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The need for the standardization of forensic anthropological case reporting practices in the United States

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Thesis

**THE NEED FOR THE STANDARDIZATION OF FORENSIC
ANTHROPOLOGICAL CASE REPORTING PRACTICES IN THE UNITED
STATES**

by

ALEXANDRA LYNN PARADIS

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Approved by

First Reader

Sean D. Tallman, Ph.D.
Assistant Professor of Anatomy and Neurobiology

Second Reader

Tara L. Moore, Ph.D.
Professor of Anatomy and Neurobiology

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ABSTRACT

Case reports in forensic anthropology include information from anthropologists to provide assistance and expertise to medicolegal entities, helping to aid in investigations. This may include information to assist with identification, determining the cause or manner of death, or with other circumstances involving a deceased individual. However, within forensic anthropology there remains no unifying standardization for writing a case report which can be used by any forensic anthropologist, independent of work environment, education, or circumstance. While some standards do exist, which are commonly utilized within the field (i.e., the *Daubert* standard, OSAC best practice guidelines, etc.), they do not provide a significant, unifying standard. In order to explore whether a lack of standardization is problematic in forensic anthropology, a survey was conducted asking forensic anthropologists who work on cases and who create case reports about their reporting practices, the standards they follow and are familiar with, and their personal experiences regarding education and overall practices when creating case reports. The survey was taken by 106 respondents from various backgrounds, education levels, and work contexts. Overall, there were multiple areas of agreement amongst respondents, which suggests an unofficial standardization that exists within the field. However, other areas, such as cognitive bias, terminology, and education and

training experiences varied significantly amongst respondents. While some areas of forensic anthropology may appear to be standardized, there is still significant variation in key areas that needs to be addressed. The findings from this study suggest that an overarching standardization for report writing should be created to provide a reference for all forensic anthropologists, regardless of work context and educational background and further research into how to best standardize the field in a way that is amenable to all.

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LIST OF ABBREVIATIONS

AABA.....	American Association of Biological Anthropology
AAFS.....	American Academy of Forensic Science
ABFA.....	American Board of Forensic Anthropology
CAPHIL.....	C. A. Pound Human Identification Laboratory
DPAA.....	Defense POW/MIA Accounting Agency
FBI.....	Federal Bureau of Investigation
FSAB.....	Forensic Specialties Accreditation Board
IRB.....	Institutional Review Board
MOU.....	Memorandum of Understanding
NAME.....	National Association of Medical Examiners
NAS.....	National Academy of Sciences
NIST.....	National Institute of Standards and Technology
OSAC.....	Organization of Scientific Area Committees
PMI.....	Postmortem Interval
SI.....	Salary Index
SOP.....	Standard Operating Procedure
SWGANTH.....	Scientific Working Group for Forensic Anthropology
USD.....	United States Dollar

CHAPTER 1 INTRODUCTION

Forensic anthropologists apply bioanthropological principles to forensic investigations. They are often employed by various entities, including academic institutions, medical examiner/coroner offices, humanitarian agencies, federal laboratories, and other such localities that require their services. Typically, a forensic anthropologist can offer various types of services, including human remains recovery and search efforts, determination of human versus non-human remains, determination of osseous versus non-osseous materials, biological profile assessment (sex, age, ancestry/population affinity, stature, pathologies), trauma analysis, and personal identification in the form of radiographic analysis (Christensen et al. 2015). These elements can be included or excluded depending upon the purpose of the case report and the needs of law enforcement, including any or all of these types of analyses.

Case reports are produced by forensic anthropologists when asked to consult for law enforcement as a means of presenting information collected through careful analyses of human remains. They can be used for multiple purposes, including narrowing possible identifications, aiding medical examiners in determining cause and manner of death, or providing more information in cases where the circumstances of death or recovery are unknown (Ubelaker et al. 2019). Throughout the field of forensic anthropology, case reports are utilized, but they often appear in different formats and include different components depending upon the institution or individual they are created by or what they are specifically being used for in an investigation (Zephro and Galloway 2019). Not all areas of a case report will be included in each case; however, there are sections that are

almost always included in the typical case report. These include the areas of the biological profile (sex, age, ancestry, stature), trauma analysis (blunt force trauma, sharp force trauma, antemortem, perimortem, and postmortem trauma), taphonomic analysis, and pathological analysis. These sections may be selected depending upon what elements are present and what is being asked of the forensic anthropologist. Within each of these sections, this variability continues into what exact type of analysis is done, depending upon the elements available for examination. For example, a method used typically for age estimation of the pubic symphysis, Brooks and Suchey (1990), may be impossible to use because a case lacks a pelvis or lacks a pubic symphysis suitable for analysis.

Beyond these general sections, there is variability that exists within all other aspects of a case report because there are no generally accepted standards across the field as to what exactly should be included in a case report. Within the field, there are multiple institutions that maintain a Standard Operating Procedure (SOP), which governs what anthropologists within their organization must use. These often include methods that are acceptable, citation expectations, standardized terminology, standardized diagrams, and other such aspects to provide consistency and quality assurance measures. For example, institutions such as the Defense POW/MIA Accounting Agency (DPAA), provide a thorough SOP to their forensic anthropologists that must be strictly adhered to (Belcher et al. 2021). However, while these institutions provide a standard for those who work under them, their standards do not expand beyond their reach. Some anthropologists may opt to continue using these standards after they have changed workplaces, but they are not

required to. This provides gaps in standardization around the United States, creating issues of continuity and reliability of case reports within the field.

These SOPs often also provide expectations for the practitioner, including peer review and procedures when receiving contextual information regarding a case. The DPAA provides a lengthy peer review for each case report, no matter the length and depth, given their mission is to complete investigations and identifications thoroughly and accurately (Palmiotto et al. 2020). They also require the individual completing analyses of remains to be different from the individual who recovered the remains in the field. This allows for a separation between the analyst and the remains, allowing the assessment to be completed without the cognitive biases that may have been developed during recovery. At many institutions, this is not the case. This may be due to a lack of resources, feasibility, or the belief that this bias control is unneeded. For these individuals, their practices are unknown and could not only vary from those in larger institutions with SOPs but also from other practitioners who work in similar circumstances.

While an SOP provides a standard for those who work at individual institutions, the standards created by them do not extend to all practitioners and all institutions within the field of forensic anthropology. Not all institutions are equipped to provide lengthy SOPs for their employees and sole practitioners often have no standard to follow. This not only leads to gaps in standardization within the field, but also gaps in the quality and understanding of reports generated by forensic anthropologists. Despite standing minimum legal expectations (i.e., the *Daubert* Standard) and attempts to provide

standards (i.e., Scientific Working Group for Forensic Anthropology [SWGANTH] and Organization of Scientific Area Committees [OSAC]), there remains a significant disconnect between not only forensic anthropologists but also law enforcement officials and their forensic anthropology colleagues. The lack of standardization manifests itself in all aspects of the field but is especially impactful in the medicolegal sphere. All areas, including terminology usage, the use of citations, method choice, peer review, education and training, and cognitive bias, come together in this context, resulting in forensic anthropologists that have different skill sets and have variable understandings of key concepts. While some may argue the variability in the field is part of its strength, there is little understanding of how variable these differences are nor how they are impacting the outcomes of cases they are a part of.

Given the nature of this work, and its importance in medicolegal investigations, this lack of standardization may be negatively impacting case outcomes. Compounding this problem, forensic anthropologists are expected to provide information to aid in cases and investigations while there remains a disconnect between law enforcement expectations and the reality of forensic anthropological analysis. Thus, this variability and the lack of standardization must be understood and measures must be taken to improve it. The goal of this study was to determine whether standardization of case reporting practices exists in forensic anthropology. Further, if standardization was found to exist, this study then examined its effectiveness throughout several areas of forensic anthropology. If it did not exist, this study investigated whether there is a need for

standardization, examined whether a lack of standardization was a problem for forensic anthropology, and present areas that should be standardized in the future.

In the United States, the practice of forensic anthropology is governed by the rules of individual institutions that employ forensic anthropologists. There remain no universal standards available to forensic anthropologists working in the field, which likely stems from the fact that forensic anthropology education itself is not standardized (Pinto et al. 2020). What ensues is a diversity in educational and professional experiences, variation in methodology deployment and literature cited, and a misunderstanding as to the professional nature of forensic anthropology in the eyes of the medicolegal field (Passalacqua et al. 2021). Due to the lack of standardization in the field of forensic anthropology, it is expected that case reports and their contents—to include terminology, citations, presentation styles, organization, peer review, and methods—vary in specificity across the United States, in turn potentially endangering the validity of the field, its methods, and its practitioners. By comparing reporting approaches from practicing forensic anthropologists across the country, representing diverse professional settings, education, and experience, it is hypothesized that there is no standardization of case reporting practices, which presents a significant problem for forensic anthropological case reports and their validity.

This thesis is separated into several chapters. The first is the introduction chapter. Chapter two is the previous research chapter, including sections on legal standards, existing standards in forensic anthropology, terminology, peer review and methods, education and training, and cognitive biasability. Chapter three is the methods chapter.

Chapter 4 is the results chapter, broken into six sections (demographics, reporting practices, existing standards, peer review, education and training, and cognitive biasability) aligning with the sections of the survey associated with this thesis. Chapter five is the discussion, which is divided into the same sections as the results. Finally, the conclusion is chapter six.

CHAPTER 2 PREVIOUS RESEARCH

Legal Standards

Testimony from expert witnesses, such as forensic anthropologists, is governed by several court rulings that enacted guidance on the type of evidence accessible in court, the credentials of those who are called to testify, and other such etiquette expected of scientific experts. While there are no specific legal standards governing case reports, the nature and purpose of case reports and their findings are subject to the same rulings applied to expert witness testimony. Forensic anthropologists may be expected to testify to any of their conclusions and opinions, including any or all aspects of a case report created on behalf of law enforcement or the medical examiner system (Holland and Crowder 2019). Rulings, and thereby laws, which govern the acceptance of evidence and expert witness testimony in court proceedings can be separated into two sections: state and federal. The Supreme Court system of the United States is governed only by the Federal Rules of Evidence, which adopt many of the standards used in state and local courts. While some of these standards overlap, certain aspects only apply to specific courts (state versus federal) or can be optionally adopted by individual states within the United States judicial system.

Related to state courts, the first ruling regarding expert witness testimony was the *Frye* test, enacted in 1923. *Frye v. United States* was an appeal of a previous ruling of the Supreme Court of the District of Columbia, where James Alphonzo Frye was convicted of murder (*Frye v. United States* 1923). The grounds of the appeal were over an expert witness who was used to render an opinion on the results of a “systolic blood pressure

deception test” (Holland and Crowder 2019). This test claimed to allow the individual conducting the test to determine if the subject was lying based upon the rise in systolic blood pressure. However, at the time, this test was not supported by the scientific community and the expert utilized by the prosecution was not qualified to render such an opinion, thus it was initially excluded from evidence from the trial proceedings (*Frye v. United States* 1923). During the appeal, the judge ruled that the systolic blood pressure deception test, which was a precursor to the modern polygraph, was not well accepted within the scientific community and thus could not be used in expert witness testimony (*Frye v. United States* 1923). This upheld the ruling of the trial court, setting a precedent for expectations of expert witnesses and the methods utilized by them in the future.

From the ruling of this case, the *Frye* test was created, which governed the use of forensic evidence and whether it was legitimate and able to be used in court proceedings. Specifically, it evaluated the testimony of expert witnesses (Grivas and Komar 2008). The ruling states that, when used, all methods and testimony must be well accepted and broadly used within the field of the expert (*Frye v. United States* 1923). To be accepted as evidence in courts that utilize the *Frye* standard, a method must have been followed according to what is generally done within the field. The *Frye* test presents a clear line separating the two phases of scientific methods: experimental and demonstrative. A method is considered experimental when it is not widely used within a field, and it is considered demonstrative when it is well-accepted and widely used amongst practitioners in a specific field (Giannelli 1980). The *Frye* test provides this moment that was

previously not quantified and marks when a method is to be admissible or inadmissible in court.

The *Frye* test is still used in many states, despite its replacement by what many would deem more expansive legislation (Giannelli 1980). Despite the improvements the *Frye* test presented, it allowed gaps to exist in expert witness standards, resulting in inaccurate testimony continuing to be used. It is no longer used by the Supreme Court of the United States and many other localities around the United States due to proceeding rulings that demonstrated problems that persisted under *Frye*. These proceeding rulings are commonly combined and recognized as the *Daubert* standard.

Currently, the predominant legal standard to which case reports and expert witness testimony are subject is known as the “*Daubert* standard,” which was established by *Daubert v. Merrell Dow Pharmaceuticals, Inc.* in 1993 (Christensen and Crowder 2009). The case involved petitioners Daubert and their children, who claimed that the mother’s ingestion of a drug called Bendectin during pregnancy was responsible for the severe birth defects seen in the children (Holland and Crowder 2019). Merrell Dow Pharmaceuticals presented testimony from an expert witness who claimed that Bendectin did not cause birth defects, which was based on a review of published scientific literature (Holland and Crowder 2019). The petitioners presented the testimony of eight expert witnesses who showed that Bendectin caused birth defects in animal trials and in other unpublished scientific literature (Holland and Crowder 2019). However, their testimony was not accepted under the *Frye* standard because it did not follow published scientific guidelines that were accepted in the field and did not meet the “general acceptance

requirement” (*Daubert v. Merrell Dow Pharmaceuticals, Inc.* 1993). This decision was later appealed to the Supreme Court, which upheld the decision but revised the Federal Rules of Evidence and created the *Daubert* Standard. Since its implementation, it has been adopted by multiple states and was formally incorporated by the United States Supreme Court within the Federal Rules of Evidence.

The *Daubert* ruling ensures that all expert witness testimony must be able to adhere to the following questions: “Has the theory or technique been tested? What is the known or potential rate of error? Do standards exist for the control of the technique’s operation? Has the theory or technique been subjected to peer review and publication? Has the theory or technique been generally accepted within the relevant scientific community?” (Christensen and Crowder 2009:1212). The criteria also allow the judge to act as a “gatekeeper” or allow the jury to decide what information should be included in expert witness testimony (Lesciotta 2015). While *Daubert* significantly improved expert witness standards and expectations, several cases would later present flaws within the wording and ideas of *Daubert*, requiring clarification and expansion. Two of these cases made a significant impact on the inclusion of forensic anthropological expert witness testimony: *General Electric Co. v. Joiner* and *Kumho Tire Co. v. Carmichael*.

General Electric Co. v. Joiner, decided in 1997, further clarified the position and terms of the *Daubert* standard (*General Electric Co. v. Joiner* 1997). The case involved Joiner, who claimed that while working he was exposed to chemicals that caused him to develop small-cell lung cancer. He presented several expert witnesses who testified that the chemicals mentioned, “PCBs, furans, and dioxins,” were shown to cause cancer, and

could be a likely cause for Joiner's cancer (Holland and Crowder 2019). However, the court did not side with Joiner because there was no evidence confirming that Joiner had ever been exposed to PCBs, furans, or dioxins. They also stated that the studies used by the experts, which included animal testing using these agents, were not close enough as a proxy to an adult human to be useful evidence (Holland and Crowder 2019).

The *General Electric Co.* ruling ensured that all evidence and conclusions must be reasonable and explained without overextending the data with anecdotal evidence (Christensen and Crowder 2009). Evidence cannot be extrapolated to write a story of what might have happened. Rather, it must clearly demonstrate what happened to the individual in question without overextending the evidence available. This ruling clarified that the *Daubert* standard should not include evidence when it is included only because of an unproven statement from an expert witness.

Along with the ruling from *General Electric Co. v. Joiner*, the *Kumho* standard, established by the case *Kumho Tire Co. v. Carmichael*, significantly impacted the way the *Daubert* standard is applied. Decided in 1999, it involved Patrick Carmichael, whose tire blew out and resulted in the death of one person and multiple injuries to others (*Kumho Tire Co. v. Carmichael* 1999). The tire responsible for the blowout was manufactured by Kumho Tire. During the trial, a tire failure analyst testified that a manufacturer defect was likely responsible for the blowout, and thus the death of the passenger (*Kumho Tire Co. v. Carmichael* 1999). Kumho Tire pushed to have the evidence dismissed due to it not following the *Daubert* standard. They claimed that because the analysis was based on the testimony of an individual who was not considered to be a scientist and failed to

follow the four tenets of the standard it could not be considered (*Kumho Tire Co. v. Carmichael* 1999). This thought was shared by the judge and the evidence of the analyst was not included.

The ruling was later reconsidered and overturned because the judge believed in a more flexible interpretation of *Daubert*. The judge cited the fact that the *Daubert* standard is to apply flexibly and was never meant to act as a “checklist” that needed to be followed (*Kumho Tire Co. v. Carmichael* 1999). The judge also thought that the *Daubert* standard was applied only to scientists because *Daubert v. Merrell Dow Pharmaceuticals, Inc.* only involved the testimony of scientists (Grivas and Komar 2008). Because of the reconsideration, the *Kumho Tire Co. v. Carmichael* ruling, now collectively called the *Kumho* Standard, allowed for the acceptance of experience-based methods into court evidence (Christensen and Crowder 2009). It allowed for the *Daubert* standard to be applied to expert witnesses deemed non-scientists, including the section regarding the judge acting as a gatekeeper. The judge still has the power to examine and reject methods, but the expertise of any witness can now be included if deemed fit. This has significant ramifications when applied to forensic anthropology. Many methods used by forensic anthropologists are applied through nonmetric, qualitative means, with all requiring practitioner interpretation and experience, even when utilizing quantitative measurements.

While *Daubert* governs all expert witness testimony, the *Kumho* standard allows for the acceptance of most forensic anthropological methods because they are based on the experience of the practitioner (Grivas and Komar 2008). A judge can decide to accept

testimony from methods that do not adhere to these criteria, for example, newer methods that are not peer-reviewed or widely accepted by the field (Lesciotto 2015). Meaning, with justification to the court, all criteria can be overstepped in favor of allowing the *Daubert* and *Kumho* criteria to be as flexible as possible. This includes the judge acting as a gatekeeper, and the inclusion of the jury in deciding if a witness is reliable (Lesciotto 2015). In combination, *Daubert* and its modifications from *Kumho* and *G.E. v. Joiner* provide the modern standards which govern many state proceedings involving expert witness testimony. These same rulings are compiled within a larger federal document, known as the Federal Rules of Evidence.

Applying to federal criminal proceedings only, the Federal Rules of Evidence, first enacted in 1973, provide expectations for expert witness testimony and evidence (Holland and Crowder 2019). The inclusion of expert witness testimony in such cases is governed by Rule 702 and Rule 703 of the Federal Rules of Evidence. The *Frye* standard was utilized by federal courts; however, the general acceptance rule was never adopted. Instead, alternate language discussing the relevance, qualifications of the expert, and the quality of the evidence were introduced (Holland and Crowder 2019). This caused many problems after the implementation of the Federal Rules of Evidence specifically because judges had no means to determine if the quality of the methods used was reliable (Holland and Crowder 2019). This later prompted the *Daubert* decision by the Supreme Court, stating the need for improved judicial gatekeeping, which was quickly adopted by federal courts.

According to the 2024 edit, Rule 702 “Testimony by Expert Witnesses” requires the witness to be an expert by “knowledge, skill, experience, training, or education” and their testimony itself must be based on facts and data, ensuring that opinion is not the basis for their testimony (National Court Rules Committee 2024). This section of the Federal Rules of Evidence directly adopts the *Daubert* and *Kumho* standards. Thus, all expectations set forth by those rulings are included in this rule, including the direct questions included within *Daubert* posed above. Rule 702 was amended in 2000 following the rulings of *Daubert v. Merrell Dow Pharmaceuticals, Inc.* and *Kumho Tire Co. v Carmichael*, officially making them federal standards (National Court Rules Committee 2024).

Rule 703 “Bases of an Expert’s Opinion Testimony” allows the sources of information used to form an expert’s opinion to be things traditionally not admissible in court, if they are consistent with methods and practices typically used within the field (National Court Rules Committee 2024). However, if an expert’s opinion is based on inadmissible evidence or unreliable data, this must be disclosed to the jury and the opposing side must be allowed to present data that proves the expert is inaccurate in their opinion (National Court Rules Committee 2024). This rule aims to balance untraditional forms of information that may be used in some fields, such as forensic anthropology, and ensures that a jury understands where information comes from during a trial. The judge and opposing side have an obligation to ensure the jury is informed. Rules 702 and 703 provide the basis for expert witness testimony in the federal system and can inform what information should be included in a forensic anthropological case report in a general

sense. However, the federal rules are not always applicable, as *Daubert* and *Frye* vary in application across by state and, in some locations, on the type of expert being used (Calhoun 2008).

These rulings dictate a basic guideline as to the quality needed in a forensic anthropological report for it to be considered admissible in the eyes of the judicial system. However, the applicability of these rulings to forensic anthropological methods remains variable. Using *Daubert*, *Kumho*, and *General Electric Co.* rulings as defining aspects of standardization is problematic because they allow for experience-based divisions across practitioners (Grivas and Komar 2008). Methods used in forensic anthropology are limited by the experience of the practitioner; if the method is followed incorrectly, despite being widely used, the testimony provided would be inaccurate. The rulings discussed do not provide a framework for the presentation of how these methods were used and how the conclusions were achieved (Christensen and Crowder 2009). They focus solely on the credibility of the method, not necessarily its implementation on every individual case.

In addition to problems with methods themselves, judges and juries are not experts on forensic anthropological methods and techniques, and thus, their rulings do not necessarily mean that the methods used are standardized and reliable (Grivas and Komar 2008). Despite their inclusion in court testimony, it is the responsibility of the practitioner to complete the analyses correctly. Nothing in current judicial rulings require a complete check of findings or require peer review from multiple sources. Further, judicial rulings allow criteria to be overstepped if a judge justifies it, allowing in testimony that may be

inaccurate (Lesciotto 2015). These statements provide a bleak outlook to those who rely on judicial rulings alone for their case report standardization. They clearly demonstrate the need for other sources of review and for the responsibility of standardization to go beyond the judicial system.

Current Forensic Anthropological Standards

Forensic anthropological case reports must not rely on judicial rulings to provide an absolute standardization for methodology and expert witness fitness (Lesciotto and Christensen 2023). The rulings are meant to act not as a standard for scientists, but rather as a flexible guideline for judges and legal practitioners (Lesciotto and Christensen 2023). *Daubert* and its successors are insufficient at this and were never meant to act as a standard for forensic scientists and the work or methods they produce. Rather, the field of forensic anthropology must strive to provide standardization for practitioners that provides a substantial and all-encompassing guideline for which all case reports must follow, regardless of the topic or legal status of their casework. Within the field of forensic anthropology, there are many organizations who have attempted to provide varying degrees of standardization. These attempts exist because of a call for reform from the National Academy of Sciences (NAS) in 2009.

The call for a standard such as this stems from a report created by the NAS titled “Strengthening Forensic Science in the United States: A Path Forward.” Since the 1970s, there has been an increase in the number of forensic scientists testifying, peaking in the 2000s (Lesciotto 2015). This increase, along with the prevalence of forensic science, led Congress to contend there was a broader need to have a higher level of expectations for

forensic sciences. Despite the legal standards that already existed, 16 years after the *Daubert* ruling there was a discontentment with the quality and standardization of methods within various fields of forensic science, including forensic anthropology. The need for this report in the eyes of the government began with the popularizing of forensic sciences in popular media. The rise of forensic TV shows and familiarization of the public with forensic science principles created unique circumstances where the jury were previously informed on forensic science techniques by the media (Holland and Crowder 2019). While these television shows were often inaccurate, and remain inaccurate today, the problem of juries doubting the work of real forensic scientists spurred a movement calling for the development of more substantial standards for methods and experts within these fields.

The NAS report was requested by Congress in order to better understand where forensic science stood overall. The report itself had several specific objectives, including to understand the current needs of forensic science, create and release best practice guidelines, and to make recommendations regarding how technology can be developed and used to help keep the public safe (National Research Council 2009). The document discusses many topics at length, giving recommendations on education and training, how to improve methods, and the discussion of forensic science in the court of law. Further, the document specifically states that there is “fragmentation” within disciplines, and they lack standardized practices that are “embraced” by all members of the field (National Research Council 200:6). The report discussed many aspects that need to be addressed by

each field, providing a necessary wake-up-call to those in the forensic sciences at this time. No longer would unstandardized junk science be acceptable within these fields.

The response to the NAS report was immediate across forensic sciences, with practitioners working to standardize what methods were used and what was expected of those in the field in terms of education and training. Forensic anthropology itself manifested this with the Scientific Working Group for Forensic Anthropology (SWGANTH). Formed in 2008, the SWGANTH operated with the goal of providing documents to forensic anthropologists with best practice recommendations related to a variety of topics. The SWGANTH was a joint task sponsored by both the Defense POW/MIA Accounting Agency (DPAA) and the Federal Bureau of Investigation (FBI) (Holland and Crowder 2019). Their standards varied from “ancestry” estimation, proficiency testing, documentation and testimony, and qualifications (SWGANTH 2013; SWGANTH 2012b; SWGANTH 2012a; SWGANTH 2010). The SWGANTH itself was composed of a board of forensic anthropologists intended to represent the diversity that exists within the field, including varying education levels and career backgrounds (SWGANTH 2011). The specific goals of this board were to provide minimum standards, guidelines, and research to better inform forensic anthropologists (SWGANTH 2011). The SWGANTH released several standards, but this group was disbanded in 2014 and was replaced by an organization with the same mission called the Organization of Scientific Area Committees (OSAC).

The OSAC was created in 2014 in collaboration between the United States National Institute of Standards and Technology (NIST) and the Department of Justice

(Forensic Anthropology Subcommittee 2023). In 2020, the OSAC was reorganized, and forensic anthropology was placed within the subcommittee for forensic medicine (Passalacqua and Pilloud 2021). The overall goal of this subcommittee is to create further standardization and best practice guidelines in direct response to the NAS report. Since their conception, they have adopted and modified many existing SWGANTH standards, aiming to provide standard outlines for all aspects of forensic anthropological casework (Forensic Anthropology Subcommittee 2023). Since 2014, OSAC has released eight standards on a variety of topics, including stature estimation, sex estimation, and how to resolve commingled remains (AAFS Standards Board 2019a; AAFS Standards Board 2019b; AAFS Standards Board 2021). The two newest standards, both released in 2023, provide standards for population affinity estimation and crime scene detection and processing (AAFS Standards Board 2023a; AAFS Standards Board 2023b).

The format of both the SWGANTH and OSAC guidelines are PDF, open-access documents that include up to 11-page outlines of general information that should be used when conducting the estimation or activity the standard is for. A common trend among these standards is to avoid providing a recommendation on specific methods, but rather to outline the expectations of how all methods are to be used. There are often no recommended sources of literature in the guidelines, and the guidelines provided discuss nothing of the limitations of these methods when literature is cited. Instead, they outline general ways methods should be applied and used. For example, the OSAC standards for sex and stature estimation both discuss only applying a method when a bone is in good condition, but they do not provide examples of what “good” means (AAFS Standards

Board 2019a; AAFS Standards Board 2019b). While the inclusion of specific methods would require the endorsement of the method by the ASB and the constant updating of the document when new methods arise, the current state of these standards is underwhelming. Additionally, while the OSAC guidelines themselves are open access, they do not make methods accessible to practitioners, and their content is frequently questionable in its validity.

Discussing specific aspects of the standards themselves, many of the OSAC standards lead with bold titles and suggest they provide important guidance on topics that remain unstandardized throughout the field of forensic anthropology. However, the trend throughout the “standards” is the lack of providing a true standard. When a forensic anthropologist consults them for guidance, all they will find is generic information that is frequently outdated or information that most forensic anthropologists already know. The OSAC standards for stature estimation and sex estimation, both released in 2019, contain a list of specific literature examples, many of which are not specific methods, but instead highlight how others have implemented specific methods in their own research (AAFS Standards Board 2019a; AAFS Standards Board 2019b). This is unique within these standards as many do not begin to suggest readings, nor do they provide significant citations of where the information originates.

A unique aspect that did not exist for the SWGANTH standards, but was introduced with the creation of OSAC, is a third-party peer review system through which all OSAC standards must be put through before approval and publication. Despite this, the information provided in them can be equally as misleading as that released in the

SWGANTH standards. An example of this can be found in a cited source in the ANSI/ASB Standard 045: Standard for Stature Estimation in Forensic Anthropology. The source contains the term “Negroes” in its title, a term no longer used or acceptable within the field of forensic anthropology or modern society (AAFS Standards Board 2019a). It is unique that this standard chose to include cited sources, but without a discussion of appropriate language and expectations of updated and accepted terminology in forensic anthropology, the inclusion of this source is problematic. As a source for best practice guidelines, everything within the document should represent what is acceptable within the field. While racist science and racist language is a part of forensic anthropology’s past that can never be erased, the continued use of sources which are long since outdated in a new publication is confusing. As with many aspects of forensic anthropology, where many of these publications fail is their lack of explanation of what terminology should be used and why it is important not to use outdated, inaccurate terms.

