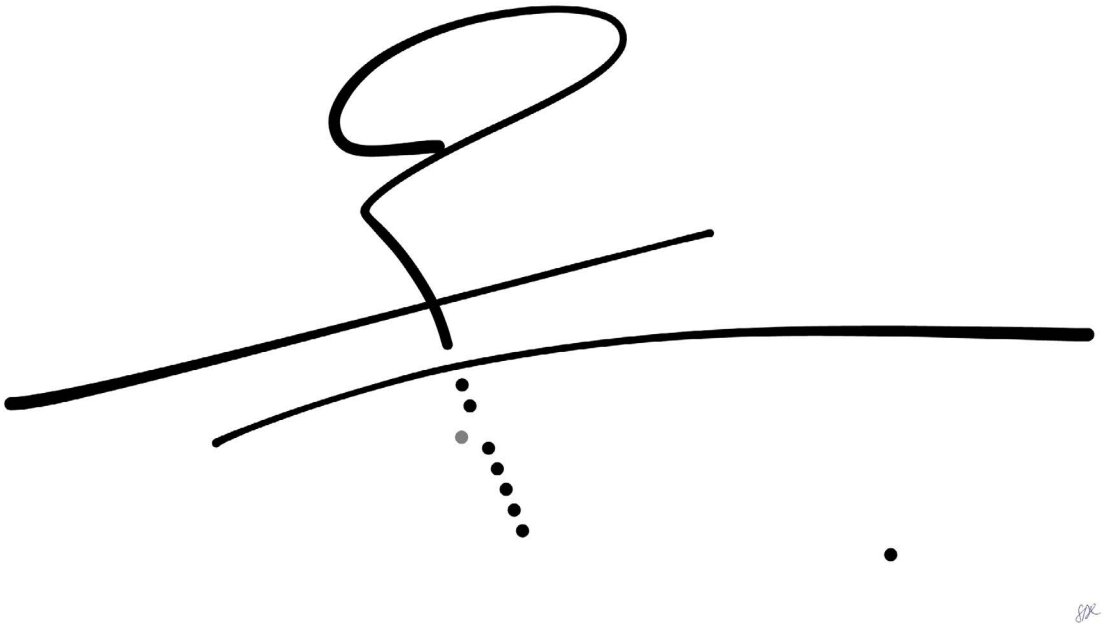
Coming of Age

Ethics and Biological Anthropology in the 21st Century

Edited by

Vanessa Campanacho and
Francisca Alves Cardoso



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Chapter 1

What about ethics in biological anthropology?

Francisca Alves Cardoso and Vanessa Campanacho

This chapter introduces the topics covered in this book and the reason behind its creation. Its content results from contributions presented at the AnthroEthics 2021 Conference, an online conference presented at the BioantTalks channel. The inaugural session took place on July the 5th, 2021, with presentations lasting until the 9th of June (2021). Those who wish to view its contributions can do so by accessing channel[1]. One objective of the conference, which is also an objective of this edited volume, was to secure contributions from various continents and countries, not limiting ethical-related research to mainstream science producers. The conference and this book were successful in that endeavour, with contributions from Australia, Brazil, Finland, Lithuania, Portugal, South Korea, Spain, the United States, and the United Kingdom, offering a wider view of ethical concerns and biological anthropology. Some of the writing styles and composed chapters will express precisely that, as not all authors are native English speakers. But the book aims for an inclusive approach to ethics in biological anthropology, regardless of the writing skills and narrative proficiency of the authors (editors included): therefore, we encourage the readers to take that into consideration when reading the book.

Another objective was for the conference to be inclusive, aggregating early-career and senior scholars' researchers. Those with junior roles often lack opportunities to be part of major contributions. Hence, we view this book as an opportunity to showcase their research and build collaborative networks. The book achieved both objectives, securing significant contributions addressing major research topics within biological anthropology with an emphasis on ethics and related issues.

Ethics is the conductive thread throughout the book and is explored in various contexts and avenues of research. Alongside the rising ethical issues, the need for accountability, responsibility, care, and caution is also constant. This further contributed to another objective: to spark critical thinking in the readers and, for those working within biological anthropology, an invitation to a reflexive approach to their own research and/or those closer to them. Each manuscript introduces a particular context/topic, its limitations, and south out resolution, as described by each corresponding author. Some of the chapters may feel like ethnographical accounts relative to others, but we leave that for the reader to decide.

Those who have long been working on ethics and discussing ethical issues (no matter its framework) are aware that there are no "rights" and "wrongs" in the sense that a "... meaning of "ethics" is hard to pin down, and the views many people have about ethics are shaky." (Velasquez *et al.* 1987)[2]. Consequently, when faced with the same dilemma, one can respond differently, offer diverse solutions, and argue many viewpoints. However, no matter this inability to provide a cohesive definition of ethics, the principle of "do no harm" is fundamental. But even this simple concept may differ between people, as when faced with complex dilemmas. With this in mind, we invite the reader to explore this

[1] AnthroEthics 2021 conference at BioantTalks channel at: https://www.youtube.com/watch?v=ctgfYtH-fco&list=PLnM-MDORLbrfHagKryu5-dkxi-1ynjP3X

[2] Velasquez, M., Andre, C., Shanks, T., & Meyer, M. J. (1987). What is ethics?, Issues in Ethics, 1(1), revised version January 2010. Accessed, March 25th, at: 1-2.https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/what-is-ethics/

book, allowing the opportunity to be surprised, enraged, astonished, sad, happy, but most of all, to be made aware of a significant number of issues that have been discussed within the discipline of biological anthropology. This book, alongside the contribution at the AnthroEthics 2021 Conference, offers precisely that.

The reference to human remains is also a constant within the context of this book. Either by directly referencing human remains or by addressing contexts in which a relationship exists. For example, Chapter 2 delves into exploring related to the curation, display, and study of human remains, in Finland, with an emphasis on collections gathered from archaeological contexts, which is complemented by Chapter 3 on issues related to the preservation and curation of poorly a priori preserved human remains, and Chapter 4 addressed both the short-term and long-term curation of human remains within the medico-legal system. These 3 chapters compose the book section on curating and displaying ancestral human remains.

Alongside the handling and curation issues related to real bone, later years have observed a growing concern for the digitalization, creation, and dissemination of 3D models of human remains. Such aspects are explored throughout Chapters 5 to 9. The acknowledgement that the digital age brought new and challenging issues regarding human remains is now well-established in academia, with each one exploring the digital need to be accounted for. Digitalization also brought the "novelty" of democratization on the access to the remains in the sense that what was once limited to anatomy theatres, academic, and archaeological contextual work is now accessible with the click of a keyboard or mouse. And, with the extended growth of artificial intelligence, one can only expect added concerns. Although these chapters relate to the discussion of digital ethics in biological anthropology, they are not limited to biological anthropology. Many collections and human remains that are being scanned and/or have given origin to 3D replicas are held in museums and are part of museological collections; for this reason, the discussion extends beyond the concern of biological anthropology into those of heritage and memory, with added dimensions of care and concerns.

The book reaches out to other domains of biological anthropology, such as ethical issues in the study of ancient DNA in South America (Chapter 11), contexts of violence in which the retrieval of history, memory, and human remains is ongoing (Chapter 12 and 14), and legal issues (Chapters 10 and 13), as a reminder that ethical and legal social aspects are always intertwined. To address one is to address both. Although the final section of the book dwells on professional issues (Chapters 16 to 18), these are as important as the remaining chapters since science is a product of those who make/write it, and this relates to society. Who produces science, engages with it, dictates research agendas, and how limited, bullied, and constrained certain groups of people?

Although the book Chapters are grouped per section, they are interconnected. Reading them is also an invitation to find those interconnectivities. We stress that this introduction aimed to provide a background to the broad themes in this book and to raise questions in the reader's mind. Scientists are privileged in the ability to shape minds in the sense that many of us are also teachers and writers of ideas, accounts, and research, which may influence policy-making and societal views of the world. And, particularly in our case, we work in a field of study in which we have the privilege to work with ancestral human remains and associated contexts. We must always remember that these remains were those of people. It is, therefore, essential to maintain and promote the highest possible ethical standards throughout our work. Hopefully, this book will provoke discussion surrounding best practices and ethical standards.

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Section I

Ethical issues in the curation and display of human remains

Chapter 2

Human osteology and ethical perspectives on research, curation and display of human remains in Finland

Heli Maijanen

Introduction

Biological anthropology, including human osteology, is a small discipline in Finland and it is currently a part of archaeology. However, the roots of biological or physical anthropology in Finland extend to the late 19th century but it has never been an independent field. In the beginning and up until the second half of the 20th century physical anthropology was part of medical science, specifically anatomy (Koski 1997). The first half of the 20th century was a busy time for craniometrics, and osteological research done by anatomists in Finland. Anthropometric studies on Finns and Sámi were conducted at this time as well (see Koski 1997). The interest in analysing archaeological skeletal remains, especially animal bones, started to move from medicine to paleontology and zoology in the 1960s (Mannermaa 2023). After that, the archaeology students themselves started to get interested in learning osteology. Currently, there are no actual programs that would give students a degree in biological anthropology or human osteology in Finland. Archaeology programs may offer some courses and researchers interested in biological anthropology tend to get more education and training from universities abroad (Mäkinen *et al.* 2022; Maijanen 2023).

The discussion on human remains and ethics started relatively late in Finland. Most of the publications concerning ethics are from the 21st century (e.g., Vilkuna 2001; Salo and Kivikero 2010; Maijanen *et al.* 2019; Moilanen 2021), even though some practical work, such as the repatriation of Sámi remains, started in the 1990s (See for example, Vilkuna 2001). The published articles focus on laws related to human remains, curation and reburial of human remains (Salo and Kivikero 2010; Núñez *et al.* 2011; Lapinoja 2011; Moilanen 2021; Maijanen 2021a), or their display in museum exhibitions (Vilkuna 2001; Moilanen 2014; Maijanen *et al.* 2019; Wessman 2022). Ethics concerning excavations are quite rarely an issue in Finland since historical human remains are rarely excavated for scientific purposes only. In most cases, new excavations focusing on human remains are done because of land use, not research (Salo and Kivikero 2010).

In practice, human remains collections are rare in Finland due to the poor preservation of skeletal remains in the soil and the common custom of reburying historical remains. In Finland, the National Heritage Agency's internal guidelines for human remains state that archaeological human remains from historical sites are usually reburied after basic analysis (Museovirasto 2021). That may be a reason why some of the recent publications tend to emphasize the importance of curating skeletal collections for future generations (e.g., Salo and Kivikero 2010; Moilanen 2021). This is very closely related to the idea of respectful treatment of human remains, which varies in different cultures (e.g., Swain 2002; Clegg 2013). Curation might be considered disrespectful to the past people whose remains are in the collection. In the Finnish context, Moilanen (2021) writes that curating and researching human remains is not necessarily unethical or disrespectful toward past humans. Moilanen highlights that the information gained from human remains is important and research may also represent a way to commemorate these individuals. Discussion on curation versus reburial is also strongly connected to the question of who and whose interests are we protecting when we rebury human remains or take them away from

exhibitions – the living or the deceased (e.g., Scarre 2003; Shelbourn 2015). Some of this discussion has also been addressed in Finnish literature (Salo and Kivikero 2010; Maijanen 2021a; Wessman 2022). Even though we cannot know how the deceased whose remains we have in the collections felt about their skeletal remains, attempts to study contemporary people's attitudes towards the possible use of their remains for research or education may help us to widen our understanding of how people wish their remains to be treated after they are dead and expand our discussions on this sensitive topic (Maijanen 2021a).

This chapter aims to explain the current situation in Finland concerning the ethics of handling human remains mainly in the archaeological context but also to some extent in the medical education context. The four major focus areas include 1) anatomical collection and anatomy education, 2) archaeological remains and various aspects of their curation and research, 3) visitors' views on human remains on display, and 4) future directions. These areas will give background to biological anthropology and research on human remains, explain the current state, give a larger context to ethics by bringing public opinions into the center, and ponder the possibilities to proceed in Finland.

Background for anatomy teaching and a 20th century anatomical collection

In Finland, deceased individuals and human remains are used mainly in medical and archaeological research and education. Currently, medical schools use donated bodies to teach human gross anatomy via dissections. Anatomy is mentioned here because of its close relationship to the early years of biological anthropology research in Finland, and also because the only documented skeletal collection in Finland is based on deceased individuals once used in teaching anatomy.

Currently, there are five medical schools in Finland teaching anatomy using deceased individuals. The deceased are mostly donated, but one university uses selected deceased individuals from autopsies if the authorities and family approve and there is no indication that the deceased would have been against this practice. The law enables both practices (Act on the Medical Use of Human Organs, Tissues and Cells 101/2001 and Government Decree on the Medical Use of Human Organs, Tissues and Cells 594/2001). After teaching, the deceased will be cremated and returned to the family. No skeletal remains are collected and thus there are no contemporary skeletal collections in Finland. However, as many countries in the early 20th century have done, Finland created a documented skeletal collection from the deceased that was used for teaching gross anatomy. This one documented collection (referred to here as the Helsinki anatomical collection) was formed between 1915 and 1935 (Telkkä 1950; Söderholm 2002). The collection was curated by the anatomy department at the University of Helsinki, but is now housed at the Natural History Museum in Helsinki. The collection has skeletal elements from 201 individuals, but none of them are full skeletons. Some individuals are represented by only a cranium, some only long bones and/or their pelvis. It has been speculated that the skeletal elements that were curated were chosen because of the research interests at the time and based on the easiness of accessing and cleaning them (Söderholm 2002).

Most of the individuals in the collection have a known sex, age, occupation, date of death, and cause of death recorded. Some individuals might also have stature in their records. These individuals did not give their consent at the time of their death and most of the deceased individuals were collected from mental hospitals, prisons, and autopsies (Telkkä 1950). Nowadays these types of collections would be considered unethical and donor consent would be required if such a collection would even be contemplated. The body donation programs for teaching anatomy started at the end of the 1960s in Finland (Niemi 1990), and, in general, no skeletal remains have been retained after that. However, since there are no contemporary and more ethically formed collections, this collection is still considered useful for research even though the questions that can be addressed with the collection are limited due

to the selection of certain elements for curation (e.g., Telkkä 1950; Kajanoja 1966; Niinimäki 2011, 2012; Maaranen and Buckberry 2018; Mansukoski and Sparacello 2018; Niskanen *et al.* 2018; Maijanen 2021b). The author is not aware of possible discussions or requests for reburying these remains.

Curation of archaeological human remains

As mentioned previously, human osteology is not a major field in Finland. For example, three Finnish universities offer an archaeology program and two of them provide human osteology courses to some extent. In 2022, the University of Oulu started a minor in osteology with five courses which include both human osteology and zooarchaeology (Maijanen 2023). One reason for the underdevelopment of osteological research and education is the lack of well-preserved skeletal remains. The soil is very acidic in Finland, and it does not allow human remains to be preserved very well unless they are burnt. For example, Ahola *et al.* (2016) compiled information from 70 known Stone Age grave sites and found nine of them with catalogued human remains. These remains are mainly teeth, cranial, and other bone fragments. These numbers demonstrate how scarce the human bone finds from Stone Age sites are in Finland. In the Bronze Age burials were mostly cremations. Cremated remains may be preserved better than unburned remains, and this can also be seen in the numbers of analyzed cremated remains. For example, Salo *et al.* (2022) studied 218 Bronze Age and Iron Age cairns with skeletal remains. The maximum amount of skeletal fragments found in one cairn was over 4.5 kg.

The preservation and type of burial lead naturally to a temporal bias of human remains that can be studied in Finland. The Stone Age has very little to offer for osteological research, whereas Bronze and Iron Age sites have more human remains, but mainly cremains that allow for a very specific type of research. Inhumations are the common practice for burial in historical times, but the remains are affected by the soil and the curation decisions made by archaeologists and other stakeholders such as museums or parishes.

The human remains collections are curated mainly for research. In general, Finnish museums follow the guidelines of the International Council of Museums (ICOM 2017) including their instructions for human remains. In addition, museums might have their own best practices regarding human remains. The National Heritage Agency created their own guidelines for human remains in their collection in 2014. Those guidelines have been updated in 2021 (Museovirasto 2021). Human remains from archaeological excavations, whether cremated or not, can be added to the National Heritage Agency's collection. There is a clear division between prehistoric and historical human remains and their treatment. Prehistoric remains, whether burnt or unburnt, will be catalogued and added to the collection. Human remains from historical contexts are catalogued when osteological analyses are carried out. After this basic analysis, the remains will be returned for reburial to the parish they came from. The National Heritage Agency can add historical skeletal remains into its collections if there are special reasons for that. The nature of these special reasons is not specified in the guidelines. Also, the author is not aware of how often that happens or how often the parish or other stakeholders, such as a university, would store the remains in their premises for research. The rule is that historical remains will be reburied sooner or later, and curation is exceptional. The differential treatment between prehistoric and historical human remains is mostly related to Christianity and thus historical remains will generally be reburied following Christian customs (Museovirasto 2021; Moilanen 2021).

One example of a slightly unconventional type of curation of archaeological human remains comes from Turku where a skeletal collection from a cemetery dating back to the 16th and 17th century is stored in an underground Chapel at the site where the remains were excavated between the 1960s and 1980s. The ional Heritage Agency gave permission to move these remains to the Chapel in 1998 and since then

they have been stored in the Chapel that is actively in use. The remains are available for research upon request (Salo and Kivikero 2010; Lapinoja 2011; Seppänen 2019).

The National Heritage Agency's guidelines also recommend that human remains should be handled appropriately in locked premises. Osteological analysis, including sex, age, and stature estimation, and recording possible pathological conditions, should be done. Other analyses are possible as well. Displaying human remains should be addressed case by case, but it is recommended that individuals on display should be complete, and the burials should be displayed as a unit. If possible, the exhibition with human remains should be planned so that people who do not wish to encounter human remains can avoid them. Repatriation and reburial are also addressed. All the requests for either one will be evaluated from the scientific, ethical, and cultural viewpoints (Museovirasto 2021).

Even though laws are not the same as ethics, they do set bare minimums on how human remains should be treated. Several publications have brought up the Finnish laws and rules that apply to deceased individuals (see Vilkuna 2001; Núñez *et al.* 2011; Lapinoja 2011). Even though there are several acts, such as the Criminal Act and Burial Act, that regulate the treatment of recently deceased, the Antiquities Act (295/1963) in Finland does not talk about human remains as such. It protects ancient burials and the finds in them but does not specify what it means for the human remains (Núñez *et al.* 2011). The Antiquities Act is currently under review for reform. A working group appointed by the Ministry of Education and Culture has given their report and it suggests the old Antiquities Act to be repealed by the Act of Archaeological Cultural Heritage. Based on the report, in the new act, human remains would be mentioned as a separate category of archaeological finds. It would also be mentioned that human remains should be treated appropriately and with respect. It seems that the new act will mention that human remains can be catalogued into a permanent collection, but they can also be reburied. (Ministry of Education and Culture 2023).

Remains of known individuals

Sometimes the identity of the buried individuals is known or can be established through documents. I will present two examples of studies that have addressed the issue of naming the studied individuals. Human remains may also include mummified remains in addition to skeletal remains. In Finland, the practice of burying higher-status individuals under the churches has resulted in natural mummification in churches built before the 18th century (Väre *et al.* 2015; Lipkin and Kallio-Seppä 2021). This unintentional mummification process is due to the cool and dry conditions in ventilated spaces under the churches which lead to the drying of the soft tissues rather than decomposition (Väre *et al.* 2015; Lipkin and Kallio-Seppä 2021). One of the most famous and most researched mummies is vicar Nikolaus Rungius who died in 1629 in Kemi parish, in northern Finland (Väre *et al.* 2015). The mummy of Rungius has been on display at the church in Keminmaa since the 1930s. In 2011, the mummy was taken to the Oulu University Hospital to be CT-scanned and basic health safety measures, such as protecting the equipment and special cleaning after the scanning, were followed during the process. Several studies on vicar's health have been published showing signs of osteoarthritis, diffuse idiopathic skeletal hyperostosis (DISH), possible tuberculosis, and gynecomastia (Väre *et al.* 2016a; Väre *et al.* 2016b; Väre *et al.* 2018; Väre *et al.* 2021).

As some of the individuals buried under the churches can be identified, like Rungius, it has also been discussed whether it is acceptable to examine and publish the paleopathological studies that concern the health information of these individuals (Väre *et al.* 2015). Even skeletal remains from churchyards may be identified through church records (Moilanen 2021). Moilanen *et al.* (2022a) studied 13 skeletons with signs of medical autopsy from three archaeological sites in Finland. At the time when these individuals were buried, autopsies were usually conducted on individuals who committed suicide or were victims

of crime. Moilanen *et al.* (2022a) tried to trace them back from historical records and provided some potential names for the autopsied remains. Moilanen (2021) states that human remains should be treated equally whether they are identified or unidentified individuals. The stories of these people can be told in a meaningful way, for example, by investigating why they were buried in a deviant manner (Moilanen 2021). One could say based on these two examples that giving a name to archaeological human remains is not considered problematic among the bioarchaeologists in Finland. However, extensive surveys among professionals or the public have not been done on this topic.

Human remains of the Sámi

While the curation practices described above apply to human remains that are considered Finnish, some remarks on the known Sámi remains should be mentioned here. The Sámi people are an indigenous group in the northern part of Europe including Norway, Sweden, Finland, and Russia. The Sámi human remains have now mostly been repatriated and reburied in Finland. In 1995, 95 Sámi skulls previously housed at the University of Helsinki were returned and reburied in Inari (Vilkuna 2001). A committee took the task of investigating what should be done with the rest of the Sámi remains and consulted Sámi representatives as well (Söderholm 2002). After the review, repatriation was recommended and the remaining Sámi remains from the University of Helsinki were returned to the Sámi Museum Siida in 2001. In August 2022, these Sámi remains were interred into three cemeteries, where they were originally exhumed, in Inari, Utsjoki, and Nellim (Ministry of Education and Culture 2022).

However, until 2019, skeletal remains interpreted as a Sámi shaman were on display at the Northern Ostrobothnia Museum. The burial was found in 1970 from Kuusamo. It was associated with the Sámi based on the grave goods which included a hammer of a noaidi's drum (Niinimäki *et al.* 2010; Äikäs 2019). The remains themselves have not been dated, but a coin in the burial dates it to the late 16th century (Kopisto 1971; Äikäs 2019). In the 1970s, the curation or display of human remains, even those of indigenous groups, was not seen as problematic. Äikäs (2019) reported that the museum staff remembered only one critical comment from visitors on displaying these remains. Nevertheless, the entire Sámi exhibition at the Northern Ostrobothnia Museum was closed in 2019 and the shaman burial was put in storage. DNA and stable isotope analyses are currently underway to help to examine the origins of this individual. Even though the artifacts associate the burial to Sámi, destructive analyses were requested to determine whether the remains are those of a Sámi individual rather than a Finn (Karjalainen 2019). This may matter when deciding whether the remains will be repatriated to the Sámi Museum or to Kuusamo, where the remains were found. Currently, the remains are at the museum until the research results are ready and further plans are made (pers. comm. Mika Sarkkinen from the Northern Ostrobothnia Museum 2023). In early December 2023, it was reported that the Northern Ostrobothnia Museum will repatriate the entire Sámi artifact collection to Siida (Guttorm and Kelemeny 2023). No other Sámi human remains are in the collection.

Finnish museum visitors' views on displaying human remains

When displaying human remains in museums, it is important to know how the visitors see remains and what they consider ethical in these contexts. In Finland, some studies have shown that human remains are seen as quite unproblematic in museum contexts (Wessman 2022; Maijanen *et al.* 2019). Wessman (2022) studied three museum exhibitions with human remains in Finland and interviewed the museum staff members who made the exhibitions. In the study, she found that there was not much discussion on the ethics of displaying human remains before the exhibitions. In addition, staff members did not report any major complaints about having human remains on display. However, Wessman (2022) noted that museums rarely have official channels for feedback and thus museums may not be aware of the concerns.

