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Cultural Considerations in Forensic Science in the United States

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“You are your culture, you live your culture, and you express your culture whether you intend to or not.” (Lindsey, Roberts, & Campbelljones’, 2005)

Abstract— Does the cultural context of any criminal justice element, ranging from the crime victim to the forensic science expert, have any impact on the pursuit of justice? Is forensic science completely free of cultural adulteration? Two dimensions of the cultural consideration variable this paper focuses on are (1), what areas of forensic analysis need to be considered to prevent, or at least, diminish cultural offenses in processing crime scenes and forensic evidence, and (2) the need of forensic science professionals and organizations to adopt a consistent scientific culture in processing and analyzing evidence (particularly in DNA analysis). While many empirical sources have addressed individual criminal justice elements in the context of cultural considerations, the writers found an empirical research void that holistically addresses the spectrum of crime scene investigation and the pursuit of justice in terms of cultural considerations in forensic science. The goal of this paper is to provide the reader with an overview of culture, in general, and how culture impacts the pursuit of justice in the context of crime scene investigation and forensic science, both negatively and positively.

Keywords- forensic science; culture; Cultural Proficiency; Contemporary America;

I. INTRODUCTION: WHY IS CULTURAL UNDERSTANDING SO CRITICAL IN FORENSIC SCIENCE?

“As individuals, we are ultimately the result of our culture, that system of values, beliefs, behaviors, and norms that provide us with the world view that we share with others that are similar to or like us within society. It is through this cultural lens that we perceive and interpret the world around us.” (Bergeron, 2013). It is no different within forensic science; as a result the writers use two foundations to set the parameters of cultural considerations in forensic science. The first addresses the “five principles of cultural proficiency”, which are discussed by Lindsey, Roberts, & Campbelljones’ (2005) in the book, The Culturally Proficient School: An Implementation Guide for School Leaders. According to Lindsey, Roberts, & Campbelljones (2005), the five principles of cultural proficiency are that culture affects people’s lives, culture serves people, culture is divided between personal identities and group identities, cultural diversity is broad and important, and, finally, culture is made up of individual and group values (Lindsey, Roberts, & Campbelljones, 2005). In addition to these five principles, the writers also use the “Cultural Proficiency Continuum”, illustrated by Lindsey, Roberts, & Campbelljones, Cross (1989), and Lindsey, Nuri, Robins, & Terrell (1999). The six degrees of the “Cultural Proficiency Continuum” (Figure 1.1), going from the left to the right, include: Cultural Destructiveness, Cultural Incapacity, Cultural Blindness, Cultural Precompetence, Cultural Competence, and, finally, Cultural Proficiency (Bergeron, 2012, p. 31). In order to summarize the six continuum steps, the following definitions are given to each step:

- **Cultural Destructiveness**: Attitudes, beliefs, or actions that try to negate or disparage cultures that are not one’s own. In the context of forensic science, an example of cultural destructiveness would be unethical behavior of law enforcement personnel such as not collecting or sending evidence items to be tested or forensic science personnel determining which pieces of evidence to examine or not examine due to preconceived bias against an individual or group.

- **Cultural Incapacity**: Elevating one’s own culture as being superior to the culture of others. An example can be seen in the fairly common occurrence of “Cop Culture”, where law enforcement officers become increasingly separated and distant from the citizens they serve. In some cases this can become so extreme that officers begin to suspect and distrust anyone who is not a sworn officer.
- **Cultural Blindness**: Cultural blindness exists when actors are either unaware of the impact of the presiding culture or do not see the importance to consider the overall effects of the presiding culture. For instance, law enforcement personnel assuming a certain suspect or group to be the culprit based on pure, external observations that support prior modus operandi elements of previous crimes, when in fact, the true explanation of crime scene observations are the result of cultural traditions and values that crime scene investigators did not recognize. A specific example of “cultural blindness” will be given later on in the paper that specifically deals with the misinterpretation of accepted Tibetan funerary practice as being the handiwork of Columbian drug operatives trying to dispose of a human body (Hamilton and Spradley, 2011, p. 425). In many cases within government organizations, cultural blindness is seen as a proxy for fairness and equal treatment, but in most cases simply serves to marginalize all but the majority or dominant culture.

![Figure 1.1](image)

- **Cultural Pre-Competence**: This is the first step in acknowledging that the “lack of cultural knowledge, understanding, and experience can limit one’s ability” (Bergeron, 2012, p. 32). At this stage, law enforcement personnel begin to recognize the impact that culture has in their operations and investigational activities and may begin to seek out knowledge and expertise to assist in these activities.

- **Cultural Competence**: Individuals and groups not only realizing the importance of understanding the cultural context, but in addition, they proactively seek and engage in ways to enhance performance to the existing cultural context. This is the level when individuals and organizations begin to take specific actions related to cultural knowledge and expertise to enhance effectiveness – possibly by the recruitment of personnel from specific cultural or ethnic backgrounds or awareness, training, and education related to cultural considerations.