While these guidelines do exist as attempts at standardization within the forensic anthropological community, it remains to be seen how influential and utilized these documents are and how impactful they are on reporting practices and on professionalizing anthropology. Forensic anthropology has been significantly impacted by the introduction of legal rulings, with *Daubert* being cited very frequently in anthropological literature (Lesciotto and Christensen 2023). However, since these standards are not enforced nor required by any group within the field, their impact is likely much less significant to everyday casework. Given the content of these, and their likely lack of application to casework, their status as a standard for case reporting

practices is likely minimal. Without some form of enforcement or without substantial standardization recommendations, OSAC and SWGANTH guidelines fade into the background of forensic anthropology.

Besides the introduction of SWGANTH and OSAC guidelines over the past few years, all other forms of standardization and guidelines come from individual organizations or places of employment. The American Board of Forensic Anthropology (ABFA) is the only organization in the US that provides accreditation to forensic anthropologists as of 2024. They currently have over 120 diplomates who have been certified by the board and who are subject to the standards set forth by the board itself (ABFA 2024). Upon receiving accreditation, diplomates are expected to follow the code of ethics set forth by the board and to continue their education of current forensic anthropological research and innovations. When applying to become a diplomate of the ABFA, forensic anthropologists must provide examples of their case reports, which must include specific criteria released by the board (Boyd et al. 2020). Considering these expectations of what to include in reports are not applicable until one decides to apply to the ABFA, many applicants struggle with this portion of the application process. Many include too little information in their report or notes, and some submit reports with errors or misinterpretation, including over-interpretation, of their results (Boyd et al. 2020). The creation of case reporting expectations is likely beneficial to those who are members of the ABFA already, but because the standards do not exist outside of the ABFA and are restricted in use or enforceability, they provide a barrier to those who are not yet

members. However, there are many workplaces which implement standardizations, which may or may not be on par with the expectations of the ABFA.

Similar to the ABFA, standardization expectations exist around the country in individual forensic anthropology laboratories. Many large organizations and universities are able to provide a Standard Operating Procedure (SOP), by which all employees must adhere. An SOP is a document produced by an individual institution that describes all actions to be taken by an individual while performing a certain activity (Fleischman et al. 2018). Such SOPs exist at laboratories such as the DPAA, the C. A. Pound Human Identification Laboratory at the University of Florida, and the Harris County Institute of Forensic Sciences, among others. These typically include everything a forensic anthropologist needs to complete a case, including approved methods, forms, and explicit expectations to be followed during the reporting process, focusing especially on safety, analysis, and security (Belcher et al. 2021). Typically, there are also set expectations for how casework is to be completed, including peer review, to provide quality assurance. This is especially important for accredited laboratories, such as the DPAA, as they have set guidelines to follow regarding how they handle various aspects of their casework. Although, SOPs are a positive piece of existing standardization around the country, they also present problems when examining standardization as a problem in forensic anthropology as a whole.

As of 2024, the only forensic anthropology laboratory that has published their SOPs online is the New York City Office of the Chief Medical Examiner's Forensic

Anthropology Division. This resource includes a full SOP, including methods to be used, explanations of evidence handling, and outdoor crime scene response (New York City Office of the Chief Medical Examiner's Forensic Anthropology Division 2024). This is a unique situation, as SOPs are often not published in any online format that is accessible to all forensic anthropologists. All other SOPs are kept in-house and are only available to those working at that specific institution, meaning there are no other references out there for individuals looking to develop their own. While SOPs developed at individual institutions may be beneficial and utilized by those who work there, the requirements of those SOPs disappear when an individual leaves that institution. Many individuals may opt to continue to use this type of standardization once they have changed workplaces, but there is nothing requiring their compliance. There is also no guarantee that the new place of employment will have an SOP, as many university laboratories are underfunded and understaffed, often requiring forensic anthropologists to work alone (Passalacqua and Pilloud 2021). This may also occur in other work settings, such as at state-funded laboratories or medical examiner offices. There remains no overarching source of standardization for such individuals.

According to a recent publication, OSAC currently has a draft under review for a "Quality Assurance" standard, which was released for public comment in November 2023 (AAFS Standards Boards 2024). This document highlights potential ways to provide quality assurance measures within a forensic anthropological laboratory and discusses the specifics of what types of SOPs should be created in each lab. Further, they include links to currently published SOPs to be used for a reference. This is a beneficial

resource when it comes to standardization at a surface level. It provides basic information related to what should be accomplished by individual institutions, or individual practitioners if possible. However, the problems associated with OSAC standards still apply. The standard is not required of any institution and is not enforced, thereby standing as a suggestion rather than a standard. The standard recommends a course of action but does not require it nor provide its own reference to be used, such as standardized forms or other such guidelines. While a standard such as this is a step in the right direction, and will likely be adopted by those who can when it is officially published, it does not go beyond providing surface level suggestions. There are still individuals in the field who need a source of standardization because their place of employment does not provide it.

None of these current standards provide a substantial, universal guideline that is accessible to all practitioners. Existing standards either provide little standardization within them, such as those released by SWGANTH and OSAC, or are limited only to employees or members of specific institutions, such as the ABFA standards and organization-specific SOPs. It should not and cannot be the responsibility of every practitioner to make up a standardization procedure. This contributes to a major problem we see today: forensic anthropologists completing work based solely on their own experience without any checks and balances. This leads to varying applications of methods, inaccurate usage of terminology, and various levels of biased analyses occurring throughout the field. The lack of substantial standardization, from both legal standards and current standards in forensic anthropology, has severely impacted these

areas of the field and bleed into all areas of forensic anthropology, including research and casework. These areas, and how forensic anthropology's failure in providing standardization has impacted them, will be discussed in the following chapters.

Terminology

Forensic anthropology has a long history related to race and racial ideas. Generations of forensic anthropologists, and their predecessors in physical anthropology, played a role in reinforcing the biological race concept and the ideals of white supremacy (Pilloud et al. 2021). These issues appeared frequently, both in the form of anthropometrics and by weaponizing traits in a manner that reflects the prejudices and stereotypes held by the practitioner. While the field itself has superficially transitioned away from race estimation, its theoretical background, methods, and casework have fallen behind in the implementation of these new ideals (Ross and Williams 2021). As a result of the lack of an adopted standard of terminology for all anthropologists, terminology varies by practitioner and laboratory. In response to the NAS report in 2009, which called for standardization of terminology usage within the forensic sciences, there was a desire to change the terminology used in forensic anthropology (Bunch 2014). Over the years, OSAC has provided guidelines to forensic anthropologists on what should be used for specific aspects of the biological profile, contained within the standard for part of the analysis.

Within their standards, OSAC provides some terminology suggestions for practitioners to follow. For example, the OSAC ANSI/ASB Standard 090: Standard for

Sex Estimation in Forensic Anthropology discusses general terminology and expectations for sex estimation (AAFS Standards Board 2019b). The standard defines the terms “male” and “female,” and specifically discusses gender in a continuum of masculinity and femininity. However, this explanation of sex and gender is outdated and misleading to those who utilize the standard in their practices. Many individuals identify themselves as beyond what is considered “masculine” and “feminine” in terms of gender, for example bigender, gender fluid, and non-binary individuals. Further, the standard uses the term “sex” rather than “assigned sex” in its definitions, excluding transgender and intersex individuals by referring to sex as either male or female (AAFS Standards Board 2019b). These realities of sex and gender were prevalent in society before 2019; they are not new or radical concepts, but are true identities that may have been held by the decedents in cases. Lacking a basic understanding of these concepts is a significant issue and highlights the fact that many forensic anthropologists may not be as progressive or informed on the issues they may be facing with identity in casework. Similarly, issues related to terminology usage can be seen in how OSAC and forensic anthropologists across the field discuss ancestry or population affinity estimation.

In 2023, OSAC released its “Standard for Population Affinity Estimation in Forensic Anthropology,” supplanting the previously released SWGANTH “Ancestry Assessment” publication (AAFS Standards Board 2023a; SWGANTH 2013). The OSAC standard provides updated guidelines on the best practices for estimating population affinity, including nonmetric and metric methods, and how such findings should be reported. While the standard does not provide suggested citations or terminology for

referring to categories of population affinity, it does provide basic definitions of terms such as population affinity itself and reference population. Most importantly, it discusses the decision of OSAC to change the terminology used for this aspect of the biological profile from “ancestry” to “population affinity”. They provide definitions of each, citing that population affinity is not bound by geographical or temporal boundaries like ancestry is, and how ancestry is frequently “conflated” with race (AAFS Standards Board 2023a). In this same paragraph, they state that reference groups or populations are pooled from several areas, including social race (AAFS Standards Board 2023a). Population affinity was created to move away from these ideas and towards terminology that truly encompassed what forensic anthropology could do.

The goal of population affinity is to move away from social race and ancestry concepts that have remained the same for much of forensic anthropology’s history. The term “affinity” refers to more than a typological approach, but rather a population-based understanding of human variation (Ross and Pilloud 2021). Frequently, forensic anthropologists implement a terminological change before a change in theory to accompany it, as was seen with the change from “race” to “ancestry” (Tallman et al. 2021). However, this problem is not necessarily solved by the introduction of population affinity. The OSAC standard reaffirms this problem, as it provides little to no reasoning nor citations suggesting this is something that will be reflected in the way forensic anthropologists conduct population affinity/ancestry estimations. Population affinity is still being estimated using the same methods and data as race and ancestry. This can be observed, for example, in *FORDISC*, which continues to use continental, country,

linguistic, and race terminology for reference populations (Ross and Pilloud 2021). For example, Black, White, Vietnamese, Hispanic, Guatemalan, Asian, American Indian, Japanese, and Chinese. Despite practitioners attempting to separate the term population affinity from ancestry and social race, the methodologies have not yet been developed nor have updates been made for this alteration (Tallman et al. 2021). Changing terminology further confuses individuals within the field and outside the field, as forensic anthropologists often work within a larger network of forensic scientists.

The lack of true standards in terminology has manifested itself in a wide variety of misunderstandings, with varying terminology being used throughout the field. In published forensic anthropology journal articles, there is an apparent understanding of what race and ancestry are, but there are no standard definitions or guidelines for anthropologists to refer to (Tallman et al. 2021). This creates a situation in the field where each practitioner may have their own understanding and definition of each term, creating a problematic misunderstanding of meanings. While practitioners may have a clear definition of these terms in their minds, that understanding may not be apparent in their published materials (Maier et al. 2020). Because these terms are often not defined, the author's intended meaning is lost on the reader. Although the terms 'ancestry' and 'race' have changed in meaning over the years, representing a shift away from the biological race concept, the methodological approaches to ancestry estimation have not shifted with them (Tallman et al. 2021). The lack of standard definitions of 'race' and 'ancestry,' and a lack of terms to be used when discussing other aspects of the biological profile, creates confusion among forensic anthropologists and perpetuates an outdated

view of forensic anthropological theory which is not corrected by the newest OSAC publication. Nowhere does the standard suggest that terms used, whether standardized or not, should be defined within a case report, creating more confusion amongst practitioners. This issue is further perpetuated by the casework of forensic anthropologists, as they often cross beyond their field and work with other individuals in the medicolegal sphere.

When terms are not defined within the text, it can lead to confusion among both forensic anthropologists and practitioners from other disciplines. A regularly occurring example can be seen when discussing the term “perimortem” in forensic anthropology versus in the medical field. Forensic anthropologists frequently overlap with the medical field, due in part to our history as part of anatomy departments and our current roles within the medicolegal sphere (Boyd and Boyd 2018). Forensic anthropologists often define perimortem as related to how bone reacts, rather than being connected to the death event. Medical examiners, or others educated within the medical field, consider perimortem to be directly connected to the cause and manner of death. In a report, a forensic anthropologist may be commenting on a fracture that was made “perimortem” but may not be connected to the death event. Bone reacts to stress in varying ways depending on the environmental conditions of the remains; thus, a perimortem fracture may have occurred much later than the death event itself. While there have been efforts by forensic anthropologists to avoid using the term perimortem as a result of this confusion, the use of the term persists (Bunch 2014). This situation, much like that of ancestry versus population affinity, results in confusion when the terms are not clearly

defined. This may be especially important in case reports, which are typically generated to help in an ongoing investigation. Just as population affinity estimates should be clearly defined as not relating to social race categories, terms such as perimortem trauma should be described and defined so that all parties can understand the information provided.

Given the research indicating the variability in the understanding of terminology in forensic anthropology, and forensics in general (Tallman et al. 2021; Bird and Bird 2022), it is essential to create a standardized set of terminology to be used by all practitioners. Forensic anthropologists must be aware of how language can impact individuals within the legal system, especially those whose remains are being identified or analyzed as part of an investigation. Without intending to, practitioners may introduce racialized terminology which can lead to the stigmatization of the individuals being analyzed (Bird and Bird 2022). Despite the motivations behind terminology used in case reports, those words may be misinterpreted by others and their meaning may be twisted, leading to preconceived ideas being applied to an individual. In the case of *FORDISC* terminology, including the use of “black” and “white,” the connection of those terms to social race categories may be emphasized and that information used to categorize the individual. Forensic anthropologists need to take responsibility for how their choice of terminology can impact identification efforts, leading to miscategorization and labeling (Bird and Bird 2022). The field suffers from a lack of strong changes in methodology and theory, combined with a variation in terminology usage without defining the utilized terms. This combination is dangerous and could negatively impact investigations,

including the expectations of what forensic anthropologists can provide to that investigation.

What exists today for guidance on these matters leaves much to be desired, as can be seen in the SWGANTH and OSAC standards discussed in the previous section. What ensues from this is a disarray of terminology being used throughout the field, frequently without definitions to provide specificity. In the world of casework within forensic anthropology, practitioners are expected to work within the medicolegal sphere and provide information to investigators to aid in the case. However, it must be acknowledged that forensic anthropologists have a separate set of terminology from these other disciplines and that it is the responsibility of anthropologists to inform these parties as to what their conclusions mean. Law enforcement expects to use forensic anthropology reports, but they do not cater to the expectations and methodology behind forensic terminology (Parsons 2022). Practitioners must be clear about the meaning of their conclusions within the context of their field, keeping in mind how those conclusions could be misunderstood by allied fields. Because of this, forensic anthropologists need a combined source of terminology that can be provided to all outside the field and can be communicated clearly in case reports. The rejection of the biological race concept within biological anthropology is only one step; forensic anthropologists must ensure that their work no longer provides a connection between social race and biological estimations of ancestry or population affinity (Pilloud et al. 2021).

Peer Review and Methods

Within a forensic anthropological case report, there are three important aspects that are frequently left to the discretion of an institution or a practitioner. These aspects are: the use of citations within the case report itself, what methods are utilized for a particular case, and whether a case report is peer reviewed. Citations, methods, and peer review make up the foundations of the report itself and help to provide legitimacy for the results and opinions it contains. When completing a case report and utilizing techniques it is common practice to cite literature and methods so that all analysis can be explained by the methods and techniques within that literature. Experience in the field is essential to fully understand the results one finds through analysis; however, the experience should be justified by peer-reviewed methods and source material (Christensen and Crowder 2009). This traceability also allows for the perpetual reliability and replicability of case conclusions to be examined by other forensic anthropologists, typically in the form of peer review (Christensen and Crowder 2009). However, as with other aspects of case reports, there are no solid standardizations available to all forensic anthropologists. As the report itself is what a forensic anthropologist is able to testify to in court and is the source of information provided to law enforcement, variability in these areas can lead to significant problems.

In their 2023 draft “Quality Assurance,” OSAC provides standards on developing methods, technical review, and providing quality assurance and training to an individual laboratory (AAFS Standards Boards 2024). This standard is generally tailored for

institutions developing a quality assurance document and an SOP, thus, the guidelines it provides are not necessarily helpful for sole practitioners. This is the only standard that provides any general guidance related to case reports and expectations of such. When it is approved and released, it will provide beneficial information to individual institutions, but it does not provide many guidelines which would be possible for all practitioners to implement. Beyond this, the OSAC “Standard for Sex Estimation in Forensic Anthropology” states that methods used should be documented; however, this is not included in other OSAC standards (AAFS Standards Board 2019b). Thus, despite this statement, it remains unknown if this standard is accepted and followed by practitioners. This lack of standardization or at least guidelines allow for individuals to variably cite what methods they are using, leading to difficulties in peer review.

Citations in forensic anthropological case reporting includes specifically indicating which methods were utilized by the practitioner or where they drew their conclusions from. Some methods, for example, Brooks and Suchey’s (1990) age estimation method, have specific casts or materials to be used for estimation of that aspect of the biological profile. Other aspects, including pathology, trauma, and taphonomy are based on the experience and interpretation of the practitioner when comparing their case to published literature. Each of these aspects has hundreds of methods associated with certain areas of the body, including the pelvis, cranium, humerus, and many others, and has both metric and nonmetric methods (Spradley 2017). The inclusion of citations is essential as it allows for other forensic anthropologists to understand where the opinions included in the report are drawn from and allow a peer

review process to determine accuracy of the results. It is currently unknown how many individuals cite their methods within their case reports. Within published literature, it is commonplace for practitioners to cite their sources; however, this same expectation is not clear within forensic anthropological case reports (Ubelaker 2021). This persists despite the interest of forensic anthropologists wanting to follow established court rulings, including *Daubert*, and the desire for complete documentation and information to be included in the event of a court proceeding (Love et al. 2020). The lack of clear citation criteria leads to a variety of methods being used and a significant lack of standardization and expectation as to what is appropriate to be used in case reports.

Winburn and Algee-Hewitt (2021) published a study looking at the implementation of methods, focusing on ancestry or population affinity. Specifically, they were interested in understanding what methods were used and how that may be impacting case outcomes. It was found that 110 participants frequently used osteometric methods in their analysis, but it was noted that many more likely used osteometrics but did not document this in their report (Winburn and Algee-Hewitt 2021). The authors attempted to understand trends in ancestry/population affinity assessments to determine what methods were being used; thus, when the citations were not included, it was impossible to determine the basis for the assessment. Ancestry/population affinity can be an important aspect of a biological profile, despite the problems associated with the practice (Bethard and DiGangi 2020; DiGangi and Bethard 2021; Stull et al. 2021). Providing no population affinity or an incorrect interpretation can cause problems with

identification, which can be exacerbated by a lack of peer review and quality assurance measures.

The standardization of methods to be used within forensic anthropology is highly contested among practitioners. Many within the field, including OSAC and its predecessor SWGANTH, state that including a list of approved methods would not allow for the variation seen in cases, as the elements available for analysis can vary significantly. Rather, in the OSAC “Standard for Stature Estimation” they state that the methodology used needs to be from peer-reviewed sources that are recent and validated by the field (AAFS Standards Board 2019a). In another standard published in the same year “Standard for Sex Estimation,” it was stated that all methods used should be “generally accepted procedures” (AAFS Standards Board 2019b). The difference in terminology may seem small to some; however, there is a difference between stating that something needs to be peer reviewed versus generally accepted. Peer review is a very specific term well known to all scientists, while general acceptance can be related to the wording used in the *Daubert* and *Frye* Standards. While the point of not providing a comprehensive list of methods is valid, something generally accepted may not be peer reviewed, and peer review does not always equal generally accepted. There are many published, peer reviewed methods within forensic anthropology that should never be used in cases just as being “generally accepted” is not sufficient enough for a method to be valid. This wording, and the overall lack of enforcement involved with current standards, has led to many instances of variable application of methods within the field, for example, with the application of sex estimation methods (Garvin and Passalacqua 2012).

There are many methods and literature examples available for each method and each aspect of the biological profile. When examining a specific aspect, for example, age estimation, there are countless methods, some of which are favored over others. When present, the pubic symphysis is considered the best method of age estimation; however, there are various available specific methods for assessing age using the pubic symphysis (Garvin and Passalacqua 2012). Popular methods such as the “Suchey-Brooks method” (Brooks and Suchey 1990) are favored by many; however, there are many older methods that are popular amongst practitioners. In fact, no one method of age estimation was accepted by even half of the respondents to Garvin and Passalacqua’s (2012) survey. This survey also found that approximately 45% of respondents stated that they used their experience and expertise to produce an age range they felt fit with what they saw in the skeleton they were examining (Garvin and Passalacqua 2012). While it is not inherently wrong that forensic anthropologists use a variety of methods, given the variation on a case-by-case basis, it is concerning that so many rely on their experience to lead their analysis and their applications of a method.

Beyond the variation seen amongst methods, which exists for a number of reasons, there is variability in the application of those methods and no standardization exists on how methods are to be implemented (Christensen and Crowder 2009). Interobserver error is frequently discussed by forensic anthropologists when trying to understand the efficacy of methods, especially as related to osteometrics. From an outside perspective, and even amongst some in the field, measurements completed using a measuring device, such as sliding or spreading calipers, are more objective than

nonmetric scoring methods (Adams and Byrd 2002). However, this is frequently not the case as there is variation in where osteometric measurements are meant to be taken, with both cranial and postcranial measurements. When asked to perform postcranial measurements on a skeleton, 43% of participants required a correction to their work, including such errors as: transposed numbers, decimal place errors, failure to zero out calipers, recording the wrong measurement, or having a general misunderstanding of the definition of the landmarks to be used (Adams and Byrd 2002). Taking incorrect measurements has enormous implications when they are used throughout the biological profile. For example, the same measurements can be used to estimate sex, stature, and population affinity when using *FORDISC* (Jantz and Ousley 2005). To further compound this lack of understanding, the measurements themselves are “reliable” when they have 80% or above accuracy rates (Smith and Boaks 2014). This is not a standardization but rather a generalized rule within the field, which may be creating even more inaccuracy. The variation in the implementation of osteometrics, as well as other methods, is an important aspect of why peer review and quality assurance measures should be required of all forensic anthropologists.

While all forensic anthropologists must have experience in the field and with analysis in order to provide a valid case report, the results must be supported by methods and source material that has been peer reviewed and proven within the field (Christensen and Crowder 2009). Standardization sources, such as SOPs, typically provide standardized methods to those working at institutions; however, it is also common to require peer review of all reports. Peer review provides another level of quality assurance

and can often prevent mistakes made from continuing to be used in medicolegal situations. The OSAC draft “Quality Assurance” states that technical review should be completed by all, requiring a second-party reviewer to examine all documents and determine if what is provided is enough to support the findings of the practitioner (AAFS Standards Board 2024). However, while this task may be easy for forensic anthropologists working at a large institution, peer review may be something inaccessible to sole practitioners. According to Passalacqua and Pilloud (2020), 43% of respondents work for an institution where peer review is mandated and organized internally, and 16% of respondents personally arrange for their reports to be peer reviewed. However, the survey also stated that 26% of respondents do not have their case reports peer reviewed. While this number is smaller than those who do have their reports peer reviewed, there are still many individuals who do not have a quality assurance system. This may be due to lack of funding, a lack of access to other forensic anthropologists, limited time to organize a peer review system, or even a desire to not have work reviewed.

Citations, methods, and peer review are the three most important aspects to discuss when thinking about a case report itself. They are the fundamentals of quality assurance, and their implementation is the basis for SOPs. These three aspects, as well as other factors within the field, also heavily influence education and training objectives in forensic anthropology. It is important for forensic anthropologists to be educated in these areas in order to prevent the use of anecdotal and experiential work in medicolegal cases (Christensen and Crowder 2009). With the standards currently available to practitioners, there is a strong disconnect between what should be occurring and what is currently

happening across the United States. Education and training are other areas negatively impacted by the lack of standards, and which informs these fundamental areas of case reporting practice.

Education and Training

Education and training are essential aspects to any field, and forensic anthropology is no exception. The career path of an aspiring forensic anthropologist begins at the undergraduate level; however, there is no distinct course load expected of prospective students. This same trend can be seen throughout graduate school, with some practitioners holding a Master's degree and some continuing on to a PhD. Even within these degree programs, there is variability as to what is expected and taught to degree holders. Continuing in the workplace, training should be an expected part of any job. However, throughout the field, there is no specific set of guidelines providing what should be included in training and what qualifies an individual to be a forensic anthropologist. The variability seen throughout practitioners and workplaces is reflective of the education and experience of those who build SOPs or who complete cases as sole practitioners. Since education is not standardized, there is significant variability in what skills forensic anthropologists possess before and after entering the field. This leads to a gap in skillsets that varies from practitioner to practitioner across the field. There are many things that contribute to this lack of standardization, including degree programs and differences in experiences among students and professors.

Education and training requirements in forensic anthropology create issues of qualification and opinion amongst many practitioners. These problems include varying education levels, varying levels of experience, and courses. For example, many forensic anthropologists believe that a doctoral degree is unnecessary to be in the field, which can further be seen in practitioners outside of the United States (Passalacqua and Pilloud 2020). While there are others who contend that having a PhD should be required and all those who practice without one are unethical (Boyd et al. 2020). In a 2020 survey, only 45% of respondents stated they believed a PhD was necessary to be a forensic anthropologist (Passalacqua and Pilloud 2020). The issue of required degree is further complicated by the coursework and expectations that vary between degree programs and between professors, each of which is uniquely arranged and trained. For example, human osteology, a fundamental aspect of forensic anthropology, was frequently taken, but other courses varied by availability and institution (Passalacqua and Pilloud 2020). It is to be expected that forensic anthropologists have a varied background from their peers, with some specializing in specific aspects of analysis. However, what is lacking in the field are standardized basic requirements for what every forensic anthropologist should be taught and should know.

The lack of standardization and foundational knowledge leads to significant differences in application and understanding across the field. Because forensic anthropology is taught in a variety of ways, with varying levels of education and courses, there are many different terms and definitions for words used in the biological profile (Winburn and Clemmons 2021). This is compounded by the variation in professors and

their individual experiences, which they often pass on to their students (Pinto et al. 2020; Ross and Pilloud 2021). Despite the guideline of using modern sources from OSAC, there is a trend amongst forensic anthropologists to avoid using newer methods. Many consider new methods to be no more reliable than older methods and would require more time to learn, given that they were not taught in educational programs (Garvin and Passalacqua 2012). Not only is there a lack of standardization when it comes to specific sources of methods used, but there is also a lack of desire amongst practitioners to learn new and potentially more inclusive methods. In some cases, no method may be used, with all information and interpretations done following the experience and opinion of the practitioner. Thus, methods being taught in educational programs may stagnate and may not be educating the next generation of forensic anthropologists in the best manner. Further adding to this problem, errors related to taking osteometric measurements are seen most frequently in those with less than one year of experience, followed by those with more than ten years of experience, as individuals lack experience or begin to stagnate in their knowledge (Adams and Byrd 2002). All of these are examples of problems that exist because of a lack of standardization in forensic anthropology, which begins at the educational level.

While these problems may appear superficial, they define the ability to practice forensic anthropology as a professional. Over the years, there have been suggestions over how standardization and professionalization of education and training should be achieved within the field. Many claim that professional organizations such as the ABFA, American Academy of Forensic Sciences (AAFS), or the American Association of Biological

Anthropology (AABA) should be responsible for this standardization (Passalacqua et al. 2021). Currently, the only source of official certification in the US within the field of forensic anthropology is the ABFA.

The ABFA, established in 1977, was created to “professionalize” forensic anthropology (Christensen and Crowder 2009). The ABFA is composed of PhD-holding forensic anthropologists who pass a series of screenings and who ultimately must sit for and pass two exams. Currently, before being allowed to sit for the exams, a forensic anthropologist must have a PhD and must provide certain information about their career and work experience. This includes submitting case reports to the ABFA which are then examined for their content and the quality of the work (Bartelink et al. 2020). Individuals evaluating the case reports and experience of applicants are current members of the board and have expectations of what should be included in the reports. When an applicant has passed the screening, they are allowed to take the first exam. The first exam is multiple choice, asking questions regarding methodology and literature, with the majority of the exam based upon the biological profile (Bartelink et al. 2020). The second exam, the practical, is a rigorous, in-person exam involving all parts of the biological profile and forensic anthropological analysis.

Within the ABFA itself, there are many problems with the board’s expectations, history, and accountability. After one becomes certified by the ABFA, they are required to continue their professional development and education and recertify every three years (Bartelink et al. 2020). However, diplomates are not required to submit competency and

proficiency testing results completed at their place of employment to the ABFA (Bartelink et al. 2020). The history of the ABFA itself is grounded in individuals who themselves were not tested or evaluated, with the first 22 diplomates never required to take a qualifying exam (Bartelink et al. 2020). The standards and expectations of diplomates are codified in an ethics statement released by the ABFA, but the consequences for violation are removal of certification, which would allow for the individual to continue practicing (Boyd et al. 2020). All of this means that while the ABFA has requirements on what to know for the exam itself, there is no way to ensure the quality of the work someone is completing once that individual has been certified or that what is included in the exams is being taught in educational programs.

The requirements of the ABFA currently exclude many forensic anthropologists that work in the field with a master's degree. In 2023, the ABFA announced plans to implement a tiered system which would allow practitioners with a Master's degree to become certified. Their title would be "analyst" versus the PhD "diplomate" indicating a distinct difference between the two (ABFA 2023). While this may be a beneficial change to those who want to become certified, this does not change the issues that exist within the ABFA. To begin, the ABFA exams require extensive study time and memorization of literature and methods to be used during the exam. Not all forensic anthropologists have the economic or time resources to study and pay or sit for the exams (Passalacqua and Pilloud 2020). Further, many forensic anthropologists contend that the ABFA includes questions in their exams that go beyond the scope of the field, including forensic odontology and postmortem intervals (Passalacqua and Pilloud 2020). Without

standardized educational objectives, the field lacks an agreed upon body of knowledge on which to test to achieve ABFA diplomate status. Therefore, the ABFA examination process favors individuals who can take time off from work to study to fill in their potential gaps in education. This is in stark contrast to highly standardized fields like medicine and dentistry (Wojtczak and Schwarz 2000; Timmermans and Berg 1997; Field et al. 2020). Additionally, while the ABFA contends that they promote ethics, it is unknown whether the standards ABFA diplomates are held to are enforced, including continuing education and expectations of case reporting practices (Bartelink et al. 2020).