In 2018, the Northern Ostrobothnian Museum and researchers from the archaeology unit at the University of Oulu planned and executed a temporary exhibition called "Young soldier from Finnish war". The exhibition was based on a box found in museum storage. The box included textile fragments of soldier's uniform, human remains, and some other artifacts. The contents had been brought to the museum in 1952 from a mass grave that was found during construction work. The mass grave was assumed to date to the early 19th century and the Finnish war (Kuokkanen *et al.* 2018). Most of the remains were reburied in the 1950s but this box with a fragment of femur, tibiae, fibulae, cervical vertebrae, and mandible was left in the collection. After studying the remains and other artifacts it was decided to have an exhibition to tell the story of the Finnish war and how much information could be gained from this one box. While planning the exhibition, the group of researchers discussed the need to have human remains on display. The university researchers were more hesitant to have the human remains on display, but the museum staff was sure that the visitors would want to see them. It was decided the human remains would be on display, but only for educational purposes to demonstrate what information the remains gave us. For example, the mandible and teeth were there to show a slight pipe notch on the canine and first premolar, and a third molar with incomplete roots indicated the young age of the individual. In addition, the distal femur and a tibia were on display. A picture of a radiograph of the skeletal remains was part of the exhibition and the femur was included to show that the possible growth line seen on the radiograph cannot be seen on the bone and the tibia demonstrated the presence of a prominent muscle attachment which was likely related to marching. Due to the prior discussions, a survey was conducted during the exhibition to examine museum visitors' opinions and attitudes towards human remains on display in museums. This survey and its results were originally published by Maijanen *et al.* (2019). The survey was put out as a paper sheet during the entire length of the exhibition (23.10.2018–3.2.2019). The survey gained 113 responses, out of which 18 were excluded due to lacking information. The participants included 63 women and 32 men. Most of the respondents (54/95) were between 16 and 45 years of age, 12 individuals were under 16, and 33 individuals over 45 years. The survey had 10 claims that were evaluated on a five-point scale: totally agree, somewhat agree, totally disagree, somewhat disagree, and cannot say. The results of the survey showed that most of the respondents (84.2%) agreed that the exhibition gave them new information about human remains, in this case focusing on human skeletal remains and their research. Human remains were found to be interesting, and respondents (83.1 %) wanted to see more human remains in the museums, whereas only 1.6 % agreed with the claim that human remains are scary and they would not want to see them in the museums. Naturally, this claim can be problematic since people might not think human remains are scary but still would not want to see them in museum displays and thus did not agree with the claim.

Most of the respondents (89.5%) agreed that museums can have human remains in exhibitions if their display is done with respect and for educational purposes. Only 3.2 % agreed that museums should not display human remains at all. When potential conditions for displaying human remains were inquired, 75.8 % agreed that any human remains could be displayed regardless of their age and assumed culture or religion. However, 62.1 % thought that the assumed cultural and religious customs should be considered if remains were to be put on show. Only 18.9 % of the respondents agreed that only human remains older than 100 years could be shown in exhibitions. This seems like the respondents are open to having even younger human remains on display and may not feel as strongly about recent human remains as mentioned before (see Kilmister 2003). In addition, 63.2% agreed that exhibitions could exhibit human remains whose identity cannot be known, or they cannot be connected to living relatives. In general, respondents seem to think that displaying human remains in museums is acceptable, and people have an interest in seeing them (more details in Maijanen *et al.* 2019). This agrees with Wessman's (2022) conclusions that in Finland human remains have not generally been considered problematic in museum exhibitions.

Potential new directions

After this review of the current state of research and treatment of human remains in Finland, I want to address some possible new directions and how to balance keeping osteological research alive but also letting the individuals be reburied. Some of the directions might be using living individual data with consent or ethical approval, imaging the archaeological remains before reburial, or taking samples for future research before burial. I will shortly address these directions and what they might offer.

Imaging of living individuals

Since there are no contemporary skeletal collections in Finland, different types of images of living individuals have been used as a source of skeletal information. Mostly CT-scans, MRIs, and radiographs have been utilized for studying the sex and body size of individuals (e.g., Oura *et al.* 2018a; Oura *et al.* 2018b; Keisu *et al.* 2019; Junno *et al.* 2020; Maijanen *et al.* 2021; Oura *et al.* 2023; Maijanen *et al.* in press). In some of these studies, the data is from the Northern Finland Birth Cohorts (NFBC). These cohorts include a large collection of health data and biological samples. For example, NFBC1966 is comprised of individuals born in 1966 and the data has been collected since their 24th gestational week. Over 12000 babies were born to the cohort and the data also includes follow-up questionnaires at the age of 1, 14, 31, and 46 years. The individuals in the cohort were 46 years old in 2012 and over 10000 of them, who were still alive and had a home address in Finland, received an invitation to answer a questionnaire and to participate in a clinical examination (see more information Nordström *et al.* 2021). This voluntary follow-up examination included among other things MRIs of the lower back/lumbar region (e.g., Oura *et al.* 2018a; Oura *et al.* 2018b) and radiographs of the knee (e.g., Keisu *et al.* 2019; Maijanen *et al.* 2021).

In addition, other types of imaging data may be available for study if the research plan is approved by the Regional medical research ethics committee of the Wellbeing services county of North Ostrobothnia. For example, trauma patients' CT-scans were used for estimating sex from humeral and femoral heads (Maijanen *et al.* in press). In this study, the identity of the individuals was not known by the researchers, since the research coordinator at the hospital selected and pseudonymized the images before the data collection. The selected images could only be accessed and studied at the hospital. The utilization of images from living people will likely shift the focus of the research into more forensic related questions from bioarchaeology.

Imaging of archaeological remains

Since most of the skeletal remains excavated from the historical sites are reburied quite rapidly after the excavation and basic analysis, the possibility of preserving the remains for research by three-dimensional (3D) imaging has been discussed. This naturally requires some funds and equipment but would also enable more comprehensive research afterwards. This would allow the researchers to ask new questions in the future and to revisit old interpretations with new methods or just with a new pair of eyes. However, imaging is not unproblematic either and would require ethical discussions before executing on a larger scale (see BABAO 2019; Smith and Hirst 2019; Schug *et al.* 2021; Alves-Cardoso and Campanacho 2022; also the chapters of Bryson and DeLeon, and Campanacho and Alves-Cardoso in this book).

Sample collections

If the archaeological skeletal remains will be reburied after the analysis, Finnish archaeologists could consider taking bone and tooth samples for future research. We know that techniques develop, and we might get results in 20 years from DNA samples that did not yield results today. Thus, it might be useful

to take samples from the analyzed individuals before they are reburied. Naturally, this will require storage space and would require discussions on the ethics of extracting a sample from an individual whose other remains were reburied, storing the samples without specific questions in mind and not knowing whether they will ever be analyzed (see Squires *et al.* 2019 on destructive sampling). However, these samples might be useful in future research answering questions that we do not know yet. For example, a recent aDNA study revealed very interesting results of an early medieval grave from Finland (Moilanen *et al.* 2022b). The grave was found in 1968 and it has been interpreted to be the grave of a powerful woman with two swords. Only femoral fragments of the individual were preserved, and no osteological analysis was possible. The sex of the individual has been interpreted from the feminine clothing. In the recent study, aDNA analysis was made and the results suggest the buried individual was male with an extra X chromosome (XXY) and thus he had Klinefelter syndrome. This could explain why the grave goods are mixed, a sword and feminine clothing (Moilanen *et al.* 2022b). Without the DNA-analysis on the curated skeletal fragments this interpretation could not have been possible.

Conclusion

Human remains are studied more carefully for their scientific information nowadays in Finland. However, historical human remains are usually reburied quite soon after their excavations and basic analysis, thus limiting the research opportunities. The National Heritage Agency has guidelines for handling human remains and museums following the international guidelines of the ICOM. Due to the increased interest in osteological research, there is also more ethical debate on the respectful treatment of the remains in the Finnish context than ever before. Mostly the discussions concern the dilemma of curating and reburying and what they mean for the deceased, their descendants, and science. More open communication between different stakeholders and the public may help to navigate this difficult topic. More research on the interests and opinions of different groups towards human remains should be done, since the surveys and interviews so far have shown quite unproblematic reactions from the public in Finland. Thus, larger surveys on public opinions should be conducted to have a better understanding of how Finnish people in general see this complex issue. This might give us a more holistic approach to understanding the variety of views on death and human remains.

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Chapter 3

Conservation of poorly preserved human remains in US museums: Ethical considerations

Vanessa Campanacho

Introduction

The establishment of museological collections is intimately linked to our need to understand the world (Simmons 2018). Early collections in the 1400s were mere cabinets of curiosities comprising unusual assemblages, but by the 16th century, collecting efforts started to be linked to the production of knowledge (Simmons 2018). However, cabinets of curiosities remained popular until the 19th century. While their popularity has waned over time, they occasionally resurface. A notable example is the 'Cabinet of Curiosities' exhibit that was unveiled at the Science Museum of the University of Coimbra, Portugal in May 18, 2022 (Costa *et al.* 2022). In the 1970s, museums once more shifted their focus to better serve society beyond their traditional functions of collecting, preserving, researching, and educating (Brown and Mairesse 2018). The most recent definition of a museum, as provided by the International Council of Museums (ICOM), states: "A museum is a not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing." (ICOM 2022: 3). But museums are not a static reality. They continue to evolve in synergy with ethical discussions, their socio-political roles, public expectations and agency, and decolonizing practices. However, the pace and modalities of this evolution can differ by location and culture (Brown and Mairesse 2018). For instance, ongoing ethical debates among scholars and descendant communities concerning the collection of human remains are increasingly influencing changes in museums. These debates impact various aspects of museum operations, including the display, care, curation, storage, and research of human remains. This debate has been framed by a change of perspective among scholars in the last few decades, especially among anthropologists, including in the United States. Anthropologists have gradually changed from perceiving human remains as study objects removed from their context to perceiving them as individuals who lived in a specific social-political context with a continuous link to the living (Odegaard and Cassman 2016). This shift in perspective, as well as the advent of numerous ethical discussions - mentioned in more detail below - are also reflected in the gradual establishment and implementation of a code of practices and ethical policies in professional and academic organizations. In 1989, the World Archaeological Congress (WAC) adopted the Vermillion Accord on Human Remains at the WAC Inter-Congress in South Dakota, USA (World Archaeological Congress 2023). This was a first step toward a more ethical treatment of human remains, as it focused on respect for the deceased, their descendants, and communities. Afterward, the American Association of Biological Anthropologists (AABA - formally known as the American Association of Physical Anthropologists) in 2003 published its code of ethics for its members (AABA 2003). The AABA is currently expanding on a roadmap for the ethical study of human remains based on the opinions and feedback of descendant communities and members of the association (AABA 2023). In 2004, the International Council for Museums published a code of ethics with minimum standards for museum professionals regarding the acquisition, display, and study of heritage, including of human remains, which has been updated in 2017 (ICOM 2017). In light of this, for example, museums, including in the US, are now more likely to approach the display of human remains

with a greater awareness of the needs and concerns of different stakeholders and the descendant communities (Gazi 2014). Another prominent ethical discussion that is taking place, with great implications in bioanthropology and the museum sector, concerns the origin and manner in which a number of osteological collections have been amassed over the centuries. Scholars are now questioning, acknowledging, and slowly addressing the harmful and unethical practices of our predecessors. One example in the United States is the repatriation of Native Americans and Native Hawaiians after the Native American Graves Protection and Repatriation Act was passed in 1990 (NAGPRA - Ousley *et al.* 2005; Kakaliouras 2014; Martinez *et al.* 2014; Odegaard and Cassman 2016). The implementation of NAGPRA was not a smooth process. It resulted from decades of activism by Native Americans to regain their rightful status as the rights holders of their ancestral human remains and cultural artifacts (Kim and Steadman 2014; Martinez *et al.* 2014). Although NAGPRA has created the possibility of a collaborative relationship between Native Americans and anthropologists and has brought an indigenous perspective to the history of the United States, it has not been free of conflict, blockages, and frustration (Ousley *et al.* 2005; Martinez *et al.* 2014; Odegaard and Cassman 2016). Nevertheless, NAGPRA has been an important contributor in changing the perspective on how to care for institutionalized human remains in relation to descendant communities in the United States.

Another example reports to the anatomical collections. These collections amassed in the 19th and 20th centuries in a medical context were composed of the remains of some of the most marginalized individuals of the American society without their consent, such as African Americans, Native Americans, immigrants, and other marginalized groups. Anatomical collections have been the subject of several discussions that raised major ethical issues about their existence, curation, study, and repatriation (e.g., Nystrom 2014; Watkins and Muller 2015; Watkins 2018a, 2018b; Muller *et al.* 2017; Lans 2018; de la Cova 2019; Campanacho *et al.* 2021; Dunnavant *et al.* 2021).

The primary focus of this paper is to delve into a less explored topic in anthropological ethics within the scientific community: the curation of extremely poorly preserved individuals. Human remains in museum collections have varying levels of preservation, even, for example, between individuals from the same archaeological context. For some individuals, only one bone or a few bone fragments remains, and these may be heavily damaged on a macroscopic and microscopic level. In this case, the osteobiographic, morphometric, histological, and pathological information that can be obtained is limited. In fact, in research, poorly preserved individuals are frequently disregarded in favor of better-preserved individuals. The establishment of osteological collections is usually justified by their research and teaching potential and their contribution to the production of scientific knowledge. However, if extremely damaged individuals with very few bone elements are not being studied, it can be questioned whether it is ethically right for curators and scholars to retain them in museum storage. Thus, this chapter will explore the ethical ramifications of curating poorly preserved individuals. It will also be outlined specific guidelines for the management of poorly preserved individuals for research and teaching in US museums, building up from existing information for the general care of human remains. The primary purpose of this chapter is to discuss the curation of poorly preserved human remains within US museum policies, it can also be applied to some extent to other institutions that curate human remains, such as universities, galleries, heritage sites, research laboratories, churches, commercial archaeological units, and medical institutions worldwide. However, it is important to note that legal and societal rules pertaining to the handling of human remains can vary between cultures and countries (Giesen and White 2013). As such, there needs to be some awareness of the specific regulations and guidelines that apply in each context by professionals. The present discussion, which focuses on poorly preserved individuals, does not apply to Native American and Native Hawaiian remains governed under NAGPRA. Instead, it centers on non-living humans who are not in the process of, or under discussion, for repatriation from US museums.

Treating human remains with respect and dignity

The analysis of human remains provides a glimpse of humanity's shared history by providing information on the lives and death rituals of past communities with or without ties to living communities. Research of Human remains has provided data on diseases, migration patterns, diet, morphometrics, human evolution, demographics, genetic data, and molecular data. However, the ethical and practical issues of handling human skeletal remains are complex (Bowron 2003). These remains belonged to individuals who walked this earth with their aspirations embodied in specific social and economic systems (Squires *et al.* 2019a), just as we do now. We are connected to them through our humanity. Therefore, our research and curation procedures must be based on providing the respect and dignity that humans deserve. Human remains that are dehumanized, when not treated with respect and dignity, can signal a devaluation of the lives of others, both living and dead (de Tienda Palop and Currás 2019). But what exactly does it mean to treat human remains with respect and dignity? No universal answer exists to this question and, likely, one will never be reached. Respectful practices for handling the remains of individuals can vary greatly between countries, cultures, and religious groups (Brooks and Rumsey 2007; de Tienda Palop and Currás 2019). These practices can also change over time as belief systems evolve. In addition, the temporal distance between the deceased and modern society can lead to different emotional public responses and scientific approaches (Kilmister 2003; Brooks and Rumsey 2007; Gazi 2014; Alves-Cardoso and Campanacho 2022). However, as stated by Tienda Palop and Currás (2019), no matter how much time has passed, these individuals still deserve respect and be treated with dignity. There appears to be a general consensus among scholars that respect and dignity can be upheld by ensuring no harm or stigma is caused to the individuals studied and their communities (Fossheim 2019). While bioanthropologists play a prominent role in advancing scientific knowledge, the pursuit of science alone is not sufficient justification for researching human remains, especially if unethical paradigms and methodologies are followed (Alfonso and Powell 2007). As Giesen and White aptly stated, "Times have changed: research is now a privilege not a right; justification and, in most cases, consultation are prerequisites to research regardless of research techniques" (2013: 19). Dignity and respect may also require the repatriation and/or reburial of humans whose body elements have suffered a high degree of damage, and no scientific justification can be claimed for retaining them in museums. So, ultimately, treating individuals with respect and dignity may even entail refraining from performing research altogether and instead repatriating or reburying their remains.

Ethical considerations on the curation of extremely poorly preserved human remains in museums

Museums have a duty to preserve their collections for future generations (Malaro and DeAngelis 2012), including the preservation of nonliving individuals cared for in their facilities. However, in recent decades, governmental and philanthropic financial support for US museums has been declining (Kerlin and Pollak 2011; Malaro and DeAngelis 2012). One consequence of a precarious funding is the cutback in human and material resources, which in turn can jeopardize the curation, storage, and preservation of museological collections (MacFarland and Vokes 2016; Freiwald and Wolf 2019). Collection care is a costly and time-consuming process, but it is usually invisible to those unfamiliar with the process (Malaro and DeAngelis 2012). Thus, museum boards often prioritize marketing, new infrastructure construction, and public programs in their budgets, at the expense of collections care and preservation (Malaro and DeAngelis 2012). As museums struggle over fewer resources, there is a potential risk of neglecting the proper care and preservation of human remains, as improper storage conditions and handling can accelerate their physical damage (Bowron 2003; Cassman and Odegaard 2007a). Even when specialized staff is present, constant handling of human remains for research and teaching can result in damage and loss of elements (Caffell *et al.* 2001). Handling and storage damage can present as fractures, element losses, repairs and reconstructions, surface erosion, mold, delamination, and cracking of

the bone (Caffell *et al.* 2001; Bowron 2003). However, the level of preservation and completeness of human remains is also dependent on a multitude of taphonomic factors such as chemical breakdown, weathering, surface abrasion, and nonhuman biological agents before even being accessed into a museum. Postmortem damage on human remains can also be human-produced during exhumation and transportation (Bowron 2003).

Completeness and preservation of the remains also affect the collection of research data (APABE 2017), such as age, sex, stature, and pathological lesions. Less complete and preserved are the remains, less information about an individual is obtained (Bowron 2003). As a result, less complete and preserved individuals are often dismissed in favor of better-preserved ones. Some argue that even less complete and less preserved individuals can still contribute to existing data (APABE 2017). This is especially true if there is little information for less represented individuals from specific regions and periods (APABE 2017). The emergence of new technologies and methodologies allows for new types of analysis, especially in the field of genetics, which can potentially yield new information. For this reason, it has been argued that individuals should be kept in museums. As APABE states, "It is the unpredictable nature of scientific innovation which is one of the most powerful arguments for a consistent policy of long-term retention of collections" (2017: 43). Additionally, removing less preserved individuals can potentially introduce biases into the analysis (Brickley 2018). Another argument against deaccessioning human remains is that it would separate them from others in the same collection (Childs 1999). There is also fear that repatriation and reburial could become a more widespread practice, leading to the dwindling of collections, this fear was especially expressed before the implementation of NAGPRA (Kakaliouras 2014). However, if extremely poorly preserved individuals have a lower scientific and educational value and have been sitting in reserves for decades, overlooked in favor of better-preserved individuals, it can be questioned if the aforementioned reasons are justification enough to retain these individuals. Curating human remains in museums without serving the community may be considered unethical and may infringe on the dignity of a person through inactivity. Especially, as benign neglect and inactivity by curators and researchers may lead to public resentment and anger (Cassman *et al.* 2007). From an ethical perspective, the responsibilities of curation and care extend beyond legal requirements established for each state (Malaro and DeAngelis 2012; Woodhead 2013). These responsibilities serve to benefit the public and maintain their trust. As such, curators and researchers should act as 'ethical guardians' (Woodhead 2013: 32). Thus, for these cases, repatriation and/or reburial should be considered, even if it means the deaccession of extremely poorly preserved individuals from museological collections. Although further exploration is needed to understand public opinions in the US, two studies from the UK can shed some light on these perceptions. A study by Carroll (2009) reported that 70% of 220 museum visitors in the UK agreed that skeletons from archaeological contexts should be reburied. More tellingly, 71% believed that the decision to rebury should be left to archaeologists when they determined that specific individuals had no further scientific or research use. However, Carroll (2009) study collected public opinion from a small, self-selected group of museum visitors and may not be representative of the population at large. Furthermore, the issue is more complex than this, especially considering the unethical origin of many collections of human remains in the US and the importance of hearing the voices of the descendant communities on the matter of research and reburial. Another example, also from the UK, is the Museum of London, whose policy for the care of human remains states the deaccessioning and reburial of human remains deemed without research potential (Museum of London Human Remains Working Group 2011).

Guidelines for the curation and care of the poorly preserved human remains

Museums aim to curate and preserve their collections for the long term (Malaro and DeAngelis 2012), including institutionalized nonliving individuals. This has led to the establishment of curation and conservation policies for human remains followed by museums, including those in the US, such as the International Council for Museums (ICOM 2017) and the American Alliance of Museums (AAM 2021).

However, these policies often do not specifically address the management of poorly preserved individuals (i.e. those with only one or a few body elements that have suffered extreme taphonomic damage). In this chapter, it is argued that extremely poorly preserved individuals deserve careful consideration in their management. This section suggests guidelines for the treatment of poorly preserved human remains:

As a first step, record the level of preservation and completeness of each individual and record the date when the analysis was performed. This will enable curators and collections managers to identify poorly preserved and incomplete individuals, as well as the level of analysis that can be performed on each individual. For skeletal remains, the most commonly used standards for recording completeness and preservation by US institutions and researchers are those of Buikstra and Ubelaker (1994), which serve as the basis for the open-source Osteoware® software[1]. However, curators may consider other recording systems, such as those proposed by Rowbotham *et al.* (2017) and Brickley (2018), to record bone preservation and completeness. It is acknowledged that systematically recording the level of preservation and completeness for all individuals may not be feasible, except in cases where a major problem necessitates a full analysis of an entire collection (Cassman and Odegard 2007a). This is due to practical and financial constraints on resources. In such cases, it is recommended to record preservation and completeness for a portion of the collection, especially whenever an individual is handled for study or educational purposes. Cassman and Odegard (2007a: 34) emphasized the importance of conducting a baseline condition assessment, which involves regularly evaluating changes in collections over time since the last assessment. This will provide curators with some knowledge about the level of preservation and completeness of the collections they are responsible for (Cassman and Odegard 2007a) to the public and descendent communities. It is also recommended photographing the individuals in the anatomical position into digital repositories curated by the museum for future reference. This includes capturing images of problematic areas with deterioration concerns (Cassman and Odegard 2007a). Photographs should include the individual's collection number, the date the photographs were taken and a scale for reference (Cassman and Odegard 2007a). This visual record can help curators better assess any changes in preservation and completeness over time. Cassman and Odegard (2007a) also recommend including written documentation with clear and detailed language to report potential issues of concern. This can be done through a formal report or by adding notes to photographs or sketches reference (Cassman and Odegard 2007a). It is important to record any postmortem damage that requires further institutional investigation and attention, as well as any cleaning or previous treatments performed on the individual.

Whenever poorly preserved and incomplete human remains are used for teaching or research, it is important to systematically record the collection number and the date they were handled (Caffell and Jacob 2019). This will provide information on how often a specific individual has been studied. Curators and researchers should make an effort to incorporate the analysis of poorly preserved and incomplete skeletons for research or teaching, as appropriate.