- **Cultural Proficiency**: As defined by Lindsey, Lindsey, Roberts, & Campbelljones (2005), cultural proficiency is “honoring the differences among cultures, seeing diversity as a benefit and interacting knowledgeably and respectfully among a variety of cultural groups” (Lindsey, Roberts, & Campbelljones, 2005). At this ideal level, law enforcement officials not only consider culture, but actively incorporate those considerations in their investigations and operational activities from the onset. The use of specialized units such as gang enforcement, domestic violence, or human trafficking that have specific cultural training and education are examples of how a culturally proficient organization might operate.

II. **HISTORICAL PERSPECTIVES OF FORENSIC SCIENCE CULTURE**

A. **Historical perspectives Overview**

According to Christopher Hamlin’s (2012) journal article, entitled, “Forensic cultures in historical perspective: Technologies of witness, testimony, judgment (and justice)?”, there have been four major historical forensic science cultures. The four major historical forensic cultures, as noted by Hamlin (2012) are the **Early Modern Europe, Late 19th Century America, Mid-19th Century India, and Contemporary America.**

B. **Different forensic science culture eras**

1) **Early Modern Europe**: In the Early Modern Europe forensic culture, medical professionals focused on bodies as evidence within an inquisitorial juridical institution (Carolina Code). In the Carolina Code, or Inquisitionprozess, magistrates were responsible for all criminal justice components. These responsibilities were deciding to investigate a crime, determining guilt, and dictating appropriate sentences (Hamlin, 2012, p. 6). This era was interested in “adjudicating identity, and, with it, rights to property” (Hamlin, 2012, p. 7). The dominating means of justice was an elaborate set of rules that were to be followed throughout. For instance, a main forensic topic was whether or not a female could technically have been raped if a pregnancy resulted since the dominating rule at the time was that pregnancy only resulted from lust and pleasure. Once advances were made in forensic understanding, such as determining still births from infanticide, the rules were simply rewritten.

2) **Late 19th Century America**: This era focused on chemical analysis and psychology via social reformers and chemistry professionals that were led by Mateu Orfila and Francois Magendie. The growth of forensic experience started to replace older, accepted scholastic rules that were...
cherished in the Early Modern Europe era (Hamlin, 2012, p. 10).

3) Mid-19th Century India: The focus of this era, according to Hamlin (2012) concentrated on the need of general toxicology in the parameters of poisonings. He stressed the need of understanding cultural influence to assist in the identification of possible homicides against “natural” death. The topic of poisoning is addressed later on in the article.

4) Contemporary America: Both the mid-19th century India and Contemporary America focus on forensic techniques, whereas the late 19th Century America dealt more with professional boundaries. In Contemporary America, “the public’s fascination with forensic science is not with systemic issues but with isolated crimes of individual against individual. And, unlike the reformist 1889 Congress, contemporary forensic culture is about detection solely, not prevention” (Hamlin, 2012, p. 12). Detection inherently involves the identification process. Hamlin points out that in Contemporary America, the dominant juridical institution is adversarial in nature and it is defined by archaic rules of evidence versus DNA (Hamlin, 2012, p. 6). The recent focus of DNA collection and analysis is a proponent of current legal arguments and debates framed around the US Constitution’s 4th amendment right against unreasonable search and seizure. This diabolical topic opens up new realms of scientific empirical research and focus.

III. THE NEED OF FORENSIC SCIENCE PROFESSIONALS AND ORGANIZATIONS TO ADOPT A CONSISTENT SCIENTIFIC CULTURE IN PROCESSING AND ANALYZING EVIDENCE

The American system of forensic science originates from numerous independent laboratories that are not uniform in policy, procedure, or rules/regulations. The oldest forensic science laboratory in the United States dates back to 1923. Notably, the oldest laboratory is housed at the Los Angeles Police Department, which was founded by August Vollmer. Close to 400 independent public forensic science laboratories exist at various levels of federal, state, and local governments in the United States. Consequently, independent laboratories have individual policies regarding the adoption of its own forensic science culture.

Thus, forensic science laboratories in the United States operate at different professional levels. This fact creates a consistent lack of forensic science culture. In considering whether or not forensic science has a “culture”, one must consider and research all forensic laboratory’s policies and procedures. The multi-level forensic science laboratories in the United States create different levels of need. Some laboratories have better equipment than others and better qualified forensic personnel. This disparity creates a research hurdle of generalizing what is today’s “forensic science culture”.

As pointed out by Cole (2012), the existence of a “forensic culture” being a part of “epistemic culture” creates cause for concern due to the “National Academy Science’s (NAS) recent identification of ‘culture’ as one of the problems at the root of what it identified as ‘serious deficiencies’ in U.S. forensic science and ‘scientific culture’ as an antidote to those problems” (Cole, 2012, p. 36).