Despite there being no standardized education and training in forensic anthropology, being able to correctly apply and understand methods is required to get a job in the field (Christensen and Crowder 2009). Along with this, there are expectations from the ABFA that those applying to be diplomates will have a unified understanding of key concepts, which is not the case. Within the field of forensic anthropology, there are no other significant attempts at providing a standardization of education and training that are enforced (Passalacqua and Pilloud 2021). The AAFS OSAC standards suggest training and quality assurance, but there is no resource for those looking to understand what education and training is needed before becoming a forensic anthropologist.

Cognitive Biasability

Within forensic science, there is a long-standing belief in the complete objectivity of practitioners and methods (Dror 2015). Objectivity can be defined as the belief that scientists can separate themselves from their work and research, and do not experience

bias that would impact how they complete cases or their analyses. At the same time, subjectivity is the connection between a scientist and their objects of study that inherently exists (Winburn and Clemmons 2021). This belief is held by many within forensic science and has remained prominent in forensic anthropology despite acknowledgments of inherent subjectivity and attempts at limiting and controlling bias (i.e., quality assurance protocols, peer review, etc.). The idea of forensic anthropologists maintaining their objectivity likely stems from the connection between forensic anthropology and medicolegal investigations, as forensic anthropologists are commonly called as expert witnesses in court proceedings (Winburn 2018). This lack of acknowledgment creates problems within forensic anthropological analysis and the application of methods by practitioners, as they are not aware of the bias that may impact interpretation. While many individual institutions have quality assurance measures in place that implement bias mitigating procedures, they do not apply to the wider field and are not seen in any widespread standardization. Despite calls for quality assurance from the NAS report in 2009, the OSAC standards currently in place do not provide substantial guidance on this subject and create problematic situations that allow variation in how contextual information and bias are handled.

Currently, the OSAC does not have a published standard that specifically discusses contextual information and cognitive bias mitigation. As of 2024, a draft of a “Quality Assurance” standard is open for comment; however, it does not specifically discuss cognitive bias (AAFS Standards Boards 2024). The topic is mentioned briefly in the OSAC Standard for Sex Estimation. It is stated within this standard that the skeleton

is not the only thing that can be analyzed, but that contextual information can also be noted in the sex estimation report (AAFS Standards Board 2019b). While contextual information may be important in certain situations, especially when a forensic anthropologist suspects remains may belong to a transgender individual, it may also impact the conclusions a practitioner comes to in a negative way (Tallman et al. 2022). It is positive that practitioners are encouraged to include contextual information that seems “inconsistent” with the estimated sex (AAFS Standards Board 2019b). However, this information should never be the basis for an assessment. With prior information, the practitioner may be more likely to complete a method in such a way that it reaffirms the contextual information, rather than being an objective assessment. Because of the cognitive abilities of the human brain, information learned before tends to impact rationalization and decision-making abilities (Nakhaeizadeh et al. 2014b). Current standards fail to recognize the problems associated with cognitive bias and lack enforcement of rules against it, failing to prevent bias from impacting cases and their outcomes. Without a discussion of bias and the misuse of contextual information in a medicolegal setting, this information is not useful and leaves much room for variation amongst practitioners. An example of this variation can be seen in a study conducted by Nakhaeizadeh et al. (2014a, 2014b), which explored how variability in providing contextual information can negatively impact observers and their conclusions.

As related to the OSAC sex estimation standard’s recommendation, Nakhaeizadeh et al. (2014a) discuss cognitive bias as it relates to estimating the sex, age, and ancestry of a decedent. Participants were divided into three groups, two were provided contextual

information and one was provided no contextual information. Overall, they found that groups given contextual information were more likely to agree with the information they were provided, even if it went against the evidence in front of them. Interestingly, when ancestry was estimated by all groups, there was significant variation in what was estimated, even though the individual utilized for the study matched the “textbook” indicators of European-derived morphological features (Nakhaeizadeh et al. 2014a). This shows that cognitive bias plays an important role in how individual practitioners conduct their analyses. Some may argue that the biological profile is not a large part of casework conducted by forensic anthropologists; however, this same trend is observed in other areas of analysis, such as trauma (Nakhaeizadeh et al. 2014b).

Unlike the estimation of the biological profile, trauma analysis is a frequently requested aspect of casework in a medicolegal setting (Pilloud et al. 2021). Forensic anthropologists are expected to provide an analysis of trauma type and location, which can help law enforcement officials with their investigation into the cause and manner of death. This aspect of casework is also one of the most likely to require forensic anthropologists to testify to their findings (Bethard and DiGangi 2019). Nakhaeizadeh et al. (2014b) examined the effect of contextual information on forensic anthropological conclusions as they relate to trauma analysis. This study asked biological anthropologists with experiences in osteology to complete a survey indicating whether there was trauma present in each image of human remains. One group received information stating that the remains were found in a mass disaster context, insinuating a high probability of trauma. The second was informed that the remains were found in an archaeological context,

insinuating a low probability of trauma. The third and final group was given no information as to the context of the remains. They found that those in the mass disaster context group were significantly more likely to indicate that trauma was present (Nakhaeizadeh et al. 2014b). One example used to show this result was a photograph of a sternal foramen, which is a common morphology seen on the sternal body, believed by some to indicate trauma, specifically a gunshot wound. In the mass disaster group, 22 out of 33 respondents indicated trauma present in the image. In the archaeological group, only two out of 33 respondents stated that trauma was present. In the control group, six out of 33 indicated trauma was present. As has been outlined by these two studies, having access to contextual information before the examination may alter the conclusions of a practitioner. Individuals are not only biased by the science created by others, and by their own experiences, but also by the introduction of contextual information about a case, creating another factor that prevents objectivity.

How and when forensic anthropologists receive contextual information prior to analysis is unknown and is a variable aspect of the reporting process. The availability of contextual information often varies by the practitioner and by case, with some practitioners having access to contextual information before beginning their assessments (Winburn and Clemmons 2021). Depending on the practitioner or governing body, some practitioners may be presented with contextual information surrounding the individual being examined, which is frequently seen in medicolegal situations (Winburn 2018). Given the importance of mitigating the influence of contextual information during analysis, it is essential that forensic anthropologists acknowledge the potential bias

presented by this information. This begins with gaining an understanding of cognitive bias, the problems it can cause, and the ways to minimize it.

Both contextual and cognitive biases can lead to the stigmatization and dehumanization of decedents and fellow practitioners because they allow for the beliefs of the practitioner to be applied unchecked to all contexts (Bird and Bird 2022). The mindset of objectivity is especially problematic as it pertains to forensic work because it allows individuals to turn off their social and political obligations, remaining “objective observers,” rather than advocates for those they are working to identify (Winburn and Clemmons 2021). Bird and Bird (2022) demonstrate the impact of terminology and its relation to how individuals are treated by society. The authors focus on how identity and stigma affect individuals who remain unidentified. They discuss the three levels of terminology-based stratification: stigma, deviance, and dehumanization. How individuals are termed determines what social resources they have access to and becomes an aspect of the individual’s social identity. Using terms that reinforce racialism, and other social and political motivations, automatically opens the door to stigma, and the labeling of deviance and can result in the mislabeling and dehumanization of individuals being investigated (Bird and Bird 2022). Having access to this information may indirectly affect the cognitive biasability of the investigating forensic anthropologist.

With the current lack of standards, there are many issues arising with the transfer of forensic anthropological case reports to the medicolegal field, especially in conjunction with law enforcement. This variation can be seen in ancestry estimations provided as part of a biological profile.

Parsons (2022) explores the accuracy of ancestry estimations at three medical examiners' offices across the United States. The author showed that there is a 99% accuracy rate among the 177 identified cases examined when comparing the estimated ancestry and the classified social race category of the decedent. Because social race categories are used by law enforcement in missing persons files, forensic anthropologists are often under pressure to conform to these categories (Parsons 2022). However, due to the flawed nature of ancestry methods and their tendency to be created using small, unethically curated collections, the estimations created are broad categories. Forensic anthropologists must often balance between the available data and providing helpful conclusions to law enforcement (Parsons 2022). Further, while law enforcement expects to use the biological profile in their case, they do not fully know or understand anthropological techniques and language (Parsons 2022; Passalacqua et al. 2021). The responsibility of forensic anthropologists is to provide information to assist in cases, but, as mentioned in the *General Electric Co.* ruling, they have an obligation to prevent overextension of their methods and data. Without standards as to what is acceptable and possible to estimate from methods of the biological profile, forensic anthropologists may be indirectly contributing to the perpetuation of the biological race concept and providing inaccurate, overextended information to police.

Overall, contextual information presents an important point to be standardized within forensic anthropology. While it may provide important clues as to the identity of decedents, it has the potential to provide a significant bias to forensic anthropologists. As forensic scientists and expert witnesses, forensic anthropologists have a responsibility to

ensure their methods and conclusions are bound by sound, scientific practices. This includes the information they use to form their conclusions. Practitioners are responsible for their conclusions and how they will be used after they have been given to those in a medicolegal setting. As is seen in Parsons (2022), conclusions can take on a life of their own and they must be presented with the utmost care for what is at stake. Because of this responsibility, having no standardization is a risky practice and one that needs to be addressed to prevent misuse and misinterpretation with the creation of quality, robust guidelines.

Each of the sections above present different aspects of standardization in forensic anthropology. The first two, legal standards and existing standards, present what is currently available as a standardization for forensic anthropologists. The guidelines discussed, such as the *Daubert* Standard and OSAC best practice guidelines, present the documents intended to provide a source of standardization to the field. *Daubert* directly applies to expert witness testimony and OSAC guidelines pertain to various aspects of forensic anthropological casework and analysis. The preceding sections on terminology, peer review and methods, education and training, and cognitive biasability represent the areas of forensic anthropology where research has been conducted on the effectiveness of those “standards”. Each of those is a critical aspect of a case report and to forensic anthropology practices in general. These areas will be explored in the remainder of this thesis to determine if the sources presented in the first two sections provide a standardization. Further, they will be used to understand whether any standardization is

effective and whether the presence or absence of a standard presents a problem for forensic anthropology.

Chapter 3 METHODS

The experimental design of this project centered on understanding the variation in reporting practices amongst practicing forensic anthropologists using a survey-based approach. This was determined to be the most amenable source of data collection for several reasons. It allowed the researchers the ability to reach many different practitioners across the United States, making the sample size and data diverse. Further, it allowed for easy dispersal of the survey medium. The survey was distributed to a listserv of forensic anthropologists from across the United States, as well as through social media associated with the Forensic and Bioanthropology Laboratory of which the author is a part. Finally, a survey approach allowed for the collection of data regarding case reporting practices, without access to physical case reports. While examining physical case reports was considered by the author, it was determined to be beyond the scope of this thesis project and would have involved significant work from participants.

The Qualtrics survey suite, which is provided for free through Boston University, was used to create a survey as well as to collect and organize the data. The survey was made over the course of several months in collaboration between the author and her advisor to determine which questions would provide the most meaningful data on reporting practices. The final version of the survey was 75 questions, which can be seen in Table 1.1. It included questions from a wide range of topics, directly connected or contributory to case reporting practices in forensic anthropology. The survey was reviewed and approved by the Institutional Review Board (IRB) at the author's institution (Boston University, IRB # H-43507). This survey was open to all forensic

anthropologists of varying backgrounds and levels of experience, including students.

However, considering the subject of the survey, it was designed to be taken by those who have experience creating case reports in some fashion.

Table 1.1: IRB-approved questions included in the Qualtrics survey

Demographics	
Question	Responses
What is your highest degree obtained?	High school, Associates (AA, AS); Bachelors (BS/BA), master's (MS/MA), PhD, MD
How many years of experience do you have?	1-2, 3-4, 5-7, 8-10, 11-15, 16-20, 21-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51+
What is your gender?	Open response
What is your sex?	Open response
What is your age?	Open response
What is your current annual salary? (USD)	Below \$20k, \$20-30k, \$30-40k, \$40-50k, \$50-60k, \$60-70k, \$70-80k, \$80-90k, \$90-100k, \$100-110k, \$110-120k, \$120-130k, \$130-140k, \$140-150k, \$150k+, Prefer not to say
In what type of context do you work? (Select all that apply)	Laboratory (Federal), Laboratory (State), Medical Examiner's/Coroner's office, contracting company, academic, freelance, postdoctoral fellow, museum, N/A—student, other
Are you a sole practitioner?	Yes, no
Do you work in a team-based work environment with other forensic anthropologists?	Yes, no
Are you certified by the American Board of Forensic Anthropology?	Yes, no
Is there anything else you would like to mention about demographics?	Open response
Report Preparation	
Question	Responses
In what order do you complete the biological profile?	Arrange in order 1-7: Age Pathological analysis

	Population affinity/ancestry Sex Stature Taphonomic analysis Trauma analysis
In what order do you organize your case report?	Arrange in order 1-7: Age Pathological analysis Population affinity/ancestry Sex Stature Taphonomic analysis Trauma analysis
Which of the following terms do you use to refer to the subject of a case report? (Select all that apply)	“Individual”; “decedent”; “specimen”; “person”; “case”; other (fill in)
Do you include a skeletal inventory in your case reports?	Yes, no
Do you include a skeletal homunculus to demonstrate the completeness of remains?	Yes; no
Do you quantify the completeness of the remains in a case report (using percentages or other numerical representations)?	Yes, no; explain
How many pages is your typical case report?	1-2, 3-4, 4-5, 6-7, 8-9, 10+
Do you usually cite peer-reviewed literature in your case reports?	Yes, no
When conducting skeletal analyses for the biological profile, how often do you have the published methods in front of you?	Always, frequently, sometimes, rarely, never
Would you cite a book chapter in a case report?	Yes, no; explain
Would you cite a presentation from a professional meeting in a case report?	Yes, no; explain
Would you cite an unvalidated method in a case report?	Yes, no; explain
Do you include an estimation of postmortem interval in your case reports?	Yes, no, other (explain)
Do you estimate and report on ancestry/population affinity?	Yes, no, other (explain)
Which term do you use for ancestry/population affinity estimation?	“Ancestry”; “population affinity”; “population affiliation”; “race”; N/A (don’t report/discuss); other (explain)

Do you provide definitions for the above terms?	Yes; no
Do you use pronouns in case reports to refer to the analyzed individual (e.g., “she/her,” “he/him,” “they/them”?)	Yes, no
Do you use the terms “feminine” and “masculine” to describe skeletal features for sex estimation?	Yes; no
Is there anything else you would like to mention about report preparation?	Open response
Existing Standards	
Question	Responses
Are you familiar with the Academy Standards Board’s Organization of Scientific Area Committees for Forensic Sciences (ASB OSAC) standards for best practice?	Yes, no
Are you familiar with the Scientific Working Group for Forensic Anthropology (SWGANTH) guidelines?	Yes, no
How often do you look at and follow the ASB OSAC standards for best practice when completing a case report?	Always, frequently, sometimes, rarely, never
How important are the <i>Daubert</i> and <i>Kumho</i> standards in what methods you choose to use?	Extremely important, very important, moderately important, slightly important, not important at all
How important are the OSAC and SWGANTH standards in what methods you choose to use?	Extremely important, very important, moderately important, slightly important, not important at all
Do you feel that the OSAC standards for best practice provide beneficial standards when completing case reports?	Yes, no
Does your lab have a Standard Operating Procedure (SOP)?	Yes, no
Do you think that standardization of case reporting across the field of forensic anthropology is important?	Yes, no; explain
Does your place of work provide standard case reporting guidelines (e.g. report templates, suggested methods)?	Yes, no
Who do you believe has the responsibility to ensure standardization in the field of forensic anthropology?	Professional organizations (e.g. AAFS, ABFA, etc.), individual labs, individual practitioners, ASB/OSAC, other (explain)
The following definition should be considered when answering the next two questions. A universal standard can be defined as something	No response required

that is followed by and applied to all in a particular group.	
Do you believe it is necessary to create a universal standardization in methods and reporting for the field of forensic anthropology?	Yes, no
If provided a universal standard, would you follow it?	Yes, no
Is there anything else you would like to mention about existing standards?	Open response
Peer Review	
Questions	Responses
Are all of your case reports peer reviewed?	Yes, no
Do you use in-house (internal) peer reviewers for your case reports?	Yes, no, N/A
Do you use external peer reviewers (if not at a lab with other anthropologists)?	Yes, no, N/A
Do you provide peer reviews for forensic anthropologists at institutions other than your own?	Yes, no
If you peer review externally (i.e., not in traditional job description), do you charge a fee?	Yes, no; if yes, how much?
Is there anything else you would like to mention about peer review?	Open response
Education and Training	
Question	Responses
Have you ever taken the ABFA certification exam?	Yes, no
If you have not taken the ABFA exam, why have you not taken it? Select all that apply.	Financial constraints, time restraints, not required for current position, not interested in joining, do not qualify to complete the exam, other (please specify)
Do you think that ABFA certification should be required to be a forensic anthropologist?	Yes, no
Do you think a Ph.D. should be required to work as a forensic anthropologist?	Yes, no
What, outside of formal education, did you do to gain experience in forensic anthropology?	Open response

How often are you asked to complete a task that you were not taught in traditional educational contexts (e.g., in classroom, laboratory, or field trainings during degree programs or postdoctoral work)?	Frequently, sometimes, rarely, never
Can you provide an example of this task (e.g., postmortem interval estimation, facial approximation, photo superimposition, forensic archaeology)?	Open response
How important is archaeological excavation (e.g. body recovery via forensic archaeology) in your current position?	Extremely important, very important, moderately important, slightly important, not important at all
In your formal education, were you directly taught how to take osteometric measurements for the biological profile?	Yes, no
Have you ever mentored an individual wanting to become a forensic anthropologist (formally or informally)? Select all that apply.	Yes, formally; yes, informally; no
Were you mentored in forensic anthropology? Select all that apply.	Yes, formally; yes, informally; no
Do you believe that forensic anthropology education should be formally standardized (e.g. regulated/overseen by a regulatory body)?	Yes, no
Is there anything else you would like to mention about education and training?	Open response
Cognitive Biasability	
Question	Responses
Do you believe that forensic anthropologists are objective?	Yes, no; explain
How objective do you think forensic anthropological reports are?	Very objective, somewhat objective, moderately objective, not very objective, not objective at all
How often do you receive contextual information on a case prior to starting your analysis?	Always, frequently, sometimes, rarely, never
Does your place of employment have any bias mitigating procedures?	Yes, no, explain
Is there anything else you would like to mention about cognitive biasability?	Open response

Before being allowed access to the survey questions, respondents were asked to select “yes” on a single question advising them of their rights as participants. The content of this question can be seen in Table 1.2. The selection of “yes” was required of all participants before beginning to answer the survey questions. Upon beginning the survey, respondents were asked several questions on a variety of topics, which were subdivided by section. The sections of the survey were: Demographics, Report Preparation, Existing Standards, Peer Review, Education and Training, and Cognitive Biasability. Each section contained six to 20 questions, depending upon the section topic. All questions for each section appeared at once within the survey, allowing the respondent to examine all questions they were asked about a particular subject. At the end of each section, there was an open text box allowing for extended comments from the respondent about the questions they have previously answered. This was designed to allow for an explanation of answers and the inclusion of comments or further questions. Some questions also included open text boxes below the sections to allow for further explanation of answers or clarification if a participant wished to explain their selection.

Table 1.2: IRB-approved question 1 included first in the Qualtrics survey

You are being asked to voluntarily participate in a research study. We are asking you to be in this study because you are a forensic anthropology professional, practitioner, professor/instructor, or student. We are doing this study to understand and highlight the variation in reporting methods in forensic anthropological case reports. This includes outlining the lack of standardized methods, training, organization, and overall content of case reports. If you agree, the survey will take approximately 20 minutes. Some of the questions will include topics such as basic demographic information (sex, gender, age), experience within the field, training experience, organization and methods of reporting, and allied areas of interest. We will not record your name or any information that shows your identity. You will not be signing this form. All responses will be anonymous and confidential, and recorded within the Qualtrics Survey Suite. All responses will be stored in a password-protected electronic format and on an encrypted, password-protected computer. This study was deemed exempt by the Boston University Medical Campus Institutional Review Board (H-43507). If you have questions or concerns, please contact Alexandra Paradis at alexpar@bu.edu or Dr. Sean Tallman at tallman@bu.edu. By continuing, you are agreeing to participate in the survey. If you would like to continue with this survey and understand your rights as a participant, please click yes.

Age, sex, gender, and other questions related to demographics were collected to better understand the impacts of the answers to the question pertaining to salary, along with gauging who is more likely to be a sole practitioner. A question regarding salary was used to compare results to Passalacqua et al. (2020). These salary ranges are based on the median incomes of anthropologists and archaeologists reported as of May 2021 by the Bureau of Labor Statistics. The median income of this group was \$61,910, with the lowest reported as less than \$37,870 and the highest reported as more than \$99,830 (Bureau of Labor Statistics, 2022). The author is interested in understanding the trend in

salary and its applications to case reports in forensic anthropology, which is why it was included in the survey.

The data from this survey was compiled and analyzed to determine trends across each question. Sex and gender results were used to compare salaries amongst applied positions, to compare these results with the results of previously published surveys. Age, experience level, work context, and educational level, however, were used to understand if there is variation across generations of practitioners. It is important to note that correlating age/education/experience and the responses from the survey was not the main objective of this project. Rather, the objective was to explore the variation in responses themselves, indicating the variety in reporting practices, and the overall lack of standardization that this may indicate.

The data from this survey was qualitatively and quantitatively analyzed using the Qualtrics Survey Suite and Microsoft Excel. Statistical comparisons between demographic groups (work context, years of experience) and specific questions were done using Microsoft Excel. Chi-square tests were used to determine the statistical significance of certain survey results when compared to the demographic groups of survey respondents. For these comparisons, only work context and years of experience were used. These chi-square tests were run using Microsoft Excel and all used an alpha value of 0.05. For some questions, respondent groups were combined in order to have larger sample sizes and to show overall trends. All responses written in Spanish were translated using Google Translate.

CHAPTER 4 RESULTS

Participant Demographics

In total, 106 individuals participated in the survey. However, not every single respondent answered every question within the survey. The total number of responses varied by question. Of these participants (n=106), approximately 63.2% (n=67/106) had a PhD, 27.4% (n=29/106) had a Master's degree (MS/MA), 7.5% (n=8/106) had a Bachelor's degree, and 1.9% (n=2/106) had an MD. There was significant variation in the reported of experience, with the most participants having between 11 and 15 years (14.9%) (n=16/107). Of 107 participants, 9.3% (n=10/107) of respondents had between 1-2 years of experience; 12.2% (n=13/107) had 3-4 years; 14.0% (n=15/107) had 5-7 years; 12.2% (n=13/107) had 8-10 years; 12.2% (n=13/107) had 16-20 years; 12.2% (n=13/107) had 21-25 years; 6.5% (n=7/107) had 26-30 years; 4.7% (n=5/107) had 31-35 years; 0.9% (n=1/107) had 46-50 years, and 0.9% (n=1/107) had 51+ years of experience (Figure 1.1). There was little diversity when it came to the gender of participants (n=104), with 76.5% (n=78/104) of participants identifying as female, 17.6% (n=18/104) identifying as male, and 5.9% (n=6/104) of participants identifying as either non-binary, agender, or gender queer. This trend was also reflected in sex, with 81.7% (n=85/104) of participants identifying as female and 18.3% (n=19/104) as male. The average age of participants (n=99), who provided a specific age, was 39 years old, with an age range of 23-75 years.

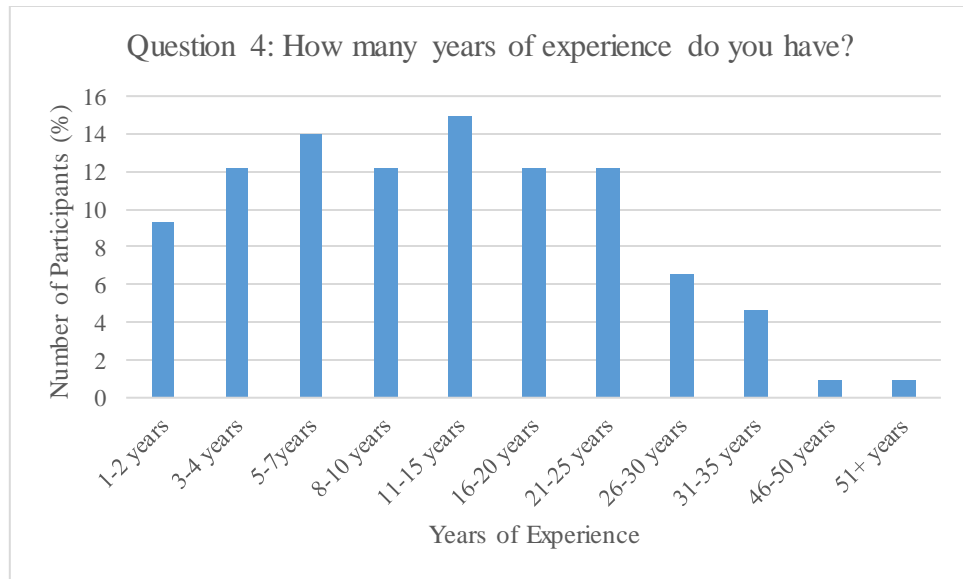


Figure 1.1. Bar chart showing the number of years of experience of the survey respondents

The most common context for individuals to work in was academia, representing 51.4% (n=55/107) of participants (Figure 1.2). This was followed by students (18.7%, n=20/107), medical examiner/coroner office (16.8%, n=18/107), Laboratory (federal) (10.3%, n=11/107), freelance (7.5%, n=8/107), Laboratory (state) (5.6%, n=6/107), contracting company (3.7%, n=4/107), postdoctoral fellow (2.8%, n=3/107), and museum (1.9%, n=2/107). Of the 107 responses to this question, 15.0% (n=16/107) of respondents also indicated “other,” indicating other contexts they work in, including humanitarian organizations and emergency deployments (Table 2.1). Of the 105 individuals who answered these questions, 32.4% (n=34/105) were sole practitioners and 39.0% (n=41/105) did not work in team-based work environments with other forensic anthropologists. Of 106 responses, 69.8% (n=74/106) of participants are not certified by

the American Board of Forensic Anthropology (ABFA) while 30.2% (n=32/106) are certified by the ABFA.

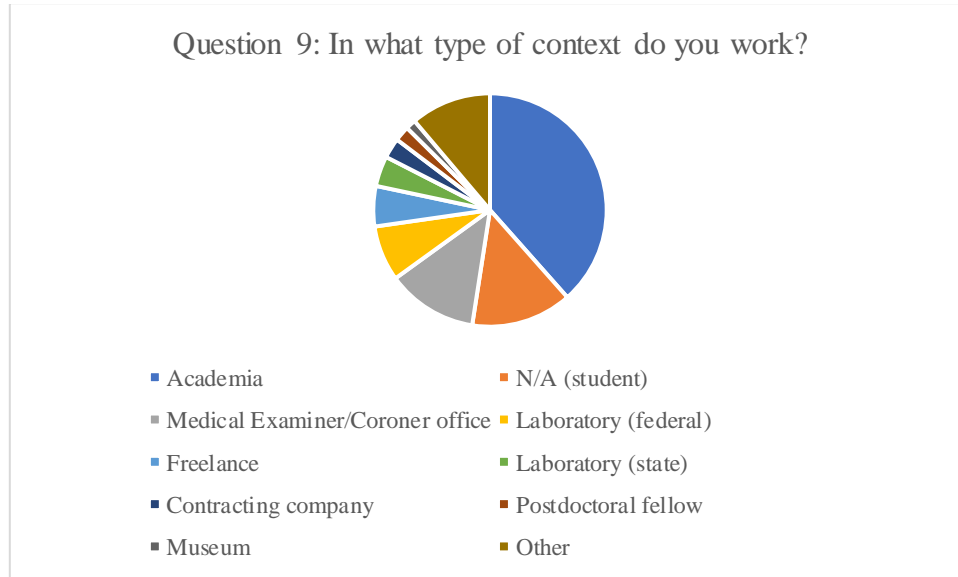


Figure 1.2. Graph showing the types of contexts survey respondents work in

Table 2.1. Open-text responses to the question: “what type of context do you work?” when the respondent indicated “Other”

Human Rights NGO's	Ad hoc
international humanitarian organization	Student funded through these contexts
Emergency deployments	NGO
Humanitarian (2)	receive state funding
Private forensic company	State contract
State government commission	I work on forensic cases as part of the forensic anthropology master’s program
Abroad	I’m in

A total of 106 individuals responded to a question regarding their salary, with 12.3% (n=13/106) making below \$20k; 9.4% (n=10/106) making \$20-30k; 2.8% (n=3/106) making \$30-40k; 4.7% (n=5/106) making \$40-50k; 6.6% (n=7/106) making \$50-60k; 5.7% (n=6/106) making \$60-70k; 6.6% (n=7/106) making \$70-80k; 9.4%

(n=10/106) making \$80-90k; 6.6% (n=7/106) making \$90-100k; 4.7% (n=5/106) making \$100-110k; 2.8% (n=3/106) making \$110-120k; 5.7% (n=6/106) making \$120-130k; 3.8% (n=4/106) making \$130-140k; 3.8% (n=4/106) making \$140-150k; 3.8% (n=4/106) making \$150k or more, and 11.3% (n=12/106) preferring not to say.