A great focus by the institution should also be directed towards implementing preventive conservation policies and practices, including having them easily available to staff, researchers, students and volunteers (BABAO 2019; Malaro and DeAngelis 2012). This is important as improper storage conditions and improper handling are major factors of damage to human remains post-collection (Caffell *et al.* 2001; Bowron 2003; Cassman and Odegaard 2007a). Therefore, to better preserve the physical and chemical integrity of human remains and deter rapid deterioration, it is important to monitor and improve storage conditions, including environmental conditions and materials used (Bowron 2003; APABE 2017). Even when individuals are stored with high-quality storage materials, the latter will also deteriorate with time and will require to be replaced (Freiwald and Wolf 2019). Human remains

[1] Osteoware® is a free software created by the Smithsonian Institution in 2020 for data entry of osteological and paleopathological analysis. The software can be downloaded at: https://naturalhistory.si.edu/research/anthropology/programs/repatriation-office/osteoware

should be allocated dedicated storage areas, with each individual stored separately, except in cases of commingled remains (APABE 2017). In addition, curators and collections managers should familiarize themselves with curatorial best practices as suggested by BABAO (2019). Students and researchers should also become familiar with best practices for handling human remains and have available instructions on packaging human remains (Bowron 2003; Cassman and Odegaard 2007b). The sharing of previously obtained osteological, pathological, or genetic data from poorly preserved and incomplete individuals can potentially aid in their preservation. This approach minimizes the need for physical manipulation, thereby mitigating further damage.

After a period of 5 years, review the usage of poorly preserved and incomplete human remains for research and/or teaching. It is also recommended to note any further deterioration, establish potential causes for the damage, and implement treatments to rectify or at least slow down further damage (Cassman and Odegard 2007a) on the poorly preserved and incomplete human remains. The main goal of curation practices is to ensure the long-term preservation of collections for study. Performing condition assessments cyclically can help achieve this goal. This not only helps current curators improve their care, but also provides information to future stakeholders about damage, when it was first recorded, the rate of deterioration, and steps taken to slow it down (Cassman and Odegard 2007a). Although a 5-year review period is suggested, museums may choose to conduct reviews more or less frequently based on their available resources.

After another 5-year period, a second review should be conducted on the usage of poorly preserved and incomplete human remains for research and teaching purposes. If these remains continue to be unstudied, it may be necessary to consider and discuss the ethical implications of keeping them in the museum and potentially deaccessioning them. This decision should be carefully weighed and discussed among curators, museum directors, and community representatives. Alternatively, museums may choose to wait another period before reevaluating the use of these individuals for research and teaching. If the museum decides to deaccession poorly preserved skeletons, it is important to document them with photographs and descriptions before doing so. This will ensure that records of these individuals still exist and can potentially be used in future research.

Deaccession and disposal process of poorly preserved individuals in US museums

This section provides a general overview of the deaccession and disposal process of human remains, which can be applied for poorly preserved and incomplete individuals. Deaccession and disposal refer to different steps in the removal of human remains from a museological collection. Deaccession is the formal process of permanently removing accessioned collections from a museum database, catalog, or register, while disposal refers to the physical process of removing them from the custody of a museum (Malaro 1991; Malaro and DeAngelis 2012; ICOM 2019). Although the term 'disposal' may seem disrespectful when applied to human remains, it is a term used within museology to denote the physical removal of collections from their premises. In this context, it is used in this chapter purely as a technical term for scholarly understanding. Importantly, 'disposal' does not equate to unethical treatment of the individuals in question. The process of removing human remains from museums should at all times be conducted with the utmost respect to unsure their dignity, whether through repatriation and/or reburial.

The process of deaccession is not taken lightly by museums and researchers. In fact, it has been surrounded by controversy and debate, as museums have to consider their responsibilities to the public as safeguards of natural and cultural heritage and human remains (Malaro 1991; Malaro and DeAngelis 2012; University of the State of New York 2014). However, good museum management is not only related to the best accession policies (acquisition and registration), but also to the periodic

reevaluation of the collections and deaccessioning (Malaro and DeAngelis 2012; San Diego Museum of Man 2017). Cassman *et al.* (2007) advocated for a limited and careful accession of human remains into collections. Cassman *et al.* (2007) argued that since storage and care are expensive and time-consuming processes, accessions should be a thoughtful process that follows the institution's mission statement and collection management policy. Not all agree with Cassman *et al.* (2007). For example, the Maxwell Museum of Anthropology has a different approach. Although the latter recognizes the financial and space constraints, their policy is to receive all human remains that are presented to them. The Maxwell Museum believes this is a more ethical approach because it allows human remains to be properly curated in the museum or repatriated as appropriate, instead of being in private hands or commercialized (Edgar and Rautman 2014). Irrespective of accession policies, deaccession should be a well-thought-out and gradual process, with allocated decision-making authority and a well-documented record of all actions taken (Malaro 1991; AAMG 2017; Moser 2020). It should be fully considered on a case-by-case basis before implementation, in the best interest of the public in full accordance with federal and state laws (University of the State of New York 2014; AAMG 2017; San Diego Museum of Man 2017; ICOM 2017, 2019; AAM 2021). Additionally, it can be argued that deaccession can be performed to provide the utmost respect for extremely poorly preserved nonliving individuals who should no longer be in museums.

Deaccession is a complex process that can be based on a multitude of criteria. For example, it may be considered for deaccession if it is not being used for research, teaching, or exhibition, or if it is poorly preserved and incomplete (Malaro and DeAngelis 2012; Moser 2020). As such, it is important to gather the opinions of colleagues within and outside the museum, as well as public and descendant communities when deliberating on deaccession (Malaro and DeAngelis 2012; Robinson 2015; Moser 2020). Legal counsel may also be sought during the deaccession process, particularly if there are any issues with the accession records or if there is a lack of documentation (Moser 2020; AAM 2021), or if there are any legally binding restrictions against deaccession (Malaro and DeAngelis 2012). The International Council of Museums (ICOM 2019) recommends that museums be transparent in their procedures, from acquisition to deaccession, whenever possible. However, museums may have different policies for their staff to follow, especially as state and local laws can vary greatly (Edgar and Rautman 2014). As a result, it has been recommended that museums policies follow the guidelines established by certain associations, such as the American Alliance of Museums (AAM 2021), the Association of Academic Museums and Galleries (AAMG 2017), and the American Association for State and Local History (AASLH 2018). Even though the process of deaccession and disposal may follow different policies, there can be some common ground among museums.

Most museums are non-profit organizations run by boards of private citizens, with a lower number of federal museums controlled by the government (Malaro 1991). Non-profit museums have a broader range of powers including the deaccession and disposal of their collections under a governing board following the written recommendation of the curatorial staff and appropriate administrative and review committees (Malaro 1991; University of the State of New York 2014; San Diego Museum of Man 2017). However, museums may have to report to governmental institutions about their deaccessions. For example, museums in New York have to produce an annual report to the State Education Committee with a list of deaccessions (Moser 2020). Museums should follow a transparent process when updating their records, which will be kept in perpetuity, after a deaccession procedure has been approved. Besides all associated documentation, photographs, schemes, condition assessments, and anthropological data gathered while the human remains were accessed into the museum. Museum collection records should be updated to include the date of deaccession, all documents and information associated with the deaccession process including the authorization documents, and the method of disposal (Malaro and DeAngelis 2012; Moser 2020; AAM 2021), for access to museum personal, scholars and descendant communities. Records should also indicate if the provenance and/or identity of an individual set for

deaccession is known or unknown. If lacking, exhaustive research should be conducted to gather information about provenance (ICOM 2019). In this chapter, provenance refers to the geographic location, origin community, temporal context, and how human remains were brought to a museum. The absence of provenance information for poorly preserved and incomplete human remains can pose a challenge in the identification of descendant communities, and to involve them in the decision-making regarding the repatriation and/or reburial process. Analysis of archives is recommended as a first step to find provenance information through historical documents. If the archives search yields no results, a multi-isotopic and ancient DNA analysis may be considered to provide information about geographic and community provenance of the human remains (Bartelink and Chesson 2019, Weisse 2021). However, an isotopic and ancient DNA analysis requires bone destruction, which may raise ethical questions and be even considered a disrespectful and violent act towards the individual and their descendants (Squires *et al.* 2019b, Weisse 2021, Fleskes *et al.* 2022). Additionally, isotopic analysis in poorly preserved human remains may yield no results. Therefore, the ethical issues, emotional and financial cost and constraints of the isotopic and/or ancient DNA analysis must be taken into account by museum personal before proceeding with a destructive analysis to determine provenance.

The disposition process of human remains deemed poorly preserved should be done through repatriation and/or reburial upholding the highest ethical standards. Repatriation can be directed towards the legal next of kin, descendant community, estate, territory or country of origin (AAM 2021). However, not all individuals repatriated will be reburied (Clegg 2013). The repatriation process is more than just returning individuals to their communities; it may also serve as a healing process by returning ancestors to the care and control of their descendant communities as the rightful holders (Clegg 2013). Museums should ensure suitable packing and transportation for the disposal process (Moser 2020) and also consider the monetary costs and funding for the repatriation and reburial of human remains. It is also important to note that it can be difficult to replicate the funerary rituals an individual had after his death, especially if those rituals are no longer practiced in modern times. Even when the funerary ritual is performed nowadays, it will never fully replicate the original ritual, as the individual's immediate family and friends will most likely not be present, and the reburial will not be performed in the exact location from which the individual was exhumed. Nevertheless, curators should always bestow respect and gratitude. Museums must work closely with communities, and religious, secular and legal authorities to determine the appropriate course of action and ensure that the law, cultural practices and beliefs are respected and followed (San Diego Museum of Man 2017). As a final step, in the interest of transparency, museums may consider notifying the public of their deaccessions and disposals through press releases and notifications on their websites to reassure the public that they remain committed to their mission and the best interest of the public (Moser 2020).

Conclusion

This chapter explored the ethical considerations of curating poorly preserved and extremely incomplete human remains in museum collections in the United States. The limited information that can be obtained from poorly preserved individuals and their exclusion from research in favor of better-preserved individuals brings a moral dilemma about why they are being kept in museum collections. Guidelines were suggested to ensure better conservation and management of poorly preserved and incomplete human remains, which involves a periodic re-evaluation on a five-year interval of their preservation and whether they have been studied during that period. This can eventually culminate in their deaccession and return to their communities if they are not used for scientific purposes. The process recommended in this chapter is quite conservative, as it involves a decision that will take at least a decade to reach about the curation of poorly preserved and extremely incomplete human remains. Furthermore, it is argued that all records and documentation associated with them should be

retained by the museum, even if the human remains are repatriated and/or reburied. This will allow for information to still be available not only for researchers but also for the community and public.

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Chapter 4

Addressing Improper Curation of Human Remains in Medico-Legal Contexts

Kristy A Winter and M. Elizabeth Dyess

Introduction

The management of the deceased requires that all necessary measures be adopted to ensure their identification and traceability from the recovery, storage, and through transportation to their final resting place. Remains may then be held for months, or even years, prior to their final disposition (Salado Puerto and Tuller 2017). More often remains are held on a temporary basis for the purposes of identification within a medico-legal system and/or judicial proceedings (Salado Puerto *et al.* 2021). During which remains may be subject to conditions and actions that inadvertently expedite decomposition or jeopardize the possibility of obtaining a positive identification. Both risk causing the families of the deceased further undue harm. In mass fatalities, the unexpected number of the deceased entering medico-legal systems can overwhelm or collapse the system resulting in poor practice and reduced care for the deceased, as previously seen with recent pandemics and conflicts (Corpuz 2021; Morcillo Mendez 2024; Salado Puerto and Tuller 2017). Without proper planning, government support, and resources, the possibility of returning the deceased to their loved ones may be lost. In extreme circumstances, remains may be lost, buried in mass graves, or cremated without identification (Salado Puerto and Tuller 2017).

At any point from recovery to the final disposition, and even after, the remains can be stalled or separated from the medico-legal system (Figure 1). This chapter aims to address the situations, severity and implications of the improper curation of the deceased within a medico-legal context and propose situationally dependent recommendations to avoid the potential loss of the individual and their identity, establish continuity of care and uphold the dignity of the deceased (Finegan *et al.* 2020).

Ethical considerations

It is necessary that a bridge be built between ethics and standards of practice (Carew *et al.* 2023; National Academy of Science 2009). It is the responsibility of those overseeing the care of the deceased to act in the best interest of not only the deceased, but their next of kin and community. However, focusing only

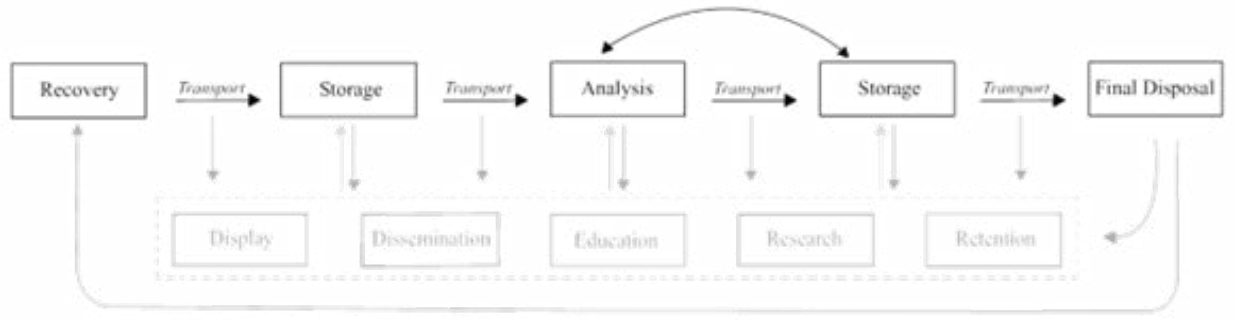

Figure 1: Simplified overview of the medico-legal system pathway, highlighting the possible situations of separation from the medico-legal system. Illustration by Studio Artis Humanae ©.

on the practitioner-level introduces individual bias and can ignore the inherent practice bias from the structural-level (Dror 2020; Ward and Syverson 2009). Therefore, an integrated approach at all levels is required.

It is important to note that ethics have been proposed and implemented that intersect with those outlined in this chapter. The intention of the authors is to provide a cohesive account of current practice and call attention to practices that continue to put remains at risk, while acknowledging the literary contributions that serve as foundations for this chapter. It is paramount that any action taken to identify the deceased is justifiably necessary and does not violate social, cultural, religious, or kinship demands and rights.

Current Practice

The current disciplinary landscape has highlighted the inadequacies of current ethical guidelines and laws, as well as a divide in the behaviour and perceived responsibility of experts (Adams *et al.* 2022; Dunsworth 2021). What may be lawful or minimally required, may not necessarily be ethical or sufficient (Dunsworth 2021; Thompson 2001). As more evidence of misconduct comes forth, organisations, institutions and professionals are making efforts to rectify the harm caused by past, poor practice (American Anthropological Association 2021; Dunsworth 2021; Kiefer 2022). However, there has been limited cohesive development of ethical conduct in relation to the storage of human remains that can be applied to all countries and situations. Granted, uniform standards, procedures, methods, or codes of conduct do not equate to complete uniformity or acceptance (Márquez-Grant *et al.* 2016; Winter, 2019). No proposed ethical code, framework, or legislation is static or independent, future ethics are yet to be developed, contextualised, and are desperately needed (Dunsworth 2021; Gazi 2014).

Guiding Frameworks

An additional avenue to approach discussions of ethical conduct is through the application of theorised frameworks. Three broad frameworks on ethical decision making (The Consequentialist Framework; the Duty Framework; and the Virtue Framework) have been proposed (Alexander and Moore 2021; Hursthouse and Pettigrove 2022; Sinnott-Armstrong 2014). The level of attention and critique that each framework has received has allowed for considerable progress to be made in recognising the various circumstances that may enact harm upon the deceased. For this reason, it is paramount that such frameworks underpin disciplinary guidelines and inform associated legal obligations.

The Virtue Framework focuses on which virtues should motivate decisions for specific situations. It is important to recognize that empathy - the ability to understand and share the feelings of another (Oxford Languages 2023) - is one among many virtues that require a place in forensic science (Carew *et al.* 2023). Grief from ambiguous loss is widely recognized as a source of enormous suffering for the surviving loved ones (Boss 2016; Salado Puerto *et al.* 2021). Having the ability to understand and feel the suffering of others, is necessary to ensure that consideration for loved ones is placed at the centre of practice; “Is this process in line with what the loved ones would want?”.

Empathy has guided some of the duties and obligations that custodians abide by and demonstrate through the Duty Framework. Duties are dependent on the context (geographical location, recognition of the deceased, cultural and religious influence, legal system, etc.), with some contexts imposing rules that are harmful to the deceased’s identification and/or return to their loved ones, i.e. mass burial, limited or no documentation, cremation rather than burial, sampling, etc. For situations where mandated procedures are conflicting or cause more harm, mitigation measures may be adopted to lessen the harm, or adjustments to the procedures may be proposed by experts.

The final framework that could be applied, the Consequentialist Framework, relies on the direct and indirect effect it will have on stakeholders. The deceased (under the recognition of conscious life) are arguably unaffected by the storage of their remains; however, their mourning loved ones/community are deeply affected by the way the deceased are stored – especially indefinite storage without consent. Regardless of the process or type of storage applied, if the wishes of the deceased or their loved ones are not considered, they can be negatively affected (trauma) until final disposition or after.

Storage

Plans for short-term or long-term temporary storage after recovery must be put in place until the final disposition of the remains. During their storage, the focus should be on the analysis of the remains for scientific and legal identification, to allow for mourning and placement in their final resting place (Salado Puerto *et al.* 2021). Despite contexts, such as mass fatality events, having set procedures, not all procedures adhere to recommendations or take into account the dignity of the deceased (Al-Dawoody *et al.* 2021; Go and Docot 2021).

Preservation of remains during storage becomes a key consideration for the increased possibility of identification. Without intervention, decomposition of remains can accelerate and can result in loss of information required for identification (Owen and Lynch 2016). Interventions such as refrigerated mortuaries and transport, body-bags and alternatives, adapted post-mortem examinations, streamlined medico-legal processes, embalming, and adequate resources are not always available or incorporated (Finegan *et al.* 2020; New Zealand History 2023). Hence the push for short-term storage of the remains before their final disposition. However, short-term storage of the remains may become long-term storage. In many contexts, long-term storage for delayed identification is required due to the limited resources available to authorities, communities, or forensic services at the time of death (MacGregor *et al.* 2021; Salado Puerto *et al.* 2021). Sometimes, the wishes of the loved ones include long term/indefinite storage or retainment of the remains for the benefit of location security, research, and education. The informed consent for these conditions is paramount and can act as a 'final resting place'.

Forensic Cases

Remains intended to pass through a medico-legal system can be pertaining to forensic interest and may fall into this category of practice. It is acknowledged that some remains that should pass through a medico-legal system may never receive that chance.

Remains under medico-legal investigation are subjected to high legal and scientific standards and procedures to ensure chain of custody, documentation continuity, and to withstand scrutiny in criminal/ judicial proceedings (the United Kingdom's Human Tissue Act 2004 for example). This is a regular domestic procedure and achieved to high-quality standards in most contexts. However, this has not always been the case, with some individuals, personal effects, or samples falling into undefined storage. A recent example is that the remains of at least one individual from the 1985 MOVE bombing (an active forensic case) were stored at the University of Pennsylvania Museum, included in their education curriculum which decontextualised them from their medico-legal context (removed from regular medico-legal procedures) and concealed from their families until recently (Adams *et al.* 2022; Dunsworth 2021). Another example is the temporary 'loss' of a body from the Chicago Cook County morgue (Chicago Tribune 2007). In these situations, forensic related remains can be retained for unjustifiable amounts of time without the consent of the loved ones, due to pitfalls within the medico-legal system, overwhelmed capacity, limitations in ethical recommendations, and inadequate individual behaviour. Similar situations must be avoided to reduce the harm to the loved ones, with an efficient medico-legal structure ensuring the non-delay of mourning and final disposition (Salado Puerto *et al.*

2021). All remains, and associated material, should be well documented and discussed with the loved ones to ensure desired final disposition/mourning.

Unidentified Human Remains

The delay, or inability to provide identification to a set of human remains has long been identified as a global public health crisis, affecting medico-legal systems and loved ones of the deceased (Suwalowska *et al.* 2023). In Australia alone, with a comparatively well-functioning and resourced medico-legal system the number of unidentified remains continues to grow despite the absence of mass fatalities (Australian Federal Police 2023; Winter 2019). Whereas overwhelmed and under-resourced medico-legal systems can fail to maintain an identification process for every individual. Individuals have been deposited in commingled mass graves, left in places of death (sometimes with partial identity details), cremated, or buried in single unmarked graves (Amnesty International 2022; Finegan *et al.* 2020; Go and Docot 2021; Koshiw 2022; Salado Puerto and Tuller 2017). Practitioners should aim to ensure that every effort is made to identify all individuals that pass-through medico-legal systems, and to return them to their kinship, even if years later.

Separation of Elements and Effects

There are examples historically and recently where an individual, or parts of an individual, have been separated and 'reduced' to their element (Adams *et al.* 2022; De Leon 2015). For example; the removal of a migrant individual's hands for fingerprinting without the loved ones' knowledge (De Leon 2015), or the separation of hands from the Marchioness Accident victims without record of the removal (Walker and Mallet 2011). Another example is the removal of a woman's bones that were then used for educational models (Markovic and Marković-Živković 2010). While separation can be necessary for analysis, at the point of notification of death to families all remains, samples, and separated elements should be disclosed and returned for final disposition.

With long-term remains, body elements of individuals may have been separated into different storage units with limited documentation. This can obscure the origins of the remains and decontextualise the individual, with a potential loss of identity. Reassociation of an individual can become a challenging exercise in the presence of limited documentation. There have been attempts to reassociate skeletal elements through genetic testing, osteometric pair-matching, reunification of unique numbers, and grouping of remains of like-taphonomy, with each method becoming increasingly less reliable and with limited success (Bonthorne 2021; Čakar *et al.* 2018; Harries 2016). The only preventative measure is the thorough documentation, labelling, and a robust information management system before temporary separation.

Sampling of Biological Material

Sampling from individuals for further analysis (genetic, isotopic, etc.) is a standardized practice within the realm of identification, with many standard operating procedures outlining the process within a single medico-legal structure (ICRC 2019). These standards tend to outline procedures for procuring the sample from the remains, documentation of the sample, labelling, storage, etc. However, there may not be procedures in place for complicated situations; transport of samples across borders, between medico-legal systems, or the return of the sample to the individual – this can be culturally or religiously important for the kinship (Al-Dawoody *et al.* 2021). Separating samples from the source introduces the risk of loss, broken chain of custody, reduction of result quality, and sample destruction.

Destructive sampling or analysis can be necessary for identification, but can conflict with legal obligations, cultural and kinship wishes (APABE 2023; Congram and Finegan 2022). Additionally, in criminal /judicial proceedings, destruction as a consequence of procedure for analysis prevents further testing and quality control, questioning the validity of results (Rollingwood Acres, Inc. v. Rhode Island Department of Environmental Management. State of Rhode Island and Providence Plantations Providence Superior Court, C. A. PC-2014-1339, 15 Dec 2014). Consultation of all stakeholders should be undertaken before sampling, with priority on non-destructive methods or reducing the amount of destruction, with every step and result of the process heavily documented and recorded in multiple formats for future reference and quality control (APABE 2023; National Institute of Justice 2023). The results should be protected, and can be shared between medico-legal systems if required.

In all sampling, a mitigation process should be applied. Consent should be obtained before sampling (where possible), analysis should be completed locally by accredited institutions (where possible), or samples should be accompanied across borders and ultimately returned to the source to ensure chain of custody. The indefinite storage of samples and destructive analysis should be questioned, and the storage of the analysed results and associated metadata should be protected (Finegan *et al.* 2020). Sampling without sound justification or clear benefit (such as near-immediate identification of the individual), is not recommended. Additionally, the sharing and dissemination of information has not been outlined or accepted by authorities or forensic experts on a larger scale. Each institution, context, authority, and practitioner often has their own procedure or ethical code of conduct, with little consistency among them.