One area of non-uniformity in forensic science culture is in forensic report vocabulary. For instance, there are no standards of uniformity in report writing utilizing terms, such as “match” and “can’t be excluded as a source of”. In 2009, the Committee on Identifying the Needs of Forensic Science Community, National Research Council (2009) published a report entitled, “Strengthening Forensic Science in the United States: A Path Forward” wrote, “This imprecision in vocabulary stems in part from the paucity of research in forensic science and the corresponding limitations in interpreting the results of forensic analyses” (National Research Council, 2009, p. 186).

Other recommendations that were made by the National Research Council (2009) were as follows:

1) Research is needed to address issues of accuracy, reliability, and validity in the forensic science disciplines.

2) To improve the scientific bases of forensic science examinations and to maximize independence from or autonomy within the law enforcement community, Congress should authorize and appropriate incentive funds to the National Institute of Forensic Science (NIFS) for allocation to state and local jurisdictions for the purpose of removing all public forensic laboratories and facilities from the administrative control of law enforcement agencies or prosecutors’ offices.


Competing goals and cultures prolifically create animosity and ambiguity between forensic science laboratories that are administered by law enforcement agencies. Cultural pressures of being under the same management as the arresting division often create the potential for biased reporting. If forensic science laboratories were autonomous, the freedom to report openly would absolve any doubt of the reliability or reporting (National Research Council, 2009, p. 184).

Margot (2011) summarized this paradox effectively when she wrote the following:

In most countries, authorities have either used practitioners from the ranks of law enforcement or, in more technical circumstances, natural scientists were hired to create the first "real" laboratories in the 1950s.
These scientists came from chemistry, physics, biology, engineering, and medicine, and were quickly confronted with difficult problems of interpretation and with the uncertain quality of crime specimens. Some made essential contributions and developed a real culture in forensic science (for example, Stuart Kind in the United Kingdom and Paul Kirk in the United States), but many labs existed within a police culture and were directed by officers who were often more concerned with their climb up the ladder of police ranks than the development of a science culture. The current situation of many forensic science practitioners is the result of a structural error due to policy and historical decisions. It is compounded by the fact that many laboratories created within law enforcement agencies have been populated by poorly paid civil servants who, if they were good scientists, quickly moved to highly paid industry positions. This development is a sad reality that has resulted in poor science performed by poorly qualified practitioners. (p. 799)

At the heart of forensic science culture is the question of DNA analysis. Michael Lynch (2013) wrote that DNA evidence has earned exceptional legal status and acceptance. Lynch (2013) contends that DNA evidence is not “a transcendent source of ‘truth’ in the criminal justice system” (p.60). A contributing factor to this issue is that DNA profiling is the result of police laboratories and other independent laboratories bias. In addressing biased law enforcement laboratory analysis, Lynch (2013) wrote that the Houston Police Department Crime Laboratory was the source of a 2003 investigation of having problems with evidence processing, ranging from evidence handling and interpretation (p. 65).

Lynch (2013) wrote the following:

Currently, DNA evidence is treated as exceptional, but it also is upheld as a model for other forms of forensic evidence to emulate. Given the current state of forensic science, there is reason to welcome an expansion of precision estimation (expressed through probability figures), upgraded procedural standards and practitioner credentials, protections against error, and so forth. However, there also is a reason to be concerned about the possible institutionalization of a threshold of certainty ascribed to those technologies that ‘pass the test’. Even if it makes sense to say that DNA evidence is ‘nature’s testimony’, it nevertheless remains the case that its probative value as testimony is bound up in competing and all-too-human narratives. (p. 68)

The lack of a consistent forensic science culture in processing evidence, particularly DNA evidence, was exacerbated in the terrorist attacks of 2001. On September 11, 2001, the terrorist attacks on the World Trade Center Towers, the US Pentagon, and the crash of United Airlines Flight 93 created multiple, massive crime scenes. The two types of mass fatality crime scenes that were created were: Closed and Open. A “Closed” incident refers to when the identification personnel have a predetermined list of potential victims, such as a passenger manifest. Thus, the identification personnel know if each name is marked off the list or not. An “Open” incident refers to a situation where identification personnel do not have ANY idea who may or may not be a casualty. For example, the Word Trade Center attack was an “open” incident where workers did not know who may or may not have been in the building. The Flight 93 terrorist attack was a “closed” incident because workers had a passenger manifest (National Criminal Justice Reference Service, 2006, p. 68). Geberth (2006) wrote, “Dr. Shaler points out that such mass fatality events are characterized by massive search and rescue missions that typically occur in three phases: rescue, recovery, and identification” (Geberth, 2006, p. 269). After a nine month recovery phase, the debris that was recovered went to the Fresh Kills Landfill. When the debris arrived at Fresh Kills Landfill, it was dumped and then spread out by machines. It was at this time that crime scene investigators sifted and separated the material. The debris then was sent up to a second area via a conveyer belt where it went through a second screening by crime scene investigators (Geberth, 2006, p. 270-271). According to Geberth (2006), “Until the World Trade Center disaster, DNA was a secondary mode for identification. The World Trade Center effort was characterized by an environment that propelled DNA testing into the forefront as the primary identification modality” (Geberth, 2006, p. 272). Overall, 2,749 people died and 19, 916 remains were recovered.

