

The Utilization of Bite-mark Evidence in Concert with Cognitive Bias in the Wrongful Convictions of Ray Krone

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There are several types of forensic science with long histories of research and development that can be very helpful in convicting offenders; however, some forms of forensic evidence, such as forensic odontology's bite-mark evidence, are utilized despite a high error rate and short history of application since its first use in 1948. Ray Krone, who was wrongfully convicted twice on first degree murder and kidnapping charges due to a combination of cognitive bias and faulty bite-mark evidence, spent 11 years in prison, part of which was on death row, before he was exonerated by a DNA match to another person. Krone was convicted, overturned that conviction on appeal, and was convicted again despite a wealth of evidence demonstrating that he could not have been the perpetrator. Some of this evidence included footprints, DNA, hair, and fingerprints that did not match Krone; nevertheless, the prosecution convinced the jury through the testimony of a forensic odontologist, that bite-mark evidence is unique and that "DNA is meaningless and has nothing to do with this case" (Koen & Bowers, 2017).

In the early morning hours of December 29, 1991, Kim Ancona was seen closing up the C.B.S. Lounge in Phoenix, Arizona where she worked as a waitress. Later that morning, her body was found in the bathroom by the owner of the C.B.S. Lounge: she had been raped and stabbed to death. The bathroom floor had been cleaned by Ancona just before her murder, which meant that the crime scene was relatively clean and uncontaminated (Nelson, 2005). During the investigation, police reported having found "14 [bloody] shoe prints in the kitchen area leading to and from the area where the knife

used in the killing was kept” (Nelson, 2005). They found seventeen hairs on her body, most of which were Caucasian in origin. In her address book, police found the name “Ray” along with a phone number (see photo 2). Most pivotal to this case were several bite marks on Ancona’s neck and breast. Investigators immediately assumed that Ancona was murdered by someone she knew because there was “no evidence of a break-in or robbery” (Koen & Bowers, 2017). Several witnesses described a short man with black hair hanging around in the area near the bar. One of the witnesses sent police an anonymous note describing this man in detail (see photo 1), but because one of Ancona’s coworkers told investigators that Ancona “liked a guy named Ray Krone” investigators immediately headed to Krone’s place of residence and took him in for questioning (Koen & Bowers, 2017).

Krone was questioned for three hours, and investigators insisted that he and Ancona were in a relationship, which he denied. Krone also voluntarily submitted to shirtless upper body photographs, a blood draw, fingerprinting, and dental impressions in Styrofoam (Koen & Bowers, 2017). Two days later, Krone was arrested by officers in riot gear and placed in a county jail. While in prison, Krone was charged with first-degree murder, kidnapping, and sexual assault. Krone’s initial Public Defender told him, “You can expect to be found guilty, but we will fight it on appeal” (Koen & Bowers, 2017). He quickly changed lawyers which put a severe financial strain on his family. At the first trial, which began 7 months after his arrest, the defense attorney was able to demonstrate that the shoe prints didn’t match Krone’s in size or brand, and that the fingerprints on the murder weapon and the crime scene did not match Krone (Koen & Bowers, 2017). Hair analysis was considered inconclusive at the time, as the hairs that were tested were Caucasian in origin but did not contain follicles. Krone also had an alibi witness in his best friend and

roommate; however, the Prosecutor discredited his alibi witness by indicating he would lie for Krone because Krone said, “we had been in the air force together, we had known each other for over a decade, and I had always been there for him in times of need” (Koen & Bowers, 2017).

Despite all the evidence pointing to another perpetrator, the prosecution’s star witness, Dr. Raymond Rawson, who was paid over \$50,000 for his expert testimony, played a video he prepared comparing Krone’s dental model to the wounds (see photo 4); he went on to state that Krone’s bite was a complete match to the bites on Ancona’s body. The prosecution then went on to declare that bite marks are as unique as fingerprints. It only took the jury three-and-a-half hours to return with a guilty verdict on the charges of first-degree murder and kidnapping. Krone was sentenced to death.

Although it took several years, in 1995, Krone was able to overturn his initial conviction due to a violation of the discovery process. The videotaped evidence of bite-mark comparisons created by Dr. Rawson was withheld from Krone’s defense team despite a documented requested to either preclude the tape or have time to review it, so the Appeals Court found that “the trial court should have either granted a continuance or precluded the tape when first asked to do so...we cannot say it did not affect the verdict” (State v. Krone, 1995).