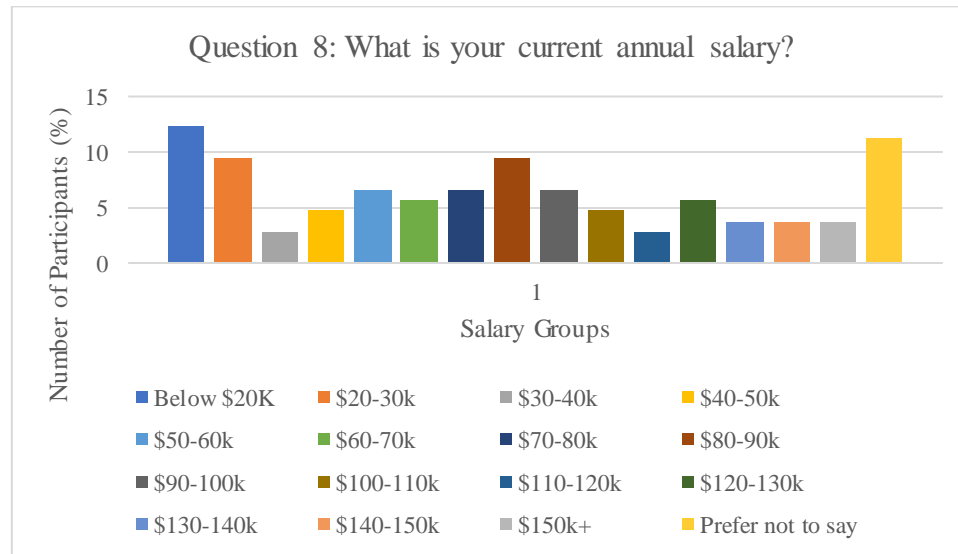


Figure 1.3. Bar chart showing the salary groups of the survey respondents in USD

Salary information collected from participants and compared to the published results of Passalacqua et al. (2020). Results were compared based on gender, education level, academic versus applied work contexts, ABFA certification, and years of experience. A salary index (SI) was not created, unlike Passalacqua et al. (2020), as these results were only compared for overall trends. Gender was used for this analysis, while sex was analyzed in Passalacqua et al. (2020), thus the comparison between the two is slightly different. However, when using individuals who identified their sex as male or female, female respondents tended to have a higher average. In this survey, male

respondents represented a higher percentage of those who earned the higher salary ranges (Figure 1.4).

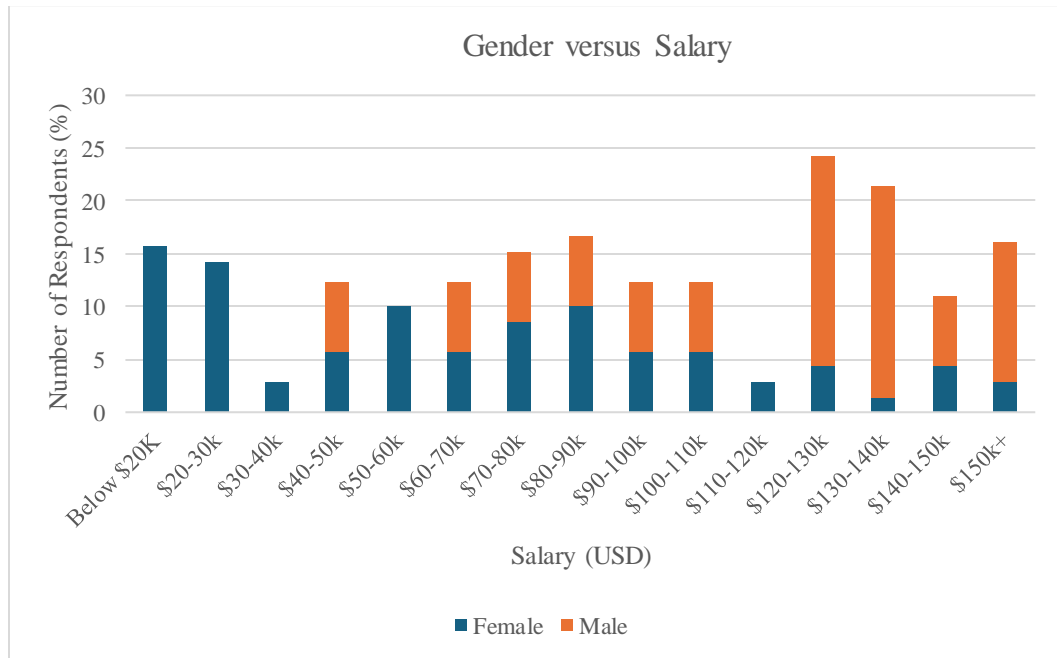


Figure 1.4. Gender versus salary groups of survey participants

Those respondents who have a PhD have a higher mean salary those with a Master's degree in the 2020 survey. In this survey, data was compared from those with a PhD, a Master's, and a Bachelor's degree. Respondents with a PhD tended to have a higher salary than those with a Master's or a Bachelor's (Figure 1.5).

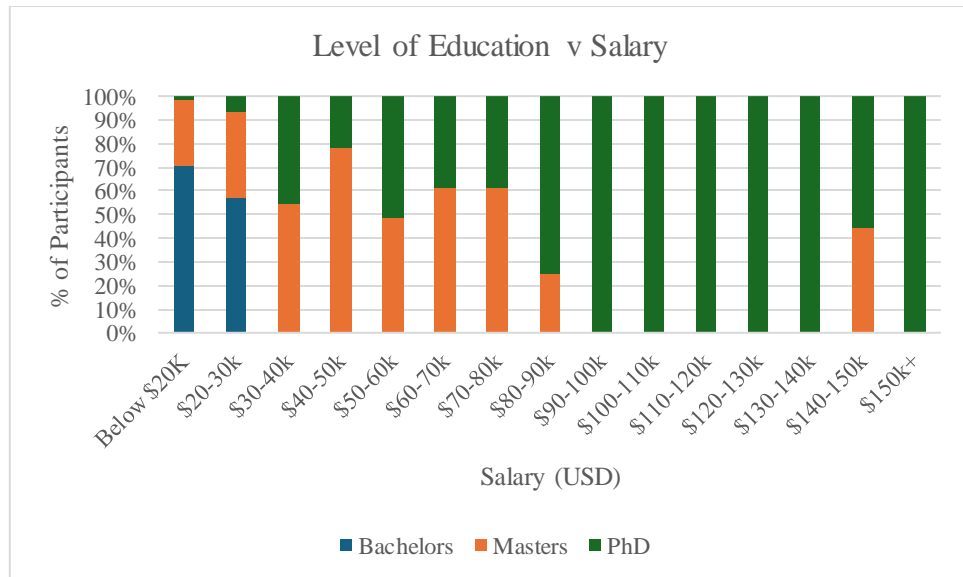


Figure 1.5. Level of education versus salary groups of survey participants

The number of respondents with a Bachelor's degree was small ($n=8/106$), but all respondents reported a salary of either \$20-30k or below \$20k. According to this survey, forensic anthropologists working in an academic context were the highest paid, which is consistent with the results of Passalacqua et al. (2020) and represent a majority of the respondents to this survey, along with those who work in medical examiner/coroner's offices (Figure 1.6).

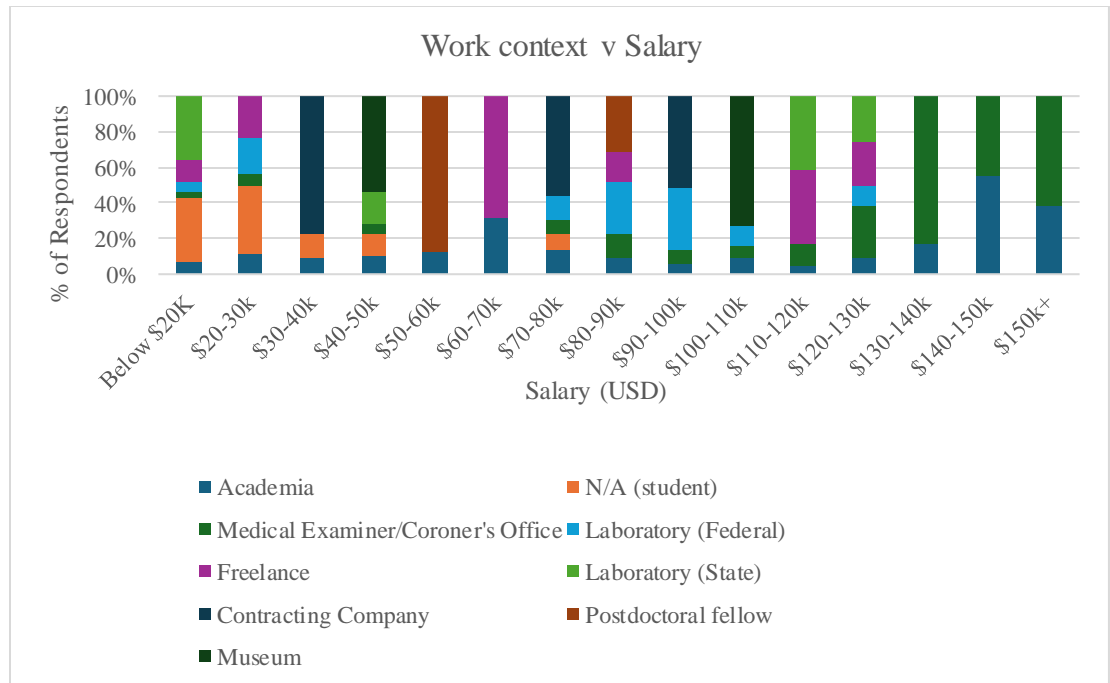


Figure 1.6. Work context versus salary groups of survey participants

The study also found that those with ABFA certification had a higher salary than those who were not ABFA certified (Figure 1.7). This is consistent with the results of Passalacqua et al. (2020), who showed those with ABFA certification had a higher average salary. Finally, when comparing years of experience, there is much more variety in salary ranges (Figure 1.8). This is reflected in Passalacqua et al. (2020), as they state there is no correlation between their salary index category and the number of years a participant has been active in the field.

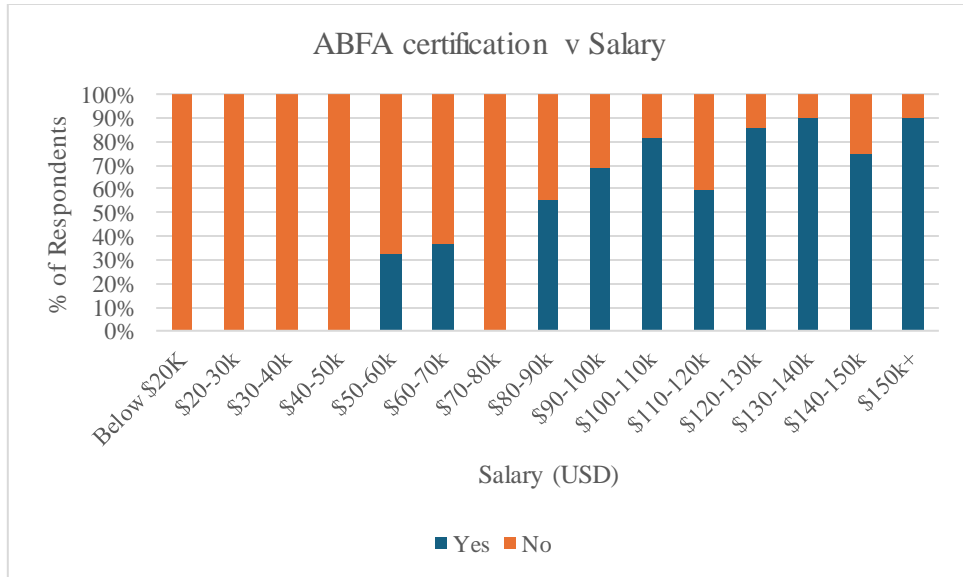


Figure 1.7. ABFA certification versus salary groups of survey participants

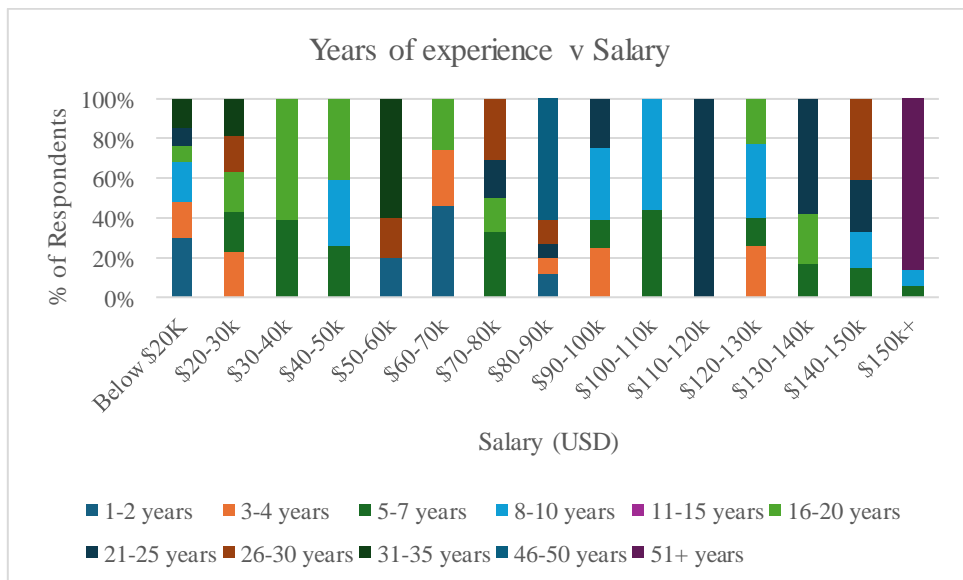


Figure 1.8. Years of experience versus salary groups of survey participants

At the end of this section, all participants were provided an opportunity to state any other comments they had about the section that were otherwise not addressed (Table 2.25). In the demographics section, many respondents indicated that they were not from the United States or were not currently working at an institution in the United States.

While this survey was designed to focus on practitioner and standards in the United States, these responses were kept to understand the opinions of these individuals.

Table 2.2. Open-text responses to the question: “Is there anything else you would like to mention about demographics?”

I am certified by the Latin American Forensic Anthropology Association
I am South African
Canadian undergrad looking for lab work
Not US based
I am Italian and based in the UK
Certified UK
Also have international certifications
I have a non-local peer review team for my cases who are all board certified

Report Preparation

Participants were asked to rank in what order they complete the biological profile, including age, pathological analysis, population affinity/ancestry, sex, stature, taphonomic analysis, and trauma analysis (Figure 2.1). Of 90 responses, sex was most commonly completed first (47.8%, n=43/90), followed by taphonomy (25.6%, n=23/90), age (16.7%, n=15/90), population affinity/ancestry (4.4%, n=4/90), trauma (3.3%, n=3/90), and pathology (2.2%, n=2/90). Stature was never completed first. Most likely to be completed second was sex as well (37.8%, n=34/90), followed by age (34.4%, n=31/90), population affinity/ancestry (13.3%, n=12/90), pathology (5.6%, n=5/90), trauma and stature (both 3.3%, n=3/90), and taphonomy (2.2%, n=2/90). Population affinity/ancestry was most likely to be completed third (45.6%, n=41/90), followed by age (27.8%, n=25/90), stature (12.2%, n=11/90), sex (7.8%, n=7/90), trauma (4.4%, n=4/90), and taphonomy (2.2%, n=2/90). Stature was estimated fourth by 55.6% (n=50/90) of respondents, followed by population affinity/ancestry (18.9%, n=17/90), age

(13.3%, n=12/90), pathology (5.6%, n=5/90), sex (4.4%, n=4/90), and taphonomy (2.2%, n=2/90). Trauma was completed fifth by 32.2% (n=29/90) of respondents, followed by taphonomy and pathology (both 18.9%, n=17/90), stature (14.4%, n=13/90), age and population affinity/ancestry (6.7%, n=6/90), and sex (2.2%, n=2/90). Pathology was completed sixth by 40.0% (n=36/90) of respondents, followed by trauma (34.4%, n=31/90), taphonomy (12.2%, n=11/90), stature (7.8%, n=7/90), population affinity/ancestry (4.4%, n=4/90), and age (1.1%, n=1/90). Finally, taphonomy was completed last by 36.7% (n=33/90) of respondents, followed by pathology (27.8%, n=25/90), trauma (22.2%, n=20/90), stature and population affinity/ancestry (both 6.7%, n=6/90).

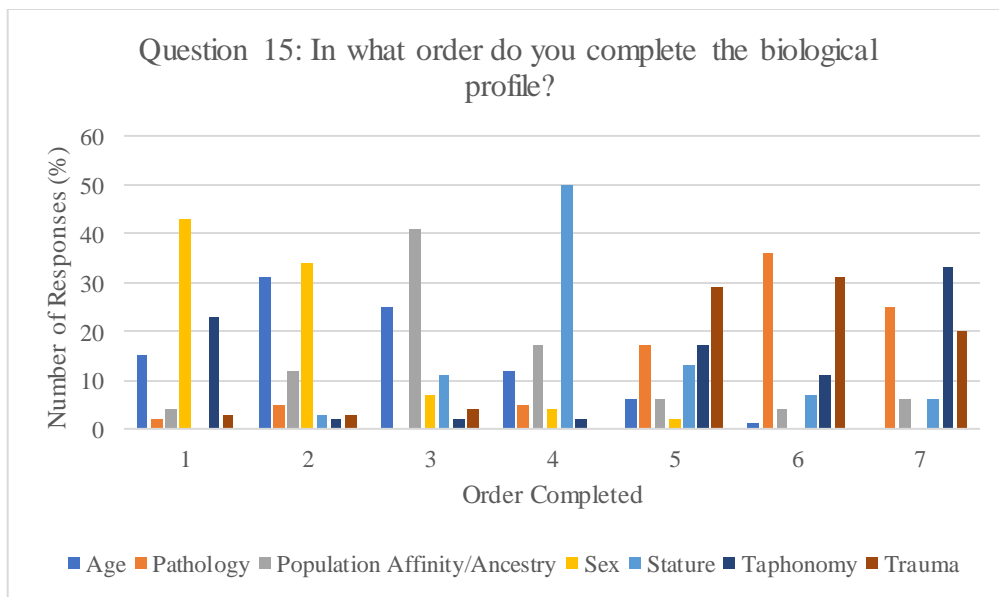


Figure 2.1. Bar chart showing the order respondents complete the biological profile

Similarly, participants were asked to rank in what order they organize their case reports (Figure 2.2). Of 89 responses, sex was placed first in a case report by 56.2% (n=50/89) of respondents. This was followed by age (20.2%, n=18/89), taphonomy

(15.7%, n=14/89), population affinity/ancestry (4.5%, n=4/89), and pathology (3.4%, n=3/89). Age was placed second by 44.9% (n=40/89) of respondents, followed by sex (30.3%, n=27/89), population affinity/ancestry (21.4%, n=19/89), trauma (2.3%, n=2/89), and pathology (1.1%, n=1/89). Population affinity/ancestry was placed third by 51.7% (n=46/89) of respondents, followed by age (25.8%, n=23/89), stature (12.4%, n=11/89), sex (9.0%, n=8/89), and taphonomy (1.1%, n=1/89). Stature was placed fourth by 74.2% (n=66/89) of respondents, followed by population affinity/ancestry (14.6%, n=13/89), age (5.6%, n=5/89), sex (3.3%, n=3/89), pathology, and trauma (both 1.1%, n=1/89). Trauma was placed fifth by 41.6% (n=37/89) of respondents, followed by pathology (27.0%, n=24/89), stature (11.2%, n=10/89), taphonomy (10.1%, n=9/89), population affinity/ancestry (6.7%, n=6/89), age (2.3%, n=2/89), and sex (1.1%, n=1/89). Pathology was placed sixth by 42.7% (n=38/89) of respondents, followed by trauma (31.5%, n=28/89), taphonomy (23.6%, n=21/89), age, and stature (both 1.2%, n=1/89). Finally, taphonomy was placed last by 49.4% (n=44/89) of respondents, followed by pathology

(24.7%, n=22/89), trauma (23.6%, n=21/89), population affinity/ancestry, and stature (both 1.1%, n=1/89).

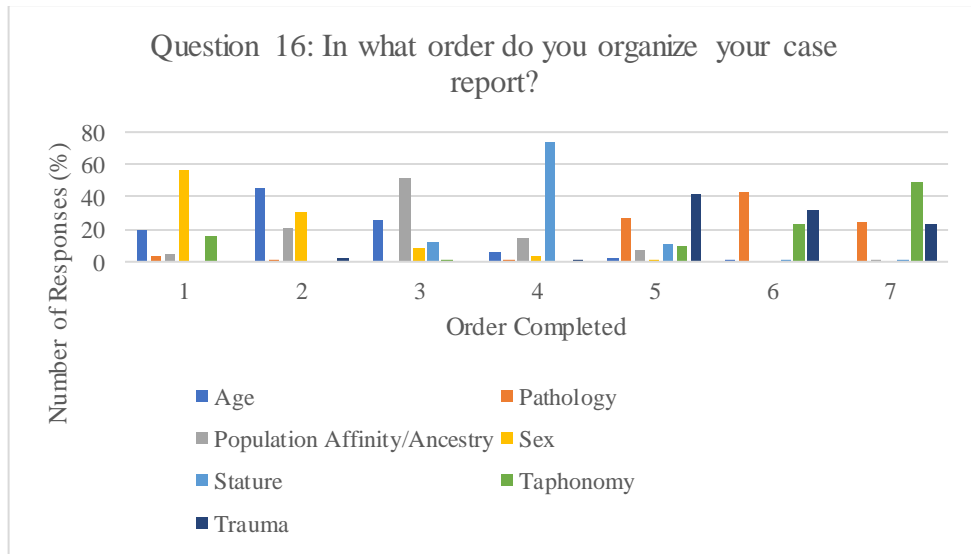


Figure 2.2. Bar chart showing the order in which survey respondents organize a case report

The most commonly used terminology reported by respondents (n=89) to refer to the subject of a case report was “individual” (86.7%, n=78/89), followed by “decedent” (55.6%, n=50/89), “case” (27.8%, n=25/89), “person” (14.4%, n=13/89), and “specimen” (6.7%, n=6/89). Some individuals (12.2%, n=11/89) also included other terminology they frequently use, including “remains”, “human remains”, “assigned ID number”, “deceased”, “skeletal remains”, and “service member”, with one individual stating that what terminology they used depended upon the type of report.

Terminology used by respondents in case reports to refer to the individual being analyzed was correlated to both the years of experience and the work contexts of respondents. When compared to years of experience, “individual” was most likely to be used across the experience levels (Figure 2.3). “Specimen” was most commonly used by

those within the 11–20-year range ($n=3/25$). A chi-square test was completed and indicated that these results were due to chance and did not represent the overall population, with a p -value of 0.4346. When compared to work context, those in academia ($n=48/89$) and applied contexts ($n=40/89$) (medical examiner/coroner’s office, laboratory (federal), and laboratory (state)) were also all more likely to use “individual” than any other terminology (Figure 2.4). A chi-square test was completed resulting in a p -value of 0.479, indicating the correlations between work contexts and terminology were due to chance.

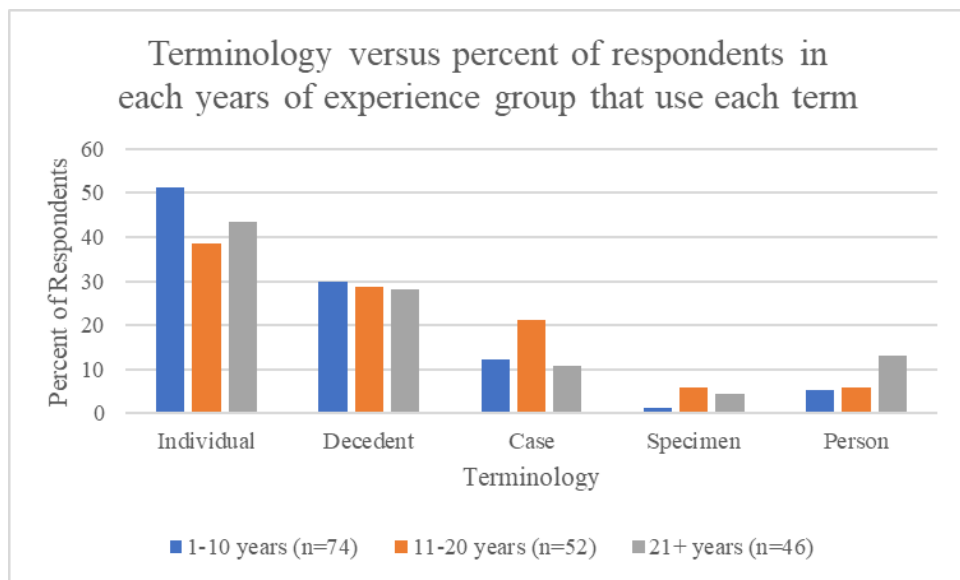


Figure 2.3. Bar chart showing a comparison between terminology usage in case reports and respondents’ years of experience

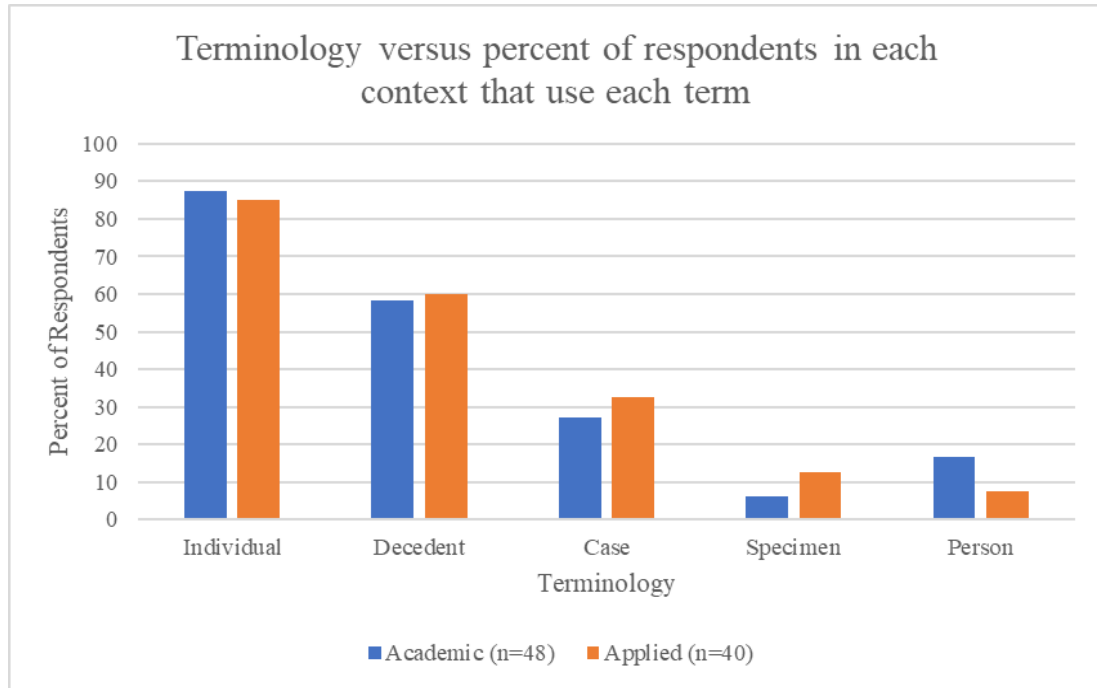


Figure 2.4. Bar chart showing a comparison between terminology usage in case reports and respondents' work context

Also related to what is included in reports, 94.4% (n=85/90) of individuals stated that they do include a skeletal inventory in their case reports, while 73.9% (n=65/88) stated they include a skeletal homunculus. On the other hand, 5.6% (n=5/90) of respondents indicated they do not include a skeletal inventory and 26.1% (n=23/88) of respondents indicated they do not include a skeletal homunculus. When asked whether participants quantify the completeness of a case, using percentages or numerical representations, 68.2% (n=60/88) said they do not. Many stated that quantifying completeness is too difficult to do and can result in a result that is too subjective. Rather, those respondents provide a general overview of what is missing, complete, etc. or refer to a skeletal diagram or homunculus (Table 2.3). For those who said they do quantify the completeness of skeletal remains (46.7%, n=28/88), many stated that they included

percentages, describe what is present, or provide an approximation (Table 2.4). The most common length of a case report was 4-5 pages (27.9%, n=24/86), followed by 3-4 pages (24.4%, n=21/86), 5-6 pages (18.6%, n=16/86), 10+ pages (18.6%, n=16/86), 8-9 pages (9.3%, n=8/86), and 1-2 pages (1.2%, n=1/86) (Figure 2.5).