One of the main lessons that was learned from 9/11 was that both state and local agencies need to be prepared to face a major DNA identification process if mass fatalities are experienced (National Criminal Justice Reference Service, 2006, p. v). In the 2001 mass fatality crime scene, multiple organizations were involved in the DNA Identification Phase: (National Criminal Justice Reference Service, 2006, p. 32).

- Medical Examiner/Coroner
- Investigating Agencies
- Victims’ Families
- Recovery Team
- DMORT
- FEMA
- Vendors
- Partner Laboratories

In conjunction with the last mentioned in the above list, Partner Laboratories, the World Trade Center terrorist attack response utilized a decentralized structure with multiple partner laboratories having two approaches: Daisy-Chain Model and the hub-and-spoke model. In the daisy-chain model, “samples (or extracts) are shipped to the first partner laboratory, which ships extracts to the second partner
laboratory, which ships extracts to the third partner laboratory, and so on” (National Criminal Justice Reference Service, 2006, p. 28). The hub-and-spoke model allows for the managing laboratory to control for shipment of evidence by that one laboratory. Regardless of which approach is used in a mass fatality identification process, different partner laboratories having different allocated responsibilities creates a “culture” issue. The “culture” that is being referred to is the normal, day-to-day policies and procedures that each individual partner laboratory would normally be subjected to. This can be paralleled to multiple police departments within one county that have different policies and procedures. Though all of the police departments share the goal of serving and protecting, each department has its own “culture”. Thus, one of the main points that was brought out in the Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents, was that all of the partner laboratories needed to form a unified forensic science “culture”. According to the Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents (2006) report,

The project manager should work to understand the cultures of the various agencies and departments with which the laboratory will be working in the identifications effort. In addition, the project manager should establish formal and informal channels for receiving and sharing information. p. 31

To ensure that the newly “adopted” culture is being followed, a representative from each partner laboratory needs to meet with the medical examiner’s office at least weekly in regards to the transfer of samples, any problems that may have developed, and anticipated work load constraints, such as deciding major questions.

One of the first decisions that management has to decide is, “When are we finished?” This question narrows management into making one of two choices. Those two choices are:

- The identification of human remains will end for a particular victim when one body part has been positively identified with that victim. This choice usually allows the family only one body part to bury.

- The identification of every human remain will be identified no matter how many remains there are. This usually results in a prolonged identification process. However, the family ends up with several pieces of the body to bury. The importance of having as much of the body intact is significant to many religions and cultural values (i.e. Maori).

Once this question has been answered, then management must decide, “What is the minimum fragment size that will be analyzed?” The usual minimum fragment size that will be tested is between 1 to 10 centimeters. The decision on the minimum fragment size affects the following:

- How the crime scene is processed to collect the remains
- The processing of the remains at the morgue
- The number of samples that will be ultimately turned in for DNA analysis

Forensic science first has to concentrate on adopting more of a national standard forensic science culture. Once this has been significantly addressed, considerations of societal cultural impact in forensic science will have a more firm foundation.

IV. FORENSIC SCIENCE CAUSING CULTURAL OFFENSES

Death notifications are always hard for law enforcement to take on, but this arduous task is exacerbated tenfold if law enforcement has a cultural blindness to a family’s traditions, values, and rituals. According to Bergeron (2012), the burial rites and ceremony practices aide mourning families by providing a strong psychological need to ceremonially say good-bye. Forensic science protocol may hinder these ceremonial practices by having to perform autopsies and/or not being able to identify the deceased (p. 34). The National Association of County and City Health Officials (NACCHO) (2012) wrote, “autopsies, timeframe and handling of the body, including ceremonial washing of the deceased and religious ceremonies and/or items to be left with the dead” will result in conflicts between the forensic science community and the families of the deceased (p. 4). The NACCHO (2012) also wrote the following:

For the bereaved, cultural and religious beliefs and death practices may lead to requests irreconcilable with the demands faced by the Medical Examiner/Coroner (ME/C) in a mass fatality. [Responders need to] strive to be culturally competent and sensitive—responding to requests when possible and demonstrating awareness and sensitivity when explaining why requests cannot be made. (p. 1)