Likeness of the Remains

Copies, models, or replications can be made of the human remains during analysis to further assist identification. Culture can dictate whether the likeness of an individual or object is equivalent to the original (The Ship of Theseus Paradox) (Isaac 2015), however, this cannot be broadly applied across all situations. Posthumous casts have been made of individuals for educational purposes, as well as for identification. There are examples of post-mortem facial casts with partial identity details created for medico-legal investigations, that have been left in storage indefinitely without documentation (Collection Custodian M.E. Dyess, personal communication, August 19, 2023). The replication of the deceased's likeness could be visually identifiable, even though the object is not the person and may not be treated in the same regard as the remains.

Furthermore, advances in technology have provided the avenue for collections of 'virtual' remains. While there are several benefits to the emergence of 'digital' collections; such as increased accessibility, continued access, non-invasive creation, increased visibility, isolation of elements, comparatively inexpensive, limited delay in final disposition, and increased capacity for sharing (Blau *et al.* 2008; Carew *et al.* 2018; Cordner *et al.* 2011; Reynolds *et al.* 2017; Winter *et al.* 2021). The replication of human remains, associated information, and virtual models, raises concerns regarding the protection and management of this data, particularly in the medico-legal context (Carew *et al.* 2023; Congram and Finegan 2022). As mentioned previously, the virtual replication of remains implies that they are still human remains, just in a different format (Isaac 2015; Winter 2019). Thus, concerns that apply to physical human remains also apply to virtual remains.

All forms of information about an individual, including their likeness, could be individually identifiable information. Replications, copies, representations, and all associated information that have been collected, stored, and analysed should have specific protocols (Isaac 2015; Salado Puerto *et al.* 2021; Ulguim 2018), especially for the management and protection of the data on the deceased (Finegan *et al.* 2020). These protocols should include specifics about the access (who, when, how), use (what will

the information be used for), data storage (including length of storage and modality), consent, data ownership, intellectual property, archiving, deletion process, and information security (software and hardware) (Márquez-Grant and Errickson 2017). If information must be shared between teams, organisations, institutions, or authorities, procedures should be in place for the alignment of consent and information procedures, and risks to privacy and security.

Temporary Burial

One solution proposed for under-resourced medico-legal systems is the temporary burial of individuals in single graves with documentation for future exhumations and further analysis (Finegan *et al.* 2020). However, those exhumations may never happen and might go against the local religious, spiritual, or cultural wishes, or require additional resources (Al-Dawoody *et al.* 2021). In the cases of temporary burials, or even clandestine and ad hoc burials, the thorough documentation of the individual (GPS coordinates, photographs, fingerprints, DNA samples, etc.) prior to burial under a grave marker in an allocated single grave under the care of the authorities is paramount (Forensic Guardian International 2023; ICRC 2020). Even in emergency situations, single graves are recommended (Finegan *et al.* 2020; ICRC 2020), although if mass graves are used, an effective, dedicated, and tailored information management system (separate from a database) is a vital component in the identification process and contextualisation of information (Salado Puerto *et al.* 2021).

Unclaimed Human Remains

In some cases, if the loved ones/community are not in a position to receive human remains, are unaware of the death, are not linked to the identified remains, or if they themselves are deceased – the remains are considered "unclaimed". There are limited recommendations for unclaimed remains in the medico-legal context, with decisions being made by individuals without guidance or familiarity with the moral and ethical implications. Some decisions being their reburial, cremation, storage in collections, inclusion in educational material, donation, or selling of the remains.

One avenue previously explored for unclaimed remains – with some previous literature justifying the practice (Coelho and Caplan 1997) - is the offering of these individuals by some state authorities to educational or research institutions (depending on the country). Presently in the United States, legislature regarding the "unclaimed" varies by state. In the Los Angeles County jurisdiction, after three years unclaimed remains are honoured with a ceremony and buried in a single non-denominational mass grave (Los Angeles County 2022). Most often, if the state, county, or country does not allocate funds or provide provisions for the disposition of the unclaimed, they are donated to medical institutions or other research facilities (Quinet *et al.* 2015; Winter 2019). Provided that the unclaimed are disproportionately minority groups and low socioeconomic individuals (migrants, ancestral minorities, those affected by addiction, and those who suffer from poor physical or mental health, and the prosecuted or executed) or otherwise institutionally vulnerable (Coelho and Caplan 1997; Quinet *et al.* 2015), using these individuals can perpetuate violence against historically victimized populations (Dunsworth 2021). Continuing the micropolitics of marginalized individuals.

As a primary step, the next of kin of the unclaimed should be sought and consulted on their wishes for final disposition. In the absence of these wishes, the remains should be included in the authorities' Unified Registry of Unidentified/Unclaimed Persons, with a unique file number, for future reconciliation (Salado Puerto *et al.* 2021). Considering possible logistical constraints, such as limited access to long-term temperature-controlled storage facilities, the individuals may be buried under a grave marker in an allocated single grave under the care of the authorities with extensive documentation (per Temporary Burials), to serve as a temporary resting place. In the case of the local preference for cremation,

the remains should be extensively analysed and documented prior to cremation for possible future identification; and stored in an urn in a long-term storage facility for future retrieval under the care of the authorities.

Final Disposition

After the identification of the remains and the notification to the loved ones, the decision on the final disposition of human remains will vary according to local, cultural, and religious context. The wishes of the deceased and their loved ones for the final disposition of the remains should be upheld where possible, including during emergency situations (Corpuz 2021; Finegan *et al.* 2020; Wall and Lidwell-Durnin 2012).

Repatriation

The return of an individual to their kinship is dependent on the situation (conflict, domestic, etc.), policies, resources, religious expectations, documentation, identification, legal obligations, and wishes of the kinship. Sometimes there are limited opportunities for the repatriation of remains; either due to governance, contextual situations like a pandemic, or a lack of resources (Dunsworth 2021; Masarwa 2022; Stantis *et al.* 2023).

Contemporary repatriations during conflict are increasingly challenging due to the unstable and unsafe nature of the conflict. Contemporary procedures should uphold the states' obligations to the Geneva Conventions – the search for, identification, and return to loved ones (Geneva Convention I Articles 15-17; Geneva Convention II Articles 18-20; Geneva Convention III Article 120; Geneva Convention IV Articles 129-130; Additional Protocol I Articles 33-34; Additional Protocol II Article 8). This then applies pressure for the search of remains in active weapon contaminated areas for their transfer across front-lines, in exchange for remains of their own (Marson 2023). This places the recovery Military Units at risk, with some units not having the appropriate training, struggling to adapt to the ethical and legal considerations, or the scientific knowledge for complicated recoveries (Congram and Finegan 2022; Márquez-Grant and Errickson 2021; Marson 2023). If immediate recovery is not possible, the time between death and the resolution of the final missing person increases. Remains can become historical or even archaeological (e.g., World War I). Situations of repatriation post-conflict can be further complicated due to the reduced amount of information available for identification. Thus, a multi-disciplinary approach with an integrated line of evidence methodology (DNA, personal effects, historical records, isotopes, anthropological analysis, etc.) and kinship focused repatriation is required (Salado Puerto *et al.* 2021; MacGregor *et al.* 2021). Lee and Dong, in this edition, provide additional information and an example in this regard.

Post Final Disposition

Ideally, after identification and final disposition of an individual they have reached their final resting place. However, this is an imperfect assumption. There are countless examples of removal of individuals from their final resting place for various reasons (additional elements found, misidentification, archaeological research, rescue, scientific inquiry, education, trade, display, repatriation, etc.) (Al-Dawoody *et al.* 2021; Cardoso 2006; DeWitte 2015; Halling and Seidemann 2016; Graham *et al.* 2022). It is not within the scope of this chapter to thoroughly address these situations; however, the authors acknowledge that this is a possibility, and is practiced with archaeological remains. It is recommended that the wealth of research and recommendations, combined with the legal obligations and codes of practice for the situation are consulted to ensure a high standard of ethical practice can be achieved

(DeWitte 2015; Dunsworth 2021; Gazi *et al.* 2014; Graham *et al.* 2022; Jean-Nabbache 2022; Stantis *et al.* 2023; Squires *et al.* 2021).

Recommendations

As demonstrated above, individuals who pass through a medico-legal system are at risk of being subjected to varying degrees of care. While ethical conduct can be proposed through guidelines, recommendations, considerations, legal obligations, frameworks, and codes of practice, this provides an illusion of control over the issues (Dror 2020). There is no true consensus on the issues and conduct and no possibility for global uniformity. Recommendations and considerations should be contextualized as social and cultural contexts influence practice regarding the deceased (Blau 2009), thus this chapter can only provide recommendations for the consideration regarding the curation of remains within medico-legal structures. As per the literature and the three frameworks explored, the following recommendations have been proposed for contextualisation and minimisation of negative impact:

- Integration of available guidelines, recommendations, considerations, legal obligations, frameworks, and codes of practice should be contextualised and applied to each medico-legal system.
- The deceased and their loved ones should be central to the process, even if they are not yet identified, to ensure their wishes are considered, and ensure continuity of care and dignity for the deceased.
- Individuals should be identified through an integrated multidisciplinary approach and their kinship sought for their final disposition, with minimal delays (temporary short-term storage).
- Implement consistent and rigorous standards for the documentation, labelling, and protected storage of data, to prevent decontextualization of the remains (and associated elements) from the medico-legal context.
- Every individual, separated elements, replicas, records, and samples require Unique File Numbers for traceability and integrity of the information.
- For Unidentified and Unclaimed remains, they should be registered into the Unified Registry of Unidentified/Unclaimed Persons.
- Sampling, separation, or replication of remains – either physical or digital – should have sound justification, clear benefit, be heavily documented, and maintain a chain of custody.
- The loved ones should be informed of all sampling, replications, and separation of parts of the deceased at the point of Notification of Death, with all elements returned to the individual prior to their final disposition.
- Prior to temporary burial, ensure thorough documentation of the individual (Unique File Number, GPS coordinates of the grave, photographs, fingerprints, DNA samples, etc.), and allocate a single burial with a grave marker under the care of authorities (Forensic Guardian International 2023; ICRC 2020).
- Development of an information management system for the protection of information from every individual, separated element(s), replicas, records, and samples are required, with consideration to the needs and desires of kinship and community.
- The information management system must include specifics about the type of information, access (who, when how), use (what will the information be used for), data storage (including length of storage and modality), consent, legal obligations, data ownership, intellectual property, quality control, archiving, deletion process, resources (funding, etc.), and information security (software and hardware) (Márquez-Grant and Errickson 2017; Salado Puerto *et al.* 2021).

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Section II

Digital ethics in biological anthropology

Chapter 5

Human Remains on Social Media: Education or Exploitation?

Susie Johns

Introduction

Human remains have long been a stalwart of archaeology and integral to representing the past within museums. Although this brings its own ethical issues (Curtis 2003), the launch of archaeology into the digital age has created a novel anthology of additional contentions to consider. There is a notable disparity between guidelines for displaying human remains in physical settings such as museums and sharing images of similar remains online (Williams and Atkin 2015). Dennis (2020) highlighted that assuming that equal ethical practices in museums, universities and research facilities automatically apply in digital venues and contexts is false. This suggests that cyber curation detaches from the ethical fundamentals for archaeology and heritage professionals dealing with the dead, listed by Brooks and Rumsey (2008) as respect, dignity, culture, religion and ownership.

The broad access to images and themes of death and mortality online mirrors a growing trend in documentaries about serial killers, dark tourism destinations becoming mainstream and using disturbing images for entertainment (Oosterwijk 2017). Current Western society appears to be becoming desensitised towards themes previously considered taboo (Mrug *et al.* 2015) and fascinated with the macabre side of human life. Foltyn (2008) even labels corpses "as the new sex": a commodity which can entice consumers and boost audience figures. Bodies and Academia (2016) outlines the risk that using grotesque images to attract attention can make a disrespectful spectacle of human remains. The balance between encouraging the public to engage with archaeology without it descending into 'spectacle' is what archaeologists, and other professionals disseminating their work with human remains, need to find.

This surge of reverence for all things macabre is beyond the scope of this research; however, the ethics of exploiting it or contributing to its growth is at its core. This research concentrates on human remains in the heritage sector. However, the findings, particularly the recommendations, could be applied to those in other fields, including medicine, forensic anthropology and ethnography. While the intentions of archaeologists, historians and museum curators may be to use images of human remains to educate, there is a risk that these will be reused by secondary pages less ethically, focusing on the morbid and sensational rather than the scientific and historical aspects of the story. In contributing such images to be openly accessible online, this research considers whether heritage professionals risk betraying the fundamental human rights still applicable to these deceased individuals (Moon 2019).

Archaeology on the Internet

Williams and Atkin (2015) recognise that the archaeological dead increasingly populate various media types and query the lack of investigation around this phenomenon carried out by archaeologists. The benefits for heritage professionals of using the Internet to engage with the public are many and varied (Renfrew and Bahn 2004). Social media is globally accessible and offers information exchange opportunities for archaeologists with relevant professionals, keen amateurs, and the general public. As of July 2020, Archaeology Magazine's Facebook page (Archaeology Magazine 2020) has 2,069,545 followers,

while the ArchaeologyUK page (ArchaeologyUK 2020) attracts 12,925, indicating the popularity and reach of the subject.

From blogs giving real-time dissemination of excavation finds, to promoting exhibitions and events, social media is an obvious vehicle for reaching out and drawing in those who may not traditionally access excavation reports and interpretation (Errickson and Thompson 2019). Disseminating archaeological research through social media meets the framework for what Richardson and Almansa-Sánchez (2015) consider public archaeology. Thus, using social media to promote archaeology and other applicable professions is a valid and legitimate exercise; however, the sector must address the controversies this evokes when the research includes human remains, as considered in this chapter.

Current Guidelines

Despite stringent guidelines for institutions handling, curating, and displaying human remains, the specific issue of sharing images on social media is, at best, briefly mentioned but more often omitted entirely.

The Human Tissue Act (2004) relates only to human remains under 100 years old, requiring those curating them to obtain a license and maintain quality-assured standards. The complementary Code of Practice issued by the Human Tissue Authority (2017) states that images are beyond the scope of the Human Tissue Act; therefore, there is no governance for their public display or use.

The Guidance for the Care of Human Remains in Museums explicitly mentions the photography of remains for educational and general museum use, suggesting institutions "consider the views of cultural communities and genealogical descendants" (Department for Culture Media and Sport 2005: 20). This paragraph does not mention sharing the images in the public domain nor the implications of the global online community having unadulterated access to them. The section goes on to suggest physical remains and, by proxy, images of them "should be displayed in such a way as to avoid people coming across them unawares" (Department for Culture Media and Sport 2005: 20).

The British Association for Biological Anthropology and Osteoarchaeology's Recommendations on the Ethical Issues Surrounding 2D and 3D Digital Imaging of Human Remains (BABAO 2019) contains the most comprehensive section around display and handling, outlining two variables for consideration. While the first, about situational conditions, is limited in their relevance as local sensitivities and consultation do not apply to posting on a global forum, the second, the nature of the individual depicted, is universally pertinent. However, the current research demonstrated that BABAO's inclination not to share images where the circumstances of death are particularly sensitive, such as genocide, was not unanimously adhered to by Facebook users. The guidance addresses the extent to which remains are directly accessed online, suggesting a warning message for the user to click before viewing the image. Although the document does not mention specific contexts for this suggestion, it is reasonable to infer that the guidance could apply to the Facebook 'covered image' function described below. However, only Facebook can apply the warning screen to posts and images. Their Community Standards (Facebook 2020) list the circumstances required to prompt this action, limited to "dismemberment, visible internal organs, partially decomposed bodies, charred or burning people, victims of cannibalism and throat-slitting". Most posts recorded in this research sample would not be eligible to follow BABAO's advice as they would not fall under these criteria.

Pollard (2016) is adamant about providing trigger warnings to archaeology students in recognition of the adverse effects viewing human remains of any kind can have. Considering trigger warnings and strict safeguarding of images and remains is increasingly common practice for students deliberately

choosing courses featuring work with human remains or photos of them, it is absurdly incongruent that the same consideration for the emotional well-being of the general public online is not applied.

Research Methodology

Ethical Considerations for the Research

Neuendorf (2020) suggests that gauging public opinion on current issues through internet-based content analysis can be a proxy for more traditional public opinion polling. This method was used in the current research to avoid showing participants images of human remains, instead using only pre-existing content and comments. This required recognition that the opinions expressed by personas represented on social media may not honestly reflect their 'real-world' morality (Kerrigan 2007). The identities of all pages, posters and commenters were anonymised and redacted from this chapter.

Why Facebook?

Although social media platforms share a similar framework of content and interaction, Facebook was chosen for two reasons. Firstly, the variety in content type and using groups and pages as organisational structures to access content relevant to individuals' interests. 'Liking' a page will enable posts from it to appear on the user's newsfeed, the platform used to view and interact with content (Abrahm 2016).

Secondly, Facebook has a broad demography of users and is the most extensive global social network, with 2.7 billion people, 35% of the world's total population, using the platform monthly (Clement 2020).

Profiles, Pages and Posts

A hundred posts from across six-page categories were analysed using a purpose-made researcher profile which 'liked' relevant pages. All images and text analysed were seen on the primary level of the profile's newsfeed, with no effort needed to seek them out.

Pages to 'like' were selected based on the likelihood of featuring human remains and were grouped into six categories:

- operated by a specific museum curating human remains
- general interest in history
- archaeology specific, often run by a commercial unit or project
- history or archaeology-based humour
- operated by news agencies
- featured 'interesting' (or a synonym) stories

The criteria for selecting posts were (1) they included an image of human remains of any type, (2) they were visible on the newsfeed between 13th December 2019 and 31st May 2020. Ncapture and Nvivo were used to capture and code posts and comments for analysis. The number of posts was not equally distributed across the categories; therefore, the data shown in the tables below are recorded in actual numbers and percentages of the category total to enable valid bilateral comparisons.

Table 1 - Image analysis. The images were coded according to their attributes to enable comparisons to be made between those with different attributes from the same Facebook pages, or the same attributes from across the page types. These findings are detailed below for juvenile remains, those with soft tissue, modern remains and those identified by name within the post.

	History or Archaeology Based Humour		"Interesting" Stories		Museum Page		General History		General News		Archaeology Specific	
# posts sampled	14		26		9		21		5		25	
Image Content	#	%	#	%	#	%	#	%	#	%	#	%
Covered Photo	0	0	5	19	1	11	5	24	0	0	0	0
Soft Tissue	2	14	15	58	4	44	14	67	1	20	1	4
Skull Only	6	43	3	12	1	11	2	10	1	20	1	4
Clothed	0	0	6	23	0	0	8	38	0	0	0	0
Multiple Individuals	3	21	7	27	3	33	3	14	2	40	6	24
Museum Display	3	21	7	27	8	89	4	19	0	0	5	20
Historic Photo	0	0	0	0	1	11	2	10	0	0	0	0
Perimortem Position	0	0	7	27	0	0	6	29	0	0	0	0
Archaeology Excavation	6	43	6	23	0	0	5	24	3	60	15	60
Ancient	5	36	6	23	1	11	3	14	1	20	10	40
Historic	2	14	3	12	4	44	5	24	1	20	6	24
Modern	1	7	9	35	4	44	11	52	1	20	0	0
Juvenile	0	0	2	8	1	11	3	14	1	20	1	4
Identified by name	0	0	4	15	2	22	5	24	0	0	0	0

Image Content

The first analysis focused on the images of human remains used in the original posts, as shown in Table 1 below. If the provenance of the remains was unspecified or unclear, it was unaccounted for in the relevant category.

Where the chronological period was specified, this was simplified into the bands of 'ancient' (Palaeolithic to the Roman Invasion of the UK in 43AD), 'historic' (43AD to the outbreak of World War 1 in 1914), and 'modern' (1914 to the present) as defined by Historic England (2018).

Covered photos appear as a grey blur with an icon of an eye in the centre and a warning that the image may cause offence or upset (Gibbs 2015). The user must click the eye icon to view a covered photo, but it and its accompanying text appear on the primary newsfeed level.

Original Post Language and Purpose

The second strand focused on the text accompanying the image, as shown in Table 2. Only text visible on the newsfeed was included, not accompanying text accessed through a link or by clicking "read more".

User Comments

The final research strand related to comments made by Facebook users in response to the posts. Only comments that specifically mentioned or responded to the image or associated text were included in

TABLE 2 - ORIGINAL POST LANGUAGE CONTENT ANALYSIS. THE TEXT ACCOMPANYING THE IMAGE IN THE ORIGINAL POST WAS CODED INTO ONE OF THESE FOUR CATEGORIES ONCE ITS VOCABULARY, TONE, CONTEXT, AND PURPOSE HAD BEEN IDENTIFIED. IT WAS ALSO NOTED IF IT PROVIDED A LINK TO MORE INFORMATION, ALTHOUGH THE TONE OF THIS OFFER VARIED BETWEEN CLICKBAIT SENSATIONALIST LANGUAGE, AN INFORMATIVE LINK TO A BROADER ARTICLE, AND A PROMOTIONAL LINK TO BOOK TICKETS, WHICH WOULD BE CONSIDERED BEFORE CATEGORISING THE LANGUAGE USED IN THE POST. THIS ENABLED ANALYSIS OF THE IMPACT THE POST LANGUAGE AND TONE HAD ON THE RESPONSE FROM THE AUDIENCE IN THE COMMENTS WHICH CAN BE SEEN BY VIEWING TABLES 2 AND 3 AND THE FIGURES BELOW.

	History or Archaeology Based Humour		"Interesting" Stories		Museum Page		General History		General News		Archaeology Specific	
# posts sampled	14		26		9		21		5		25	
Original Post Content	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Informative Language	1	7	4	15	3	33	6	29	2	40	6	24
Promotional Language	0	0	2	8	6	67	0	0	0	0	6	24
Sensationalist Language	0	0	14	54	1	11	10	48	2	40	1	4
Humorous Meme	12	86	0	0	0	0	1	5	0	0	0	0
Link to Additional Information	3	21	20	77	2	22	11	52	5	100	15	60

the content analysis. Comments that mentioned the display of the same remains in a museum were included if they contributed to comparing physical and digital curation, as shown in Table 3.

Results and Discussion

Juvenile Remains

The treatment of juvenile remains on display in museums are particularly emotive subjects for the public (Wilson 2015; Bonney *et al.* 2019), substantiated by the predominately negative responses revealed in Figure 1.

Two images in the current research were of babies with medical conditions displayed in the same museum. One featured on the museum's page (FB69) and one on an 'interesting' story page (FB70). The language used by the former, where the remains shown are skeletal, was informative with scientific reference to the children's condition. Responses to this post were exclusively positive, including "such remarkable imagery. Hauntingly beautiful." (FB69). In contrast, the latter appeared to promote the museum, claiming it "masters the macabre" (FB70) and listing some exhibits. The preserved infants in this image were within a large glass vessel with their pathological features clear to the audience, attracting memes and positive and negative comments in response, including "I LOVE weird things in jars" (FB70).

FB37, posted on an archaeology page, was an image of a skeletal mother and infant with information about the excavation and a link to the project page. The only reference to the child in the comments was to question the validity of the report: "What makes them say "son?" A juvenile's sex can't realistically be determined", with a scientific debate ensuing (FB37). The image, juxtaposed alongside an artist's impression of the individuals in the grave, demonstrated their position and grave construction. In this context, alongside the informative text, the image is a justified inclusion for its educational function.