Table 2.3. Open-text responses to the question: “Do you quantify the completeness of the remains in a case report (using percentages or other numerical representations)?” when respondent indicated “No”

Just list: mostly complete, missing hands, feet, and right tibia
A qualifier (mostly, partially, etc.) and then list the elements that are present or absent (as appropriate)
Completeness not quantified numerically, but is stated generally using adjectives such as "complete," "mostly complete", "partial" skeleton; or "isolated [element]"
It's too subjective. I let the inventory represent the completeness of remains
I usually include this in an appendix
We generally use fairly vague terms such as fairly incomplete, or almost complete followed by a list of all the missing bones
No numerical but descriptive text
Hard to quantify
I provide a general describe the overall condition of the remains.
Partial, incomplete, complete, nearly complete
I will specifically list what is present or absent (whichever is the cleaner way to present it)
Not in the report; in notes, I consider an element complete if it is "75%" present (but will make a note if portions are absent).
I just say "mostly complete" or "incomplete" and refer to homunculus
I usually list in a paragraph which remains are present and refer to the overview photo and homunculus
I qualitatively describe completeness (complete, nearly complete, partial)
We use terms like “partial”
I don't use a percentage because I think it's too hard to determine and can lead to inaccuracies
Absent elements are listed
I give a general statement (mostly, partially, etc.).
Bench notes have a homunculus and report lists items.
A layout photo and homunculus are included, which demonstrates the "completeness" of the remains as well as qualifiers like partial or complete.

Table 2.4. Open-text responses to the question: “Do you quantify the completeness of the remains in a case report (using percentages or other numerical representations)?” when respondent indicated “Yes”

Describe what is mostly present
absent, <25, 25-50, 50-75, 75<
Utilizando standars de Buistra y Ubelajer 1994 (Using standards from Buikstra and Ubelaker 1994)
Percentages/Percentage completeness
Not with specific numbers. I use generalizations with qualifiers and am descriptive (e.g., "approximately three-quarters of the proximal tibia is present")

Pero descripciones cualitativas (But qualitative descriptions)

List everything either there or not there

Yes, but only when I feel necessary.

It depends, just like it depends on the order of the case report

Define as either complete, mostly complete, partially complete, and list the skeletal elements absent

I usually classified the overall quantitative preservation into the following: <25%, 25-50%, 50-75%, 75-100% or 100%. This is only used to provide a general overview. Details on preservation are then added in a table either within the text or the appendices

Qualitative: complete, nearly complete, partial

percentages or range of complete/absent (i.e., "mostly", "few", "partially", etc.)

Not approximate percentages but rough completeness

Percentages for individual bones, and list of present or missing elements (dependent on which is more appropriate)

Rowbotham for overall completeness, as well as statement regarding the areas of the body represented or missing particularly if patterned, i.e. only the top half of the body was recovered from the 5th lumbar superiorly.

% Complete in four categories

Complete/incomplete

Mostly, completely, limited, just the lower half

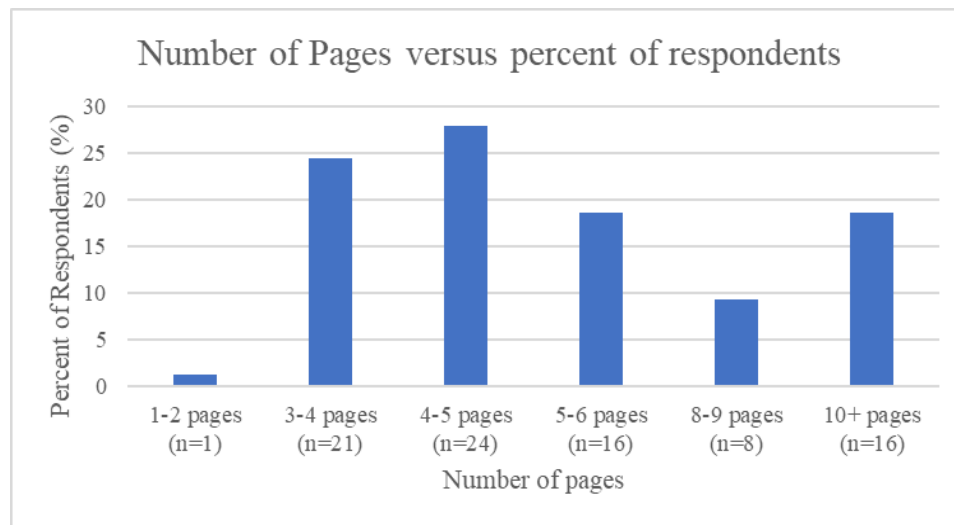


Figure 2.5. Bar chart showing the number of pages of a typical case report

Of 89 respondents, 91.0% (n=81/89) of respondents typically cite peer-reviewed research in their case reports, while 9.0% (n=8/89) of respondents indicated they do not cite peer-reviewed research in their case reports. The inclusion of peer reviewed literature was correlated to the length of case reports to determine if report length was linked to this (Figure 2.6). A chi-square test indicated that there was no correlation between report

length and the inclusion of peer reviewed literature, when comparing the lengths of 1-5 pages ($n=39/79$) and 6-10+ pages ($n=40/79$), with a resulting p -value of 0.91042.

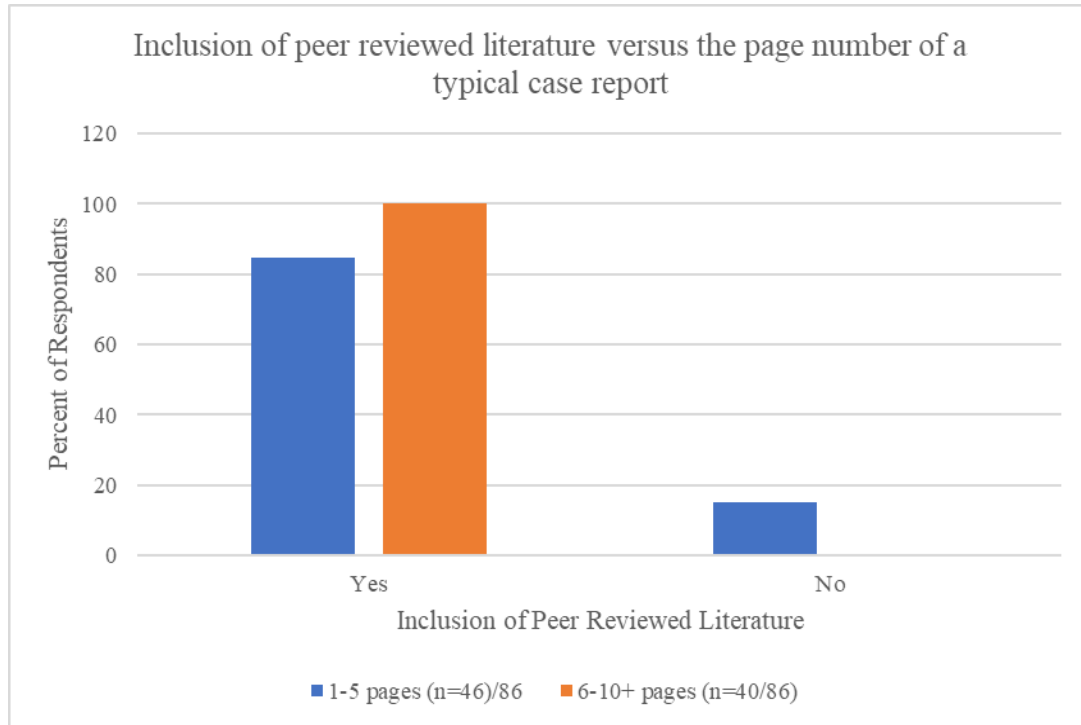


Figure 2.6. Bar graph showing the comparison between case report length and the inclusion of peer reviewed literature

Of 88 respondents, 59.1% ($n=52/88$) of participants stated they “always” have a published method in front of them when completing a case report, while 33.0% ($n=29/88$) stated they “frequently” have the method, and 8.0% ($n=7/88$) “sometimes” have the method in front of them. No respondents indicated they “rarely” or “never” have the published method in front of them when completing a case report. When asked about specific sources, 79.5% ($n=70/88$) of participants stated they would cite a book chapter, while 20.5% ($n=18/88$) of participants stated they would not cite a book chapter. Additionally, 28.4% ($n=25/88$) of participants stated they would cite a presentation from

a professional meeting in a case report, while 71.6% (n=63/88) of participants stated they would not cite a presentation from a professional meeting. When asked about citing unvalidated methods in a case report, 77.3% (n=68/88) stated they would not cite an unvalidated method in a case report, while 22.7% (n=20/88) stated they would cite an unvalidated method. Each of the questions regarding method use asked respondents to elaborate on their responses, which can be seen in Tables 2.5 to 2.10. Many stated they would commonly use textbooks when completing taphonomic and pathological analyses, including trauma analysis, as most of the methods and sources for those areas have not been published in journal articles. Relating to the use of presentations at conferences, some stated that these reports are peer reviewed and thus they would be comfortable using them, while other stated that they are not peer reviewed and the results presented frequently change upon publication. In terms of using an unvalidated methods, some stated their informal use of these methods or use of the method following an internal (in-house) validation, while others stated that this would not be appropriate for a case report and would violate *Daubert*.

Table 2.5. Open-text responses to the question: “Would you cite a book chapter in a case report?” when respondent indicated “Yes”

For taph[onomy]/scavenging Companion to Forensic Anthropology - Symes et al.	Trauma usually Particularly with trauma, taphonomy, or pathological analyses, many of these references are found in books, so I will cite those specific chapters
Sometimes book chapters are the best resource, e.g., large radiographic medical volumes for antemortem trauma	If it was the only information available - for thermal alteration usually
There are many book chapters I commonly cite in my routine casework, including but not limited to chapters on ancestry assessment methods and trauma analysis.	Book chapters are also peer reviewed, albeit different from articles/manuscripts

Some can provide information/methodological suggestions/research that are useful to cases - maybe to supplement main analyses	Sometimes book chapters cover very specific and relevant case examples
If chapter/methodology is generally accepted/utilized by other practitioners in Forensic Anthropology	I use the Human bone manual by White and Folkens and Intro to forensic anthropology by Byers
For the most part out go to reference work is definitely articles, but I have nothing against book chapters. For pathological analyses I mainly use books or book chapters	If it is an edited volume, but not if it is a single author book.
Only if a certain method is published in a book chapter or it refers to a case study relevant to the individual I am examining.	If relevant tech note, method or to support interpretation.
Only if necessary	Sometimes it is more clear to cite a chapter, plus citing directly to the author instead of editors
If the book chapter is a review of methods for a specific estimation, for instance	Only if I have no other means to estimate age but cranial sutures (using Nawrocki, in the Reichs volume)
For burn analysis specifically I often cite book chapters because there is little peer reviewed data	If a reference is needed for the analysis. otherwise, it is listed in the bench notes. Our reports are similar to pathology report format.
These questions are difficult and will be potentially misleading since you seem to be assuming every case report is the same. They are not.	If the book chapter includes the extension of methods initially published in peer-reviewed articles OR it covers trauma or pathological descriptions for comparison.
I often cite specific chapters for trauma (from Galloway) or other references.	Potentially for Taph related points, but only if chapter is rooted in peer reviewed research
If appropriate to the method I was using	

Table 2.6. Open-text responses to the question: “Would you cite a book chapter in a case report?” when respondent indicated “No”

Not normally, typically only cite methods
No citations in case report
Only the primary literature
I will go to the primary source first and cite a book chapter only if the primary source is no longer available.
I use the original source. The only time I reference literature if for specific methods.
I use sources cited in our SOPs for methods (if the chapter is a method I might if it is approved by our director)

Table 2.7. Open-text responses to the question: “Would you cite a presentation from a professional meeting in a case report?” when respondent indicated “Yes”

If it was the only method available – histo[ological] age of the femur

If appropriate to the method I was using and it wasn't published in a peer reviewed journal
If the work is otherwise unpublished or I received further clarification from the author
If I was describing/interpreting something unusual, something that is not widely published on yet, etc, and a convincing, well-developed meeting presentation was the only available reference.
Also peer reviewed
Some can provide information/methodological suggestions/research that are useful to cases - maybe to supplement main analyses
If there is nothing else I can find published
Mainly for contextual interpretations, nothing definitive
If there is something available at least online for others to refer to, e.g. in a fire case when the new method of documenting thermally trauma was proposed at the AAFS meeting and the poster of damage by body region was made available
Depending on the context (I cited a poster on cremains to describe their condition but I would not do this for a method)
If it was an observation, or something that was not a test, this would be okay.

Table 2.8. Open-text responses to the question: “Would you cite a presentation from a professional meeting in a case report?” when respondent indicated “No”

Not unless absolutely needed
While presentations provide valuable innovation, many of the methods or analyses presented at professional meetings have yet to be published or validated
I am not absolutely against this, but have never done it and it is difficult or impossible for someone to cross-check the source
Would wait until it was published
This is not typically peer reviewed
It has never been necessary to cite presentations as there has been enough articles or books to reference. However, perhaps for peculiar cases I might consider citing a presentation
But I might consider adding a footnote or mention of it. Typically would only cite primary literature that is already published
Ideally not, but if it is a recent case study or something that would make a significant difference to my analysis then yes.
I don't think I've ever done this, because usually they prefer peer reviewed sources.
I never have, and prefer to use the article published from the presentation
Insufficient oversight (peer review, validation, etc) to warrant inclusion in forensic casework.
Unfortunately, there's often not enough information in the abstract for me to justify citing it for a report.
I choose not to include conference presentations because they are not peer-reviewed and commonly the abstracts do not contain the complete information that was presented.
Results often change
While abstracts are PR'ed [peer reviewed], the information or methods described in the presentation are not necessarily validated. It would depend on what part of the case report I am using it for, and whether there are additional supporting articles or presentation.

Table 2.9. Open-text responses to the question: “Would you cite an unvalidated method in a case report?” when respondent indicated “Yes”

If it was the only option - I'd comment that it was unvalidated
Sometimes casework demands the use of unvalidated methods. If the research is sound (statistical methods used correctly; sample demographics are appropriate, etc), then I feel comfortable using such methods.

Depends on the method and stats used and population group, some data to support age related changes on certain population groups are not entirely validated

"Validated" is a bit loaded. Who decides how something is validated? If a study is methodologically robust, has a good sample size and the interpretation is logical and reasonable, then I would cite it.

If a method has been peer reviewed and published in a scientific journal or forensic anthropology book and is generally accepted/utilized in the field.

Lots of methods are unvalidated in anthropology. What does it mean to be validated anyway - on which population should it be tested? What threshold of performance should it be held to?

If I was justifying why a popular, but unvalidated method was not used.

Depends what you mean by unvalidated our company validates all methods used for other forensic science but anth[ropology] has not validated all methods that a large task, we have a declaration to state the status of our methods

No trauma methods are validated

If the methodology was utilized, it should be openly cited

Table 2.10. Open-text responses to the question: “Would you cite an unvalidated method in a case report?” when respondent indicated “No”

Depending on your lab's SOP you may internally validate a method though

That would not be appropriate for a case report or analysis

I may use to for analysis but not make any definite conclusions or refer to it (for example MaMD which is not validated yet)

Would wait until published

That would not reflect best practices

While good to stay current on research an unvalidated method is just that and does not support a professional reports contents

It is not best practice. Again, if it is a particularly peculiar case I might consider it, but will clearly indicate that it is not validated in the report. But to date I have not done this.

The method is under validated, and could be question in court now if I have supporting method that has been verified, I would use that and then use the unverified as a support method

Again would mention it and maybe use footnotes but if there is no full primary publication I would not cite it

It may be used informally to compare against a validated method. Usually as an academic exercise. For example, using an orthopedic grading system for a pathological condition in living patients.

I think we don't even have a clear set of criteria for what it means to have a validated method. So that is the first major problem. Sometimes I will include unvalidated methods in my notes and highlight that they are unvalidated, still in beta phase. I feel pressure [because] some of the methods on the ABFA exam weren't even validated....

Rarely unless I had used it personally with success that I had documented

No, this does not meet Daubert

This is not something the laboratory I work for allows us to do. Validated methods have to be peer reviewed.

1) I work in a laboratory that does not allow this practice and 2) an unvalidated methods is less defensible and has greater uncertainty regarding its accuracy and precision.

Accuracy of unvalidated methods cannot be stated with certainty

Of 88 responses, 55.7% (n=49/88) of participants state they include an estimation of postmortem interval (PMI) in their reports, while 44.3% (n=39/88) do not include an

estimation of PMI in their reports. Both those who do include and those who do not include a PMI in their reports stated that this typically depended on what law enforcement wanted (Tables 2.11 and 2.12). When asked about ancestry/population affinity, 80.7% (n=71/88) of respondents stated that they do estimate it in case reports, while 1.1% (n=1/88) of respondents stated they do not estimate population affinity/ancestry. Of those 88 responses, 18.2% (n=16/88) of participants selected “other” as their responses to this question, most stating that they only complete it when it is needed for other aspects of the biological profile (i.e., stature) or that they use it with immense caution (Table 2.13).

The most common terms used for ancestry/population affinity estimation were “population affinity” (43.8%, n=39/89) and “ancestry” (38.2%, n=34/89). Of 89 responses, 2.3% (n=2/89) stated they used the term “race” and 1.1% (n=1/89) stated they used “population affiliation.” Some also selected “other” (13.5%, n=12/89) stating they used terms such as geographic ancestry, ancestry/population affinity, or stating that they indicate both population affinity and social race in their case reports (Table 2.14). When comparing terminology and work context, population affinity was more commonly used in those who work in academia (n=23/47), while ancestry was more commonly used by those who work in applied positions (n=20/43) (medical examiner/coroner’s office, laboratory (federal), laboratory (state) (Figure 2.7).

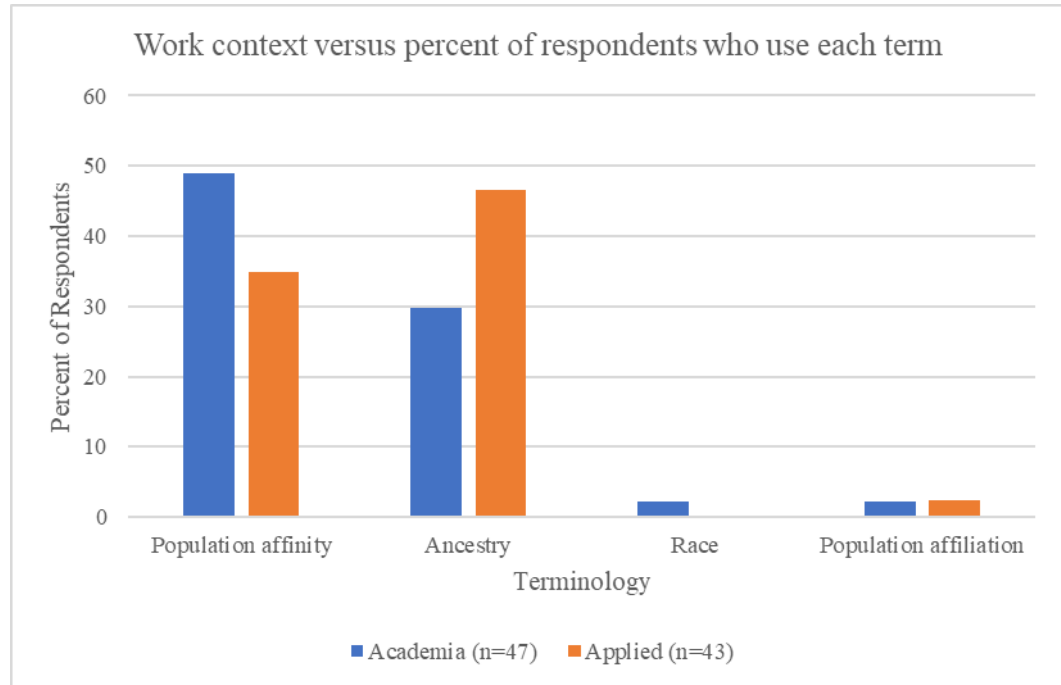


Figure 2.7. Bar graph showing a comparison between terminology used and respondents' work context

Of 87 respondents, 43.6% (n=38/87) stated that they provide definitions of the terms used for ancestry/population affinity, while 56.3% (n=49/87) stated that they do not define their terms. Of 87 responses, 89.7% (n=78/87) stated they do not use pronouns, such as “she/her,” “he/him,” or “they/them” to refer to the analyzed individuals, while 10.3% (n=9/87) stated that they do use pronouns to refer to analyzed individuals. Of 87 responses, 78.2% (n=68/87) stated they do not use the terms “feminine” and “masculine” to describe skeletal features for sex estimation, while 21.8% (n=19/87) stated that they do use such terms.

Table 2.11. Open-text responses to the question: “Do you include an estimation of postmortem interval in your case reports?” when the respondent indicated “Yes”

Sometimes and depending on how much tissue is present
If specifically asked by law enforcement

I provide details of appearance and other characteristics, as well as examples of known cases from the region along side my estimation.
When appropriate
Wide ranges, usually 6 - 12 months, 1-3 years etc
But very broadly (days to weeks etc)
But I am very cautious about this. There are too many unknowns in most contexts and we simply cannot be precise. I sometimes only give a minimum estimated time.
Using Megyesi et al. 2005
Using an internal database of known PMI from previous casework along with publications on sequences of PMI environmental factors and entomology a generalized PMI is often reported in cases when applicable.
If appropriate/needed for the case. Only if can be supported with citations. PMI is generally a broad estimation.
It depends on how reliable it can be given my areas of experience and expertise
Only, if it falls within my expertise (Mummified or skeletonized remains). If fresh remains are recovered I would recommend a forensic pathological and/or entomological analysis, depending on the available evidence.
If I am able to estimate postmortem interval I will. However if I am not confident in PMI I will say that
When asked to we do, we also discuss forensic significance
Usually we have the police reports and the taphonomic analysis that might also include entomology
These questions are difficult and will be potentially misleading since you seem to be assuming every case report is the same. They are not.
May only be a broad estimate but I include where possible - always for cases where Medicolegal significance is ruled out. This is not included in your list of topics covered in a report. I always assess and report Medicolegal significance.
I have written case reports previously that are requested for the estimation of the postmortem interval, but these are commonly caveated concerning the confidence of the estimation.
My interpretations are generally very vague and I use terms such as "extended period of time"

Table 2.12. Open-text responses to the question: “Do you include an estimation of postmortem interval in your case reports?” when the respondent indicated “No”

Only if specifically asked
We do not receive enough prior knowledge on a case
Not required by my jurisdiction.
Unless I am supplied such by a qualified entomologist
Most of our cases lack any context. There is also an enormous backlog of cases in my country, so it is not uncommon to receive a case 5 years (or more) after it was recovered
I avoid it as I am not a trained taphonomist
Cases are already known from a specific time frame upon recovery
I am not confident enough in PMI estimations to provide such information in my reports unless specifically asked to do so (e.g., forensically significant vs. archaeological).
Typically will not do this unless specifically asked (which is rare). The methods are poor and not reliable.
We do not have SOPs for this and I am not confident in the accuracy of any current methods aside from forensic entomology (which I would leave to that specialist)
PMI is outside of the purview of our laboratory

Table 2.13. Open-text responses to the question: “Do you estimate and report on ancestry/population affinity?” when the respondent indicated “Other”

Yes, but again with this am very cautious. Context matters- if I am in the US, I am more inclined to use US convention, but in other countries/contexts, reference literature/studies are usually sparse. I am careful to make clear that ancestry is not categorically (biologically) and so due caution is warranted when interpreting this.
Occasionally, sometimes it is not possible
Highly dependent on case and what is present
I do, but I present multiple usually conflicting estimates and present the very valid critiques of the practice
Preferably no, but if the only methods for (for instance) stature in those particular remains require ancestry, I will do so.
I am currently, mainly as it will have an effect on other methods I currently use. However following recent developments I would like to revise my approach.
I include it depending who requested the report
Depends on the state of remains and what’s being asked in the analysis
Yes, usually presented with estimates from several methods, listing the results of each methods and attempting to come to a consensus, but if not there is a low bar for listing a decedent's population affinity "indeterminate". A footnote is also included that explains that race is not a biological concept, and PA may not translate to how the individual identifies.
Yes for using the appropriate stature estimates but I do not put the ancestry in reports
I sometimes provide an estimate of population affinity based on published and validated methods, but I may also include a statement on how the person may have identified (social race). But more commonly the methods do not provide a clear estimate and I report as undetermined.
Usually not relevant as I work in the Middle East and typical ancestry profiles do not apply

Table 2.14. Open-text responses to the question: “Which term do you use for ancestry/population affinity estimation?” when the respondent indicated “Other”

Ancestry/population affinity
I address population affinity as it relates to the skeleton and then race as it relates to social identification.
It varies sometimes: I will use ancestry/ancestral affiliation (e.g., traits show this individual is consistent with someone from this population), or sometimes I use bioaffinity.
A combination of skeletal representation of population affinity along with a social race the decedent may have identified with
Geographic ancestry
I use both ancestry and pop affinity with explanation
Population affinity / social race

At the end of this section, participants were asked if they would like to make any additional comments about the content or their opinions, which can be seen in Table 2.15. Many comments critiqued the question relating to case report length, stating that there are many different types of case reports which can vary in length. There was also a

discussion of terminology usage, with some stating they have no choice in terminology and must adhere to the SOPs they are bound by.

Table 2.15. Open-text responses to the question: “Is there anything else you would like to mention about report preparation?”

The "typical length" varies depending on the analysis and complexity of the case. I chose 4-5 but there's a decent amount of variation.
Report length depends on the type of report. A full report (bio profile and trauma will be longer than a trauma only report. So the question asking about report length isn't very insightful unless you specify report types.
This survey seems to assume that every report includes biological profile. There also seems to be an assumption that all reports are the same length and have the same components. This is not true. Most of our reports are specifically trauma-focused and do not include bio profile. Also, I do not consider trauma, pathological conditions, and taphonomy part of the bio profile.
I put in a small summary table at the beginning then more detailed descriptions of each later on
In the event that I know the person is trans, I will mention it
Sometimes I am asked to comment on specific things only, or things that I would not normally report.
A skeletal homunculus diagram is only used when it is necessary to show the skeletal representation. Trauma, pathology, and taphonomic alterations are all considered at the same time during each skeletal element analysis.
Order for completing biological profile - taph/trauma/path are kind of all completed together - look for skeletal anomalies and assess them and record based on assessment; also order can change based on circumstances (eg assessing age in subadult remains first to see if they are old enough to estimate sex); I also think it is important to define sex in terms of forensic anthropology case reports (eg skeletal sex is a spectrum of variation that we condense to try to estimate a binary sex assigned at birth); number of report pages is really varied based on what methods used/what elements are present/possible analyses and how much trauma (and therefore photos/diagrams are included)
For the ancestry/population affinity section, most practitioners in our lab still use the term ancestry, although we are transitioning to using population affinity to stay on par with international standards. The context and manner in which we have been using ancestry is synonymous to what is now referred to as population affinity.
Especie y número mínimo de individuos (Species and minimum number of individuals)
Never define the remains by the profile directly. Worded as remains consistent with x characteristic as opposed to the remains are X.
The pronouns are needed in my language because we don't have neutral pronouns to substitute
For sex estimation, I use statements like "traits consistent with male" "traits consistent with female"
I use terms like gracile and robust rather than biased terms such as feminine and masculine.
These questions refer to case reports, but they are really asking about Biological profile reports. Most of my reports do not include the bio profile because that is not the question. I do not include trauma analysis or PMI as a part of the bio profile. The bio profile provides the demographic information of the decedent. Other additional information like trauma, PM damage, PMI, etc are a part of the full skeletal analysis, but not the biological profile.
I would say something to the effect of more consistent with biological fe/male, never masculine or feminine
I only use a homunculus when I feel necessary.
These questions are difficult and will be potentially misleading since you seem to be assuming every case report is the same. They are not.

Regarding definitions of ancestry and population affinity - I don't define the terms, but I typically write a paragraph that explains my conclusions for this aspect of the bio profile. So I try to expand on my conclusions which is a type of definition

Your survey does not provide enough options for comments. I never include stature as it contributes very little to the identification and is generally too broad to be useful. I will only include if the person is notably tall or short. You have no space for Background to the case or how I became involved. Context is always included.

I provide a definition and limitations for both sex (e.g., "methods used for the estimation of sex are binary and may not encompass how the individual represented themselves/was perceived..."), and pop. affiliation, with a similar note re: representation and perception

The choice of ancestry is not defined by myself but a requirement of employment.

I have some leniency but we have SOPs to adhere to

I have only authored mock reports and co-authored reports with board certified individuals

Existing Standards

Participants were asked about their familiarity with current standards that apply to forensic anthropological case reporting practices. These included the Academy Standards Board's Organization of Scientific Area Committees for Forensic Science (ASB OSAC) standards for best practice, the Scientific Working Group for Forensic Anthropology (SWGANTH) guidelines, the *Daubert* standard, the *Kumho* standard, and standard operating procedures (SOPs) at individual institutions. When asked if they were familiar with the ASB OSAC standards for best practice, 88.0% (n=73/83) of 83 respondents stated they were familiar with them. When asked about how often they look at and follow the OSAC standards when completing a case report, 82 individuals responded in a variety of ways: 14.6% (n=12/82) selected "always"; 26.8% (n=22/82) selected "frequently"; 31.7% (n=26/82) selected "sometimes"; 9.8% (n=8/82) selected "rarely," and 17.1% (n=14/82) selected "never". Of 83 respondents, 94.0% (n=78/83) were familiar with the SWGANTH guidelines. Respondents (n=82) stated that the OSAC and SWGANTH standards were: "not at all important" (9.8%, n=8/82), "slightly important" (11.0%, n=9/82), "moderately important" (25.6%, n=21/82), "very important" (34.2%, n=28/82),

and extremely important (19.5%, n=16/82) to what methods they chose to use in case reports. Respondents (n=79) were also asked if they feel the OSAC standards provide beneficial standards, of which 77.2% (n=61/79) stated “yes” they do, while 22.8% (n=18/79) stated “no” they do not. When respondents (n=82) were asked about the importance of the *Daubert* and *Kumho* standards when choosing methods to use, 14.6% (n=12/82) stated they were “not at all important”; 3.7% (n=3/82) stated they were “slightly important”; 24.4% (n=20/82) stated they were “moderately important”; 40.2% (n=33/82) stated they were “very important,” and 17.1% (n=14/82) stated they were “extremely important”. Of 82 respondents, 76.8% (n=63/82) stated that their laboratory has an SOP, while 23.2% (n=19/82) stated their laboratory does not have an SOP. Of 82 respondents, 72.0% (n=59/82) stated that their place of work provides standard case reporting guidelines, including report templates and suggested methods, while 28.0% (n=23/82) do not have this resource provided to them.