Crime scene investigators and forensic personnel often are not trained or educated on the importance to consider cultural values in processing crime scenes or forensic evidence. If forensic professionals are not educated or trained, then it would be expected that certain cultural values would be trodden on because responding personnel do not know the offense, or the potential to offend, even exists. If cultural values are identified at crime scenes, it is important that the victim’s family be included in trying to alleviate conflicting values between forensic science culture and the cultural values of the family (Hudson, Allan, Bedford, Buckleton, & Stuart, 2008).
According to Hudson, Allan, Bedford, Buckleton, and Stuart (2008), “The greatest potential for conflict between the pursuit of justice and cultural values occurs in the event of a suspicious or homicidal death” (p. 380). In cases of suspicious death or known homicides, the deceased victim’s body is the first piece of forensic evidence that needs to be protected, properly collected, and then forensically analyzed. The forensic analysis of the body starts with an external examination for visual wounds, trace evidence (hair, fiber, gunshot residue, etc.), blood stain pattern identification, and body placement. Typically, the body is often labeled as evidence item number 1 in a crime scene. Once the body has been removed from the crime scene, it is then sent to a forensic laboratory so that an autopsy can be performed. One key belief of Maori Culture is the importance of not leaving a deceased body alone. As often is the case, the very nature of the autopsy routine often involves the body being left in a morgue like setting until a forensic pathologist has enough time to start the autopsy. Thus, the offending of certain cultural beliefs occurs before the first incision is made to the body. Maori cultural beliefs stress that the body is to be left intact. As pointed out by Hudson, Allan, Bedford, Buckleton, and Stuart (2008),

To disrespect the dead remains one of the strongest prohibitions amongst Maori. All parts of the body should be kept together if possible, and buried as one. From the moment the death is notified to the family they become *tapu*, “set aside from everyday matters.” (p. 381)

New Zealand’s Institute of Environmental Science (ESR) has taken proactive steps in addressing the need of cultural considerations in forensic science. ESR is a government owned forensic science entity that is responsible for being the sole provider of forensic analysis to New Zealand Police. As evidence of this proactive leadership, ESR has published an educational brochure that is placed in each crime scene kit that summarizes certain cultural beliefs, practically Maori belief, and how to address certain cultural issues if the need arises. In addition to the brochure, employee training is addressed that focuses on actual scenes that caused cultural offenses.

V. ADVANTAGES OF UTILIZING CULTURAL CONSIDERATIONS IN FORENSIC SCIENCE

A. Crime Scene Investigation

Addressed earlier in introduction section of “cultural blindness”, if a crime scene investigator is ignorant of certain cultural influences in play, the ignorance could actually give birth to false assumptions being formulated. A specific example of “cultural blindness” was the misinterpretation of accepted Tibetan funerary practice as being the handiwork of Columbian drug operatives trying to dispose of a human body (Hamilton and Spradley, 2011, p. 425). Since 2006, the increase of violence at the Mexico/United States border has caused significant attention to forensic crime scene analysis in cases in which mass graves are found. In March 2010, the forensic anthropology faculty at Texas State University was contacted in a case in which it was assumed that Mexican drug cartels were utilizing vultures to dispose of bodies of arch cartel rivals. The Texas State University’s Department of Anthropology had done extensive research into forensic analysis of vulture behavior. The immediate arrival of vultures to a particular areas indicates that the area is used habitually that allows for sustained access to deceased, decaying remains. The combination of analyzing crime scene photos in culmination of scientific observations and conclusions of vultures’ behavior, the Texas State University’s Department of Anthropology found that the vultures that were depicted were not native to that specific area. An investigative lead of the source of the vultures came from an examination of a license plate of an SUV vehicle depicted in the crime scene photographs. The license plate was a pattern match to Tibetan license plates. Instead of depicting a new cartel behavior, the crime scene actually depicted ancient culture of “sky burial” in which remains are purposively exposed to natural elements and vulture ingestion. Hamilton and Spradley (2011) wrote the following:

In this ceremony [“sky burial”], monks deliberately allow the body to be exposed to the elements and prepare the remains for vulture ingestion. Vultures are viewed as natural agents capable of returning the body back to the earth and the air [1, 2]. The monks score the body with knives to better attract the vultures and for ease of their ingestion. Once the body is scavenged to the bone, monks will then pound the remaining skeletal and cartilaginous elements with axes and sledgehammers to reduce the bones, which are then mixed with *tsampa* (barley flour) to further encourage consumption by the vultures. These elements are all present in the BUITRES document, and it is clear that the pictures show a culturally sanctioned religious burial practice, and not drug cartel activity. (p. 428)

B. Poison Detection

In a critique of Dr. Norman Chevers’ 1856 *Manual of Medical Jurisprudence for Bengal and the Northwest Territories*, Hamlin (2012) wrote the Chevers’ emphasized the importance of understanding cultural influences regarding the topic of poisonings. Hamlin (2012) wrote the following in regards to Chevers’ focus on the importance of understanding poisonings:

Accordingly, he urges a revolution of forensic techniques. Systematic studies of Indian poisons are needed… But the main reason for recourse to a forensic science is the inaccessibility of Indian minds. Chevers knows a good deal about ethnic and regional diversity. His book is packed with exotic and horrific incidents or practices.
Crime scene investigators are trained to look for suspicious elements that may be present. Unfortunately, poisonings are often overlooked by crime scene investigators. In compliance with Title 15, Section 4, Chapter 2, of the Code of Alabama 1975, autopsies are completed only after a coroner or district attorney (depending on the county) has requested one. A request by a coroner or a district attorney doesn’t automatically ensure that the forensic pathologist will approve an autopsy (ALISON, 2013)\textsuperscript{15}. Obviously, a coroner would have to suspect an unnatural cause of death to request an autopsy that is financially funded by the government. As demonstrated below, poison homicides are often overlooked by novice crime scene investigators and forensic personnel.

In an empirical analysis of poisons in the United States from 1999-2005, Shepherd and Ferslew (2009) found that there was a relatively low rate of homicides associated with known poisons. They found 21,792 undetermined poisoning deaths and 523 homicidal poisonings with a resulting population rate of 10.82 poisons per million persons in the United States. Of the possible types of poisons (1) drugs, medicaments and biological substances (2) corrosive substances (3) pesticides (4) gases and vapors (5) specified other noxious chemicals and (6) unspecified chemical or noxious substances. They found that the most common known type poison method was by drugs, medicaments, and biological substances. They also found that vulnerable populations, at each age extreme, were the most vulnerable. This creates challenges for crime scene investigators in that actual poisons can mimic sudden death syndrome in infants or natural causes in elderly victims. Shepherd and Ferslew (2009) stressed the fact that many deaths are actually homicides by poison but will never be discovered. They wrote the following:

It is unknown how many of the cases in this report underwent autopsy or laboratory analysis. Because extensive forensic evaluations are not performed for most deaths, it is possible that some cases of poisoning may go undetected. With identified poisonings, the intent behind the injury is often unclear and in many cases is undetermined... Given the surreptitious nature of poisoning, it is possible that a substantial proportion of these undetermined deaths could have been homicidal in nature. (p. 345)\textsuperscript{16}

C. Human Identification Using Cultural Considerations

1) Caution must be utilized in using tattoos to determine cultural or ethical significance: In an article written in the Journal of Forensic Identification, James Bailey (2002) researched forty police officers’ ability to assess tattoo identification in conjunction with limited background information and the resulting accuracy of determining a subject’s cultural background. Bailey (2002) wrote that two researchers “identified five subcultures associated with tattoos and group memberships or affiliations: gang, drug, incarcerated, racist, and miscellaneous groups. Within the gang-related subculture, four additional categories are identified: Hispanic, Black, Asian, and motorcycle (biker) gangs” (Bailey, 2002, p. 608)\textsuperscript{17}. The experimental results indicated that the investigators were not able, with any consistency, use tattoos of research subjects to properly identify ethnic or cultural background information.

2) The Use of Material Culture to Establish the Ethnic Identity of Victims in Genocide: One current investigative use of material culture (clothing and/or personal effects) analysis inherently comes with the issue of genocide. Genocide occurs when there has been a specific target of persons being killed as a result of nationality, religiosity, ethnicity, or racial background. Consequently, it is important that the prosecutor be able to show the jury that the victims were noticeably identified in one of the four groups. Prior to 2008, however, no empirical testing of material culture pointing to a person belonging to one of the four protected groups had been completed and its “validity in modern forensic contexts [were] untested” (Komar and Lathrop, 2008, p. 1035)\textsuperscript{18}. Thus, Komar and Lathrop (2008) decided to empirically research the use of material culture to identify one of four groups that are protected by law. Material culture is useful to investigators because it is usually able to be physically analyzed, even after a body has been decomposed, for social identity and trauma, such as bloodstain pattern analysis or gunshot trauma. Komar and Lathrop’s study focused on White Hispanic and White non-Hispanic from the American southwest. From 2002 to 2005, researchers collected autopsy records depicting written descriptions of clothing and personal effects. Komar and Lathrop’s (2008) research goals were as follows:

The goals of the research was to determine (1) whether clothing and personal effects could be reliably categorized and scored, (2) whether statistically significant differences exist between the two ethnic groups, and (3) whether such differences could be used to construct a model that accurately predicts ethnic identity in unknown individuals.(p. 1036)
Differences in material culture of the two groups (White Hispanic and White non-Hispanic), were found to be statistically significant in all observed aspects/dimensions. The different dimensions of material culture that were observed in this study were: Clothing (present or not present), Type of Currency, Nationality, Documents (Driver’s license), Language of deceased, Language Source (Documents), Religion, Evidence of Religion (jewelry, such as a cross). However, it must be noted, just as care must be taken with identifying background information based on tattoos, the presence or absence of material culture of genocide victims may be erroneous. For instance, victims of genocide may actually change their clothing to portray certain affiliations not their own prior to their death. Additionally, manipulation of material culture by offenders may create erroneous observations. The researchers did point out that “it is vital that all methods be subjected to rigorous testing of both internal and external validity before they are applied in forensic contexts” (Komar & Lathrop, 2008, p. 1039).