TABLE 3 - AUDIENCE COMMENTS CONTENT ANALYSIS. TO BE COUNTED IN THE DATA, THE POST HAD TO ATTRACT AT LEAST ONE COMMENT USING THE LANGUAGE TYPE IN DIRECT RESPONSE TO THE IMAGE OR TEXT. FOR POSITIVE COMMENTS THIS COULD INCLUDE PHRASES SUCH AS "COOL" OR "INTERESTING", OR THE USE OF POSITIVE HUMANISING LANGUAGE SUCH AS "BEAUTIFUL". NEGATIVE COMMENTS COULD BE AIMED AT THE ORIGINAL POSTER OR TOWARD THE IMAGE OR TEXT ITSELF, INCLUDING PHRASES SUCH AS "SICK", "INAPPROPRIATE" OR "REPULSIVE". HUMOROUS COMMENTS AND MEMES OFTEN USED THE IMAGE OR TEXT TO FIND A PUN, A CELEBRITY COMPARISON, OR A PUNCHLINE USING OBSERVATIONAL COMEDY. THE PHYSICAL DISPLAY OF REMAINS MENTIONED IN COMMENTS WERE RECORDED WHEN THEY WERE DIRECTLY RELATED TO THOSE IN THE IMAGE.

	History or Archaeology Based Humour		"Interesting" Stories		Museum Page		General History		General News		Archaeology Specific	
# posts sampled	14		26		9		21		5		25	
Audience Comments	#	%	#	%	#	%	#	%	#	%	#	%
Positive comments towards image and/or text	4	29	13	50	4	44	21	100	4	80	9	36
Negative comments towards image and/ or text	2	14	14	54	2	22	16	76	4	80	8	32
Humorous comment or meme	12	86	19	73	1	11	14	67	4	80	6	24
Physical display discussed	0	0	4	15	1	11	3	14	0	0	3	12

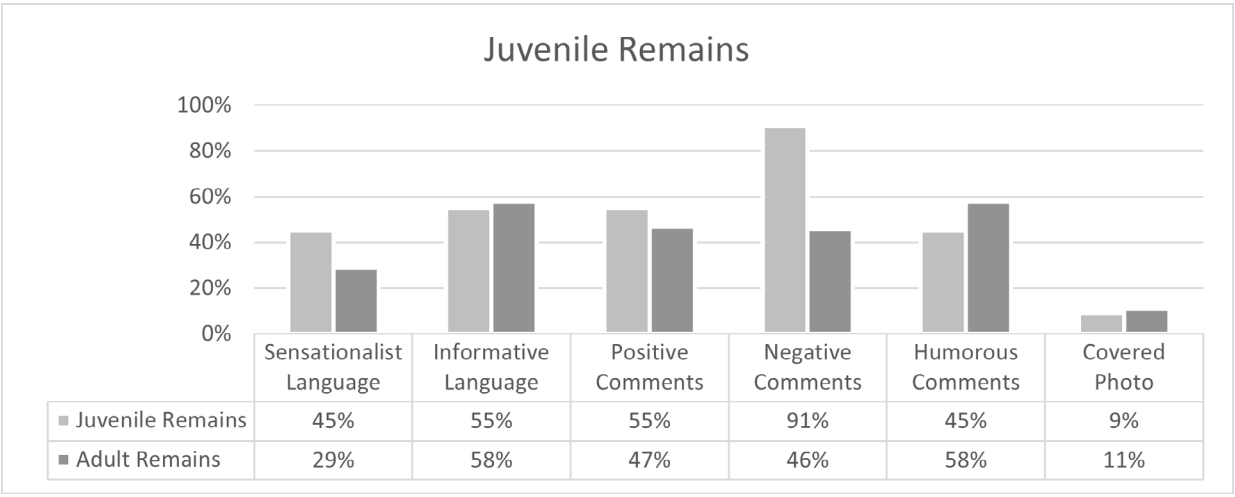
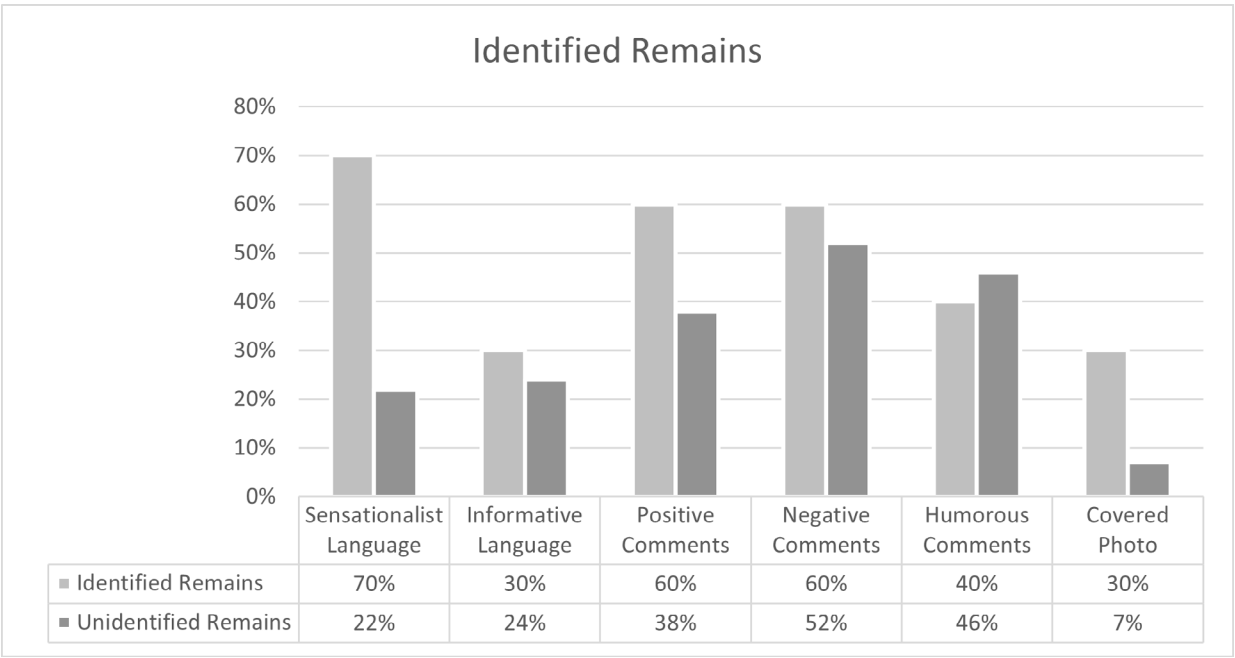


Figure 1 - Original post language and audience comment analysis, juvenile & adult remains.

Responses to FB59, an Incan teenage mummy posted to a history page, varied between humanising and disapproving, such as "this young girl is the genuine sleeping beauty. So terribly sad to see her here like this. How can they preserve her having removed her from her resting place?", and objectified "Wow! Where do they have it?". Pictured in a laboratory surrounded by Personal Protection Equipment-clad researchers, the image portrayed her as a scientific subject, perhaps instigating this objectification. This does not promote the individual's dignity, and although she may have been treated with care by the researchers, sharing the image of the scientific processes feels intrusive. The post did not offer context to the research, identifying where the laboratory was, whether the researchers were from her country



	Sensationalist Language	Informative Language	Positive Comments	Negative Comments	Humorous Comments	Covered Photo
Identified Remains	70%	30%	60%	60%	40%	30%
Unidentified Remains	22%	24%	38%	52%	46%	7%

Figure 2 - Original post language and audience comment analysis, identified & unidentified remains.

of origin, or what procedures they were carrying out and why. This lack of context may incite additional ethical questions around consent and the treatment of indigenous remains.

Remains Identified by Name

Identity is a potentially contentious issue for the public as it humanises the remains and connects the viewer with the individual and their kin. The increasing popularity of genealogy as a hobby may be a factor, with greater connections to long-dead ancestors felt through archival research (Cannell 2011).

In the current research, ten posts are identified by name by the original poster: three on 'interesting' story pages, one on a museum page and six on history pages. The museum page featured an image of Grover Krantz's skeleton, stating he wished to be displayed in the museum post-mortem (FB99). The post had no humorous responses and a mix of positive and negative comments summarised in the sentiment, "I find it a little gruesome, but it was his choice" (FB99). This is one of only two posts explicitly addressing consent from the deceased individual to be displayed, albeit physically rather than on social media.

In contrast, a post on an 'interesting' story page featuring Hannelore Schmatz in her perimortem position on Everest (FB25) received positive and humorous comments such as "Did she stop for directions 20 times?" with no adverse reactions. The text in the post focused on her 1979 mountaineering achievement stating, "Unfortunately, her glorious climb to the mountain's peak would be her last" (FB25). Public opinion tends to find participants of extreme risk-taking behaviour morally questionable (Olivier 2006; Huber 2015), which may explain the lack of empathy and a high proportion of humorous responses in the current research.

A post on a history page of John Torrington of the 1845 Franklin Expedition featured a close-up image of his partially decomposed face and brief text describing a "mystery that ended in starvation and cannibalism". Three comments discussed the image not being covered by Facebook, with one stating,

"Viewer discretion advised". Positive and negative comments were made, with some revering the post as a "fascinating piece of history". There were comical comments, although these tended to be at the viewer's expense rather than John's, such as "me waking up for work after leaving a window open in December" (FB100). The tone of jokes towards named individuals differed depending on the context of the individual's cause of death and the nature of the remains shown.

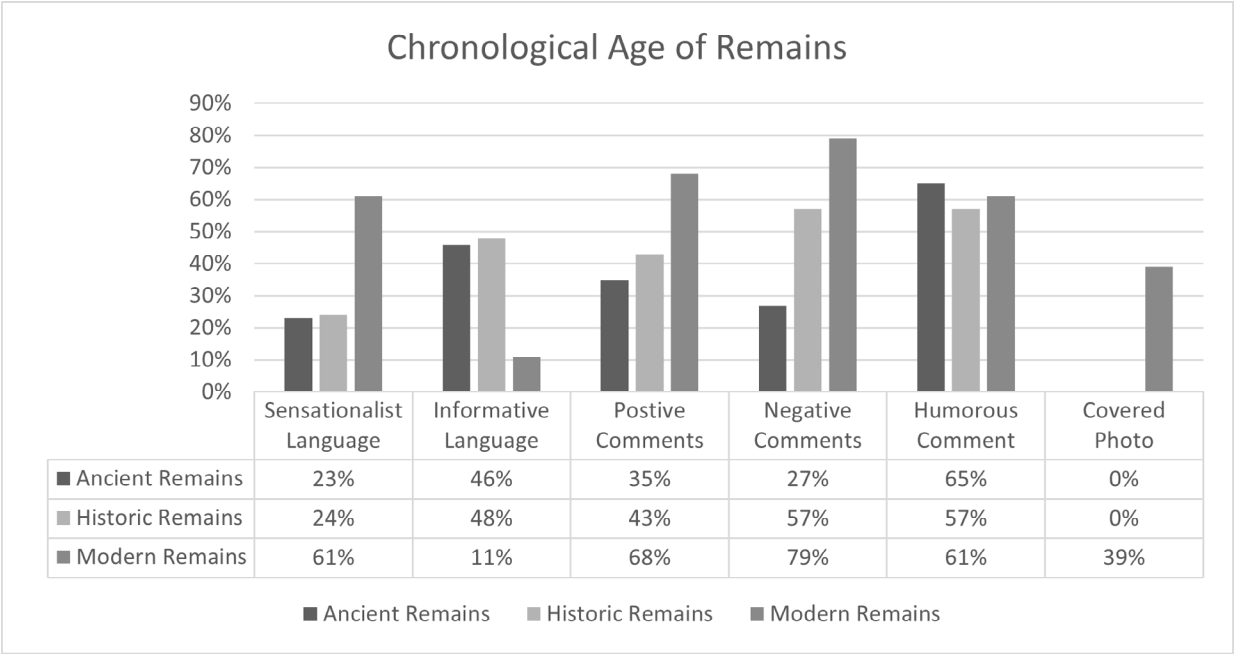
The spike in the sensationalist language seen in Figure 2 reflected that they featured more heavily on 'interesting' story and history pages, which had higher proportions of provocative narratives. Sensationalist language in a journalistic context can be traced to the 19th Century Penny Press (Grabe *et al.* 2001). In historical narratives, sensationalism appeals to emotions, including excitement, fear, and astonishment (Sloan and Mullikin Parcell 2002). The seemingly informative reports featured in these Facebook posts, but with added sensationalist language, suggest their evolution into infotainment. The public no longer finds traditional reporting of information compelling; therefore, infotainment has emerged to keep audiences engaged in all forms of media (Stockwell 2004).

Chronological Proximity of Remains

Within the current research, 22 images featured modern remains, seven of which were forensic-related images and eight depicted war victims. All 11 covered photos were within the modern category, despite equally graphic images occurring within the historic category. Facebook's covered image function appeared to consider older remains less likely to offend, resulting in inconsistencies in its application.

The Code of Conduct developed for the Inforce Foundation pertains to those working in forensic archaeology and related fields in the UK and internationally. A dedicated section relates to Education and Liaison:

- Only use illustrative material of human remains, when necessary, in publication or lecture
- make efforts to ensure that illustrative material will not be offensive from any legal, political, cultural, or religious point of view



	Sensationalist Language	Informative Language	Postive Comments	Negative Comments	Humorous Comment	Covered Photo
Ancient Remains	23%	46%	35%	27%	65%	0%
Historic Remains	24%	48%	43%	57%	57%	0%
Modern Remains	61%	11%	68%	79%	61%	39%

Figure 3 - Original post language and audience comment analysis, ancient, historic & modern remains.

- only use shocking, explicit or gruesome illustrations where such is beneficial, and only to professional audiences (Hunter and Cox 2005)

In contradiction to this Code of Conduct, the posts in the current research contained modern forensic remains. The provenance of these images was predominantly news agencies reporting from different countries at the time of the event.

FB32, from an 'interesting' story page, featured the 1970 Kent State Massacre. The image showed one individual in her perimortem position, prompting negative comments such as "What if you knew her and saw her dead on the ground". Although there were some witty comments, the majority were negative. Several comments stated that it was familiar to them from USA history textbooks and expressed approval of its use for education rather than social media.

In response to a post on an 'interesting' story page depicting multiple clothed corpses, recently buried and exhumed following the 1940 Katyn Massacre, one comment read, "This isn't interesting. It's sick. You DO know you are giving people Post Traumatic Stress Disorder, right? Like we need to be presented with this [expletive]" (FB21). No positive reactions to the post were recorded. While the language used in the post was not overtly sensationalist, the poster could be accused of consciously choosing a short quote from a witness testimony focused on the most horrific elements of the Katyn narrative. The depiction of multiple modern individuals in such a sensitive context raises the question of consent to share it freely within a clickbait post. Although faces were not identifiable, living relatives or communities may disagree with the circulation of the images in the infotainment style.

The chronological proximity of these modern remains influenced public attitudes towards them, as Figure 3 demonstrates. De Tienda Palop and Currás (2019: 32) concur, recognising that "a few bones from the Neolithic do not produce the same discomfort as a 'fresh' body of the last century".

State of Decay

Of the 33 posts containing remains with soft tissue, 48% were modern and discussed above. This section focuses on the remaining 52%, ancient or historic mummies or bog bodies, to compare attitudes towards differing states of decay not influenced by close chronological proximity.

For remains with soft tissue, positive comments tended to be humanising, such as "she seems to be at peace. Lovely woman" (FB78) in response to a Chinese mummy, rather than expressing enjoyment, such as "so cool!!" (FB52) towards multiple skeletons in a plague pit. Negative comments towards skeletal remains tended to comment on archaeological practices such as "let them rest in peace" (FB52) rather than the revulsion frequently expressed towards remains with soft tissue. Skeletons appeared less interesting to the public but more relevant to those specifically interested in archaeology, attracting fewer comments overall as seen in Figure 4.

The prolificacy of skeletal remains and Egyptian mummy collections in museums may dampen the public's astonishment towards them. Recently museums have evolved to include plastinates and innovative reframing of skeletons to sustain their appeal and visitor numbers (Page 2011). The discrepancy between the attitudes of posters and commenters towards skeletal remains and those with soft tissue may be influenced by the skeleton's status in popular culture. Kearl (2015) proposes the skeleton, and skulls in particular, have become entirely disconnected from their association with death and are now a conventional fashion and pop-culture commodity. While viewing a physical skeleton may evoke discomfort, perhaps images of them facilitate this disconnect, even where the picture is of actual remains.

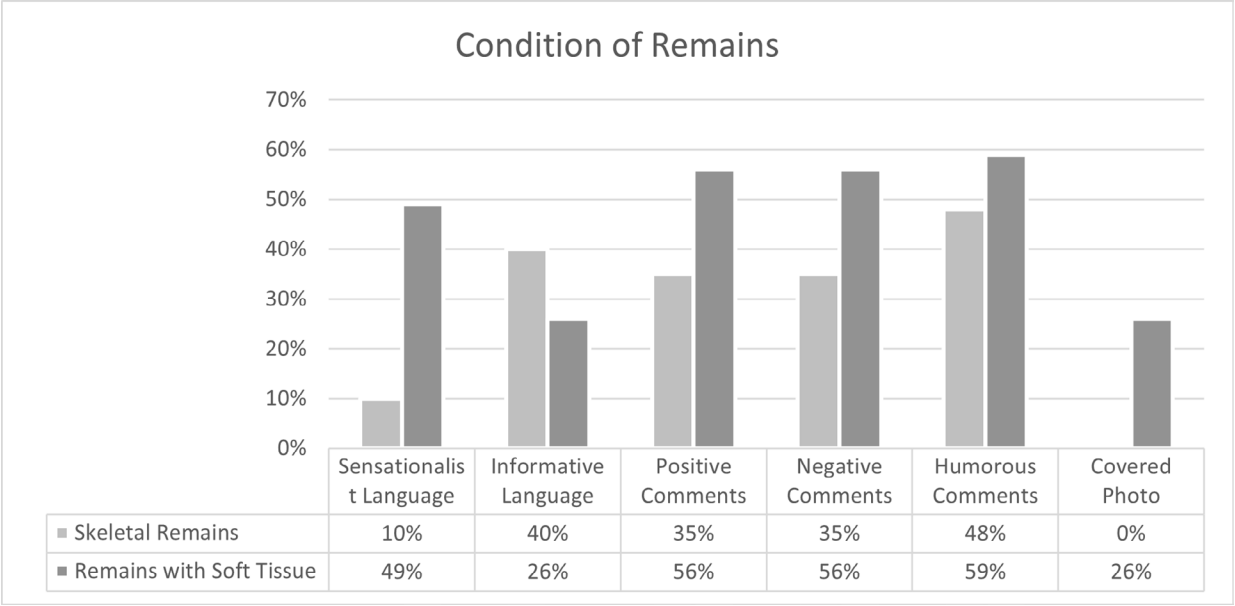


Figure 4 - Original post language and audience comment analysis, skeletal & remains with soft tissue.

In the current study, four ancient and historic remains with soft tissue were bog bodies, and 19 were mummies. Bog bodies featured on a museum page which exhibits the remains (FB03), a page of an archaeology project (FB48), and on two pages sharing 'interesting' stories (FB23 and FB84). The nature of the posts from these different pages was markedly diverse in their tone. The museum page included lengthy informative text explaining the preservation process and carbon dating, with links to more information. Responses to the post were predominantly positive, with one commenter using personifying language: "I visit him every time I'm in [city] to pay my respects" (FB03). One commenter objected to this individual's physical and digital display: "Come to the museum to see - to stare - at a dead body that was killed brutally and now is an object for entertainment - no thanks. Death is still death, suffering and agony is still what it is, I can still feel them all right here. It's bad enough to read about, to see pictures etc." (FB03). This post and those appearing on the 'interesting' story pages attracted droll comments comparing the deceased's hair to celebrities (FB03, FB23 and FB84). Although not outlandishly disrespectful, these jokes overtly used the individual to achieve a punchline.

On the 'interesting' story pages, positive comments described them as "beautiful in a semi-morbid way" and "unique and definitely different, but I guess I'm morbid lol" (FB84). These reactions suggest that morbidity is an appealing characteristic, conforming with the language used in the two original posts. FB23 focused on the individual's "expression of sheer pain", encouraging readers to "click to read morbid facts about the most gruesome mummies ever discovered". These phrases served as lexical intensifiers to change the post's tone (Burgers and de Graaf 2013), as these archaeologically and scientifically significant bog bodies were not considered appealing enough without grisly details.

Sensationalised historical narratives are used on social media as clickbait with little concern for the facts (Martinez 2017), but applying this technique to archaeological research is not new. Tensions between archaeologists and tabloid journalists were rife during the 19th Century Tutankhamun excavation, with the latter focusing on entertaining narratives rather than the actual pieces of art and archaeology discovered (Fritze 2020). Profit was to be made by newspapers through enticing readers with exciting illustrations and tales of romanticised curses (Hollman 2019), a precursor to the advertising revenue gained through clickbait posts on Facebook seen here.

Disparity Between the Physical and Digital Display of Remains

Museums are aware of the need to protect visitors from inadvertently viewing human remains, and both examples below have warnings and offer visitors an alternative route to miss out the areas containing remains and graphic photographs entirely. The physical environment housing human remains at The National Museum of Ireland is designed to evoke a sense of respect and reflection, dimly lit with space for very few visitors at a time. O'Sullivan (2006: 20) describes it as "almost sepulchral" and with the power to compel visitors to speak in quiet voices, if at all. The Holocaust exhibition in the Imperial War Museum, London, uses comparable design elements (Popescu 2020). Here lighting, structural components and visual display characteristics are used to create a feeling of unease and provoke a visceral response. The environment within which physical remains, or images of them, are displayed is crucial in eliciting respect from their audiences, implying that without this corporeal influence, those viewing the deceased online are vulnerable to a reduced degree of intuitive respect.

Public Attitudes in the Digital World

The comments recorded in this study are doubtful to be replicated openly in the physical contexts of a museum. Social etiquette and physical settings attempt to enforce respectful behaviour from visitors. The factors affecting the morality of online communication have been widely explored, with Suler (2004) identifying influencing factors: (1) dissociative anonymity (comments not associated with real life), (2) invisibility (nobody here knows me in real life), (3) dissociative imagination (comments not made in the real world or about real people), and (4) minimising authority (on the Internet I can act freely without consequence); all of which could impact user interactions with the posts and the results obtained in this research.

Conclusion

The dead have fascinating stories to tell, and it is evident that there is a benefit in telling them; however, professionals must share them in an educational and informative manner, while still entertaining to attract wider audiences (Renfrew and Bahn 2004). Suppose some willing viewers brandish their fascination with the macabre. In that case, it could be argued that fulfilling their curiosity and making archaeology appealing to them is nothing more than shifting the narrative to suit a new audience. These alternative narratives can be problematic for archaeologists, including the over-simplification of complex interpretation, damaging perceptions of professional archaeology and concentrating on provocative elements (Finn 2001), as identified in the current research.

Ultimately, as advocates for, and caretakers of the dead, the sector is responsible for actively reducing the risk of indignity through the unsolicited reuse of images and susceptibility to inappropriate comments. A consistent message that the dead are to be respected, regardless of the context in which they are viewed, will ensure a desensitised public does not become inherently disrespectful. While the images already deposited online will remain for posterity, there is an opportunity to consider how the sector moves forward regarding ethically sharing images in the future.

Recommendations for Best Practice

Based on the findings made in this research, several recommendations for best practices when sharing images of human remains are presented:

- only sharing images on the organisation's website in a gallery with a content warning
- not using images at the newsfeed level on social media

- posting images on social media by using a link to the organisation's gallery with a content warning
- watermarking images
- critically considering whether the use of the image is justified and beneficial for the education of the audience
- critically considering the context and content of the image to assess its appropriateness and whether additional permissions are required for its use
- respecting the beliefs and opinions, and where possible, seeking consent from relatives, descendants or custodians of the deceased
- consistently using informative language in posts

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Chapter 6

Dissemination of audio-visual material involving human remains

Kristy A Winter, Juan Lopez Restrepo and Pierre Guyomarc'h

Introduction

Audio-visual material (photographic images and video footage) of human remains (the body, whole or in part), of a deceased individual regardless of the state of decomposition forms a routine component of forensic and archaeological/anthropological documentation and reporting. Visual documentation of the remains allows the viewer to perceive the remains and documents the interpretation of the expert. In the absence of physical remains, the associated audio-visual material, if presented with the opportunity, can be replicated, displayed and shared with little consideration of the justification, limits, consent or underlying ethical values (Harries *et al.* 2018; Sallam 2019; Ulguim 2018a). Such dissemination can remove the deceased person from their context, dehumanize them, and can be detrimental to work that requires their documentation (Mahnad 2022; Sallam 2019; Williams and Atkin 2015).