At Krone’s second trial, the defense attorney again demonstrated that the fingerprints and handprints found at the crime scene and on the murder weapon were not a match to Krone. The shoe prints in blood “belonged to someone who wore size 9 1/2 Converse sneakers, whereas Krone wore a size 11 and did not own Converse sneakers” (Koen & Bowers, 2017) (see photo 4). “Almost 30 experts testified and three bite mark experts testified for the defense” yet, again, Dr. Rawson was called for the prosecution where he

testified that Krone's bite-mark was a "match" to the victim's wounds and as unique as fingerprints (Koen & Bowers, 2017). The defense also discovered that investigators had swabbed the bite-mark areas and discovered saliva during the initial investigation, but that the saliva had not been DNA tested even though testing was available at the time of the crime. The defense had the saliva samples tested for DNA, and the tests came back not a match to Krone. At this time "the statistics of a DNA match "ranged from 1 in 2 million, to 1 in 200 million" which is a far cry from current statistics of 1 in 1 trillion (Dawid & Thomas, 2010).

During summation, in order to explain away the difference in DNA evidence results and bite-marks the prosecutor said, "You can disregard that DNA. That DNA is meaningless and has nothing to do with this case...that DNA was just transferred there by accident off of somebody's glass" (Koen & Bowers, 2017). After 3 days of deliberation, Krone was again found guilty. He was sentenced to life in prison plus 21 years.

Krone spent another 6 years in prison before the "Arizona State Legislature passed a new law allowing inmates who had untested DNA available in their case to get that DNA tested if it had direct bearing on guilt or innocence" (Koen & Bowers, 2017). Although the saliva on Ancona's body was already tested and was not considered new DNA evidence under this law, Krone's defense team was able to have the DNA on Ancona's clothing tested instead, which confirmed that he was not a contributor of the DNA at the crime scene; however, because the jury at the second trial had already rejected the importance of the DNA evidence, the information was not enough to overturn Krone's conviction.

An unnamed forensic analyst took the extra effort (even though this step was not part of the court order) to have the DNA run through the national database which identified a man already serving time for the sexual assault of a child

(Koen & Bowers, 2017). This man, Kenneth Phillips, matched the description of the man written about in the anonymous letter. When questioned, Phillips stated, on tape, that he was so drunk he didn't remember anything about that night but that he had been in the bar and woke up the next day covered in blood (Koen & Bowers, 2017). This information was presented to the prosecutor's office, where the prosecutor argued that the taped statement meant nothing and that the DNA wasn't as reliable as bite-mark evidence.

It was also discovered that, before Krone's first trial, FBI bite-mark analysts had declared the bite-marks could not have been Krone's but that that information was suppressed by the prosecution. "The defense never learned that, before trial, police had initially consulted an FBI odontologist who after examining the bite marks concluded that Krone's teeth were very different from the marks." (Garrett, 2011). Despite all of this information, it took a newspaper reporter writing an exposé on the case and another year in prison before Krone was finally exonerated in 2002. He became the one hundredth death row inmate in the United States to be exonerated.

After reviews of exonerations due to bite-mark evidence, the Forensic Odontologist who helped prosecute Krone, Dr. Raymond Rawson, was also found to be responsible for the conviction and then exoneration of another innocent man. There are indications that Dr. Rawson knew bite-mark evidence is not unique but was under pressure to overstate its importance due to the amount of money he was being paid by the state for his expert testimony. Dr. Dick Souviron, a Forensic Odontologist who helped convict serial killer Ted Bundy in Florida with bite-mark evidence, independently reviewed the dental evidence that Rawson used against Krone and said "It was...so obvious that Ray Krone's teeth didn't match the wound. But Rawson went right ahead saying it did. Stunning!" (Nelson, 2005).

Forensic Odontology's bite-mark evidence is so unreliable, that, "in 61% of the trials of [the first 250] defendants who were exonerated [by DNA evidence], the forensic [experts] gave invalid testimony which included 5 of 7 bite mark comparisons" (Garrett, 2011). This is due to the different variables in skin elasticity, the questionable uniqueness of tooth cusps, and the violence during the biting process; without a researched background the "error rates by forensic dentists are perhaps the highest of any forensic identification specialty still being practiced" (Bowers, 2019).

In 1999, the American Board of Forensic Odontology performed a test on some its diplomats, where they attempted to match a small number of dental models to bite-marks—they were correct only 36.5% of the time (Bowers, 2019). In fact, "Forensic Odontologists...regularly disagree not only about whether a bite mark matches a defendant, but whether a mark comes from a human bite at all" (Garrett, 2011). In 2015, the ABFO performed another test on its members to test this theory. Thirty-nine examiners were in the study, and agreed unanimously in "only 4 of the 100 cases [with an] agreement of at least 90 percent in only 20 of the 100 cases" (Bowers, 2019).