VI. Areas of Future Research

As pointed out earlier in the article, after the World Trade Center Terrorist Attacks in 2001, DNA became the primary mode of human identification. The utilization of DNA is here to stay; in fact, the collection of DNA material from all spectra of society will eventually become the center of attention and debate. This introduces several areas of research foci that have been left unaddressed in the forensic science culture of Contemporary America.

On October 17, 2008, the National Forensic Science Technology Center (NFSTC), in association with the Bureau of Justice and the National Institute of Justice, recorded training video sessions for online viewing. In the medical examiner forensic training video, at approximately 11:09, DNA analyst Rob O’Brien told the students that as he was in training, he analyzed a piece of evidence from an old murder case for DNA evidence. After the evidence was analyzed, an “unknown source” of DNA was reported. Knowing this to be odd, the lead investigator requested that the lab technicians’ DNA to be ran against the “unknown source”. After the unknown source was ran against novice DNA analyst Rob O’Brien’s DNA, it was found that O’Brien contaminated the evidence by simply talking over the evidence as he was processing it on the counter. O’Brien had not been wearing a face mask as he processed the evidence (O’Brien, 2008, video: 11:09).19

As evidenced in the above paragraph, contamination of crime scene evidence is easily done. With the advances in DNA technology, such as the utilization of “Touch DNA”, DNA processing is so good now that the potential for several “unknown sources” of DNA could actually be coming from crime scene investigators, first responders, lab technicians, and any other official that comes in contact with the evidence. An “unknown source” of DNA throws the case in so many directions. The problem is that this “unknown source” will remain an “unknown source” if it did, in fact, come from an official law enforcement representative and not some true, third party suspect.

This problem could easily be solved if all law enforcement officials have to submit a DNA profile to CODIS (Combined DNA Index System). Just as law enforcement officials submit their fingerprints to be kept on file, creating, storing, and using law enforcement genetic material is also of utmost importance in addressing the contemporary American forensic culture of the CSI Effect (Hamlin, 2012, p. 14).

However, it must be pointed out that fingerprint information has one dimension of information, whereas DNA information is multi-dimensional in terms of race and gender (Lwin, 2010, p. 196)20. The mass collection and storage of such personal information as DNA goes against the American police “Code of Silence” subculture. To evidence the American police “Code of Silence” sub-culture, Collins (2011) wrote the following:

In a still-unresolved dispute in Los Angeles, the police union and top brass have traded salvos over a requirement that officers give DNA samples in shootings involving police and other use-of-force incidents. Union leaders say management won’t restrict how the DNA information is used and stored, and the union cautioned officers in 2009 about potential privacy and misuse problems. (para. 10)21

The approval to collect all law enforcement’s DNA profile will have to jump hurdles. As reported by Collins (2011), the only state in the United States to have an existing law requiring all law enforcement personnel contribute a DNA sample to CODIS is Louisiana. Collins wrote, “Louisiana appears to be the only state with a law requiring officers to provide genetic samples. The law was enacted in 2003 and applies only to officers hired on or after Aug. 15 of that year” (Collins, 2011, para. 13).

Conversely, “Police in other parts of the world, including the United Kingdom and Australia, have been keeping officers’ DNA on file for several years” (Collins, 2011, para. 17). Further research needs to analyze already current law enforcement DNA database systems, such as the United Kingdom, to either support the purported abuse of police DNA databases or to quench the accusation. Why has only one state in the United States taken initiative in addressing the obvious problem of “unknown DNA contributors” possibly stemming from law enforcement personnel?
Anecdotal observations by the authors via personal informal interviews of law enforcement officers in Alabama suggest that DNA Elimination samples are NOT being collected from law enforcement officers that have entered a crime scene. Thus, one of the most important issues of concern in regards to law enforcement’s cultural impact to forensic science and crime scene processing is the complete void of law enforcement DNA Elimination samples being collected and processed against evidence that is submitted for forensic analysis.

In a Journal of Forensic Identification article, Poy and van Oorschot (2006) found that “DNA can be transferred to a latex glove during routine casework” and that the task being performed has a greater influence on the amount of alleles present versus the time worn (Poy & van Oorschot, 2006, 568). In this experiment, approximately 120 ng of DNA and 30 number of alleles were found to be on the latex glove of a research participant who handled a heavily soiled dress for about ten minutes. The research participant was simply handling the evidence for further processing.