Collectively, there is limited consensus on the legislation, recommendations, and codes of ethics for audio-visual material of human remains and its dissemination. Several types of forensic, anthropological and/or archaeological published material include various images of deceased individuals. The inclusion of these images in materials is dependent on the discretion of the author(s). However, the collective community of practice emphasizes that taking and sharing images of human remains without valid reasoning is not recommended (Márquez-Grant and Errickson 2017; Passalacqua and Pilloud 2018).

The importance of ensuring that the dignity and privacy of the deceased (and their relatives/communities) are respected before sharing or disseminating any audio-visual material cannot be overstated. Once said images have been shared, the damage or impact could very easily become irreversible. Through a careful examination of the relevant jurisprudence and scholarly literature, this chapter aims to provide an insightful overview of the ongoing legal debate and ethical considerations surrounding the dissemination of audio-visual material involving human remains.

Considerations towards death

The conceptualization of death, its perception and actuality, is variable and inspired by the different traditions, cultures, societies, beliefs and religions (Fahlander and Oestigaard 2008). This can further be influenced by the materials related to death, including audio-visual material of human remains. In times of conflict/crises, documentation is crucial for the analysis of the situation, planning of operations, tracing of individuals, and possible future funding (humanitarian, military, etc). However, audio-visual material of the deceased draws attention to the consequences of crises/conflict through a certain lens, invoking certain emotions from the viewer, limiting their scope of visuals and understandings of the crises themselves (Bleiker *et al.* 2014; Graham *et al.* 2022; Kelley 2017; Robbins 2011). For example, in 2015, a series of photographs were taken of the body of 3-year-old Alan Kurdi on a beach near the Turkish tourist town of Bodrum by Turkish photojournalist, Nilüfer Demir (Adler-Nissen *et al.* 2020; Drainville 2016). The child had drowned alongside the majority of his immediate family as they tried to reach the Greek island of Kos, after fleeing from Kobane, a Syrian town that had come under attack by the Islamic State (Adler-Nissen *et al.* 2020). One image depicted the lifeless body in a red shirt, blue pants, face down and facing the direction of the ocean as the water met the shore. There were limited indications of death,

removed from a broader context, no clear evidence of decomposition, clothing intact and in a natural position (Drainville 2016). These photographs evoked an international response and temporary change toward perceptions of migrants and refugees with limited long-term effects (Adler-Nissen *et al.* 2020). Similar photographs of the deceased during crises have been disseminated continuously, with graphic or explicit imagery that may evoke an emotional response (Mahnad 2022). It is possible that the conscious and/or unconscious recognition of death within the material can trigger the awareness of mortality in the viewer (Fahlander and Oestigaard 2008; Robins 2011). However, without these images there could be separation or further misunderstanding of the crises/conflict and the consequences (Kelley 2017), although they can quickly gravitate towards mediums of curiosity and possibly entertainment. It must be stressed: Sharing audio-visual material of the deceased is not necessary to validate their death.

The deceased have frequently been featured in media, influenced by their historical, cultural, and societal relationships with the living. Over the centuries, mediums have transitioned, and the perceptions of the deceased have changed. Death and the deceased have featured in popular culture as this avenue provides a safe, controlled, and stylized way to engage with human mortality from a 'removed' setting (Penfold-Mounce 2016). Audio-visual material containing human remains have featured in media, perpetuating the desensitization towards the deceased, their decontextualization, and their possible sensationalism.

The topic of sensationalism of the deceased will not be discussed in detail in this chapter, however, the sharing of audio-visual material of the deceased can evoke a morbid curiosity element to the material (Penfold-Mounce 2016). There are historic examples of 'tourist like' behaviours from members of the public and deathcare workers when encountering the deceased, like the collection of 'artefacts' from the deceased (including the deceased themselves) or the display of the remains (Cumback 2018; Huffer and Graham 2017; Harrison 2006; Harrison 2010; Penfold-Mounce 2010; Penfold-Mounce 2016). These behaviours associated with the deceased can be translated into the digital world through the visual recording of the remains, and the dissemination of this material.

Ethical considerations

Deathcare practitioners and experts are bound by the code of ethics put forth by their professional organizations and institutions. In addition, institutions can be bound by additional accreditation boards, standards and legislation. For example, the Human Tissue Authority (HTA) requires registered institutions to ensure suitable practice when handling human remains (England, Wales, and Northern Ireland) (Harries *et al.* 2018; HTA 2017). With this in mind, a deathcare worker must abide by codes of ethics, accreditation requirements, standards and legislation in addition to their moral code.

Published Code of Ethics by professional organisations

It is increasingly recognized that ethical values and principles defined by professional associations should be followed globally and be based on empirical evidence (Harries *et al.* 2018; Ward and Syversen 2009). As per the code of ethics developed by the Society for American Archaeology (SAA), photographs of full or explicit human remains are not accepted for publication in their journals and encourage authors to consider the wishes and seek approvals from the community or institutions (SAA, 2021). This is shadowed in the code of ethics put forth by the British Association for Biological Anthropology and Osteoarcheology (BABAO), images of human remains should not be published without permission or consideration from the stakeholders, institutions or genealogical/cultural communities (BABAO, 2019a, 2019b). This is generally reiterated in other codes of ethics, guidelines and recommendations, where there should be no additional harm done, the wishes of the deceased's local community, relative or guardian should be granted where possible, informed consent should always be sought, and the individual(s) treated with respect and dignity at all times (American Anthropological Association 2023;

American Association of Biological Anthropologists 2003; Department for Culture, Media and Sport 2019; Harries *et al.* 2018; Lambert 2016; Márquez-Grant and Errickson 2017; Scientific Working Group for Forensic Anthropology 2010; World Archaeological Congress 2018). This chapter and the understanding of ethical codes is highly limited by the literary competencies of the authors, availability of ethical codes put forth by institutions and organisations, and it is additionally influenced by the imbalance of the found material. We recognise the large limitation of the chapter's lack of global ethical codes.

However, it has been recognized that there are inadequacies in current ethical codes and different opinions on ethics within professional organizations, with the dissemination of audio-visual material continually questioned (Adams *et al.* 2022). Social and cultural contexts influence practice regarding the deceased, with communities potentially having limited knowledge of ethics and code of practice for human remains put forth by several organizations outside of their social and cultural context (Blau 2009; Ulguim 2018b; Watkins 2005). One should note that no ethical code or legislation is static and future codes or legislation are yet to be developed (Gazi 2014).

Ethical Frameworks for decision making

Regardless of legality, some practices or situations may be determined as unethical for certain parties. For the consideration of ethics associated, three broad frameworks on ethical decision making (The Consequentialist Framework; the Duty Framework; and the Virtue Framework) have been selected as the analysis methodology (Alexander and Moore 2021; Hursthouse and Pettigrove 2022; Sinnott-Armstrong 2022). None of these frameworks are perfect, but the wealth of research on each framework allows for an understanding of the strengths and pitfalls of each framework that can influence the considerations recommended for each example of practice.

As per the Consequentialist Framework, the focus is towards how the actions will directly or indirectly affect the individuals involved. By one definition, the deceased themselves are unaffected by the dissemination of their image as they are not alive and it does not affect their physical body. However, their image is affected, the perception of them (individual) and of the collective deceased (community group) are affected, their kinship is affected, and the audience can be affected. If audio-visual material of the deceased is disseminated without the consent of the kinship, this negatively affects the kinship and the image of the person as there is no control over the material and associated information. Depending on the associated information provided with the material, this can affect the perception of the deceased and the 'community group' positively or negatively. If the images have been decontextualised and paired with biases (for example migration policies, misinformation, or political arguments), this can negatively affect the individuals involved and their kinship. The audience themselves can be (psychologically) negatively affected by absorbing the material without trigger warnings or consent to view the material on their own terms. In any case, the individuals affected should be considered in every decision when sharing or disseminating material.

Under the Duty Framework, there are certain duties and ethical obligations that must be abided by, and things that should never be done. It is our duty as deathcare workers (i.e. at large, including forensic practitioners, archaeologists, osteologists, etc.) to protect the deceased from further harm, follow the mandate of the work and abide by professional ethical codes. These can be in conflict when images of the deceased have to be shared in order to reach an identification, although there is no possibility to obtain consent. Or in the case that the work has to be documented and published externally for recognition or funding. Further harm can be done by following the duties and obligations, however, there may be mitigation measures that can be adopted in certain cases to reduce the harm to the deceased.

Finally, the Virtue Framework highlights the character traits that should motivate decisions. While the virtues of the professions and institutions deathcare workers exist in may differ, a large overlapping virtue is integrity - the quality of being honest and having strong moral principles (Oxford Languages 2023). For the specific question of disseminating audio-visual material of the deceased, one should abide by the above ethical frameworks, associate the correct information to the material, seek consent for the dissemination and state how the material will be shared. Deathcare workers should be trustworthy and uphold the strongest of moral principles in order to protect the deceased from further harm.

Legal Considerations

Among legal scholars, there is an ongoing debate when it comes to post-mortem rights of which deceased individuals should be granted legal rights and protections after death (Shui 2015; Tschumy 2022; Buitelaar 2017; Smolensky 2009). Post-mortem rights are well reflected in many areas of law and across all legal systems; for example, the succession/inheritance rights of a person's property after death, or the legally binding doctor-patient confidentiality continuing even after their patient dies (United States, Health Insurance Portability and Accountability Act; Australia, the Privacy Act 1988; Canada, Personal Information Protection and Electronic Documents Act).

There is no clear consensus on how to protect the rights of the deceased in all contexts as their rights can vary depending on the jurisdiction and specific context. There are very limited rights given to the deceased (as legal personality can end at death), and these will be overshadowed in cases of upholding the well-being and safety of a community (during a crisis, pandemic, etc.) and in cases where the wishes of the kinship/deceased impede judicial and/or criminal proceedings (Finegan *et al.* 2020; Al-Dawoody *et al.* 2021; Salado Puerto *et al.* 2021). In cases where the deceased no longer have personality rights, including the right to control the use of their image or likeness, countries can provide legal protection to the deceased (and their remains) through personality rights of their kinship, the principle of human dignity or through other legal principles. Legally speaking, even when a legal system considers that a deceased individual is legally no longer a person, the respect for human dignity does not necessarily end with death (Donzallaz 2021). However, the deceased cannot speak out when their rights have been violated, so if the law grants rights after death, it must also provide a system for enforcing those rights (Smolensky 2009).

While it is common practice to take, share and/or disseminate photos, videos, and other graphic depictions of the deceased in documentation and reporting, the legality and morality of said practice is questionable. This section will highlight the legality of such practice, specially and implied or interpreted, within different codes of law internationally and domestically that are accessible in English, German, Spanish and French as per the authors' literacy competency.

The issue regarding the publication of pictures of the deceased is explicitly addressed by the law

Some countries directly address the issue of posthumous image and privacy rights (Mexican Federal Copyright Law, article 86; Portuguese Civil Code, article 79). In Argentina, for instance, it is necessary to first obtain the consent of the deceased's heirs or the person designated by the deceased in a last wish provision in order to photograph or reproduce images or voice recordings of said deceased person in any way whatsoever (Argentinian Civil and Commercial Code [Código Civil y Comercial], article 53). Whereas in Denmark, the publication of pictures of the deceased is explicitly covered by chapter 27 of the Criminal Code, where the person forwarding this information or pictures is liable for a fine or imprisonment (HØYER *et al.* 1999).

While there is no federal law (nor state law that extends the right of privacy beyond property rights) in the United States that provides protection towards post-mortem privacy, the US government instituted a ban against photographing flag-draped coffins returning from the Persian Gulf War in 1991 (the Dover Ban) (Zenor 2013). Although the ban only affected pictures of American soldiers' coffins in order to avoid bad press, as the military wanted to avoid negative public opinion and maintain public support for the war (Kelley 2017). The official justifications for the ban were to protect the privacy of the deceased and the deceased's loved ones and reduce the hardship on the families and friends of the deceased. The ban was lifted in 2009 by the Obama Administration to allow for family consent and choice in regard to the dissemination of the photographs (among other rationales) (Kelley 2017). Both arguments for the ban and the lift remain relevant, and that consent and prevention of harm from the visual recognition of human remains should be at the centre of the decisions around the dissemination of material containing human remains.

The post-mortem protection through the rights of the surviving loved ones

Post-mortem protections can be through the rights of surviving loved ones to control the use of the deceased person's image and likeness (Smolensky 2009; Tschumy 2022 n154), or through established laws of the estate of the deceased person controlling the use of their image (Smolensky 2009). This can include the right to prevent the unauthorized use of images of the deceased in advertisements, media, or other forms of public communication (Smolensky 2009). However, relying on protecting the rights of the deceased through their surviving loved ones implies the need for surviving loved ones, and loved ones that are able and willing to act on their behalf, otherwise, their rights may not be protected (Tschumy 2022).

This approach is nevertheless followed by many legal systems, for instance:

In Switzerland, the data protection law (Loi sur la protection des données 2020) is meant to complement the right that every person has to the respect of their name, reputation and privacy. Image Rights are self-determination rights that protect an individual against unauthorized use of their own image, including the right to oppose the broadcasting of identifiable photos and videos. The deceased may not have those rights per se, but the Swiss Legal system recognizes that, due to the "sentiment de piété des proches" [sense of kinship] or [sense of devotion from surviving loved ones], one cannot display an image of human remains without the consent of the surviving loved ones (Case « ATF 127 I 115» of the Swiss Federal Court).

In France, image rights are derived from the right to privacy which is one of the personality rights which expire after death. However, Art.16-1-1 of the French Civil Code states that "the respect owed to the human body doesn't cease after death. Human Remains, including ashes, must be treated with respect, dignity and decency". In a case from April 2011, in which an interview between a psychoanalyst and a Brazilian artist had been broadcast during an exposition which followed the death of the psychoanalyst, the (French) State Council stated that if the family of the deceased suffers a moral prejudice from the display of images of the deceased, they can legally oppose said display/broadcasting (CE 27 Avril 2011, M. F.D. Lebon 314577).

In China, the Tianjin Intermediate People's Court ruled in its Chen Xiuqin against Wei Xilin case that the deceased still has the legal protection of reputation rights (Chen Xiuqin against Wei Xilin and Jin Wanbao Tianjin Interm People's Court 1989). The case related to the publication of a novel based on the deceased's life in which it was stated that she died from a sexually transmitted disease (STD). The publication of the novel caused the mother of the deceased to sue the defendant for defamation and illegal appropriation. The court stated that the deceased's right to reputation should be protected. This

case was the first step in recognizing posthumous harm (Shui 2015). In 2001, the Supreme People's Court explicitly stated in their judicial Explanations that if the deceased's relatives or near relatives psychologically suffer from "illegal use or damage of the remains of the deceased, or any other means in violation of public interests and social ethics, [or] encroachment on the remains of the deceased", they would be entitled to bring a lawsuit to the people's court for psychological damages (The Supreme People's Court on Certain Questions Regarding The Civil Liability for Compensation for Mental Pain and Suffering Caused by Tortious Acts, article 3).

The «Interest Theory» and the «Will Theory»

The «Will theory» and «Interest theory» are two theories that have been developed to explain posthumous rights, or the legal rights that are afforded to a deceased person after death. These theories provide different perspectives on the basis for posthumous rights and the extent to which they should be protected.

The «Will theory» is based on the idea that a deceased person's wishes or "will" should continue to be respected after their death (Smolensky 2009: 768). According to this theory, posthumous rights are based on the principle that a person's wishes or preferences, as expressed in their will or other written documents, should continue to be honoured after their death (Smolensky 2009: 768). Since the deceased can no longer make choices and lack the ability to form interests, a Will Theorist would argue that a deceased person cannot be legal rights holder (Smolensky 2009: 768).

In contrast, the «Interest theory» considers that the fact that a person is unable to make choices does not prevent them from being a legal right-holder because this person still has interests even if they cannot express them (Smolensky 2009: 768). The «Will theory » considers all kinds of interests of the deceased whether they belong to the surviving loved ones, the public, the State or the deceased themselves.

The « dead man's advocate theory»

The "Totenwalt" or "dead man's advocate" theory is a legal concept that refers to the idea that a deceased person needs representation in legal proceedings to protect their rights (previously mentioned), even after death. This theory calls a "dead man's advocate", whose job would be to protect the interests of the dead and preserve the wishes they expressed during their lifetime, be appointed by the state and would therefore be a state employee for the protection of the peace of the deceased, piety, human dignity, and the personality rights of the deceased (Tschumy 2022: 155). The "Totenwalt" theory is still the subject of ongoing debate in legal circles, and its exact definition and application vary from country to country.

The human dignity

Human dignity is a legal principle that plays a crucial role in the legal protection of posthumous rights, as it provides a basis for the protection of the privacy, reputation, and dignity of the deceased. Many legal systems use the principle of human dignity as the cornerstone of post-mortem rights. For instance, The German Grundgesetz considers it is only logical that the absolute protection of the inviolability of human dignity persists after a person's demise (Buitelaar 2017; German Federal Constitutional Court BVerfGE 30,173 February 1971). Notably, the European Court of Human Rights judge Fura-Sandstrom's dissenting opinion in the Akpinar-Altun v Turkey case unequivocally states that the State's responsibility to respect an individual's dignity and to protect bodily integrity "cannot be deemed to end with the death of the individual in question" (Akpinar and Altun v Turkey no. 56760/00 May 2007). The recurring argument that the deceased are by nature unable to hold and exercise personality rights is being more and more disputed by reputable jurists (Buitelaar 2017).

The impact of technology and its future implications

The impact of technology on the use of audio-visual material of the deceased has been particularly significant and far-reaching. Digital media of the deceased are now more accessible and easily distributed than ever before. This has brought new legal and ethical implications. One heavily debated topic is "the right to digital death" or privacy after death which is understood as a person's right to protection and control over their reputation and dignity after death. In the current digital age, the assumption that the dead have no personal rights because their physical existence is over, seems more and more outdated every day (Buitelaar 2017). The phenomenon of Internet users leaving digital legacies after death is particularly controversial and hasn't yet been fully addressed by many legal systems (Buitelaar 2017).

Laws will need to adapt to new challenges, and it is hard to predict the impact but it's possible, if not probable, that the advancement of technology will add new implications when it comes to the controversy surrounding the dissemination of the visual likeness of the deceased. For instance, international organisations have been known to use biometrics to register and track beneficiary assistance through iris scans and fingerprinting which creates digital legacies or "digital bodies" (Sandvik 2020). This information is then stored in large databases that hold enormous amounts of beneficiary data, including deceased beneficiaries, where archiving and storage practices are little understood even by the organizations themselves (Sandvik 2020). In any case, the community should keep in mind that the digital nature of the audio-visual material of the deceased makes it difficult to enforce legal rights or control their use particularly if they are distributed across international borders.

Recommendations and conclusions

As demonstrated above, there are large amounts of debate regarding the dissemination of audio-visual material of human remains, with no general consensus around the inherent linkage of ethics and the law. What may be lawful, may not be necessarily right ethically (Thompson 2001). In the case of the argument for the intersection of the law and ethics, as outlined above there are countries where the law and ethical practice are in agreement and no additional considerations are required. However, in countries without specific laws on the dissemination of audio-visual material containing human remains, the overarching legal principle of 'Human Dignity', the codes of ethics they are bound by, and their assessment of the situation through the proposed 3 frameworks suggested. By following the (lack of) law, does not make the act not harmful to the deceased and their kinship as highlighted above. Recommendations to reduce harm in these situations have been summarised below.

- The dignity of the individuals and their kinship should be protected.
- Restrict, as much as possible, the external dissemination of non-consented audio-visual material depicting human remains.
- Where possible, informed consent should be sought from the deceased individual's local community, next of kin, relative(s) or guardian(s), with specific consent for the dissemination of material and mediums.
    - In the case that the dead person is unidentified, and the community, next of kin, relative(s) or guardian(s) is not known, consent cannot be obtained.
    - Additionally, if medically or research related, ethical approval should be granted for the sharing of the audio-visual material before sharing.
- Access to the audio-visual material should be granted to the local community, relatives or guardians of the deceased, as they should be in control of their deceased's data and material.

- Guidelines on the dissemination of audio-visual material containing human remains should include examples of good practice, access, use, data storage (including length of storage), and information security with the ability to be revised with the emergence of new technology (Márquez-Grant and Errickson 2017; Ulguim 2018a).
- Provide trigger warnings for audio-visual material where possible.
- The benefit of including material containing human remains in reports, publications, presentations and media releases should be questioned and is it necessary to portray the information? (Passalacqua and Pilloud 2018)
    - Specifically, when and why would the material be needed?
    - Does sharing help alleviate pain in any way?
- If institutions are sharing audio-visual material, then we would argue that these images pertain to deceased persons from a specific incident in a specific jurisdiction, with the authorities with jurisdiction deciding on the legalities of sharing or publicly disseminating.
    - If the authorities have no legislation in this regard, then the priority is ensuring that the material is being shared with a specific goal in mind that benefits the investigation and most importantly the rights of the deceased and their loved ones.
- When publishing and presenting, remains with informed consent should be prioritized for dissemination, with illustrations of the remains opted for whenever possible (Figure 1).
- Consideration should be given to the other information contained in audio-visual material that may be considered a security issue for the respective authorities or potentially an invasion of privacy.

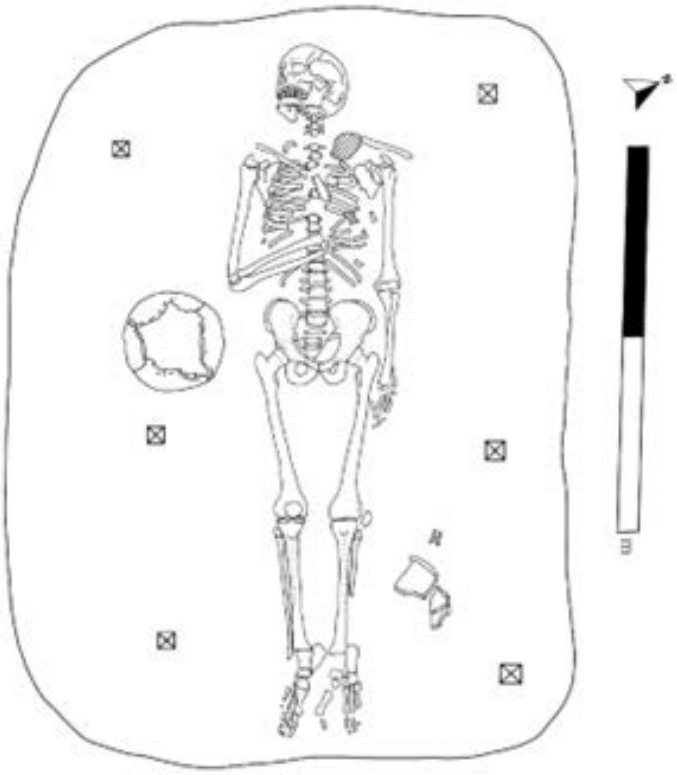

Figure 1 - Example of an illustrated simulated single articulated burial with artefacts for the demonstration of detail possible in a drawing medium for the visual recording of remains for dissemination. Illustration developed by Studio Artis Humanae©.

These recommendations should be considered for all media containing human remains: inclusion of material in reports, forensic case material, photographs for possible identification, educational material, for publication and conference presentations, news and media releases, promotional material, communication to the public, and for training. In most cases it can be deemed unnecessary to include human remains in audio-visual material that is shared and disseminated, however in very specific cases (including but not limited to forensic case material, photographs for possible identification, and educational material) it can be required and necessary. Audio-visual materials of remains that can serve as an example are valuable for developing the audience's knowledge and/or technical capacity. However, caution and the needs of the community and kinship should always be considered, and consent should be sought where possible. Different social and cultural contexts approach the audio-visual material of the deceased differently, and thus recommendations and considerations should be contextualized as social and cultural contexts influence practice in regard to the deceased (Blau 2009).

