

Student name: Mia Simmons

Degree Programme: Forensic Biology

Proposed IRP Title or Set Project: A Comparative Analysis between the United Kingdom against the United States of America exploring the influence of Forensic Evidence in Homicide Convictions.

Supervisor name: Sally Reynolds

2. As the student undertaking the above project I agree to:

- E-mail my supervisor on a fortnightly basis with a progress report.
- Meet with my supervisor at least once a month to discuss progress and I understand that it is my responsibility to organise these meetings.

- Comply with the terms of this learning contract and the guidance set out in the Guide to Independent Research Projects
- I understand that this is an *independent* project and that I am solely responsible for its completion.
- I agree to comply with all **ethical**, laboratory and fieldwork protocols established by the faculty.

3. As the supervisor of this project I agree to:

- Meet with the student undertaking this project on at least a monthly basis and to respond to the progress e-mails as appropriate.
- To meet formally with the student during the first week in November to undertake the interim interview.
- To provide guidance and support to the student undertaking this project bearing in mind that it is an *independent* research project. This is inclusive of commenting on drafts of the final report in a timely fashion.

3. DOCUMENT CHECKLIST

Research Proposal
or Plan Attached? YES NO

YES NO Risk Assessment for fieldwork and evidence of COSSH assessment for all laboratory procedures (online risk assessment completed)

YES NO Completed booking for all field equipment

YES NO Letters of permission where appropriate providing evidence of access to such things as field sites and/or museum archives

YES NO Completed Ethics Checklist

4. INTERIM INTERVIEW – Progress evaluation

Add here the key points of discussion and what has been agreed, particularly if different from Sections 2 and 3. Please indicate the date of your Interim Review (preferably in October within a month of starting Level 6).

- The choice sample countries – finalise choice over Christmas break and confirm at next meeting.
- Types of forensic evidence available to research and the impact of each used in the assignment.
- Uncertainty of how to approach not being able to access all the court records she needs to get data. Methods of accessing data and the implications of this.
- Final decision of her title; the title may change throughout the project and does not need to be finalised just yet.
- Providing a focus on gathering as much research as possible over the Christmas break.
- Organise accordingly prior to next meeting so research questions and results can be finalised prior to writing up.

Interim Review Date: Wednesday 14th April 2023

5. Variance from the Independent Research Project Guide

The IRP assessment is normally governed by the guidance provided in the Independent Research Project Guide. Any variance in terms of format (e.g. technical report, scientific paper) and word limit should be agreed and specified here. Submission date cannot be changed unless evidence of mitigating circumstances is provided in accordance with the standard BU Guidelines.

Any changes? **YES** **NO** If YES please provide details below:

Not Applicable

Both of the undersigned parties agree to be bound by this learning contract:

Student Signature:	Mia.Simmons
PRINT NAME:	Mia Jayne Simmons
Date:	Wednesday 14 th December 2023

Supervisor Signature:	
PRINT NAME:	Sally Reynolds
Date:	

8.3 Appendix C – Interim Review

**Independent Research Project
Interim Interview – Agreed Comments Form**

Student Name: Mia Simmons	Programme: Forensic Biology
Date: 14/12/2022	IRP Title: A Comparative Analysis between the United Kingdom against the United States of America exploring the influence of Forensic Evidence in Homicide Convictions.
Supervisor Name: Sally Reynolds	

Agreed comments – to include progress and plans for completion:

- We have discussed the choice sample countries – finalise choice over Christmas break and confirm at next meeting.
- We discussed the different types of forensic evidence available to research and the impact of each used in the assignment. Mia is unsure of how to approach not being able to access all the court records she needs to get data. We talked about other methods of accessing data and the implications of this.
- Mia is worried about the final decision of her title; we discussed how the title may change throughout the project and does not need to be finalised just yet.
- Providing a focus on gathering as much research as possible over the Christmas break as Mia’s IRP is very heavily research based. Organise accordingly prior to next meeting so research questions and results can be finalised prior to writing up.

Two copies of this form are needed – student to retain one copy and include in the appendices of the dissertation and the other is to be emailed to the supervisor.

Student Signature: Mia Jayne Simmons	Supervisor Signature:
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8.4 Appendix D – Risk Assessment

Hazard	Severity	Likelihood of Harm	Prevention Measures
Eye Strain	Low	Low	<ul style="list-style-type: none">- Ensure regular breaks are taken from computer.- Wear glasses with the correct prescription
Headache	Low	Low to Moderate	<ul style="list-style-type: none">- Stay hydrated.- Take regular breaks from computer.
Backache	Low	Low to Moderate	<ul style="list-style-type: none">- Assert the correct posture.- Take regular walking breaks