Participants were also asked about their opinions on standardization itself. Of 80 responses, 71.3% (n=57/80) stated they believe that the standardization of case reporting practices across forensic anthropology is important, with respondents stating they provide important aspects of practice, including terminology and reporting procedures (Table 2.16). On the other hand, 28.8% (n=23/80) of respondents stated they do not believe standardization of case reports is important, mentioning that different employers have different needs and that the variation of work in the field could never be encompassed by standardization (Table 2.17). When asked about who the responsibility of standardization belongs to, 35.0% (n=28/80) of 80 respondents said professional organizations (e.g.,

AAFS, ABFA, etc.); 7.5% (n=6/80) said individual labs/places of employment; 5.0% (n=4/80) said individual practitioners; 26.3% (n=21/80) said ASB/OSAC, and 26.3% (n=21/80) said “other.” Respondents that selected “other” explained their ideas on who should oversee standardization, which can be seen in Table 2.18. Many stated they believe it should be a combination of the previously mentioned institutions, for example, a collaboration between OSAC and individual laboratories.

Table 2.16. Open-text responses to the question: “Do you think that standardization of case reporting across the field of forensic anthropology is important?” when the respondent indicated “Yes”

The standards provide the boundaries for practice as well as the appropriate terminology for reporting.
To a certain extent there needs to be minimum standards and expectation. I don't think that means we need to be moving to a template or that there isn't room for reports to be different.
Trauma definition and language used varies drastically
Reporting is also a function of the office. For Academics, who work under no quality assurance program or lab accreditation program this standardization is very important.
It would not be practical for all cases/situations, but a foundational structure would be useful.
It should be part of the certification process that we are producing similar reports and individuals aren't relying on poor methods or procedures
I think a standard format is not only important for uniformity, but also for ease of peer-review
Within certain contexts. I believe that we should have greater standardization, but that flexibility should be built into standards to accommodate different contexts (e.g., in many countries pathologists are forced to "do" anthropology- their SOPs should be very general considering their often limited experience and training in anthropology
I had to create my own SOPs at my office and other sole practitioner should be compelled to do the same
All reports should include the same base level of information that is thorough and consistent, however, there should be room for flexibility in how reports are formatted to best serve what is required by the stakeholders.
Yes and no. I think it depends on what you mean by standardization. For example - should we be required to cite peer-reviewed literature? Yes. Should we define terminology? Yes. Do we have to use the same template or use a skeletal diagram for the inventory? No. Perhaps some minimum expectations for a scientifically defensible report are warranted, while stylistic elements are up to the practitioner.
It ensures that all labs maintain a certain level of quality across the board. Standardization also eliminates inconsistencies and confusion surrounding terminology. This will probably also make it more user friendly for police and other law enforcement officers to work with our reports.
Although, the entire field requires a consideration of biases built into current methodologies.
It adds consistency and legitimacy to the field in the eyes of our clients
Standards are important as well as data sharing
I think it is essential to standardize reporting. It can be difficult to communicate with scientists if there is a lack of standardization and explanation of methodology
Absolutely. We should be consistent and cohesive in how we present information, the language we use, and the optimal methods. Our individual lab does this but it is not standardized across the field which would help make us more cohesive as practitioners.

There can be guidelines, but each report varies based on case and needs of customer(s)
Extremely important. To follow along with pushing our discipline to a higher standard of professionalism, we don't only need certification of individuals, but also accreditation of laboratories and standardization of case reporting
To some degree... It is helpful to have legibility across practitioners, but each case is distinct and therefore some flexibility is necessary
All reports should have the minimum amount of information outlined by OSAC or ASB or the accrediting body.
Difficult for sole proprietor, definitely important for an established lab
Not in the sense of a report template, but a baseline standardization is important
To some degree but cases can vary so much it is difficult to standardize and still capture all the relevant information. I would not want to be in a system that has a standard format that I consider insufficient
Yes, to a degree. We should have the same basic reporting requirements but should be able to deviate on format based on our workplace.
We should be meeting the Daubert standard and avoiding ethical issues common in forensics (including assigning probabilities or quantities that are subjective and not based in any real reproducible method; and avoiding suggestive language that could bias jurors)
I think it's important that the words we use and the methods we are employing can be compared and understood in the same way by everyone in the discipline.
While I do not feel that case reports need to be formulaic across the discipline, I do think a certain level of consistency would be beneficial for projecting confidence in those that use our reports outside of the discipline (e.g., MEs, coroners, etc.).
However, our training is not standardized so depending where you were trained you may prefer different methods

Table 2.17. Open-text responses to the question: “Do you think that standardization of case reporting across the field of forensic anthropology is important?” when the respondent indicated “No”

Different clients have different needs/requirements
They [are] being sought for their professional opinion; they should be able to give it as they see fit
I do not feel that reports have to be standardized but should follow internal lab SOPs.
Yes and no - I think there are aspects of forensic casework and reporting that can be standardized, however, context plays such a large role in what we do and our ability to make an identification that I would be concerned that by standardizing reporting it would become too stringent and the lack of flexibility would affect our ability to make the identifications
We work for different agencies that want different things. We have to remember that we work for them, not the other way around.
Standardization within a given lab is important, but report standardization across the entire field is not feasible. Our labs operate in a wide variety of jurisdictions, with wide variation in what their customers (i.e., LEOs, MEOs, attorneys, etc) expect or require to be included in the reports. Practitioners have to have the ability to organize their reports and adjust report content to suit the needs of their customers.
Varies between countries is specific to who is reading the report - prosecution or police. Application of the report dictates how it should be set up and this will vary within and between countries.
Some methods work better for different population groups or geographical areas
Every jurisdiction is different and asks different outcomes and interpretations of their anthropologists.
Each case the comes in is so individualized, that what works for one case doesn't always work for another.

This depends on what you mean by standardization. Format or content. Content, yes. There should be some standardization of expected content, but format is determined by the office and quality assurance program (with input from the expert).

This is not an easy question. I think having standards on methods and reports is important, but there will be times when cases may not conform to the standard and in those cases if you can demonstrate why standards and best practices don't apply then you must do so.

This boils down to personal preference and what ME wants

Report format is not important but utilization of accepted methods is important.

Medical examiners do not always ask for the same information and states or counties may differ in what is necessary

Every case and person has difference requirements and the ability to tailor reports is essential; standardization may do more harm to the people (decedents) than it helps them

Too much variation in case type, practice, and stakeholders to standardize across the field.

Too much variation in what is being asked. Often I am only doing trauma or only doing taphonomy

I think context is important when writing case reports, and different analysts and different laboratories operate in different context and with different stakeholders. One standardized reporting format for ALL anthropological casework is not feasible and would be constrictive to providing all the necessary or relevant information

Table 2.18. Open-text responses to the question: “Who do you believe has the responsibility to ensure standardization in the field of forensic anthropology?” when the respondent indicated “Other”

I think it would need to be a wider discussion with individual labs, ASB/OSAC and ANAB

I do not believe that case reporting can be standardized and it should be up to lab/practitioner should be responsible for their work product

I am not based in the US (but have been), so I see a lot of (often necessary) variation across contexts.

There are legal and practical considerations about who has this responsibility. Often it falls on practitioners themselves, but should be at least at the laboratory level.

Lawmakers- only they can ensure standardization by requiring certification and accreditation to practice.

The way the field is set up no one organization has an overriding authority. If the field was like the medical field then a licensing board would have the responsibility, but no such entity exists for FA

All of the above. There should be multiple 'checkpoints' to ensure proper standardization

Professional organizations not strictly made up of the individuals whose methods are the ones that are being considered as the standardized methods.

Each lab - but as in other forensic fields, the forensic lab would be complying with OSAC recommendations

Both professional organizations and ASB/OSAC

Any of the above, but ASB/OSAC are currently the organizations formalizing minimum standards.

OSAC/ASB but ABFA can play a role.

The ABFA is a certification board, ASB and OSAC provide standards and best practices, these should be used by individual labs and practitioners

Again a multiselect would have been better. I believe all of these to have a role in it.

Right now individual labs needs to have SOPs, but a centralized mechanism would be ideal for standardization across the field

No one has the authority to standardize.

I think ASB/OSAC should be responsible for disseminating best practices within the field, however, I believe that it is up to the individual laboratories to create their own standards within the ASB/OSAC guidelines or their own accrediting agency (e.g., ANAB)

Participants were also asked about their opinions on the idea of a universal standard. For the purposes of this survey, a universal standard was defined as something that is followed by and applied to all in a particular group. When asked whether a universal standard was necessary for methods and reporting in forensic anthropology, 60.3% (n=47/78) of 78 respondents said “yes”, while 39.7 (n=31/78) said “no”. When asked if participants would follow a provided universal standard, 74.0% (n=57/77) of 77 respondents said “yes”, while 26.0% (n=20/77) said “no”.

At the end of the existing standards section, participants were provided an opportunity to provide extra comments and opinions, which can be seen in Table 2.19. Throughout the responses, individuals generally stated they would like to see standardization, but that the execution of that would be difficult given the nature of forensic anthropology. The variability in context, populations, and institution would provide little room for unification that applies to every practitioner.

Table 2.19. Open-text responses to the question: “Is there anything else you would like to mention about existing standards?”

Seems that most people who are pushing standardization are not actively practicing casework
 I believe there needs to be minimum standards and I think your lab's SOP/accreditation dictate your reporting standard above those minimum standards. I stay up-to-date on the OSAC standards but selected they don't influence my method choice or reporting because I have lab standards (that meet minimum OSAC standards) above that. This survey probably should have asked if your lab is accredited.
Some methods are dependent on the population. Modern population should be using modern standards.
 The standard for using methods should be to ensure good science is being performed. I answered the Daubert question the way I did because the courts do not dictate how we do science. We don't need them to tell us what make a valid method. The Daubert criteria is for judges to understand how to review scientific data. I wrote an article on this and to my dismay so many people in our field missed the point and keep talking about meeting those standards when they should be talking about doing good science. There are many think we can standardize in our field to provide a baseline for practice. OSAC standards tend to be very vague, which is fine, but people need to take them and develop SOPs to standardize their work.
 Many of these questions are not simple yes/no and I fear the results may be misleading. I think the work of OSAC and ASB are important steps in the right direction but the content is very general and these groups have no way to mandate compliance. At this point internal lab SOPs and external accreditation

are the best option to make sure labs are following appropriate procedures. This is not happening in many Anthro[pology] labs.

A universal standard does not promote innovation, but I would follow the standard if it was truly universal.

Re: The question above: if a universal standard was provided I would endeavor to follow it, however, I would be concerned with one standard that is applicable across all contexts, so it would depend on the casework I am conducting

Universal standards are important but can be difficult to follow given the variability in case types amongst jurisdictions, including the case demographics and circumstances

The methods that are applied are case specific

Your definition has an important caveat: "a particular group". As mentioned previously, different contexts and different questions from employers (e.g., prosecution, defense, truth commissions) mean that a degree of flexibility has to be left to the practitioner

I think standardization of reports would be too difficult for the field of anthropology

I think the last question is intriguing. Yes, I'd like to see standardization, but what if I disagreed with the standard? Would I follow it? Likely not. For example, FORDISC is highly controversial. What if the standard required its use in cases where it could be applied? Would there be the ability to not use it based on some provided rationale? Could it be used with a disclaimer from the practitioner? What would the consequences of that be and what would the enforcement be for standardization? BTW, I love this survey and the ability to open up a discussion on this topic

Standards in Canada tend to be similar to American standards so if America creates a standard, it will most likely be followed in Canada as well

Aunque se establezcan los estándares deben ser flexibles ya que depende mucho de que condiciones se encuentren los restos óseos (Although the standards are established, they must be flexible since it depends a lot on the conditions of the bone remains.)

Standards are helpful in choosing methods but I am not sure the work can be fully standardized because case circumstances vary so much case to case

The social context in which we live should be considered in development of existing standards. ie: the continuing proliferation of racialized language within the field associated with race/ancestry/affinity (pick your euphemism) requires more caution.

I believe in standardizing reporting, but not methods used

Universal standards would be good, but considering interindividual variation and geographic/temporal variations would be essential.

Would follow if appropriate and applicable given the vagaries of working under a different criminal justice system - we have obligations of expert witness and criminal procedure rules plus forensic science regulator statutory code of practice to follow

A universal standard would be so flexible and generalized. I've seen a range of reports. Customers like more or less information than others. The standards might better emphasize the bench notes

A Universal standard would maybe not consider the particularities of different places and cultures

I would follow a universal standard that maintained currency. However, standards development is very slow, so I doubt in the end it would be practical.

the last two questions are two [too] broad. Universal standard for what exactly? I believe that some universal standards can be applied (terminology, criteria for acceptable methods, etc.). So it is difficult to select Y/N for that question. Regarding Daubert. This is not really that important for practice. Daubert doesn't dictate our approach to science - it is designed to help the agents of the courts wade examine scientific evidence. We just need to "do good science"

My answers above about universal standards don't really fit a strict y/n binary. It certainly depends.

The report writing standard is based on each agency's accreditation. Those of us who work within a medical examiner office are bound by our agency's requirements. These questions seem to be more relevant for individual practitioners and academics who consult with varying agencies. OSAC is providing such guidelines to help those who are not under the umbrella of an accredited agency. The

accreditation requirements will always supersede any other standards. Fortunately, OSAC's proposed standards are based on the current accreditation requirements.

I do think minimum standards should exist, which are what OSAC/ASB are working toward. Generally, these are very broad and allows a lot of personalization in your reporting style. I chose no/rarely in response to the OSAC questions above because while I make sure I am meeting those standards, I refer to my SOPs.

I think it would be really hard to create a universal standard. each lab and each organization practicing forensic anthropology may have differing scenarios they are working in, some will follow a DVI approach which may not conform to ASB/OSAC or universal standards, just to provide one example.

Laboratories should be accredited and have SOPs. The staff should be certified or supervised by certified anthros. This will result in standardization within that lab, which may differ from standardization in another lab.

Guidelines are important. Contexts differ.

I would like to follow a standard if created, but it would depend on the standard as forensic anthropology is so case by case and methods are so different for each part of the bio profile or trauma/taph/path

Your survey needs options for "maybe". If I agreed with the standard I would follow it. One problem with simply saying a "standard" is that term lacks specificity. If the "standard" was to use the most accurate, precise, validated method available then I would follow that "standard". If the "standard" said I had to use a specific technique over another then I might not follow it if I thought the technique did not meet my standards then I would not use it. Also different legal systems require reports that are structured in specific ways. Standardization may not capture those requirements in all jurisdictions. Standardization in the form of an SOP can be dangerous and lead to lazy thinking - people think that because they are following the template they have done everything that is needed. All cases need to be evaluated and decisions regarding analysis and reporting made on the basis of the circumstances of the case - how complete the skeleton is, condition, etc. some of what is considered "standardization" is simply common sense and good practice - of course you should use the most accurate and precise methods that have been validated. Of course you use original sources and not text books. Your profs should have been instilling this practice since your first day in class. Many standards in OSAC are obvious if you have been taught and trained properly and if you need someone to tell you to use accurate methods then you have no business doing case work in the first place.

There should be some flexibility in these standards ^, our SOPs allow for comparable methods to be used depending on the context

I feel the last two questions require responding in an absolute. Regarding the need to create universal standardization, I think that methods depend heavily on context, question, etc. and the practitioner should have the freedom to explore the methods that are most applicable to their context, which they understand better than anyone else. However, I do think that there are aspects of case reports that would increase confidence in our discipline if they cannot vary widely in their reporting across practitioners. For the second question, a universal standard would be useful in terms of appropriate reporting, but may not cover all eventualities; therefore, the likelihood is that there would still be cases that require some flexibility and may not be conducive to a standard.

There is so much variability in training and knowledge, even among practitioners who are board certified; for example, we had a workshop given here by someone who was board certified and a full tenured professor in North Carolina who told us that she never examined classic metaphyseal lesions in infants because she didn't believe they existed; this is a person who is supposed to be a child abuse expert

I would use a universal standard if it was appropriate for my case

While the ASB standards are published by the SDO, none (except facial approximation) have been placed on the OSAC Registry

To reemphasize, I think that a universal standard would be restrictive because not all laboratories answer to the same stakeholders, and not all stakeholders are looking for the same information in order to make identifications.

Standards should have multiple options for flexibility because rigid standards will not fit every case

Peer Review

In this section of the survey, respondents were asked about their various ideas on peer review and their real-life applications of peer review in their case work. First, they were asked whether all their case reports are peer reviewed. Of 82 responses, 75.6% (n=62/82) stated that “yes,” all their case reports are peer reviewed, while 24.4% (n=20/82) stated that “no,” their case reports are not peer reviewed. Of 82 respondents, 74.4% (n=61/82) stated that they used in-house peer reviewers for their reports, while 12.2% (n=10/82) do not, and 13.4% (n=11/82) indicated this is not applicable to their case reports. Of 82 respondents, 28.0% (n=23/82) stated they used external peer reviewers and 41.5% (n=34/82) do not, while 30.5% (n=25/82) of respondents indicated this is not applicable to their case reports. Of 82 respondents, 51.2% (n=42/82) stated they do provide peer reviews to forensic anthropologists outside their institution while 48.8% (n=40/82) do not. For those that peer review externally, 98.6% (n=70/71) of respondents stated they do not charge a fee for that peer review. Only one respondent stated that they charge a fee, with the amount stated to be an hourly charge that is kept confidential by the company they are employed by. In the extra comment section, a few respondents stated that the organization they work for has a Memorandum of Understanding (MOU) with an outside entity for peer review, while some stated they peer review on certain cases but not all and not consistently.

At the end of the peer review section, participants were provided an opportunity to provide extra comments and opinions, which can be seen in Table 2.20. Many in the

peer review section stated various ways in which they do peer review, but in a non-formalized way.

Table 2.20. Open-text responses to the question: “Is there anything else you would like to mention about peer review?”

Since there was no box to fill in for "no" on PR fee. We establish a formal MOU at no cost.
We periodically peer review each others case reports if we want another opinion but not for every case
Extremely important part of a case report, particularly with trauma analysis
I used to be at an ME office with two anthros and we peer reviewed each others cases.
The objective of an FA is to aid the community, having a second set of eyes reviewing remains can only improve our reporting.
Since I don't have an official peer review requirement, peer review among my colleagues occurs, but it is not a formal process and reflective of collaboration among colleagues. If I were to do a formal peer-review, I would certainly charge a fee.
Que debe ser obligatoria (What should be mandatory)
We have levels of competence for exam, critical conclusions checks and peer review- so only those who have proven competence in peer review of certain cases will undertake them
Occasionally we review other's reports especially for clarity of writing and typos, but not usually for methodology.
I only have my trauma cases peer-reviewed.
I have a formal MOU established with outside agencies for which I perform peer reviews. I think some sort of formal contract should be in place.
Too expensive (time and potential fees) to apply to all cases
Your survey should be more clear regarding what peer review means. The institution I consult for uses a technical peer review, which is pointless. It ensures that all components have been included: photos, signature, case numbers, etc. It does not require a peer review of methods chosen, results obtained and interpretations or conclusions. Ensuring the report includes correct case numbers etc. is important but it is not the same as peer review of methods, content, explanations, conclusions. I provide the latter as well to select colleagues and firm we students who are now consultants. ,
The peer reviews are blind and they complete a checklist so these are standardized
I'm a graduate student so all my reports are peer reviewed but I do not peer review others
Not really applicable in humanitarian work, as all cases seen in the context of work are to be kept confidential. My role is solely to train and advise local forensic practitioners, my name can in no way be affiliated with the reports.

Education and Training

In this section of the survey, participants were asked about their own education and training background and their overall opinions of education and training in forensic anthropology. The first few questions asked the participants about the ABFA. Out of 81 responses, 63.0% (n=51/81) of participants stated that they had not taken the ABFA

exam, while 37.0% (n=30/81) stated they have taken the ABFA exam. When asked why they have not taken the ABFA exam, 15.7% (n=8/51) of 51 respondents stated financial constraints; 13.7% (n=7/51) stated time restraints; 27.5% (n=14/51) stated that certification was not required for their current position; 7.8% (n=4/51) stated they were not interested in joining; 35.3% (n=18/51) stated they do not currently qualify for the exam, and 43.1% (n=22/51) indicated “other” reasons, which can be seen in Table 2.21. Many stated that they will be sitting for the exams this year, while some stated previous experiences with the ABFA which made them no longer interested in joining. When asked whether ABFA certification should be required to work as a forensic anthropologist, 50.6% (n=40/79) of 79 respondents stated that “yes”, it should be required, while 49.4% (n=39/79) stated “no”.

Table 2.21. Open-text responses to the question: “If you have not taken the ABFA exam, why have you not taken it?” when the respondent indicated “Other”

I sit for the exams this year.
Have not previously qualified, but plan on taking.
In the process of applying
Applied and was denied for quality of photographs. Between the letters of rec (you need friends) and the gate keeping garbage, it is no longer of value to me. It is not about professional certification and that is obvious.
I do not live or practice in the US, nor does my current employer give time/incentive for this
This question is bullshit - I am very qualified to take the exam but the ABFA has decided that my masters degree and 15yrs of practice does not qualify me.
I had to wait three years before taking it after graduation, at that time I was pregnant with a full time job supporting my family. I had to focus on keeping my job rather than studying for an exam.
The exam was geographically biased and did not represent common case experience in my region, including ancestry assessment. I also disagree with some of the US wording and choice of methods and did not want to fail the test because I refused to comply with what I perceive to be USA biases. Also was eligible many years ago and was not impressed by the fact that those marking the exam were grandfathered in and never actually wrote the exam themselves. Waste of time and money for me as not required for my country.
As a non US citizen, I am not allowed to sit the exams

Participants were next asked about their opinions of and experience with education in forensic anthropology. When asked whether a Ph.D. should be required to work as a forensic anthropologist, 70.5% (n=55/78) of 78 responses stated that “no”, it should not be required, while 29.5% (n=23/78) stated that it should be required.

Participants were asked how they gained experience in forensic anthropology, outside of formal education. The full results of this question can be seen in Table 2.22, but included internships, volunteering, mentorship, and working in the field on cases. Of 79 respondents, 24.1% (n=19/79) stated that they are “frequently” asked to complete tasks that were not taught in traditional educational contexts, while 36.7% (n=29/79) replied “sometimes”, 26.6% (n=21/79) replied “rarely,” and 12.7% (n=10/79) replied “never” to this question. Examples of these tasks included: radiographic comparison, analyzing burnt or highly fragmented remains, and the estimation of the postmortem interval (Table 2.23).

Archaeological excavation was considered to be “extremely important” by 31.2% (n=25/80) of 80 respondents in their current positions, “very important” by 18.8% (n=15/80), “moderately important” by 22.5% (n=18/80), “slightly important” by 13.8% (n=11/80), and “not at all important” by 13.8% (n=11/80). Of 79 respondents, 93.7% (n=74/79) were directly taught how to take osteometric measurements for the biological profile, while 6.3% (n=5/79) were not. When asked about mentoring in forensic anthropology, 65.0% (n=52/80) of 80 respondents stated they had formally mentored an individual wanting to become a forensic anthropologist and 66.2% (n=53/80) stated they had done so informally. Of 80 respondents, 72.5% (n=58/80) stated that they had been

formally mentored and 17.5% (n=14/80) stated that they had been informally mentored during their educational experience. The final question of this section asked participants whether they believed forensic anthropology education should be formally standardized, with 67.1% (n=51/76) of 76 respondents stating “yes”, it should be standardized, while 32.9% (n=25/76) of respondents stated “no” it should not be standardized.

Table 2.22. Open-text responses to the question: “What, outside of formal education, did you do to gain experience in forensic anthropology?”

Work; internships; volunteer
I was part of an academic program that included case work.
Internships
Shadow at ME offices; self study; work supported study
Workshops, volunteer at ME offices, internships
Internships
Case work and working in a lab
MA institution had multiple DABFA faculty and worked on casework plus did postdoc at UTK
Internships, volunteering
Workshops and internships
I worked under another FA and within a museum setting (blind testing)
Internship with FAs at a medical examiners office, unique opportunities to practice FA in different contexts
Worked in the field
Nothing. I could not afford to do internships or similar opportunities as a student. So I did the best I could to maximize my experience within the bounds of my college/graduate school coursework
Mentorships
Lots of fieldwork in archeology and bio archaeology. I also went to law school.
Mentorship, research, experience in related fields (e.g., archaeology, bioarchaeology, assisting with autopsies)
Internships, volunteering with human rights work, working in forensic labs
Mentorship, formal training program, mock cases, moot courts
Attendance at conferences, working in the field under experienced practitioners, reading peer reviewed work, attending workshops. IT HAD VERY LITTLE TO DO WITH TAKING CLASSES FROM PHD ABFA LEVEL PROFESSORS.
I read articles and books in my down time
Years of forensic casework and excavation of human remains
Mentorship
Workshops and fieldwork
Estudie enfermería (Study nursing)
Lots of volunteer work on cases

Associated morgue work and teaching

Placements and other short courses. More of these should be made available.

Practical case work

I volunteered at the coroners office, I self educated with reading academic literature and watching documentaries, I shadowed anthropologists and radiologists, I found research opportunities

El trabajo constante de casos más de 10000 en 20 años (Constant work of more than 10,000 cases in 20 years)

Worked as an assistant in a forensic anth[ropology] lab, also undertook osteoarchaeology work

Cases

Work in a lab

Internship at a human decomposition facility and government laboratory..

Voluntary work, short courses, summer programs

Lab experience is the most important

Certification courses in crime scene investigation, gross anatomy and histology courses, legal training

Working cases and fieldwork.

Graduate courses, workshops.

Worked internationally, volunteered in medical examiner offices

Internships at ME offices, field schools/short courses, volunteering at museums

Post-doctoral training

Practical experience, field schools

Volunteering, short courses, workshops, conferences.

Read, internship with ME office

My education provided a lot of experience

Internships in various medicolegal settings

Internships

On the job training

Volunteering with international organizations that do forensic Anthro[pology] casework

Masters and working on a PhD but have also worked on ~150 forensic anth[ropology] cases

Case experience informed research, reading journals, discussions with colleagues

Internships, work experience, field school, short courses

Internships, volunteer case work, teaching short courses and outreach, attending workshops at AAFS, CRM

Completed a "residency" of my efforts that included: casework and fieldwork under various ABFA mentors, internships/research/work in various labs and offices, and alternate contexts (museum bioarchaeology, traditional archaeology fieldwork), including local ,state, federal, and international

Worked with practicing FA

I volunteered and worked at museums.

Interning in a medical examiner's office

Workshops; trainings; postdoctoral positions; internships and volunteering

Internships, workshops, postdoc

Casework, practice in other laboratories than your home institute, contribute to the field through research and standardization

Mentored casework for 6 years

Assisting with laboratory analyses and with coroner and medical examiner to understand the medicolegal component.

Fieldwork and archaeology

Internships, field schools, mentorship under the Royal Anthropological Institute of Great Britain and Northern Ireland.

Table 2.23. Open-text responses to a question asking respondents to list tasks they were asked to compete in their career that were not taught in traditional educational contexts

PMI
Decalcified histological analysis.
CXR; Material evidence; DNA interpretation
Family interaction for ID or notification, mass fatality recovery operations, Family assistance center operations, pediatric dissections to expose bony trauma in situ, neck structure dissection,
DNA sampling, PMI estimation, Fingerprinting, Dental X-rays
PMI, trauma, pathology
I was not taught anything beyond old school bio profiles because my mentor didn't like them. I am self taught or I have gone to the person who developed the method and got training from them
Management, working with police and advocates.
Everything because I never had formal education in forensic anthropology. I learned on the job.
I would not know how to do facial approximation or photo superimposition
Facial approximation, histology, radiography
Talking to LE [law enforcement], attending autopsy, maceration, entering cases into NamUs, curating remains
Photo superimposition, radiograph comparisons, newer methods/techniques for bio profile
Statistics
Setting up laboratory practicals and preparing practical protocols
Arqueología, antropométrica, superposición (Archaeology, anthropometrics, superposition)
Bone sampling & X-rays
In situ pediatric exams at autopsy, neck dissections, notifying families for identification, mass fatality management.
I do not perform forensic anthropology analyses that I am not trained to do.
Testifying
Radiographic interpretation
Stable isotope work
Almost everything - there were almost no classes in forensic anthropology when I was going through university. I have learned most things independent of class/lab training
Forensic archaeology, GPR
Varied experiences in field recovery
The fieldwork our laboratory does world-wide is unique and on-the-job training is provided.
Chest radiograph comparison, postmortem interval estimation
Burnt and severely fragmented remain analysis

At the end of the education and training section, participants were allowed the opportunity to provide extra comments about the content of the section, which can be

seen in Table 2.24. There were many strong opinions of what should happen to education and the importance of specific skills in the field. This section also included some comments about ABFA certification and problems that exist in the field associated with the ABFA.