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Chapter 7

The fine lines between research and science communication: How far can we go?

Angela Silva-Bessa, Marta Colmenares-Prado and Clara Veiga-Rilo

Introduction

Archaeology and biological anthropology are two scientific fields that have been holding hands for a long time (Weber 2014). Their collaborative work has brought to light an extensive knowledge of the environment (Salazar-García *et al.* 2014), physiology (Edes and Crews 2017), and cultural practices (Almeida and Varela 2022; Giordano *et al.* 2023) of past societies. On the other hand, by employing the technical aspects inherent to biological anthropology, forensic anthropologists have been conducting scientific research with the main purpose of helping police forces with human identification and crime solving (Niederegger *et al.* 2015; Franklin and Flavel 2019; Maier *et al.* 2023). As outstanding as all scientific findings might be, the ultimate goal of research is not only to share the former with peers but also with the general public itself, democratising knowledge. However, communication between experts and laypeople is not always successful. As such, this chapter aims to navigate into science communication in both biological and forensic anthropology in the Iberian Peninsula. Here, a special focus will be given to journalism due to i) its wide reach across the population, and ii) the authors' experience with science communication through journalistic pieces. For the elaboration of this chapter, an online survey was also conducted by the authors.

Science communication and dissemination

Science communication and dissemination are two terms that are often mistaken for each other. While the latter aims to make research results available to the scientific community, policymakers, and industry stakeholders, the former has the general public and mass media as its targets (European Commission 2023a). Science communication is of paramount importance for several reasons such as to enhance scientific literacy, overcome public mistrust, and inform citizens how and on what public money is being spent.

According to Article 17 of the Horizon Europe Grant Agreement (European Commission 2023b), communication activities are a legal obligation for those benefiting from European funds for research and innovation. Communicating scientific results can take many forms such as open-door events (e.g., European Researchers' Night, and Soapbox Science), public talks (e.g., Pint of Science), and online promotion (e.g., websites of research centres). Here, the greatest advantage might be the fact that experts are the direct means of transmitting information, and handling the public's curiosity and feedback especially during in-person activities. Yet, the downside of it is undoubtedly the limited number of people having access to such means of communication and the time-consuming organisation behind them. As stated by the Code of Ethics of the British Association of Biological Anthropology and Osteoarchaeology (BABAO), researchers must "make their analyses and research findings available to other colleagues and the public in a timely fashion" (BABAO 2019: 6). In this context, journalism can be advantageous due to its inherent speed and wide reach in transmitting information to laypeople.

Journalism and associated ethical concerns

Journalism plays a key role in the communication of knowledge and science to the population, as it is a tool that allows experts to easily reach all levels of society. However, the transmission of information through journalism is not problem-free for two primary reasons: i) there is an intermediary between the sender (i.e. the researchers) and the receiver of the information (i.e. the laypeople), and ii) media can be influenced by a large number of variables (e.g., political and economic interests). Even though impartiality is the cornerstone of principles of public service, scholars have seen a continual change toward more opinionated and partisan forms of journalism (Ojala 2021). Consequently, ethical concerns may be raised due to this lack of objectivity.

Although the ethics surrounding the study of human remains has been debated throughout time (Walsh-Haney and Lieberman 2005; Blau 2016; Knüsel 2019), there is still a long way to go when it comes to ethics associated with science communicators – in which journalists are included – in the fields of biological and forensic anthropology. Over the last decade, the amount and types of resources used for science communication has substantially increased, primarily driven by rapid digital developments. It is well known that news media has been changing dramatically over the years, mainly as a result of technological advances that place the Internet as the major environment for information transmission (Beckett and Mansell 2008). One of the characteristics of the online world is its dynamic nature where constant movement and updating are fundamental. Following this line of thought, eye-catching headlines are key to increasing the readership of articles in today's online press as they are more attractive to the public and will create a wider range of digital interactions. As a consequence, journalists might feel tempted to exaggerate scientific findings, or even add data to a journalistic piece that is not scientifically based (Scheufele and Krause 2019; Taddicken and Wolff 2020). In Spain, Canel (2000) conducted a national survey of information professionals whose results showed that 74% of the respondents edited information to increase the interest of the audience, 82% adjusted the information to the facts, and 17% to fit political approaches. Journalism as a knowledge relay may become a double-edged sword given that both disinformation (i.e. deliberate transmission of fraudulent data) and misinformation (i.e. unintentional transmission of incorrect information) can lead to fallacies and promote fake information to permeate in people's minds (Scheufele and Krause 2019; Taddicken and Wolff 2020). This is especially appealing in fields such as biological and forensic anthropology due to the attraction of the human species to topics like death. As suggested in the works of Monsó (2019) and Monsó and Osuna-Mascaró (2021), humans are naturally attracted to death because i) it is a universal experience faced by everyone at some point in their lives, ii) it is a way of understanding life and its meaning, and iii) it is a way of coping with the fear of the unknown. Furthermore, as Snoddy *et al.* (2023) pointed out, the presence of sensationalistic headlines and news can make the audience have unrealistic expectations of what a biological or forensic anthropologist can achieve as a professional. This can become especially problematic when dealing with descendant communities, and the relatives of a missing or deceased person.

In 2014, MacKinnon wrote about social media and its usefulness not only in establishing an online network with colleagues but also in publicising scientific work, and facilitating public engagement when using surveys for research purposes (as the authors did for the development of this chapter). The use of social media has been recently reinforced by Adams and collaborators (2022) where it was highlighted that experts should write in a more accessible way to the public. Although scientific terms can sometimes be confusing for laypeople, it is of paramount importance to use the correct terms and then adapt the concept's explanation to the public to whom it is addressed (e.g., children, young adults, or older adults). After all, professionals should be objective and rigorous during the multiple phases of their work from research design to science communication (ENFSI 2016; BABAO 2019). Science communication is a crucial aspect of scientific inquiry and discovery, comprising norms such as rigour

and responsibility (Kretser *et al.* 2019). However, concerns arise about how scientific results might be presented by the media as experts have little to no control over the final outcome (Redfern and Clegg 2017). Responsible science communication is often overlooked with erroneous communications impacting the public's trust in science and its findings (Kretser *et al.* 2019). Therefore, Redfern and Clegg (2017) proposed the revisitation by the institutions of the current policies regarding ethics and intellectual properties when sharing research results and images of human remains in digital media to avoid being in conflict with human rights.

Journalists might also feel tempted to publish images that can be considered sensitive or disrespectful. Between 2018 and 2019, Alves-Cardoso and Campanacho (2022) performed a survey on displaying 3D replicas online where approximately 2% (n = 6) of the total participants (n = 312) claimed that 3D models of human bones should not be available online in any context, even for educational purposes. Yet, 64% (n = 185) of the total respondents (n = 312) argued that the models could be available online but with controlled access (i.e. registration and login obligation in online platforms). Nevertheless, photographs of deceased individuals in distinct states of decomposition are often displayed in the media without the general public having any prior warning. As such, the authors of this chapter believe this matter deserves more debate from all parties involved, with ethics transcending the displayed individual itself; it is also worth considering the readers' thoughts on them facing images of human skeletons, preserved bodies, and/or recently deceased individuals. Moreover, BABAO (2019) highlights the necessity of consulting and getting permission from the curating institution or relevant stakeholders before publishing images of human remains. Following the same line of thought, Errickson and Thompson (2019) formulated four recommendations on how images of human remains should be posted online: i) having permission when possible, ii) showing respect to the individual, iii) justifying the necessity for posting the photographs, and iv) educating the ethical implications of handling human remains. Even though these recommendations were meant for social media, they can easily be considered for all platforms. Yet, there is still the question of how easily these images can be downloaded, edited, and shared by third parties, often misrepresenting the initial message. To prevent situations like these, some professionals – such as those from the International Committee of the Red Cross (ICRC) – have the duty of discretion where they must refrain from producing or publishing any images related to work irrespective of the medium (ICRC 2023). It is also for this reason that speakers often choose to blur the images inserted in their presentations on online or hybrid scientific events.

A preliminary survey on science communication in the Iberian Peninsula

Regarding the precedents for the ethical treatment of human remains in Spain, it is worth mentioning the Alcàsser crime where three underaged women were kidnapped, raped, tortured, and murdered in 1992. It has gone down in history due to the nefarious treatment it received from the media, being considered the starting point of Spain's TV telebasura (Gómez 2003). On the day of the discovery of the bodies, the media improvised a set within a public building (Sociedad de la Música de Alcàsser) in the village where the families of the deceased resided. In order to reach the best audience ratings, ante- and postmortem photographs of the minors were shared in prime time along with unsubstantiated conspiracy theories (i.e. not supported by the police) and also detailed explanations of what happened to the victims, all while family members grappled with emotional distress on the set. Notably, the television personnel further intensified the emotional impact by directly questioning the families about the experience of losing a child in such circumstances (Gómez 2003; Boltá 2012). Likewise, the exhibition of images of recovered human remains raises ethical dilemmas both because of their exposure to the public and of the psychological impact they may have had on the victims' families. Although this case was the most controversial regarding ethical management by the media, it is not an isolated event in Spanish audiovisual history. Similar situations still take place in Portugal as is the case of Mónica Silva, an adult female individual reported as missing in October 2023 (Visão 2023). Since then, the media

coverage has been intensive, elaborating theories that have not been supported by the police (Carvalho and Gala 2023; TVI 2023). Furthermore, the continuous media exposure has led to the revelation of Mónica's personal affairs (Carvalho and Gala; TVI 2023) which raises ethical concerns regarding the privacy invasion of Mónica and her two minor children.

Taking into account the clear media interest in forensic cases, the authors were keen to understand if the chronological proximity between the living and the dead was a determining feature for the media interest in human remains in Portugal and Spain. Additionally, the authors wanted to understand the relationship between journalists and professionals in the fields of archaeology, and biological and forensic anthropology in the Iberian Peninsula. For these reasons, an online survey was conducted through Google Forms and shared on social media (Facebook, Instagram, and LinkedIn) for one month (between November and December 2023) and sent via email to associations of professionals in these fields (Sociedad Española de Paleopatología, and BABAO). The survey was available in three languages (English, Portuguese, and Spanish), and was directed to those studying and/or working in Portugal or Spain in the fields of archaeology, biological anthropology, and forensic anthropology. A total of twelve questions were asked: nine multiple choice questions, two open questions, and one checkbox question. A total of thirty-eight individuals completed the survey.

As illustrated in Table 1, the majority of the respondents were doctoral students (n = 12; 32%) followed by biological anthropologists and field archaeologists, each corresponding to 13% (n = 5). When asked about the time periods with which they worked, 55% (n = 21) of the respondents said they studied prehistoric collections while only seven (18%) respondents worked in forensics. Of all the surveyed individuals (n = 38), 66% (n = 25) claimed that there has been an increase of interest in their work by journalists for the past five years, with 61% (n = 23) arguing that journalists are more concerned about human remains than in any other finding of an excavation. When asked if they were ever contacted and/or interviewed by someone from the Portuguese or Spanish media, 53% (n = 20) answered affirmatively.

Regarding the respondents (n = 20) that have interacted with journalists, 90% (n = 18) have been contacted on multiple occasions regarding their work, with newspapers (n = 17; 85%) and radio (n = 11; 55%) being the media that most frequently approached the experts (Table 2). Only one (5%) respondent has been invited for a podcast, while another participant (5%) has been contacted for a documentary (signalled in the option "other"). Overall, 45% (n = 9) of the respondents have experienced a misrepresentation of their own words in a journalistic piece, with 13% (n = 6) of all respondents declaring that journalists were either completely or extremely inaccurate in their articles/reports. Eighteen respondents (38%) stated that the final journalistic piece was somehow accurate; 40% (n = 19) claimed that it was extremely accurate; and 10% (n = 5) said that it was completely accurate. Ten of the professionals also mentioned that they saw their work being publicised in the media without their permission when it has not been published yet in a scientific channel (e.g., preliminary results of the findings from an excavation presented in a seminar for the local community). Only six (30%) people affirmed that journalists consistently asked for permission before photographing human remains under analysis.

To complete the survey, the authors asked if the respondents (n = 38) would like to give any feedback on this topic and/or share one occasion of their engagement with a journalist. Ten people (26%) left a comment. One individual shared that they have been contacted to discuss the ethical concerns raised regarding museums having human skeletons in their facilities. Another individual stated that, despite never encountering an issue with journalists, it is clear that the latter tend to share the most impacting statements from an interview, often disregarding the context if it is not considered interesting. This opinion was echoed by another respondent who believed journalists are often reckless when presenting information related to deceased individuals. Three respondents also agreed that the more morbid the context, the more interest aroused; one respondent mentioned that they are the one who always

Table 1. Questions included in the online survey that were common to all respondents (n = 38).

	English n = 7	Portuguese n = 16	Spanish n = 15	Total n = 38
Main job position ***(Multiple choice question)***				
Biological anthropologist	3 (43%)	1 (6%)	1 (7%)	5 (13%)
Field archaeologist	1 (14%)	0	4 (27%)	5 (13%)
Forensic anthropologist	0	0	3 (20%)	3 (8%)
Junior researcher	0	1 (6%)	0	1 (3%)
PhD student	0	9 (56%)	3 (20%)	12 (32%)
Post-doc researcher	1 (14%)	1 (6%)	2 (13%)	4 (11%)
University professor	1 (14%)	2 (13%)	0	3 (8%)
Senior researcher	1 (14%)	1 (6%)	1 (7%)	3 (8%)
Other	0	1 (6%)	1 (7%)	2 (5%)
Time period of the human remains studied ***(Open question)***				
Pre-Neolithic (Prehistory)	1 (14%)	2 (13%)	2 (13%)	5 (13%)
Post-Neolithic (Prehistory)	0	6 (38%)	10 (67%)	16 (42%)
Roman	3 (43%)	3 (19%)	3 (20%)	9 (24%)
Medieval	4 (57%)	8 (50%)	2 (13%)	14 (37%)
Modern	2 (29%)	11 (69%)	1 (7%)	14 (37%)
Contemporary	1 (14%)	7 (44%)	2 (13%)	10 (26%)
Forensic	1 (14%)	4 (25%)	2 (13%)	7 (18%)
Would you say that in the past five years journalists/reporters have become more interested in what archaeologists and biological/forensic anthropologists do? ***(Multiple choice question)***				
Yes	3 (43%)	12 (75%)	10 (67%)	25 (66%)
No	4 (57%)	4 (25%)	5 (33%)	13 (34%)
How interested would you say journalists/reporters are in human remains *versus* other findings in excavations? ***(Multiple choice question)***				
Equally interested in all findings of an excavation	3 (43%)	4 (25%)	3 (20%)	10 (26%)
Less interested in human remains than in any other findings	0	2 (13%)	3 (20%)	5 (13%)
More interested in human remains than in any other findings	4 (57%)	10 (63%)	9 (60%)	23 (61%)
Have you ever been contacted and/or interviewed by Portuguese or Spanish media? ***(Multiple choice question)***				
Yes	4 (57%)	7 (44%)	9 (60%)	20 (53%)
No	3 (43%)	9 (56%)	6 (40%)	18 (47%)

TABLE 2. QUESTIONS INCLUDED IN THE ONLINE SURVEY THAT WERE COMMON TO ALL RESPONDENTS WHO HAD BEEN CONTACTED AND/OR INTERVIEWED BY JOURNALISTS (N = 20).

	English n = 4	Portuguese n = 7	Spanish n = 9	Total n = 20
How many times would you say you have been contacted by a journalist/reporter due to your work with human remains? *(Multiple choice question)*				
Only once	1 (25%)	1 (14%)	0	2 (10%)
2-5 times	0	3 (43%)	3 (33%)	6 (30%)
6-10 times	2 (50%)	3 (43%)	2 (22%)	7 (35%)
> 10 times	1 (25%)	0	4 (44%)	5 (25%)
By what kind of media have you been interviewed/ contacted? (Checkbox question)				
Magazine	2 (50%)	3 (43%)	2 (22%)	7 (35%)
Newspaper	3 (75%)	7 (100%)	7 (78%)	17 (85%)
Podcast	1 (25%)	0	0	1 (5%)
Radio	3 (75%)	3 (43%)	5 (56%)	11 (55%)
Television	3 (75%)	3 (43%)	3 (33%)	9 (45%)
Other	0	1 (14%)	0	1 (5%)
Have you ever experienced a misrepresentation of your own words in a journalistic piece based on an interview of yours? *(Multiple choice question)*				
Yes	1 (25%)	3 (43%)	5 (56%)	9 (45%)
No	3 (75%)	4 (57%)	4 (44%)	11 (55%)
Please rate how accurate the journalist/reporter was when sharing scientific information based on your work. *(Multiple choice question)*				
Magazine				
Completely inaccurate	1 (50%)	0	0	1 (8%)
Extremely inaccurate	0	0	3 (43%)	3 (23%)
Somehow accurate	0	1 (25%)	1 (14%)	2 (15%)
Extremely accurate	0	2 (50%)	1 (14%)	3 (23%)
Completely accurate	1 (50%)	1 (25%)	2 (29%)	4 (31%)
Newspaper				
Completely inaccurate	0	1 (14%)	1 (100%)	2 (18%)
Extremely inaccurate	0	0	0	0
Somehow accurate	1 (33%)	1 (14%)	0	2 (18%)
Extremely accurate	2 (67%)	5 (71%)	0	7 (64%)
Completely accurate	0	0	0	0
Online content (e.g., social media)				
Completely inaccurate	0	0	0	0
Extremely inaccurate	0	0	0	0
Somehow accurate	2 (67%)	3 (75%)	0	5 (71%)
Extremely accurate	1 (33%)	1 (25%)	0	2 (29%)
Completely accurate	0	0	0	0
Radio program/section				
Completely inaccurate	0	0	0	0
Extremely inaccurate	0	0	0	0
Somehow accurate	1 (33%)	0	0	1 (20%)

	English n = 4	Portuguese n = 7	Spanish n = 9	Total n = 20
Extremely accurate	2 (67%)	1 (50%)	0	3 (60%)
Completely accurate	0	1 (50%)	0	1 (20%)
Television program/section				
Completely inaccurate	0	0	0	0
Extremely inaccurate	0	0	0	0
Somehow accurate	2 (67%)	2 (67%)	0	4 (67%)
Extremely accurate	1 (33%)	1 (33%)	0	2 (33%)
Completely accurate	0	0	0	0
Podcast				
Completely inaccurate	0	0	0	0
Extremely inaccurate	0	0	0	0
Somehow accurate	2 (67%)	2 (67%)	0	4 (67%)
Extremely accurate	1 (33%)	1 (33%)	0	2 (33%)
Completely accurate	0	0	0	0
Has anything related to your work/research been published in the media without your permission? *(Multiple choice question)*				
Yes	3 (75%)	2 (29%)	5 (57%)	10 (50%)
No	1 (25%)	5 (71%)	4 (44%)	10 (50%)
Do journalists or reporters ask you for permission before photographing human remains you are working with? *(Multiple choice question)*				
Always	1 (25%)	4 (57%)	1 (11%)	6 (30%)
Never	2 (50%)	1 (14%)	1 (11%)	4 (20%)
Sometimes	1 (25%)	2 (29%)	7 (78%)	10 (50%)

needed to warn journalists about the ethics of publishing images of human remains in the news. Lastly, two individuals expressed that while the media has the potential to promote less recognized fields such as zooarchaeology, they do not do so.

In their professional lives, the authors themselves have personally encountered the mishandling of human remains in the media. One case in point was an archaeological intervention on a mediaeval convent in the north of the Peninsula. Not only did the media not ask for permission to take photographs and record videos of the exhumed skeletons, but also wrote shocking and inaccurate headlines to maximise the impact of the news (e.g., "anorexic nuns" instead of "fasting nuns") (Regueira 2022[1]; Diario de Pontevedra 2022[2]). This had a profound negative effect on the relationship between the technical team and those who lived in the convent just prior to the archaeological work and considered the mediaeval individuals as their sisters. Another case occurred during a scientific study in Portuguese cemeteries with the main goal of understanding human decomposition. After an interview conducted by the Portuguese news agency LUSA (DN/LUSA 2022), other media outlets shared the interview online with headlines and information that were not aligned with what had been written in the original article (Intrieri 2022; Peixoto 2022). Furthermore, a team of journalists wanted to have access to images and footage of recent-death exhumations without considering the wishes and authorisation of the relatives of the deceased that were studied. This was vehemently denied by the researchers involved.

[1] One can read in this article: "Clarisas menudas y talvez anoréxicas".

[2] One can read in this article: "Os restos medievais de Santa Clara revelan que as monxas podían padecer anorexia".

According to Article 20[3] of the Spanish Constitution (Constitución Española de 1978), Spain protects the right to freely communicate or receive truthful information by any means of dissemination, as does Portugal (Article 37[4] of the Portuguese Constitution approved by the Decree of Approval of the Constitution of 10 April 1976 - Decreto de Aprovação da Constituição de 10 de Abril de 1976). Yet, journalists must exercise their activity with respect for professional ethics, informing with rigour and exemption, abstaining from sensationalism and clearly demarcating facts from opinions as stated by Article 14[5] of the Portuguese Law No. 1/99 of 13 January 1999 (Lei nº 1/99 de 13 de Janeiro de 1999). Although the number of individuals surveyed (n = 38) is low and cannot be considered representative, results suggest an overall discontent in how journalists approach the work conducted with human remains. Additionally, the survey also indicated that journalists not asking for permission to photograph human remains may be a common practice (only 30% of the respondents stated that journalists had always asked them for permission before collecting pictures). Firstly, these practices go against at least two of the four recommendations formulated by Errickson and Thompson (2019): i) permission, and ii) justification for the necessity of publishing such images. Secondly, it is the journalist's duty to refrain from collecting images and sounds through unauthorised means (Article 14[6] of the Portuguese Law No. 1/99 of 13 January 1999 - Lei nº 1/99 de 13 de Janeiro de 1999). As far as the Spanish case is concerned, there are no explicit obligations with regard to rigour and professional ethics for journalists; however, the code of journalism ethics states - based on the right to self-image, honour, and privacy (Article 18 of the Spanish Constitution - Constitución Española de 1978), that images harmful to an individual's personal condition must always be avoided, as well as the informative treatment of sensitive matters (e.g., painful or distressing subjects). Nevertheless, a considerable percentage of respondents (45%; n = 9) stated that the information transmitted by journalists lacked accuracy. Besides the clear inclination to sensationalism as previously noted, this can also be a consequence of the lack of training and knowledge regarding biological anthropology and related fields. To prevent this behaviour from perpetuating in the future, it is important to encourage spaces of dialogue between journalists and experts. For example, since 2017, the Argentine Forensic Anthropology Team (Equipo Argentino de Antropología Forense – EAAF) has been promoting a course in forensic sciences for journalists with the main goal of improving the quality of journalistic pieces (EAAF 2023). To the best of the authors' knowledge, there are no similar practices in Portugal or Spain. Yet, some journalists acknowledge their field's lack of professionalism in favour of sensationalistic practices, even by resorting to ethically questionable practices. This is the case of Pedro Coelho, president of the Organisation Committee of the Portuguese Journalist Congress (Congresso dos Jornalistas) who denounced through a video shared on social media that current journalism is an unprofitable market with a high potential for ethical distortion (Coelho 2023). According to Pedro Coelho, journalism in the 19th-20th centuries was supported by publicity which is not the case anymore, with journalism being conditioned by the current financial market. As a consequence, precariousness is extended to the journalist's ethics and autonomy.