Officers are also charged with processing evidence from the crime scene, to evidence bags, and then to the forensic laboratory. If DNA alleles have been shown to be inadvertently transferred from the evidence itself to a lab technician’s examination gloves, then it is a necessary inference that DNA alleles can also be transferred from crime scene evidence to an officer’s examination glove in the field.

There are several contamination dimension possibilities in terms of the transfer of DNA alleles to the examination gloves law enforcement officers use in crime scene processing. For instance, law enforcement officers generally use duty belt glove pouches, open boxes of crime examination gloves stored haphazardly in officers’ patrol vehicles, and the inadvertent retrieval of examination gloves, perhaps by grabbing the latex gloves by the fingertips from inside the box. Yet, the authors have not found empirical forensic research addressing this area of potential crime scene contamination.

Additionally, in association with forensic science focus of DNA analysis, many states have recently passed mandatory collection of DNA from arrestees. In fact, the Federal Bureau of Investigation started to collect DNA samples from arrestees not yet tried or convicted in April 2009. As recent as June 3, 2013, Maryland v. King, 569 U. S. 207 (2013), the Supreme Court held that

When officers make an arrest supported by probable cause to hold for a serious offense and bring the suspect to the station to be detained in custody, taking and analyzing a cheek swab of the arrestee’s DNA is, like fingerprinting and photographing, a legitimate police booking procedure that is reasonable under the Fourth Amendment. (p.1)

On October 1, 2010, the state of Alabama passed a law that allowed law enforcement personnel to collect DNA swabs from all persons arrested for felonies and three misdemeanor exceptions: Sexual Abuse 2nd degree, Sexual Misconduct, and Indecent Exposure. The DNA collection kits are provided to felony booking stations by the Alabama Department of Forensic Science (Alabama Department of Forensic Science, 2013). However, the collection of DNA swabs from arrestees may not actually be taking place. According to Angie Hamilton (2013), Lauderdale County has not been collecting DNA swabs from felony arrestees (A. Hamilton, personal communication, April 19, 2013). The failure of felony booking stations actually carrying out Alabama state law creates a vacuum of missing investigative data. Future research needs to address the existence of policies and procedures of all Alabama counties in complying with current Alabama state law and the actual implementation of those policies and procedures.

In conjunction with this voidance of research, Michael Lwin (2010) also addressed the forensic science issue of not expunging DNA records. Lwin (2010) wrote that the Federal Bureau of Investigation requires that the records of those persons who have been acquitted and/or those cases in which the charges have been dismissed, be expunged. However, several states do not have current law, policies, or procedures in place, to properly abide by federal law. The state of Alabama currently only has policies in place to expunge the criminal record of an arrestee, and not the actual DNA sample from CODIS unless the circuit court in which the person is either convicted or arrested orders the DNA sample to be expunged (Lwin, 2010, p. 190).

Another dimension of DNA expungement deals with consensual DNA samples obtained from persons/suspects. The Philadelphia Police Department has a DNA consent form that addresses the option DNA expungement (Michael Garvey, personal communication, October 28, 2013). The second paragraph of the DNA consent form reads as follows:

I understand that, despite providing my consent on this date, I retain the right to request the DNA profile developed from the oral swab to be expunged or deleted from the DNA database. I understand that the expungement process must be initiated by me and that I have been provided with instructions on the expungement procedures. Thus, research is needed to find to the extent that states are actually abiding by federal law in regards to expunging DNA records of those persons who have been arrested. (Philadelphia DNA consent form, second paragraph)

Anecdotal evidences from informal interviews of several police officers in Alabama, conducted by the author (Taylor), have revealed that several police departments do not have DNA consent forms informing a person of his/her right to have the consensual DNA sample expunged from CODIS.
According to Michael Garvey, in a conference session entitled “The Future of Forensic Evidence and Fourth Amendment” which was presented at the International Association of Chiefs of Police Conference in October 2013, not having an information section about the option of expunging DNA presents 4th amendment search and seizure problems for law enforcement. (Garvey, 2013).25 Future research addressing the current standards of DNA consent forms having (or not having) a section about the option of expunging consensual DNA samples needs to be done of all police departments in the United States.

VII. Conclusion

Overall, the area of cultural considerations within law enforcement and forensic science is underdeveloped in terms of comprehensive research in a holistic manner. While there are a number of sources that have addressed individual criminal justice elements in the context of cultural considerations, this has generally not been done in an interdisciplinary context across the spectrum of crime scene investigation and forensic science. More research and collaboration is needed into how culture impacts the pursuit of justice in the context of crime scene investigation and forensic science.

REFERENCES


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