Table 2.24. Open-text responses to the question: “Is there anything else you would like to mention about education and training?”

Without an agreed upon core competencies our field will not progress and make it difficult to create OSAC standards.
In lab experience is necessary to create competent practitioners - funding for these opportunities would greatly improve the field
Like any career, you learn on the job. FA was the same as any other job I've held. While practices are generally the same, each institution will have it's own SOP. I worked in the medical field before FA, and each hospital does the same things differently.
Fellowships, similar to pathology, would be beneficial - but difficult to get offices to fund.
Currently there are unqualified people calling themselves "forensic anthropologists" who perform unsupervised case work. There will never be a 100% solution, but requiring an individual certification is a step in the right direction. It is great that the ABFA is moving in this direction with tiered certification, but there needs to be a requirement that ME/Coroner offices can only use certified anthros (or have reports co-signed by certified anthros).
To clarify: I believe individuals should be board certified in order to practice, but, I do not believe that board certification should require a PhD. I think the minimum degree requirement to practice should be a masters, but that you should be capable of taking the same level of board exam and receive the same abilities for passing regardless of whether you hold a M.A. or a PhD. I do believe that to some level, especially at the graduate level there should be some form of standardization in the skills taught in forensic anthropology education, to some extent.. I don't believe that it should be the end all be all, but the expectations of what you should know how to do and how to conduct yourself in a forensic lab should be part of the requirements during education.
While PhDs may be difficult for some, it should be the preferred level of education for a certified forensic anthropologist
It would be extremely difficult to standardize education as teaching loads and university programs are so varied
We spend too much time gatekeeping and not enough time educating
Again, there is much that is context-dependent and pragmatism is a factor. About the disciplines being "formally standardized", this is simply impossible in many countries because there is inadequate education and opportunity in the discipline
There are far too many ABFA elitist ivory tower professors churning out “forensics anthropologists” who have no practical experience or places to place these students in the job market. They just get their PhD, get a job at some tiny institution and then churn out more students. It's like a puppy mill.
The current state of the United States brings in the question the ability to teach topics such as sex/gender and population affinity/social race - how as a field can we continue to educate and trained if these topics can not be discussed in the classroom or at work
Why doesn't board certification include a forensic archaeology component? It's one of the most important aspects of my job
It would be super cool if they were bachelors of science, in forensic anthropology that could stem into a masters and PhD

There needs to be more internships, and PAID internships nationally and internationally to ensure more equity in accessing experience and training in the field.

Highly variable and often core osteology knowledge missing

Slippery slope. Accreditation is expensive and often does your worst for the variability across organizations.

Lab experience is the most important

Needs to take place within the context of Forensic Science - i.e students need to be formally taught about and experience other forensic science disciplines; crime scene investigation and legal training should be mandatory

While formal graduate programs in forensic anthropology are good in theory, they have only served to crowd to the field and create territorial issues between some professionals.

In terms of ABFA certification, I only think it should be required if there is a multi-level certification process (i.e., you don't need a PhD).

All academic institutions and training programs should adopt the core curriculum proposed by the ABFA to build their program. This will allow standardization of the field moving forward. Everybody should receive practical training and not just coursework.

Proper excavation techniques are important, but infrequent.

I don't know if it should be regulated, I think there should be a consensus body that suggests the most basic topics that should be covered in education and training

Too expensive to formally standardize

I think there should be standards for education but they already in some ways exist in minimum requirements to take the board exam. But there likely should be more - like a minimum number of case work hours, etc., before you can take the exam

The survey needs more options for answering. I had minimal forensic Anthro mentoring by someone with some experience but little mentoring ability. When he was being investigated for sexually harassing his students I was mentored long distance by a Bioarch/forensic mentor. He was great but long distance prior to virtual instruction did not provide the same level of training. Students should be mentored and must gain experience working with their mentors on actual cases. It is import not only to learn methods but also workflow of various agencies, professional interaction, decision making, etc.

I think our field should aspire to become more standardized like medicine - standardized courses/skills learned formally; a type of "residency" or equivalent mentorship experience; and licensure rather than certification so there are actual teeth to handle problematic practitioners

I think SOME things in forensic anthropology education should be standardized. Meaning I think there should be some consensus about a minimum basic knowledge set. But I am wary of OVER regulating things. And this standard should change over time.

Regarding the question on having a PhD to practice forensic anthropology, I answered no but also feel this is a more fluid question. I think independent practitioners should have a PhD because of the vast experienced needed for responsible practice. However, I do feel that there are places for individuals competent in the field at the Masters level if in support of other practitioners.

The accommodations statement on the ABFA website is alarming and exclusionary; you are required to ask for accommodations by the May prior to the year you take the exam - this is before you even know if you are accepted to take the exam if it is your first time; I received a condescending email after asking if I would be able to use my insulin pump and use the restroom while taking the multiple choice portion and was told that this was a professional examination and that I should learn to use the bathroom a head of time; I've never been so offended by someone in our field in our life and it makes me want to not take it and not be a part of that organization

Qualifier to the above question: I believe there should be some standardization in what methods and training are *required* for a degree in forensic anthropology, but I also acknowledge that not all forensic anthropologists come from programs that specialize in that subfield and that there is a lot of overlap, for example, with bioarchaeology, and it would be difficult to standardize FA education completely.

Cognitive Biasability

The final section of this survey included questions regarding objectivity and bias mitigating procedures taken or not taken by forensic anthropologists. When asked whether forensic anthropologists are objective, 55.3% (n=42/76) of 76 respondents stated “yes”, while 44.7% (n=34/76) stated “no”. Several individuals elaborated on this response, with comments visible in Tables 2.25 and 2.26. Those who indicated they believe forensic anthropologists are objective stated that forensic anthropologists generally try to be objective, but that it is impossible to be completely objective as human beings. Those who indicated they do not believe forensic anthropologists are objective had something similar to say; however, many emphasized that some forensic anthropologists lack a self-awareness of the innate objectivity in every person.

Whether respondents believe that forensic anthropologists are objective was compared to their reported work context. In this survey, those working in academia more often indicated that forensic anthropologists are not objective than those working in applied contexts (medical examiner/coroner’s office, laboratory (federal), laboratory (state) (Figure 2.8). However, a chi-square test using applied and academic respondents that answered “yes” indicated that these results were due to chance, resulting in a *p*-value of 0.43488.

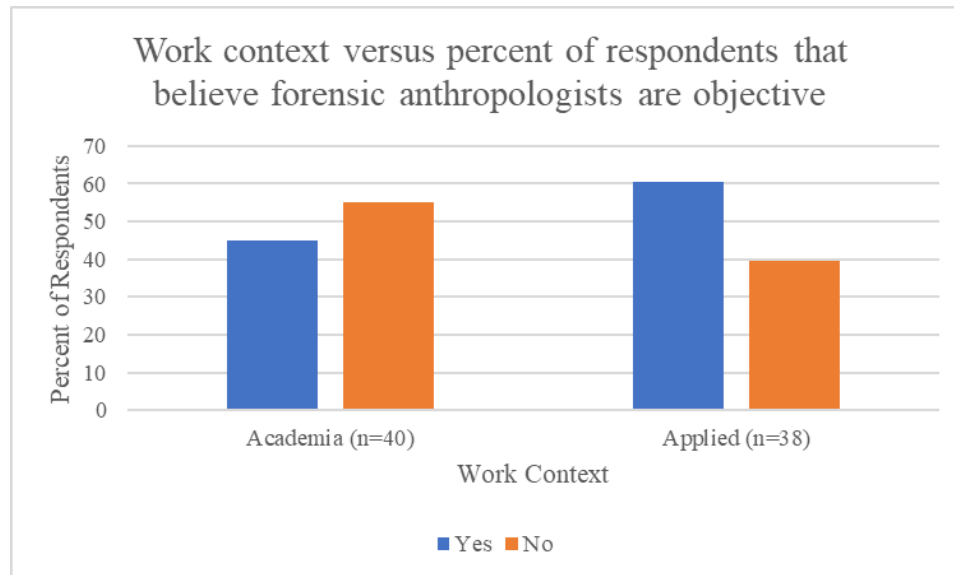


Figure 2.8. Bar graph showing a comparison between work context and whether respondents believe forensic anthropologists are objective

Of 76 respondents, 18.4% (n=14/76) stated that they believe forensic anthropological reports are “very objective”, while 48.7% (n=37/76) selected “somewhat objective”, 29.0% (n=22/76) selected “moderately objective,” and 4.0% (n=3/76) selected “not very objective.” Respondents (n=78) were asked how often they receive contextual information prior to starting their analysis, with 14.1% (n=11/78) stating “always”; 30.8% (n=24/78) “frequently”; 32.0% (n=25/78) “sometimes”; 12.8% (n=10/78) “rarely”, and 10.3% (n=8/78) “never”. Finally, individuals were asked whether their place of employment has any bias-mitigation procedures. Of 76 respondents, 47.4% (n=36/76) said “yes”, while 52.6% (n=40/76) stated “no”, there were no bias mitigating procedures in place. Many elaborated on these responses, with comments visible in Tables 2.27 and 2.28. Those that indicated “yes” described various bias-mitigating procedures, to include blind analysis, controlling of information provided to the analyst, and specific quality

assurance programs. Those that indicated “no” stated that they generally want to receive contextual information because it will likely help with their case.

Table 2.25. Open-text responses to the question: “Do you believe forensic anthropologists are objective?” when the respondent indicated “Yes”

We try to be but our experience will always affect our work
Dependent on what you know regarding the case; trauma can be interpreted differently; CXR has portions that are very objective
I would like to think that as scientists they are.
Loaded question.
As much as possible
But I know our egos can get involved. I also know that some anths [anthropologists] read the report of death ahead of developing a profile (so does path) and I do not think that is good practice.
I think that they *can* be relatively objective, but even objectivity is subjective
I think as a human being it is impossible to be 100% objective and unrealistic to expect such a level of objectivity. However, I believe most (if not all) properly trained professional forensic anthropologists endeavor to the fullest extent of their abilities to remain as objective as possible in their casework.
To an extent we are as objective as possible, but we are also inherently subjective as are the methods often used
Not sure how to answer this question, I think for the most part we try to be.
I believe that we try to be.
Anyone in academia should be objective
As a goal, but not a simple characteristic
For the most part I think many try to be. But there’s still some areas that need work
I believe that forensic anthropologists who keep themselves up to date with the literature are objectives, but many are stuck in time and have biases of their own.
It's possible. But I have no way of knowing universally if that is true.
Yes, mostly...Except when asked to specifically compare skeletal remains to a specific person. For example, photo superimposition.
Yes, some are and some are not
On a continuum
To the degree possible if they have been trained properly. No one is without bias but there are ways to minimize and/or recognize sources of bias and to address how those biases may have impacted the analysis and interpretation
I don't think true objectivity is real, rather mitigated objectivity is. SOPs minimizing error (e.g. blind analysis) are help

Table 2.26. Open-text responses to the question: “Do you believe forensic anthropologists are objective?” when the respondent indicated “No”

I think, to a certain extent that is out of our control, we get specific information about cases that may influence us, however, understanding the context.
We are humans - we are not completely objective. But we can try.
I believe most forensic anthropologist endeavor to be an objective as possible, however we all suffer from subconscious biases, and I think that is no different here

For the most part we can be but there will always be inherit bias (which may not always be a bad thing, experience is very helpful)

We can't avoid out cognitive bias, but we try to be objective. This can be addressed with peer review

We have biases, just like anyone else, and I suspect that we are often prone to prosecutorial bias (e.g., believing a hypothesis/scenario shared by the police)

We try to be, but I don't think anyone is truly objective. Everyone has some bias, whether they are aware of it or not

Every human being has a bias it's excepting, and acknowledging those biases that will allow forensic anthropologist to be considerably more objective

And any that believe so lack self awareness.

Depends on their experience and skills

I think that we have a level of objectivity. However due to a lack of standardization individuals may get different results from the same individual. Individuals also may weight skeletal traits differently. For example one may place more emphasis on the skull others on the pelvis. Some may think the mastoid process is the best estimator of sex on the skull and others may use the brow ridge or mental eminence. I think that a forensic anthropologist is also influenced by their life experiences

Everyone is uncultured, we do our best to recognize our biases, but it's not perfect

Not all the time and it is difficult to completely illuminate bias especially when have a briefing from police

I believe we do our best, but we are human and have blind spots.

Complete objectivity is impossible. In areas where you are the lone anthropologist or where you recovered the remains it is impossible to be objective

As much as we try to be (or try to appear so), you can't completely negate bias etc. Although I am not completely nihilistic and do support mitigation procedures like working in the blind, sequential unmasking, etc. when possible

The nature of our casework makes complete objectivity difficult

I don't know. I have no basis of comparison

Ideally we should strive for objectivity where appropriate but we are of course biased. We can try to mitigate bias by being aware of what they are.

We TRY to be objective. We have ways we practice objectivity. But all science is ultimately subjective and we need to work on recognizing where that subjectivity may be affecting methods/outcomes/analysis etc..

I think there are aspects of the methods we commonly use that can be objective, but the vast majority of methods and the types of evaluation common to the practice do have some level of subjectivity and are informed by individual experience. This is also important for practitioners to acknowledge, so in my opinion, it is naive to say practitioners are wholly objective.

It doesn't do us any good to pretend that we are completely objective; we are all subjective and subject to bias; rather, we should be up front about it

I think it depends on where you work and who you report to.

No, I think that all people are inherently not objective - we're humans and as humans we understand the world through our own lived experiences. Not being objective does not mean that you cannot compartmentalize in order to do your job. We're anthropologists first, and forensic anthropologists second. I think FAs can acknowledge their biases and subjectivity and still produce a report or analysis that is objective.

Table 2.27. Open-text responses to the question: “Does your place of employment have any bias-mitigating procedures?” when the respondent indicated “Yes”

One person talks with ME/LE and then just passes on the case without info

Having multiple anthropologists, we can organize blind analyses when appropriate.

QA/QC measures. Contextual information is often needed - which is how the practice of medicine works. We must train investigators and pathologists as to what information is needed and what should not be divulged.

Our casework is all conducted in the blind. The analyst who is doing the analysis have no context on where the remains came from or in what context they were recovered and are expected to continue to conduct a blind analysis until the report has been through peer review and approved.

I have told the OCME not to disclose contextual information

Forensic anthropology casework is conducted in the blind, with the analyst unaware of any background/circumstantial information about the case. Lab SOPs forbid analysts from actively seeking this information on their own, and there are repercussions for violations.

Where I currently work, we do not do case work. As an independent consultant, as a practice I make a conscious effort to consider all scenarios and interpret solely based on clear evidence, avoid speculation. I often ask for a second opinion.

Peer-review process

We follow a strict peer reviewed case assessment and interpretation procedure, laying out expectations prior to examination

We are a federal institution which has a quality control management for cases

Case work is usually blind (no "we think this person is...") and I seldom see either clothing or personal effects, crime scene photos, etc.

Quality assurance program with bias training.

Information about the context of the case is received by the Investigators and ME. This does not necessarily have to be transferred to the anthropologist.

Sequential unmasking when appropriate

My coroner knows that I don't want any info prior to a case, but this isn't formally implemented and sometimes they let things slip. I document what I know about a case in my notes.

Info can be restricted until you want it, peer review, work flow, e.g. conducting most subjective analyses first (morphology then metrics; humerus, skull, then pelvis for morphological sex) etc.

We analyze remains in the blind. The anthropologist who did the recovery does not do the analysis.

My place of employment ensures analyses related to anthropology or to support identification are done in the blind whereby other information outside of recovery information is not provided or allowed to be known until analyses are complete.

Masking of presumed identities pending analysis and bench notes for biological profile and trauma analysis

Those involved in recovery of the case or intake with knowledge from LEO do not do the analysis

Table 2.28. Open-text responses to the question: "Does your place of employment have any bias-mitigating procedures?" when the respondent indicated "No"

I generally learn the basic investigative information and what type of autopsy will be conducted, however I avoid discussing or looking at the autopsy report before my analysis is complete

Contextual information is important

We use contextual information to assess the case type but do not try to let it influence our analysis

But I insist on being left out of conversations about the case and if the deputy starts trying to lead me, I make him/her leave

Sole trader and use peer review to check

But we try not to read the MEI report that has the context before we conduct the analyses

Our goal is identification; we will use whatever information we have to assist.

As with the previous sections of the survey, the cognitive biasability section of the survey provided a section for extra comments. The responses included a combination of opinions stating the need for contextual information, even more so compared to other fields, while some stated that bias is something every forensic anthropologist needs to be aware and cautious of (Table 2.29).

Table 2.29. Open-text responses to the question: “Is there anything else you would like to mention about cognitive biasability?”

Information about the case can help, I don't have a problem knowing about the circumstances
Anthropology requires some information when performing analyses and we cannot be compared to other bench scientists.
It isn't just us. The MD/Paths have the same problem and we need to clean up our act.
Well trained forensic anthropologists know what they need to know. Information about the scene and the decedent is very important information about the suspect and theories from the police or not. It is very black-and-white in my mind what I need to know and what I do not need to know I have no problem filtering out. The information that I do not need to know this is based on many years experience
It's a very important subject that should be part of routine forensic education
It is almost impossible to not receive information on a case prior to analysis, the important factor is to acknowledge the potential for bias and try to be as objective as possible
We would like to think that we are not influenced by contextual information, however, I have not worked one single case where contextual information was not brought to my attention in advance. There's a huge disconnect between the world of academia and the practitioner's world and the idea that you are not going to have any information about the case prior to working it is delusional. Furthermore, I don't always think it is a bad thing. Sure, you don't want to have the decedents driver's license in front of you when doing the bio profile, but understanding the depositional environment from where the decedent was recovered (for example) can be extremely helpful in understanding taphonomy and PMI. Furthermore, the depositional environment is extremely important to know when testifying about the likelihood of certain activities that a suspect may have engaged in to dispose/conceal the body. So I'd like for us as a discipline to have deeper and honest discussions about bias, what it actually means, and how it affects casework...for better or worse.
Have witnessed it often, the U.K. forensic science regulators code include a section and guidance on bias, so our practice is centered around eliminating bias
While being completely objective is an ideal standard to shoot for, you always need to know the context of a case to full appreciate what you are looking at.
Anthropology is similar to pathology, in that we require a certain amount of contextual information to operate. It is important to know when to limit the information and direct others to not over share. Working completely blind is not recommended for several analyses. So it is important to recognize what may be biasing information and see how to navigate it. Working in a team environment is necessary.
Peer-review can help mitigate some issues associated with bias. My reviewers do not know the case background when they review.
Just as in medicine, patient history is advantageous
The survey needs more options - not all people do things the same. Some Anthro reports may be very objective and some may be very subjective or biased. You cannot generalize without knowing how people conduct their analyses. My colleagues strive for objectivity and may be less subjective than some but more than others.

Our director filters the case information before giving it to us to minimize the chance of us seeing any contextual info that could bias our examination

CHAPTER 5 DISCUSSION

Participant Demographics

The purpose of this study was to examine whether standardization of case reporting practices exists in forensic anthropology. Further, this study investigated whether the presence or absence of standardization in its current state is creating problems within the field and amongst practitioners. Overall, the results of the survey suggest some areas of unofficial standardization, specifically within the report preparation, existing standards, and peer review sections. Respondents tended to be familiar with currently available standards, such as the *Daubert* Standard and guidelines released by OSAC and SWGANATH, stating they were frequently references when completing casework. Within the education and training and cognitive biasability sections, there was much more variation between responses. Despite a majority of respondents stating that a PhD should not be needed to practice forensic anthropology, over half of participants indicated that ABFA certification should be required, which currently requires a PhD. In the cognitive biasability section, over half of respondents indicated that they believe forensic anthropologists are objective, with many suggesting that all practitioners working in the field are capable of being completely objective in their analyses.

Over 100 respondents completed this survey, however, there was significant variation in the number of individuals responding to each question. The number of responses to a given question ranged from 76 to 107, with fewer responses toward the end of the survey. For this reason, the data collected from this survey was only a small

example of the variation that could exist in forensic anthropology and the greater trends may vary significantly with a larger sample size. Further, because of the sample sizes for the questions, little statistical comparisons were able to be completed.

In terms of the demographics of respondents, there was a much larger percentage of females, with a very small amount of representation from male, agender, non-binary, or genderqueer individuals. This aligns with results from Tallman and Bird (2022), who indicated 76.8% of their respondents self-identified as female or woman. Both this study and Tallman and Bird (2022) reaffirm the sentiment of Pilloud and Passalacqua (2020), which discusses the increase of women in the field of forensic anthropology and other forensic science fields. Despite the positive trend of more women having access to applied fields, such as forensic anthropology, the article discusses the lack of diversity within forensic science and the problems that continue to persist that prevent diversity from increasing (Tallman and Bird 2022). Examples of this are observed throughout the survey, especially in the extended comments of respondents mentioning the barriers to joining the ABFA and the limitations of educational programs.

Work context is a variable aspect of forensic anthropology, and was one of the most cited reasons to not having a universal standard amongst respondents. Individuals working in academia were represented the most in this survey; however, many respondents also work in laboratory contexts or are current students. This is important to note as practitioners working in academia tend to complete less casework than those working in applied institutions, such as federal or state laboratories (Pilloud et al. 2021). Despite the low diversity of respondents represented in this survey, the results highlight

both the areas where there is increased agreement on standardization and the areas where forensic anthropology lacks agreement amongst practitioners.

Report Preparation

Overall, within report preparation, there were a few areas of agreement amongst respondents. Most individuals include some form of skeletal overview, including a skeletal inventory or a skeletal homunculus, while most refrain from actually quantifying the completeness of the remains present. The practice of creating percentages to quantify remains is a very subjective practice, with different numbers meaning different things to different practitioners. While some areas of forensic anthropology appear to be generally standardized, there remain many areas that vary across practitioners.

Despite the few areas of general agreement (i.e., the inclusion of a skeletal homunculus or inventory and not quantifying the completeness of remains), there were many aspects of case reports that were not agreed upon or which deviated from the expected standard. The first few questions of this section asked participants to discuss the order in which they complete the biological profile and their case reports. Information about the sex for the profile was the section most commonly completed first, with pathology, trauma, and taphonomy information addressed typically towards the end. The order in which a report is completed, including what methods and elements are examined first can impact the overall results of a report by creating a bias. According to Davidson et al. (2023), when using nonmetric methods, the order of examining elements during sex estimation (i.e., the pelvis, cranium, etc.) biases the analyst and may impact their overall conclusions not just for sex estimation but for the entire biological profile. As sex is

indicated to be completed first by a large percentage of respondents in this survey, this issue may be creating an additional source of cognitive bias.

Along with the order of the report, some respondents indicated that they never include sections such as stature, as it frequently does not contribute to identification. Another comment stated they are sometimes asked to report things they would not normally discuss in their general case report. Importantly, many comments were made about the generalization of case reports as it relates to what they contain. Not every section is possible to complete for every case, and sometimes only one section of a report is asked to be completed, especially when working in medicolegal contexts (Zephro and Galloway 2019). While this is a valid point, it further serves to highlight the lack of standardization that exists in something even as seemingly unimportant as case report or biological profile order. However, while this may appear to be the case, the writing of the report is impacted by the way the writer is thinking and understanding the information (Dror 2015). It not only “reflects” the work conducted by the practitioner, but also “influences” the work, meaning how the report is written is just as important as how the work is conducted (Dror 2015). Compounding this, deciding not to include a section or being asked to complete things not normally discussed shows the variation that exists.

Participants were also asked about the inclusion of a postmortem interval estimation in their reports, which was split nearly in half amongst respondents. This is a task frequently asked of forensic anthropologists, despite it not being a part of typical curriculum in educational programs. This is discussed further in the section regarding

education and training, and presented an area of analysis that many were uncomfortable or untrained in completing.

There was variation in the number of pages a typical case report would be, with four to five pages being the most common answer. This information was correlated to individuals who use citations and individuals who define their terminology, as these areas may account for the increased length of reports. When comparing the length of case reports and the use of citations there was no direct correlation, using a chi-square test; however, 100% of individuals who did not cite peer reviewed literature had case report lengths of 1-5 pages.

While there were individuals who cited peer reviewed literature with shorter case reports, there were no instances of literature not being cited in longer report lengths. The inclusion of definitions for terminology could also be responsible for the length of case reports increasing; however, this was consistently found in this case. When the two most common responses are combined (4-5 pages and 3-4 pages), they represent over 50% of respondents (51.76%). Of the 44 respondents who stated their case report lengths are 3-4 or 4-5 pages, 63.6% of respondents stated that they do not provide definitions for terminology used for population affinity/ancestry estimation.

It is important to note that with the question of case report length that there was no explanation of case report types (Pilloud et al. 2022). Rather, it was a general question, asking participants to generalize the length. This can vary greatly depending on what elements are present, the level or amount of trauma or pathological changes present, and what the forensic anthropologist is asked to do for a particular case. While the length

itself of a case report is not important, it may be an indicator as to whether practitioners are including literature or definitions within their case reports and is something that should be examined further with a large sample size that is more representative of the forensic anthropological population.

Several questions discussed the use of different types of sources and their citation within case reports. While the expectation for peer reviewed sources exists within the field and is generally agreed following these results, the direct referencing of them is slightly different. While many respondents stated they always refer to the published methods they are utilizing, keeping them in front of them while completing an analysis, this was not the case for all respondents. The application of methods, including taking measurements, within forensic anthropology is one of the problems that creates the most significant error (Adams and Byrd 2002). This can be exacerbated by practitioners not directly referencing texts and relying upon their memory and experience to apply a method, which has been noted in a previous survey (Garvin and Passalacqua 2012). Some methods require the comparison of skeletal elements to casts, drawings, to analyze the specific appearance of a characteristic found on the bone (e.g., Brooks and Suchey 1990), or to complete specific measurements of the skeleton (e.g. *FORDISC*). Relying upon one's memory for this can lead to incorrect estimations, biasing the practitioner and leading to the idea that one can estimate an aspect of the biological profile without directly referencing a source.

This problematic viewpoint brings up the idea of being able to determine ancestry/population affinity, for example, by simply looking at a skull.

Macromorphoscopic traits used in methods such as Hefner (2009) can be traced back to the problematic work of Earnest Hooton. Hooton's work in racial classification, detailed in his book "*Up from the Ape*", represents some of the most damaging work at the foundations of forensic anthropology (Quintyn 2023). These traits, called the "Harvard List", represent areas on the cranium from which race could be "determined" and include the anterior nasal spine, interorbital breadth, and nasal aperture width (Hefner 2009). These same trait scores are used today in macromorphoscopic ancestry analyses, but in conjunction with logistic regression equations and statistics, including known error rates, based upon population data (Hefner 2009). While the continued use of methods associated with racial classification is problematic, failing to refer to updated methods can lead to generalization, especially for those who may refuse to use learn and use newer methods in other areas (Garvin and Passalacqua 2012). Along with the direct referencing of sources, the use of specific types of sources was discussed during the survey, including book chapters, professional meeting presentations, and "unvalidated" methods.

Book chapters are frequently cited within case reports as they often represent the only sources available for areas such as trauma and pathology. Common textbooks, such as Wedel and Galloway (2014) and Ortner (2003), represent commonly used sources for blunt force trauma and pathological conditions, respectively. These chapters are subject to editing; however, books are not typically subject to highly scrutinized peer review that is characteristic of journal articles. For this reason, some respondents indicated they do not refer to these sources, as only peer reviewed literature is appropriate to be included in reports. Presentations from professional meetings similarly are not peer reviewed, as they

are typically presented prior to being published. Both would be considered “unvalidated,” yet, they are used by some forensic anthropologists doing casework today, especially in areas such as trauma, pathology, and taphonomy. This can be likened to the results of the survey conducted by Garvin and Passalacqua (2012), who noted participants utilized their “own raw data” and consulted collected volumes when completing an age estimation. Further, according to one respondent, “unvalidated” methods are included on the ABFA certification exam, which is consistent with claims that the methods on the exam are “fundamentally flawed” (Passalacqua and Pilloud 2020).

Throughout the survey, there are many comments stating what exactly does it mean for something to be “validated,” and that the use of a method is not reliant on whether a method is “validated” but rather whether the individual deems it reputable. According to the current standards in place from OSAC, estimations need to “follow methods that are published in peer-reviewed sources and validated” (AAFS Standards Board 2019a:1). “Validated” is a term used by current standardization practices. Yet, it is unclear what exactly validation means and what needs to be done to make methods “valid” within forensic anthropology. Like many other areas, such as terminology usage, the OSAC guideline fall short of providing a clear standard for practitioners.

