Under the Microscope of Forensic Science

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Introduction

Most people know forensic science from television shows such as *CSI* and *NCIS*, but they only scratch the surface of what this field really is. To dive in further, I had the pleasure of interviewing Dr. Graham Rankin, a forensic science professor here at Western Oregon University. He spent about 20 years of his career in the forensic science graduate program at Marshall University and is a Fellow (member) of the American Academy of Forensic Science. In forensics, scientists write and read reports for their studies and journal articles for research. When analyzing these texts I realized they truly are their own genres and have many unique characteristics, which will be explored further throughout this paper.

Analysis

So what exactly is forensic science? According to Dr. Rankin, it is “the use of the scientific method in analyzing evidence that will or may be presented in court in either a civil or criminal case.” Now, this is a very broad definition because it is a very broad occupation. There are divisions of forensics defined by the American Academy of Forensic Science that each have a specific focus, such as drug analysis, fire debris

analysis, medical examiner, and so on. No matter what the focus is, though, all forensic scientists write reports on studies and some write journal articles for research publication. Reports are written after a study has been conducted on a specific item or subject. It is a documentation of the study that others can look at to analyze the conclusions made. Journal articles usually involve a criminal case report and the analyses of the subject in that case. These articles get published into large research journals for public use. The formatting of both reports and articles are as follows: an abstract, keywords of the paper, an introduction, the materials and methods (for a report) or the case reports (for an article), the results, a discussion, and a conclusion. It is important in forensics to make the papers objective and unbiased, so they are all generally written in third person passive voice. They use a formalized scientific language for professionalism and try to write with as much clarity as possible.

These texts allow people to share scientific knowledge with others inside and outside of the science community. That is why, for example, the *Journal of Forensic Science* makes their articles open to the public for reading. They give detailed information on the study subject, the methods used to analyze it, the results that came from the analysis, and the conclusion of the scientists based on the evidence. Dr. Rankin gave me one of his research papers during the interview. He was a part of a research team that studied whether or not there was a test that could differentiate a certain species of a hallucinogenic plant called Salvia divinorum. They were able to find a test for the plant species and shared the results with a botany laboratory. Journal articles and reports also help share findings of studies with those working on a criminal justice case.

With all of the specifics explained in the reports, prosecutors or defendants can add new evidence to their case with ease. Being able to provide scientific evidence to help in the criminal justice system is what forensic science is for, so having the written reports to share that evidence is vital. For people who use these reports and articles, they are focused on being able to pull out key information and understand the content of what they're reading. Most of the time the ones utilizing these reports are involved in a criminal case, and if they cannot understand the facts in the way it was presented, the information loses its value. The scientists who write these documents value objectivity in their writing, being able to relay facts in an easy-to-read manner, and being very clear in their explanations of evidence so there is no confusion for the reader.

For those in the forensic science field, it is important to become an expert in your division. Rankin mentioned that he had seen many new forensic scientists attempt to write reports but failed because they weren't familiar enough with the topic and their focus. The more of an expert you become, the more depth the report will have. To write a sound report or article, one needs to understand how to write neutrally and let the paper stand independently. Understanding how to do a technical review of reports is also important to the profession. A technical review is when a scientist with the same focus reviews your report and makes sure you have all of the needed information. In an example where Dr. Rankin's report is under review, he said that, "the report would be read to see if [the other scientist] agrees with my conclusions ... especially to see if I followed the standard method, did I include all of the necessary information with the report, and did I claim something stronger than the evidence suggests." These are the

general points for a technical review, but every institution has their own variation of the general report format, specifically the reference page. So making yourself familiar with their variances will help you write a more accurate report.

If someone is considering going into forensic science, here are some of the skills and abilities they will need to succeed. Having a very good grasp of science and math is crucial for this career. In the case report Dr. Rankin sent me from the *Journal of Forensic Science*, the topic was sodium nitrate and its chemical changes when reacting with different substances in the human body. If you don't have a scientific background, this profession would be generally very difficult. Along with understanding science, you need to know how to properly use scientific language to be able to write and comprehend reports and articles. Also, being a detail-oriented person and having good organizational skills are needed for conducting analyses to make sure no information gets left out of the report. Another helpful component is familiarizing yourself with the standard scientific methods of analysis, which will help give added context when reading reports and improve analysis. The last ability that is helpful for this profession is critical thinking. Being able to deeply understand the outcomes of instrument tests and interpret the results for the conclusion of a report are vital to thrive in forensic science.