On top of the unreliability of bite-mark evidence, Detective Gregory, who investigated Ancona's murder "also ignored evidence pointing to the real killer...[and] based on a New Times review of police records in the case, it seems clear that Gregory, then others in the justice system, fell into...[cognitive bias]." (Nelson, 2005). The forensic analyst, Piette, who was responsible for the evidence collected from the scene (including fingerprints, hair, and DNA) did not test much of the evidence, including the one hair that matched Kenneth Phillips. Although the technician's inventory and alleged analysis included all 17 hairs found at the scene, the report ends right before the 17th hair, which is the one that matched Phillips' DNA profile (Nelson, 2005). In the 2005

Phoenix New Times exposé of the case, reporter Robert Nelson stated that:

From a New Times analysis of his work in the case, it's clear that Piette had in his hands...the means to both immediately exonerate Krone and immediately indict Kenneth Phillips. Instead, he at best ignored the evidence pointing to Phillips while focusing on bits of hair that, analysis showed, actually could have come from any Caucasian in the world. (Nelson, 2005)

It seems that prosecutors should be cautious when using under-researched processes as evidence, especially when their evidence is the only physical evidence presented.

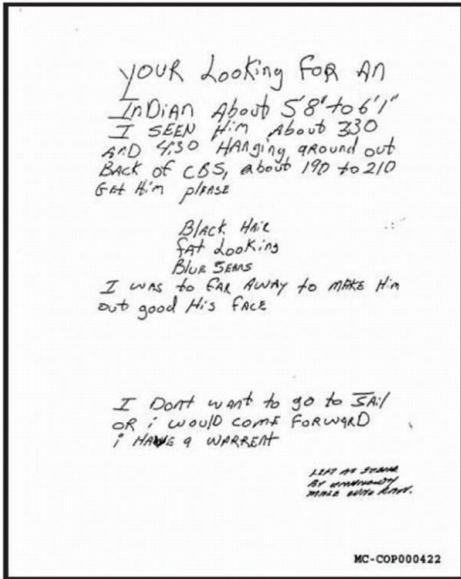
Krone is aware of the many injustices involved in his convictions despite having access to attorneys and experts that many others did not. He has also said that, "It should never be forgotten that the little girl who was sexually assaulted by Kim's actual murderer would not have been if the police had simply done their job and not focused all of their efforts on nailing me" (Koen & Bowers, 2017). Law enforcement and the prosecutor's office may experience public pressure to convict, especially in high profile cases, but no one benefits from a wrongful conviction. Because of the cognitive biases of the lead detective and the forensic analyst in the Ancona murder case, not only was a little girl sexually assaulted by Phillips, but Ray Krone spend 11 years of his life in prison where he contracted Hepatitis C, and the state had to pay out millions of dollars in (well-deserved) lawsuit money to him.

Forensic analysts also have a responsibility to remain neutral and seek the truth and not analyze evidence either in favor of conviction or acquittal. Only in 2009 did the National Academy of Sciences start to publish research on the

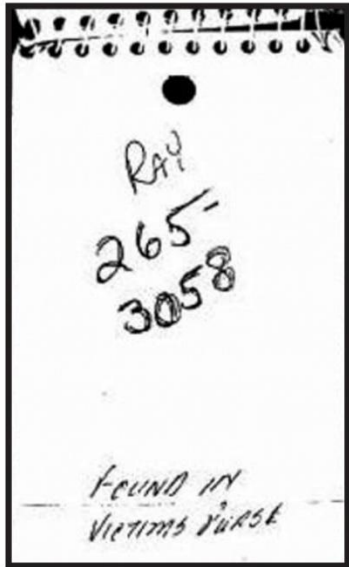
cognitive bias that some forensic analysts exhibit, after Brandon Mayfield was wrongfully implicated as the Madrid Bomber based on his fingerprints (Charman & Mueller, 2017). It has been suggested that if the analyst has information on who the suspect is then he is less likely to find the evidence ambiguous due to an unconscious bias. The study also suggests that “keeping evaluators blind to extraneous case information” may help avoid cognitive bias when evaluating evidence; it may also help as a checkpoint to reign in the effects of law enforcement’s bias as well (Charman & Mueller, 2017). This needs to be practiced not only by the forensic analyst, but also by law enforcement and the prosecutor’s office. The responsibility of both law enforcement and the prosecutor’s office is to the People, not the conviction.

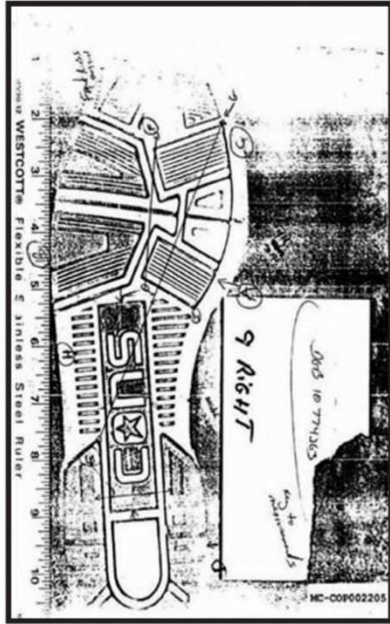
Photos:

1 (Cooper, 2009)



2 (Cooper, 2009)





3 (Cooper, 2009)



4 (science.sciencemag.org)

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