When discussing terminology as it relates to method use, most respondents utilized words such as “individual” or “decedent,” with a much smaller minority of respondents indicating their use of problematic language such as “specimen”. The use of terminology, such as “specimen” has been shown to demean and devalue the individual being assessed (Bird and Bird 2022). In this same vein, very few participants indicated

their use of pronouns when describing the decedent or the discussion and use of traits as being “feminine” or “masculine” within sex estimation. While this may be the case, several methods utilized still within forensic anthropology have this language included within them, such as Buikstra and Ubelaker (1994) and Phenice (1969). Each of these present traits, ranked from “feminine” to “masculine” which are used to score a skull and pelvis, helping to estimate sex. While most forensic anthropologists would not base their conclusions on one method, the practice of characterizing traits still exists in these methods.

While it may not be the intentions of forensic anthropologists to diminish individuals with these terms, practitioners must think about their terminology usage and their place within the greater medicolegal sphere. As defined in Merriam-Webster dictionary, the term “specimen” relates to an object something of a specific group, and can be tied to scientific study (Merriam-Webster 2024). Not only does this term imbue the idea of objectification, but that a “specimen” is something that exist purely for scientific study. This harkens back to the days of physical anthropology, where unwilling, marginalized individuals were utilized for scientific study and collections by anatomists and some of the earliest physical anthropologists (Campanacho et al. 2021). The use this terminology which objectifies an individual in the medicolegal system has been shown to lead to a cycle of devaluation (Bird and Bird 2022). Individuals being analyzed in cases were once human beings, and should be treated with respect and dignity, not as objects no more significant to a piece of evidence. Forensic anthropologists must remember they

are anthropologists first, using their skills in a medicolegal context does not excuse them from their ethical obligations (Passalacqua and Pilloud 2021).

Terms such as “feminine” or “masculine” present another side of this issue, insinuating that an individual must fall into one of these categories or along the spectrum of masculine and feminine (Tallman et al. 2022; Adams et al. 2023). This type of absolute definition of what is “feminine” or “masculine” does not exist in human variation. Methods in use today continue the use of these categories which exclude intersex individuals and individuals who may have undergone surgical intervention to make their appearance align with their gender identity (Tallman et al. 2022). The use of methods built upon this dichotomy perpetuates the ideas of physical anthropology and classification without attempting to fully capture the extent of human variation. Further, if the best methods we have available for aspects of the biological profile are built upon the ideas of this dichotomy, it begs the question of whether it is accurate or appropriate to be estimating these aspects at all.

As with sex estimation, population affinity/ancestry estimation has problematic terminology rooted deep within the practice. Over the years, especially in recent years, this topic has been highly debated within forensic anthropology and the terminology usage especially around this topic has been especially contentious (Tallman et al. 2021; Ross and Pilloud 2021; Pilloud et al. 2021; Maier et al. 2021; Ross and Williams 2021; Parsons 2022). In the past, “race” estimation dominated the field, with individuals being classified into social race categories, despite the fact that race itself is not a biological factor and does not impact the skeleton (Ross and Pilloud 2021). Ancestry evolved from

this concept, and attempted to move away from social race, while still utilizing the same methods. Population affinity is the most recent terminological change but is still met with the same critique of reusing the same methods associated with race estimation (Tallman et al. 2021). The problem with these terms is the lack of understanding of what is meant by them and the continued reliance and extrapolation to race.

Tallman et al. (2021) examined journal articles published between the years 1966 and 2020. The study examined the articles for what terminology was used (i.e. race, ancestry, population affinity, etc.) and whether those terms were clearly defined within the article. Journal articles are subject to peer review and are frequently used in case reports as sources, thus they could indicate the trends also present within case reporting practices. When compared to Tallman et al. (2021), the survey results show a transition to the new term population affinity for most respondents, with ancestry also being a common term used. While this is not surprising given the surge in calls for terminology change, what is interesting is the lack of change as related to defining what is actually meant by these terms (Tallman et al. 2021). Over half of respondents indicated that they do not define their choice of terminology within their case reports, as it related to population affinity/ancestry estimation. Despite the three-year difference since Tallman et al.'s (2021) study was published, this trend has not changed. Tallman et al. (2021) report that within journal articles, only about 13% of individuals define "race", while 12% of articles define "ancestry". The survey data collected here suggests the term "race" is no longer widely used, but the use of the terms "ancestry" and "population affinity" without proper definitions follows the same problem. When terminology lacks definitions,

especially in conjunction with case reports being turned over to parties outside of forensic anthropology, there is an automatic opportunity to utilize this information in a negative manner (Bird and Bird 2022). Even though law enforcement and others within the medicolegal sphere want a social race category for missing persons, that is not something within the skillset of a forensic anthropologist and should not be something practitioners feel obligated to do (Parsons 2022).

Existing Standards

An essential objective of this survey was to gauge the understanding and knowledge of forensic anthropologists as it relates to current standardization within the field, especially the importance and applicability of OSAC standards. While the knowledge of these standards is present, with many respondents stating their familiarity, there was significantly more variation on the applicability of those standards. There were some respondents that indicated they always refer to them (14.6%), a larger percentage stated that they only sometimes refer to these guidelines (31.7%), while some respondents (17.1%) indicated they never look at or refer to the OSAC standards. They were very important as it relates to choosing methods, which was also the case with the use of the *Daubert* and *Kumho* standards. Respondents also indicated that they believe the standards provided by the OSAC standards are beneficial. This is an important idea in that forensic anthropologists are referring to the guidelines they have available to them; the OSAC standards are not entirely ignored by practitioners and have a part to play in the current conditions of standardization. This is a positive for the field because it represents a willingness to apply a standardization, which was mirrored in the responses

in this survey. However, a portion of respondents (22.8%) indicated that they do not the OSAC standards to be beneficial, indicating that while they are accepted and used by some, they are by no means universal.

Forensic anthropologists practicing today are largely open to the idea of standardization. While many respondents indicated that their place of work provides an SOP (72.0%), many respondents indicated the responsibility of standardization should fall to professional organizations. However, it is important to note that many respondents indicated that professional organizations should work with other entities within forensic anthropology to create a more unified standardization that is applicable to all. This is in line with the idea of a universal standard, which was also received positively by respondents, with a majority (60.3%) indicating a universal standard is necessary. Further, this indicates a desire to see a standard that applies to all, with a majority of respondents (74.0%) indicating their willingness to follow a universal standard if one was provided to them. Those without the resources of an SOP (28.0%) showed a desire to remain flexible, with many indicating they would follow the standard if it was possible with their case. This is likely why the use of the OSAC standards is so widespread: they provide general guidelines that can be flexibly applied. No specific methods, templates, or criteria that need to be included, simply a basic guideline.

There is a positive aspect with basic guidelines in that it can be widely accepted. Forensic anthropological cases are vast in their diversity, and it is important that a forensic anthropologist has the flexibility to use a variety of methods depending on what their case contains. However, the negatives that arise from this approach are the

variations seen in the other areas of this survey. While unofficial agreement in areas such as peer review is present, a lack of standardization has taken its toll on many other areas, namely education and training, cognitive bias, and terminology. Along with that, agreement does not mean standardization, meaning that while many anthropologists do complete things such as peer review, some still do not. With flexibility comes widespread variation in expectations, skillsets, knowledge, and applications, which are not addressed nor enforced in the current “standards” available. As it stands today, there is no “standard” which comes close to providing something strong enough to be enforceable and for graduates and teachers alike to follow.

Peer Review

Peer review was reported to be widely used by respondents to the survey, with most indicating their use of in-house peer review processes. As a large percentage of respondents work in an academic setting, with other forensic anthropologists in their place of work, this finding was not surprising. As with the results from Passalacqua and Pilloud (2020), the percentage of individuals who receive peer review (75.6%), and have it mandated, is larger than that which does not (24.4%). However, what was slightly surprising about the results was the small number of individuals who provided external peer review to their peers that did not work at their place of work (51.2%). Peer review is often cited as one of the most important aspects of quality assurance (Christensen and Crowder 2009; AAFS Standards Board 2024), yet the service of peer review as it relates to case reports appears to be a limited resource for those working as sole practitioners. It is also interesting that individuals do not reach out to those who do provide peer review

services, as most practitioners do not charge a fee. While the barriers of location and place of employment may be a factor, being unable to afford this service does not seem to be an issue, given the data from this survey. Given its importance, and it being required by current guidelines from OSAC (AAFS Standards Board 2024), it is interesting that there remains a significant portion of respondents who do not seek peer review for their case reports.

Education and Training

Education and training are arguably two of the least standardized aspects of forensic anthropology. Despite educational programs being the basis for training new practitioners and teaching, no standardization exists on what is expected of every forensic anthropology program (Passalacqua and Pilloud 2020). While it is not expected that every person has the same qualifications, as different experiences are available to different individuals, there is an overall lack of minimum expectations. This results in forensic anthropologists working today being faced with types of analyses they have not experienced. This was seen throughout the survey results in this section, beginning with the level of education expected for practitioners.

According to Passalacqua and Pilloud (2020), 45% of respondents stated they believed a PhD was necessary to be a forensic anthropologist. In this survey, 29.5% of individuals stated that a PhD was necessary. While these results may be skewed due to the small sample size of this survey, they do represent a continuing belief that a PhD is not necessary to be an effective forensic anthropologist. The problem this presents is the idea that a PhD, or a certain degree makes you a qualified practitioner, which may not be

the case. The degree program itself may provide specific coursework, but because programs across the US are not teaching the same things, there are variable levels of basic comprehension.

These variable skillsets were explored through asking respondents about types of tasks they were asked to complete that were not formally taught to them in a classroom setting. The results provided by some respondents were notable, including trauma, pathology, photo superimposition, maceration, radiographic identifications, statistics, taphonomy, and archaeological techniques. Many of these, specifically trauma, pathology, radiographic comparisons, and taphonomy are frequently requested aspects of case reports. Radiographic identifications and trauma analysis alone make up nearly 20% of case reports completed (Pilloud et al. 2022). Another frequently cited answer to this question was estimation of a postmortem interval. Forensic anthropologists are commonly asked to estimate postmortem interval by law enforcement officials, with some respondents stating they are sometimes only asked to report on postmortem interval. According to Pilloud et al. (2022), 2.7% of cases completed by forensic anthropologists in their sample were purely postmortem interval estimation. Because PMI is usually not taught in the classroom, the approaches to these may be completely different by practitioner and are expected to be learned in other experiences, such as through a mentor or fieldwork experience.

Fieldwork and mentorship are positive aspects of forensic anthropology education in that they allow for students to learn topics beyond the scope of their degree programs. Many respondents indicated they were mentors or received mentorship from another

forensic anthropologist, either formally or informally, sometime throughout their career. While these opportunities are great for forensic anthropologists to further develop skills, this should not be the basis for education on skills that are essential to the field. Not every experience is available to all students, many field schools requiring expensive tuition and time to apply, much like applying to the ABFA. One participant had this to say in response to question 61: “what, outside of formal education, did you do to gain experience in forensic anthropology?”:

“Nothing. I could not afford to do internships or similar opportunities as a student. So, I did the best I could to maximize my experience within the bounds of my college/graduate school coursework.”

While this individual represents only one participant in this survey, this is a concerning statement for the field. Along with these, one respondent commented on the fact that forensic archaeology is not included on the ABFA exam, despite it being a significant part of their current job. Many respondents indicated that forensic archaeology is an important aspect of their job, but these skills were likely learned during internships and mentorships. If doing outside volunteer opportunities is expected to learn essential skills to work in the field, limited access, or barriers existing means gatekeeping the field further (Tallman et al. 2022). Everyone should have equal opportunities to gain the knowledge needed to become a practitioner, which is currently not possible in degree programs alone.

Following this sentiment, Passalacqua et al. (2021) stated that practitioners believe that their experiences with training and education make them qualified in work in the field of forensic anthropology. Yet, the only official means of qualification within the field is the ABFA. Despite the time and effort it takes to earn a degree in forensic

anthropology, a Master's or a PhD, the experience gained there is not enough to qualify an individual to become certified. Additionally, while the majority of respondents indicated their belief in a PhD not being required to work as a forensic anthropologist, certification by the ABFA was a necessary requirement to half of the respondents (50.6%). Currently, a PhD is required to apply to the ABFA, along with certain other requirements such as case reports and knowledge of specific aspects of the forensic anthropology methods. Some respondents indicated they believe ABFA certification should only be required if there is also a level for those with a Master's degree. According to the ABFA, a tiered program available to both those with PhDs and Master's degrees will be available in the coming years (ABFA 2024). While this will allow for more individuals to take the exam, it will not solve the problems associated with the exam and the board itself.

While the ABFA does present one means of standardization, there are many problems with the way it is structured and created. Most of the participants in this survey are not board-certified and there were some very severe critiques of the ABFA included in the comments of various questions. These included comments ranging from having unvalidated methods on the exam to allegations of not allowing an accommodation to be used during the exam, some of which are listed below:

“I think we don't even have a clear set of criteria for what it means to have a validated method. So that is the first major problem. Sometimes I will include unvalidated methods in my notes and highlight that they are unvalidated, still in beta phase. I feel pressure because some of the methods on the ABFA exam weren't even validated....”

“I had to wait three years before taking it after graduation, at that time I was pregnant with a full-time job supporting my family. I had to focus on keeping my job rather than studying for an exam.”

“The exam was geographically biased and did not represent common case experience in my region, including ancestry assessment. I also disagree with some of the U.S. wording and choice of methods and did not want to fail the test because I refused to comply with what I perceive to be USA biases. Also was eligible many years ago and was not impressed by the fact that those marking the exam were grandfathered in and never actually wrote the exam themselves. Waste of time and money for me as not required for my country.”

“This question is bullshit - I am very qualified to take the exam but the ABFA has decided that my master’s degree and 15yrs of practice does not qualify me.”

“Applied and was denied for quality of photographs. Between the letters of rec (you need friends) and the gate keeping garbage, it is no longer of value to me. It is not about professional certification and that is obvious.”

“There is so much variability in training and knowledge, even among practitioners who are board certified; for example, we had a workshop given here by someone who was board certified and a full tenured professor in North Carolina who told us that she never examined classic metaphyseal lesions in infants because she didn’t believe they existed; this is a person who is supposed to be a child abuse expert.”

“The accommodations statement on the ABFA website is a alarming and exclusionary; you are required to ask for accommodations by the May prior to the year you take the exam - this is before you even know if you are accepted to take the exam if it is your first time; I received a condescending email after asking if I would be able to use my insulin pump and use the restroom while taking the multiple choice portion and was told that this was a professional examination and that I should learn to use the bathroom ahead of time; I’ve never been so offended by someone in our field in our life and it makes me want to not take it and not be a part of that organization.”

These quotations provide some personal experiences with the ABFA that demonstrate some of the major critiques and some of the more specific things individuals

have experienced to obtain “certification” within forensic anthropology. While the ABFA may be presenting a tiered program for certification, solving the problem of degree-oriented certification, the other issues will remain persistent. Critiques of the ABFA and the exam itself are nothing new to forensic anthropology and to literature around this subject. In their 2020 survey, Passalacqua and Pilloud noted the concern and critiques of participants concerning the content and structure of the exam.

Further, the ABFA expects practitioners to have the skills to pass their exams despite there not being a mandated courseload for degree programs in forensic anthropology. Once again making everything come full circle to what experiences are available to an individual, without considering the variation and barriers that exist in the field (Tallman et al. 2022). There remains a disconnect between the expectations of knowledge of certifying bodies, such as the ABFA, and the reality of what is available to students in their degree programs (Passalacqua and Pilloud 2020). Until there is standardized education and training, certification by the ABFA cannot be an expectation of practitioners and cannot be expected to stand as a viable form of standardization.

Cognitive Biasability

Objectivity has long been the cornerstone of forensic science testimony in a courtroom setting, with the *Daubert* criteria providing the only guideline this testimony is held to. The findings in case reports are what eventually becomes this testimony, meaning all case reporting practices are also subject to the rules *Daubert* imposes (Holland and Crowder 2019). As is outlined by the *Daubert* criteria, methods used need to be well-accepted within the field and techniques need to be in place to control the

operation of the technique (Christensen and Crowder 2009). Expert witnesses are expected to be objective observers, providing the facts of the case interpreted in an objective, method-based manner (Winburn and Clemmons 2021). This section of the survey demonstrates that objectivity, through the lack of standard application of bias-mitigation procedures and contextual information, is completely unstandardized, which compromises the integrity of case reports, and thus, expert witness testimony.

One of the most significant findings from this survey was the nearly fifty-fifty split between those who consider forensic anthropologists to be objective (55.3%, n=42) versus not (44.7%, n=34). There appears to be a fundamental split in the field on whether practitioners are educated on the true meaning of objectivity and its impossibility in human beings. Objectivity is impacted by our views of the world and the information we receive through our senses, creating varying understandings and viewpoints for every single person (Winburn and Clemmons 2021; Dror 2015). True objectivity would require all individuals to have the exact same viewpoint and exact same experiences in life, which is impossible for human beings. Yet, current expectations and beliefs in educational programs teach forensic anthropologists, and forensic scientists alike, that they are objective. Science is expected to be objective, not impacted in any way by the opinions and beliefs of the observer (Winburn and Clemmons 2021). Thus, there is a disparity between reality and the illusion of objectivity, created for the purpose of pleasing juries, courts, and to appease the *Daubert* standard. It is not beneficial when methods become more “standardized” (i.e., the inclusion of error rates, etc.) when the foundation of the report itself, the analyses, are not standardized. As it stands, current

expectations of forensic anthropological analysis are not objective and do not follow any sort of discipline-wide standard (Winburn 2018). As analyses conducted are the basis for testimony, it could be argued that the lack of widespread bias-mitigation and the lack of control over the application of techniques (i.e. the use of contextual information) makes all forensic anthropological testimony not suitable in its current state to be used in trial. This is demonstrated fully by the responses concerning the means of applying contextual information and bias-mitigation.

Throughout all sections of the survey, respondents indicated their use of contextual information during cases, with few discussing the problems associated with it. Many stated that receiving contextual information related to a case was essential, as it provided important information about the deceased that could help with their analysis. It is important to note that the receipt of contextual information is not a problem, it is the receipt of it prior to analysis which can create a bias in the practitioner. In fact, contextual information can be a helpful clue for investigators, but it should not be the basis for a forensic anthropological analysis (Dror 2015). Whether meaning to or not, receiving information related to a case is something that can influence the opinion of a practitioner (Dror 2015). This is clearly demonstrated in the results of Nakhaeizadeh et al. (2014a and 2014b). In the studies, participants were influenced by what contextual information they were provided, in estimating both the biological profile (Nakhaeizadeh et al. 2014a) and analyzing trauma (Nakhaeizadeh et al. 2014b). In both studies, the participant was more likely to analyze the remains to align with the contextual information provided to them prior to their analysis.

These included many comments stating that contextual information was important for the case. For example, one comment discusses the use of contextual information by “well trained forensic anthropologists”:

“Well trained forensic anthropologists know what they need to know. Information about the scene and the decedent is very important information about the suspect and theories from the police or not. It is very black-and-white in my mind what I need to know and what I do not need to know I have no problem filtering out. The information that I do not need to know this is based on many years’ experience.”

Several comments compared forensic anthropology to medicine, requiring the use of contextual information and patient history to create a full analysis. One comment stated their use of contextual information specifically, as related to their medicolegal casework:

“We would like to think that we are not influenced by contextual information, however, I have not worked one single case where contextual information was not brought to my attention in advance. There's a huge disconnect between the world of academia and the practitioner's world and the idea that you are not going to have any information about the case prior to working it is delusional. Furthermore, I don't always think it is a bad thing. Sure, you don't want to have the decedents driver's license in front of you when doing the bio profile, but understanding the depositional environment from where the decedent was recovered (for example) can be extremely helpful in understanding taphonomy and PMI. Furthermore, the depositional environment is extremely important to know when testifying about the likelihood of certain activities that a suspect may have engaged in to dispose/conceal the body. So I'd like for us as a discipline to have deeper and honest discussions about bias, what it actually means, and how it affects casework...for better or worse.”

Forensic anthropology and medicine are alike in that they deal with human bodies and in determining the cause and effects of specific things, ideally looking to determine the root cause of something they observe. In medicine, this usually entails to use of testing to generate results for the physician to examine and then from there determine a diagnosis and treatment. Forensic anthropologists have a similar task, in that they examine remains for specific things to estimate a cause. The tests should inform the decisions made by the practitioners, but should not be considered in isolation. Additionally, the role of the forensic anthropologist is never to determine cause and manner of death, but to contribute their findings on whatever topic is asked of them. This is the greatest difference between physicians and forensic anthropologists: forensic anthropologists are not the investigators, they are the laboratory scientists (Dror 2015). Gaining contextual information takes away from their ability to generate objective and helpful results for those investigating (i.e. law enforcement, medical examiner, etc.)

As discussed by Dror (2015), contextual information in taken into the brain is processed and stored and goes on to influence the way that person process information they take in in the future. Thus comes the term cognitive biasability, which presents the idea that errors in work can be created through the information retained by that individual (Nakhaeizadeh et al. 2014b). Within the survey responses, there are many mentions of “egos” and “experiences” impacting objectivity, but that practitioners try to remain objective. Contextual information is not simply something learned and then can be ignored; it is forever woven into how an individual understands and interprets what they can see (Nakhaeizadeh et al. 2014b). Thus, while contextual information can be helpful,

it automatically biases the observer and adds another layer to the impossibility of an objective interpretation. One possible solution to solving the error introduced by contextual information is the creation of bias-mitigation procedures.

Bias-mitigation in forensic anthropology could provide a structure for which the flow of contextual and case information could be taken in, without it impacting the analyst. Such designs can be seen at laboratories, such as the DPAA, and are included in many SOPs (Holland and Tersigni-Tarrant 2012). Included in the survey responses were those that do have bias-mitigation in place, including the use of peer review and blind analyses. However, many also indicated that information was still overheard, and that the system implemented was not formalized and was dependent upon the practitioner. Further, more than half of respondents indicated their place of work had no bias mitigation procedures enforced. Peer review and other bias-mitigating procedures may be difficult for many to attain, as they may be sole practitioners or may have no resources to implement these procedures (Warren et al. 2018). However, given the demonstrated impacts of cognitive bias on casework performance (Nakhaeizadeh et al. 2014a; Nakhaeizadeh et al. 2014b, etc.) something must be done to provide a standard which can be enforced in all contexts.

In recent years, some forensic anthropologists have published on the topic of mitigated objectivity (Winburn and Clemmons 2021). This concept is essentially the idea that forensic anthropologists can attain the highest level of possible objectivity by relying on strong scientific theories, standardized expectations, and having a knowledge of the true reality of objectivity (Winburn and Clemmons 2021). The viewpoint allows forensic

anthropologists to admit the impossibility of true objectivity but to ensure the quality and consistency of their work through methods and standardization. The goal of every practitioner should be to enable this type of view into their work through the introduction of a standardized process of information flow and application.

As is demonstrated through the results of this survey, cognitive bias has the ability to impact all areas of forensic anthropology and provides the theoretical foundation for the medicolegal casework. If the goal of forensic anthropology is to attain mitigated objectivity, this cannot occur without standardization that is enforceable and applicable to multiple contexts. Standardization is a monumental task, especially when discussing topics like implementing bias mitigation and completely changing how forensic anthropology is taught, including the integration of education on the reality of objectivity. But without something that is tangible and enforceable, things will remain following the status quo.

CHAPTER 6 CONCLUSIONS

The results of this research indicate there are many areas of forensic anthropology where standardization does exist unofficially. However, in more areas than not, there is a fundamental lack of agreement on how things should be standardized, or whether aspects of the field should be standardized at all. Practitioners are beginning to transition their terminology usage, especially as it relates to terminology used for ancestry/population affinity estimation. However, the terminology change is ill defined and is not following the logical progression of a methodology change. Similarly, there is a misunderstanding as to what methods should actually be used within the field. The current OSAC standards provide minimal direction when it comes to terminology and methodology. However, what it does provide is not being directly followed. Rather, individuals or institutions determine what language and methods are valid and should be used for their casework. This creates an environment of confusion, which creates a further lack of standardization.

Other such areas to be highlighted are education and training and cognitive bias. While these topics are not directly part of a case report, they directly affect how casework is done and the competency of those doing the work. Education and training are a completely unstandardized area of the field. This is especially worrisome as all forensic anthropologists are in some way the product of their education and training. It directly impacts how they do their work, how they apply concepts, and what skills they bring to the workforce. Additionally, without standardization available to all, education and training are the only opportunities for forensic anthropologists to be properly trained and taught how to execute a report in every aspect. The expectations of workplaces are that

their employee will come in with some knowledge and skill. However, the competency and diversity of these assets is likely the most variable aspect of forensic anthropology. Without standardizing education and training, all aspects of the field will remain unstandardized, and this problem will continue as new practitioners are introduced to the field.

Cognitive bias presents a similar problem and is closely linked to education and training. Prior to entering the field, practitioners must be aware of how to conduct themselves. Currently, it is no one's responsibility but the practitioner to ensure their work is conducted in the most objective and scientific manner. However, this includes acknowledgement of cognitive bias and an understanding as to what knowledge will negatively impact their ability to complete a fair analysis. This is something not frequently taught in educational programs and that is a problem in other medicolegal fields (Dror 2015). There is also significant variation on how individual institutions manage cognitive bias and the control of contextual information.

Each of these areas present significant areas of variation in the field which will require their own standardization. With the standards currently available from the OSAC, and other forms of standardization including the *Daubert* Standard and the ABFA, these problems remain prevalent and are impacting the work done by forensic anthropologists around the United States. What is required in order to standardize forensic anthropology is a universal, open-access standard that provides useful information, approved standards, and expectations for peer review. Further, standardization that will impact all areas will rely on the unification of many institutions and practitioners and will require the creation

of new ways to keep individuals, no matter their location, degree, or work context, accountable.

Future Research

While the current standing of standardization in forensic anthropology seems to be on an upward trend, there are still significant aspects of the field that need to be addressed. In the future, more research is required into these areas of standardization and new attempts should be made at creating a standard that is both enforceable and all-encompassing, but also flexible to be adopted to multiple areas of the discipline. As was suggested by the participants in this survey, professional organizations could partner with workplaces and academic institutions to incorporate the opinions of many practitioners. This may include the formation of a committee or multiple committees to work on all aspects of standardization, using the current OSAC standards as a basic outline to be built upon.

Standardization should begin by providing a unified template for reports, which can be adapted to any extent of remains and circumstance. Sections could be included or omitted depending on the presence of certain elements or in certain contexts. One such proposed standard can be found in Bunch and Stoppacher (2015), which outlines case report guidelines based on the guidelines that exist from the National Association of Medical Examiners (NAME). This proposed standard discusses format and layout. These include ways in which to present information that would not only be the same to forensic anthropologists once adopted, but also to medical examiner's working with forensic anthropologists in a medicolegal setting. These reports may also be more familiar to law

enforcement partners, as they are frequently in contact with medical examiner/coroner's offices in their jurisdiction. While this is just one proposed example, it provides multiple reasons why it would be beneficial to explore for forensic anthropologists. It would also allow for standardized language to be used throughout the field. Notably, this would be separate from methods and standards for the receipt of contextual information, involving enforceable rules and ethics.

The standardization of bias-mitigating procedures in forensic anthropology would be a much more complicated process. Bias-mitigation must involve practices that control the flow of information from investigators to forensic anthropologists, which will be especially difficult with sole practitioners. Creating a standard that applies to information flow in larger and smaller institutions must involve a policy that can be implemented by one individual, or which creates a network of individuals. One example, from Hartley and Winburn (2021), involves the implementation of a Forensic Anthropology-hierarchy of expert performance (FA-HEP). The concept aims to illuminate areas of interobserver and intraobserver error by comparing conclusions and the observations they come from. Every conclusion must be qualified by observations made, which could also introduce an area to include citations of peer reviewed literature. This would also allow conclusions that are formed by the knowledge of contextual information to be made apparent to peer reviewers or for other quality assurance measures. This would be a helpful system in the workplaces of sole practitioners, as they would be able to receive the contextual information, and declare areas it may impact their analysis. This would, however, still require the use of external peer review services to ensure conclusions are not solely based

on context. This is only one example of a solution, which would require widespread support and enforcement, but it shows that it is possible to create systems that allow practitioners to be more objective.

Finally, the standardization of education and training in formal education programs will require extensive cooperation between universities and forensic anthropology professional organizations. However, if there is a guide for students to follow who aim to become a forensic anthropologist, that is one step in the right direction. One example could be the ABFA coursework recommendations outlined on their website, which can be followed by students. However, as has been mentioned, many of these areas may not be available to students due to barriers such as money or time. The preferable means of standardization must be the structuring of graduate level coursework to include all necessary aspects of forensic anthropology. Langley and Tersigni-Tarrant (2020) outline a competency-based learning approach that would involve the goal of obtaining skills, rather than checking boxes of coursework. Each competency would be completed by the demonstration of each skill, acting both as a means of teaching and certification. Universities would be tasked with ensuring that graduates are able to meet the competencies outlined, much like medical schools must ensure their graduates meet requirements prior to graduation.

It is the goal of this thesis not to provide standardization, but to illustrate the areas of forensic anthropology which remain unstandardized under the currently published guidelines. As can be seen through the results of this work, there is much work to be done in all aspects of case reporting practices and the factors which impact them. There is also

much disagreement within the field as to whether standardization is achievable or needed.

As with other fields that work in the medicolegal sphere, it must always be the goal of forensic anthropology practitioners to provide the highest quality of work, which is not possible with the current standing of standardization.

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