Comparison

To further understand the texts forensic scientists use in their day-to-day practices, I compared the texts Dr. Rankin gave me with my own writing for this class, another class, and my personal writing. To start, I compared Dr. Rankin's research on Salvia divinorum with my paper discussing the use of first person in academic writing. A visual difference

between them is that Dr. Rankin's paper has an abstract and section headings while mine does not. I start directly with the introduction when this is the second section in the research paper. Since these are a part of different genres, their rhetorical situations are different. My audience in this piece is my writing class and my professor. Dr. Rankin's paper is focused on a scientific audience, most likely geared towards others in forensic science. Both writing samples deeply describe aspects of their topic, but in different approaches. In my paper, I describe how the first person writing rule has made me resentful and frustrated with writing. In Rankin's paper, though, he describes a method used of enhancing the plant with methanol and the physical effects that took place afterwards. My paper relies mainly on ethos and pathos to communicate its messages, but Dr. Rankin's paper mainly uses logos to prove its conclusions and methods.

The next comparison was between the article from the *Journal of Forensic Science* about sodium nitrate and a criminal justice paper explaining the U.S. crime problem. Other than the obvious formatting differences between the papers, both texts have a research base to their ideas. In my criminal justice paper, I read several articles discussing how Americans view crime and the reasonings behind those views. These facts discovered were the support of my paper. In the forensic article, the authors researched the individual components of sodium nitrate (sodium and nitrate) and described how their combination can be very harmful. This was the groundwork that the rest of the report was built off of. While both papers have a formal tone to them due to their research nature, there are times in my paper where I change the tone to more informal to communicate ideas that play off of emotion.

The personal writing piece I'll use next for comparison is a comedy script I wrote about what I thought the 2020 Olympics would look like including the major 2020 world events. A distinct difference between this work and Rankin's research paper is my piece has a clear narrative that the characters direct. The research paper does not have a clear narrative, only describing the process of analysis for the subject plant. The tone of my writing is informal and humorous while Rankin's paper has a serious and formal tone. I made the dialogue very natural sounding and included many jokes to make it funny. For example, in one of the scenes, two characters are watching a tennis match, and they take an intermission. When they come back from the intermission, both characters look very distressed and start making petty jokes to each other out of tiredness and boredom. The research paper uses professional scientific language and does not display any emotion. Its main purpose is to communicate the process and findings of the analyses conducted, so including any jokes or humor would be inappropriate. I had a hard time finding similarities between the script and research paper because they are very different genres. The only similarity that almost all texts have in common (which therefore includes the texts I'm comparing) is that they are a written form of ideas used to communicate with others.

After comparing my own writing with the documents Dr. Rankin gave me, I realized there are a lot more differences than there are similarities. As a writer, this shows me that my current expertise is not enough to write texts for forensic science. To reach the level of expertise required, I need to expand my writing knowledge. Becoming more familiar with the forensic format is a starting point, but this is not enough. I will need to educate

myself with more math and science-based courses and understand the calculations that go into the standard analysis methods. Some practice in writing with formal scientific language will help me prepare for writing these reports. In order to write the documents for forensic science, you need to study and understand all of the components that go into this genre of writing.

Conclusion

Forensic science is a very needed profession that helps many criminal justice cases support their claims. Without this field, many questions would still be left unanswered and criminals would walk free of charges. Fellow students who are considering this field, know that this is a very detail-oriented profession and requires you to become an expert in one of the forensic divisions. Each of these reports take a lot of time and dedication to complete and often have you repeat tests to validate your findings. If you are someone who wants to help others by using math and science techniques in a very formatic profession, forensic science might be the career for you.

Author Bio

Makenna Bergerson is a freshman at WOU currently exploring what her future holds. She loves a variety of fields and topics, so conversations and hobbies don't fall short; but, dance and music are two of her biggest passions. Exploring the world through conversation and writing always brings her joy.