The legal perspective in the Iberian Peninsula

The intrinsic aim – and duty – of sharing scientific findings, and making biological anthropology and related disciplines more visible to and respected by the general public encounters a series of constraining

[3] One can read in this article: "1 - Se reconocen y protegen los derechos: a) A expresar y difundir libremente los pensamientos, ideas y opiniones mediante la palabra, el escrito o cualquier otro medio de reproducción. (...)."

[4] One can read in this article: "1 - Todos têm o direito de exprimir e divulgar livremente o seu pensamento pela palavra, pela imagem ou por qualquer outro meio, bem como o direito de se informar, sem impedimentos nem discriminações. (...)".

[5] One can read in this article: "1 – Constitui dever fundamental dos jornalistas exercer a respectiva actividade com respeito pela ética profissional, competindo-lhes, designadamente: a) Informar com rigor e isenção, rejeitando o sensacionalismo e demarcando claramente os factos da opinião; (...)".

[6] One can read in this article: "2 – (...) f) Não recolher imagens e sons com o recurso a meios não autorizados a não ser que se verifique um estado de necessidade para a segurança das pessoas envolvidas e o interesse público o justifique; (...)".

factors. The main obstacles are the lack of legal framework, and the undefined legal status of an ancient deceased person which is a controversial topic between lawyers, medical doctors, and anthropologists (Pereira 2022).

In the Spanish case, the authors would like to refer to the Organic Law No. 1/1982 of 5 May 1982 (Ley Orgánica 1/1982 de 5 de mayo de 1982) which promulgates the fundamental right to honour, to personal and family privacy, and to one's own image, guaranteed for all citizens according to Article 18 of the Spanish Constitution (Constitución Española de 1978). The provisions to deceased individuals is confined to Articles 4, 5, and 6, which declare that the exercise of protection (and never ostentation of the ownership of the protected dignity) falls on individuals who have been designated by will (i.e. heirs or executors). In the absence of prior designation, responsibility falls to the spouse, descendants, ascendants, and siblings of the deceased. Ultimately, in the absence of all of the aforementioned parties, the exercise falls to the Public Prosecutor's Office which can act ex officio, taking into account the time limitation of the memory: 80 years after the individual's death. Likewise, in the Spanish Supreme Court Judgement Case No. STS 686/2020 of 21 December 2020 (Sentencia Tribunal Supremo de 2020), it was concluded that the dignity of the deceased does not hold the same weight as that of the living, stating that the passage of time inevitably dilutes the aggressive potential on the public or social consideration of individuals in the constitutional sense of the term. Hence, individuals who – due to their temporal dimension – are part of the Spanish Historical Heritage lack protection of their fundamental right to honour. Consequently, there are no restrictions on their display, irrespective of the manner in which it is presented.

A similar scenario takes place in Portugal regarding the right to personal identity, good name and reputation, as well as the privacy of private and family life (Article 33[7] of the Portuguese Constitution approved by the Decree of Approval of the Constitution of 10 April 1976 - Decreto de Aprovação da Constituição de 10 de Abril de 1976). However, one's legal personhood ceases with death according to Article 68[8] of the Portuguese Civil Code (approved by the Decree-Law No. 47344/66 of 25 November 1966 – Decreto-Lei nº 47344/66 de 25 de Novembro de 1966). Although the respect for the dead and their memory are still protected by legal order through their loved ones, who become the legal agents to ensure such respect (Pereira 2022), any offence to the memory of a deceased individual is only punishable up to 50 years after death, in accordance with Article 185[9] of the Portuguese Penal Code (approved by the Decree-Law No. 400/82 of 23 September 1982 – Decreto-Lei nº 400/82 de 23 de Setembro de 1982). While there is a clear legal void for non-recent deaths, a detailed legislation is currently in place concerning the removal of organs and tissues for transplantation (Decree-Law No. 244/94 of 26 September 1994 - Decreto-Lei nº 244/94 de 26 de Setembro de 1994), and the dissection or sample extraction for educational/research purposes (Decree-Law No. 274/99 of 22 July 1999 - Decreto-Lei nº 274/99 de 22 de Julho de 1999).

The Iberian cultural heritage is no stranger to the exhibition of deceased individuals either in museums or in private contexts, such as wakes. Despite this cultural background, the debate on whether it is legitimate to exhibit archaeological human remains in public forums (e.g., social media, museums, and the press) has been gaining momentum among professionals in the bioarchaeological, forensic, biomedical, and museology disciplines. Due to the lack of legislation in the Iberian Peninsula regarding the exhibition of archaeological human remains, the number of museums that have rethought their deontological code in recent years has increased. The authors would like to highlight the case of the

[7] One can read in this article: "1 – A todos é reconhecido o direito à identidade pessoal, ao bom nome e reputação e à reserva da intimidade da vida privada e familiar. (...)".

[8] One can read in this article: "1 – A personalidade cessa com a morte. (...)".

[9] One can read in this article: "(...) 3 – A ofensa não é punível quando tiverem decorrido mais de 50 anos sobre o falecimento."

Spanish National Museum of Anthropology which made public the Letter of Commitment on the Treatment of Human Remains (Carta de Compromiso Sobre el Tratamiento de los Restos Humanos) (Museo Nacional de Antropología 2023). In this Letter, it is stated that the museum is restricting the display of human remains in its galleries when essential to convey a message which cannot be done in any other way with the same efficiency[10]. Additionally, the museum is withdrawing its collections from public exhibition when the communities of origin are against it, as it is the case of the mummies from the Atacama Desert (Chile)[11]. Although the authors of this chapter are not aware if the communities of origin are actively consulted by the museum, the remains that are not ascribed in the museum's inventories (available online) are being kept out of display.

The authors would also like to highlight a Portuguese circular that has been released regarding the role of biological anthropology during field work (Circular nº 1/2014 da Direção-Geral do Património Cultural) standardising the procedures to be applied in archaeological contexts. However, no mention is made concerning the display of human remains after the excavation is concluded or the practices to adopt in science communication. The authors also did not find any other governmental documentation concerning this topic.

The paradox of death and its ethical concerns

Death presents a paradox when it comes to the management of a dead person's image. A key factor in the ethical debate regarding the management of human remains is the idiosyncrasies of each context, which are directly influenced by both temporal and cultural backgrounds, not showing different societies the same ethical concerns. A good example of this is the worship of the dead in Mexico (Green 2019; John and Soni 2020), and the common practice of mummification in Italy (Giuffra *et al.* 2011; Nerlich and Bianucci 2020). Therefore, throughout history, the treatment of human remains by societies has changed reflecting religious beliefs, cultures, and ethical considerations. Furthermore, as a result of the colonialist history of many Western countries, the debate now includes the need for repatriation of human remains due to the need of managing the latter according to the beliefs of the cultures of origin and to establish a transparent dialogue with them. Today, Western ethical considerations strive to give as much information as possible while trying to respect cultural sensitivities.

This debate is therefore characterised by a subjective dimension, influenced by many social factors as previously mentioned. It should also be noted that the authors are not against the handling of human remains. They acknowledge that scientific progress is often linked to the analysis of human remains. The authors also recognize the educational potential of human remains for the general public, since through their human dimension the public can empathise more deeply and gain a better understanding of past societies and cultures. However, the authors advocate a profound reflection on the treatment of human remains. The essence of their humanity should not be forgotten, and even though life has dissipated from them, they too deserve the respect that living individuals are entitled to.

Conclusion

This chapter was conceived by the authors to discuss scientific communication in the Iberian Peninsula, with a special focus on the blurring lines between science and journalism.

[10] One can read read in this article: "Solo se expondrán restos humanos cuando sea imprescindible para entender el discurso que el museo pretenda transmitir y no se pueda realizar de otra manera con la misma eficacia."

[11] One can read in this article: "En el MNA, no se expondrán restos humanos cuando la comunidad de origen de los restos esté en contra de su exposición pública. Este es el caso del pueblo atacameño que se opone a la exposición de las momias de Atacama. También se tendrán en cuenta las tradiciones y creencias de la comunidad de origen a la hora de exponer los restos humanos."

Studies in biological and forensic anthropology have long drawn the attention of journalists, who frequently cover public lectures or excavations and ask experts for interviews. This alliance however is not always fruitful with ethical boundaries being broken and key messages misrepresented mainly for sensationalistic reasons as demonstrated by the survey conducted. The authors believe it is vital to explore the clickbait phenomenon we currently live in, where the creation of eye-catching headlines is encouraged at the expense of scientific accuracy and moral codes. Here, the authors would like to emphasise the importance of awareness and truthfulness in science communication, through the creation of responsible content. An ideal solution would be to work together with the journalists to find a way of catching people's interest without altering the fidelity of the scientific results (Snoddy *et al.* 2023), establish protocols between both parties, and have awareness campaigns. It is of paramount importance to discuss the duties, concerns, and responsibilities one must have when using communication channels for knowledge transmission.

Furthermore, time seems to work as a restrictor of one's identity in Portugal and Spain. Although there are laws regarding the honour and image of deceased individuals, their protection extends to a maximum of 50 or 80 years according to the country in question. Consequently, both the time limit and the lack of protocols have allowed archaeological human remains to have been ethically discarded of their identity as a once living individual. Hence the necessity of suitable legislation both in Portugal and Spain that takes into consideration the moral conduct in handling and displaying human remains.

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Chapter 8

A Biodigital Dilemma: Creating and Sharing 3D Models of Unethically Collected Human Remains in the United States

E. Rose Bryson and Valerie B. DeLeon

Introduction

The digitization of human remains and archaeological artifacts is one of the major democratizing innovations in the field of Anthropology. Digitization has the power to increase accessibility and academic inclusivity by taking education and research beyond the physical walls of museums and universities (Milroy and Rozefelds 2015; Boyer *et al.* 2017). Our ability to create virtual representations of fragile, rare or geographically distant artifacts and human remains is changing the way we conceptualize museum collections. More importantly, it is expanding who has access to that content. Open access to digital content means that researchers, students, and the general public don't need to travel or pay a fee to be able to learn from interesting and valuable collections all over the world (Boyer *et al.* 2017; BABAO 2019; African Fossils 2023; BlueLink 2023; Smithsonian 2023). Although its scientific value is clear, many researchers have voiced concern that the increasing digitization of human remains raises several ethical considerations (Cornwall 2016; Hassett 2018; Jones 2019; Hirst *et al.* 2020; Schug *et al.* 2021). We echo this concern and contribute this position paper to provide guidance under a specific set of circumstances. Although we value and promote the use of three-dimensional (3D) digitization, we argue that not all human skeletal remains within the United States should be digitized, given the political history of skeletal collection. We believe that this practice should be discouraged in some cases to avoid the unconstrained and decontextualized sharing of 3D bone models derived from individuals that deserve ethical protection by the research community. Finally, we encourage all stewards of human remains to be proactive about investigating the provenance of their collection, and to create a Code of Ethics guidance document for digitized remains.

The history of skeletal collecting in the United States is far from apolitical, and as stewards of those collections, we do a disservice to the deceased and their living communities by not acknowledging how those collections are inextricably rooted in U.S. colonialism (Redman 2016; Colwell 2017). This understanding of the history of these collections is at the heart of the digitization debate. Many prominent skeletal collections in the U.S. were built from remains that were originally collected unethically, without consent, and represent the most marginalized members of our society. The skeletons of Indigenous peoples, enslaved individuals, and many more, were looted from cemeteries, taken as "trophies" from massacre sites and battlefields, and obtained with legal authority but no individual consent from unclaimed bodies within prisons, hospitals and psychiatric institutions (Halling and Seidemann 2016: 1323; Redman 2016; Colwell 2017; de la Cova 2019). If use of those physical remains is deemed unethical due to their lack of consent, is it ethical to continue use of the digital derivatives of those physical remains, through digital 3D models, 3D printing, or even 2D images?

The term "marginalized other", coined by Dr. Carlina de la Cova, refers to individuals "peripheralized to the margins of society by those in power due to their ancestry, low social status, class differences, or attributes tied to what the dominant society viewed (or continues to view) as deviant" (de la Cova 2019: 134). Within the bioethical digitization debate, and the context of the political history of skeletal collection in this country, we propose that unconsented remains known to represent the "marginalized

other," where that group could be identified, should not be digitized for further use without the consent of their descendent communities. As we work to raise our ethical standards for skeletal digitization and sharing, we should recognize that it would be unethical to further utilize remains stemming from populations who experienced genocide, oppression and exploitation due to U.S. settler colonialism. In this article we employ the phrase "ethically protected populations", to refer to the remains of Indigenous peoples, enslaved individuals, and other disenfranchised or historically oppressed populations in the United States. We propose this designation because these populations, and particularly the remains of African Americans and Native Americans, were targeted with intent by anatomical and anthropological collectors (Redman 2016; Colwell 2017; Dunnavant *et al.* 2021; Williams and Ross 2021). These individuals deserve posthumous legal and ethical protection for their physical and digital remains that was not afforded to them in life. All human remains deserve dignity. In this article we aim to bring attention to this subset of an overall collection that experienced unconsented anatomization. We advocate for specific attention to be paid to these remains as individual stewards and institutions update their digital Code of Ethics protocols. Publicly sharing 3D models of these ethically protected populations, collected without consent and divorced from their historical context, facilitates the continued erasure of these ancestors' identities and life experiences.

In a survey of curators only 40% reported having a formal plan to regulate their users' 3D digitization (Smith and Hirst 2019). Just as granting organizations urge researchers to construct a plan for outreach and data storage before initiating projects, it is crucial that researchers consider the ethics of sharing or printing 3D models of human remains before scanning them. Despite recent guidelines published by individual researchers, no field-wide consensus on institutional best practices in digital bioethics currently exists in the United States (Schug *et al.* 2021; Ulgium 2018; Hassett 2018; Hirst 2018; but see IFAA 2023 in international setting). This leaves it up to the individual researcher to decide what skeletal material is appropriate to digitize and what contextual information about provenance or life history – if any – should be included. Unsurprisingly, this results in confusion in the scientific community about what can ethically and legally be digitized, publicly viewed outside of academia, shared in an open access format, replicated in 3D prints, or even sold for profit. This ambiguity can lead to unintentionally unethical choices that cannot be undone in the digital environment. Once a model has been made publicly downloadable, the steward of those remains no longer has control over its use. It is therefore imperative that researchers proactively a) create a Code of Ethics for their skeletal collection including any regulations on digital content, b) become informed about the provenance and life histories of the remains in their collections, c) engage with descendent communities when possible to learn their preferences for respectful handling, storage, digitization, further use and/or repatriation, and d) are aware of the potential harm caused by divorcing remains of ethically protected populations from their historical context, thereby objectifying them.

Public Sharing of Digitized Skeletal Remains

The online distribution of digitized human remains raises serious ethical concerns. Because digital derivatives can be shared across the world instantaneously through the internet, this bioethical issue is of international concern. In the current unregulated system, a steward of human remains who makes 3D models available for open access downloading should assume that they have allowed for the possibility of worldwide, public (nonacademic) use and reproduction of those models. This is a point that stewards, within academia or the general public, may not have considered when they use internet platforms to present their collections. However, once those models are released online and made downloadable, any true control over their use is ultimately lost. Cornwall (2017) describes this phenomenon as models being "e-mortal (electronically immortal)", meaning that once remains are made publicly available online they become indefinitely accessible (2017: 43). Therefore, it is the responsibility of every steward of human remains, not just those in academia, to consider the provenance and ethical distribution of

the remains they digitize. As stated above, these remains are at risk of being 3D printed, manipulated into a different form, or sold as physical or digital replicas (Jones 2019; Schug *et al.* 2021). This dilemma highlights the need for a critical evaluation of the human skeletal material we make public, and the need for ethical guidance at the institutional level rather than solely by individual researchers.

Two prominent and increasingly popular digital platforms for sharing 3D models are Sketchfab and MorphoSource (Hassett 2018; Ulgium 2018; Alves-Cardoso and Campanacho 2022). Although Sketchfab was not originally designed with the intent of being a distributor for anatomical images or museum collections, it has become a very popular choice. Sketchfab is described as the leading platform for 3D modeling and currently hosts over 10 million users (Sketchfab 2022; Sketchfab 2023). MorphoSource is a platform specifically designed for increasing the accessibility and discoverability of digitized physical specimens throughout academia and between museums and was described in 2017 as the largest web archive for 3D museum data (Boyer *et al.* 2017). Both are valuable resources for digitization, research and education, but neither were first designed with the political history of human skeletal collections in mind.

The MorphoSource Terms of Use contract for Users states that the uploading party has "the responsibility to make your own assessment of the copyright, and other legal concerns and restrictions that might affect your use of MorphoSource content and to assume personal responsibility for your uses of Content" (MorphoSource 2023). The platform does however, have different levels of accessibility, wherein users must request permission to download certain content. This allows the steward to Approve or Deny requests at their own judgment and impose specific use limitations (Boyer *et al.* 2017). The Sketchfab Terms of Use agreement states that "[y]ou are solely responsible for ensuring that any User Content you submit to the Services complies with any applicable laws and third party rights..." The User Restrictions and Obligations section further requires that you will not "[v]iolate the legal rights (including the rights of publicity and privacy) of others or contain any material that could give rise to any civil or criminal liability under applicable laws or regulations..." or "[t]ransmit any material or content that is pornographic, dehumanizing, threatening, harassing, libelous, hate-oriented, harmful, defamatory, racist, xenophobic, or illegal" (Sketchfab 2021: 4-5).

In both cases these platforms, alongside many other model-sharing websites, currently leave judgments on the ethicality of the content up to the "contributor" and their institution. This structure leads to field-wide inconsistency in ethical standards for sharing 3D models of human tissue. Without comprehensive agreement on ethical best practices for sharing 3D data, human remains collected unethically or without consent (e.g., skeletal remains that were stolen, represent enslaved individuals, or were victims of warfare) could potentially be digitized and shared without context. Ongoing engagement with the leadership of these and other websites is important in the conversation of ethical curation of digital human remains given its political history in the United States. Future Terms of Use agreements might include simple regulations such as requiring the Model Description of all human remains to include any existing contextual information on provenance/life history, or lack thereof (Schug *et al.* 2021). This allows users to make an informed decision about use of that material and its potential status within an "ethically protected population."

The potential for commercialization of 3D models adds another layer of concern to the distribution of imaging data from unethically collected human remains (Alves-Cardoso and Campanacho 2022). In their "Recommendations for Good Practice Around Human Tissue Image Acquisition and Use in Anatomy Education and Research," the International Federation of Associations of Anatomists states "Images of human tissues should not be commodified or commercialized" (IFAA 2023). Sketchfab contributors are able to make their 3D content available for purchase, creating the possibility for economic benefit from human remains. Regulations on the commercialization of digital data in the U.S. are not likely, given

the challenges of regulating the sale of physical human remains. Within the U.S., human remains can be purchased through legal and illicit sources with ease as there are no federal laws prohibiting the sale of human remains, and state laws vary widely (Halling *et al.* 2016; Levenson 2023; Patkin 2023). The only current exception to this is the Native American Graves Protection and Repatriation Act (NAGPRA), a federal law prohibiting the sale, purchase, use for profit or transportation of Indigenous remains (NPS 2023). Critical to this conversation however, NAPGRA does not mention regulation on digital derivatives, though Schug *et al.* (2021) state that stewards should honor the spirit of the law until it can be amended.

Currently, social media platforms have arisen as a new source of concern in the unregulated sale of human remains (Halling *et al.* 2016, BABAO 2023). While some internet platforms such as Ebay and Etsy have banned the sale of human skeletal remains on their sites in response to a 2016 article in the Journal of Forensic Sciences condemning the companies' behavior, other social media platforms such as Instagram and Facebook continue to host those sales (Halling *et al.* 2016; Ebay 2023; Etsy 2023; BABAO 2023). Both physical human bones and their digital derivatives can be easily acquired online in a matter of minutes. It is likely that these remains disproportionately represent marginalized and ethnic minority groups (BABAO 2023). Commodification of 3D models representing human remains should continue to be discussed within future bioethical conversations as we update standards for skeletal ethics in the U.S. This is especially important given that many of the remains held in museum and university legacy collections were acquired within the framework of colonialism.

Historical Context & Current Action

Modern digital ethics concerning skeletal remains are inextricably linked to the ways in which skeletal collections were first created. The origin and persisting legacy of skeletal collections across the globe is rooted in racism and colonization (Redman 2016; Buikstra *et al.* 2022). It is vital to ground conversations on digital ethics within this historical context before discussing use and dissemination of the digital derivatives of these remains. Throughout Europe and North America, the impetus for collecting human skeletons, to study and display to the public, reflected a racialized interest in human variation (Redman 2016; Colwell, 2017). This desire led to the pseudoscientific categorization of humans into distinct morphological groups ("races"), with skeletal features being incorrectly touted as proof for the racist ideologies of the time. This included the promotion of white supremacist racial hierarchies, biological determinism (asserting a connection between intelligence and anatomy), and the concept of polygeny (the assertion of separate evolutionary origins between the "races") (Redman 2016; Blakey 2020; Williams and Ross 2021).

The most prominent skeletal collections in the U.S. were initially assembled through an arms-race raid of archaeological sites, cemeteries, battlefield casualties and victims of genocide. This was done with the systematic intent of filling collections with remains that were considered rare specimens, from the white perspective. Consequently, the foundational skeletal collections in the U.S. were initially built from, conservatively, hundreds of thousands of Indigenous, African, and African American bodies, anatomized without the consent or knowledge of their ancestral communities (Redman 2016; Colwell 2017; de la Cova 2019). Though recent efforts have been made to "decolonize" museum and university spaces which house these collections, this history contributed to a pervasive and persistent attitude of 'othering' towards communities of color in the general public as well as academia.

In 2020, widespread Black Lives Matter protests swept the country in response to the inhumane and inequitable treatment of communities of color, specifically Black Americans, by the police. Black scholars within Archaeology, Anthropology and Anatomy led and inspired conversations about the role these fields have played in the exploitation of Black and Indigenous cultures and bodies. As researchers we were asked to consider the part that we play within the system today and take the time to mindfully

and actively construct the antiracist future we want for our academic fields and our country (Flewellen *et al.* 2021; Wenner-Gren Foundation 2021). During this time, significant public demands were made to address the colonial influence on museum and university skeletal collections.

Public acknowledgements of the museum-decolonization effort were made by two universities housing large skeletal collections with unethical origins. Harvard University, which houses the skeletal remains of over 22,000 individuals and the University of Pennsylvania, home to the Morton Collection which houses +1,300 individuals, both released statements publicly acknowledging their institution's role in this history and their intent to address past wrongdoings (Harvard 2021; University of Pennsylvania 2021). The statement from Harvard University President Lawrence Bacow read: "We must begin to confront the reality of a past in which academic curiosity and opportunity overwhelmed humanity. ...On behalf of the University community, I apologize for Harvard's role in collection practices that placed the academic enterprise above respect for the dead and human decency. Our museum collections undoubtedly help to expand the frontiers of knowledge, but we cannot—and should not—continue to pursue truth in ignorance of our history" (Harvard 2021). The statement from the University of Pennsylvania acknowledges that institutions need to "examine the colonial and racist histories of their collecting practices," and furthermore that, "it is time for these individuals to be returned to their ancestral communities, wherever possible, as a step toward atonement and repair" (University of Pennsylvania 2021).

During this period the Penn Museum faced national public criticism for housing the physical remains of Katricia and Delisha Africa, two Black children killed by Philadelphia law enforcement in the MOVE bombings of 1985. After the bombing in which 11 people were killed and 60 houses burned, the children's remains were not buried or returned to their family (PBS 2014; Dunnavant *et al.* 2021; NBC 2021). Instead, they were released by the Medical Examiner to a University of Pennsylvania professor for consultation, and held there until their eventual repatriation to MOVE members in July 2021. While being stored at the Penn Museum, the remains were digitized into video format for academic use in an online class at another university. This was done without the knowledge or consent of their living relatives (Tucker Law Group 2021).

As the story gained national attention, University of Pennsylvania enlisted the Tucker Law Group (TLG) to conduct an independent investigation. The TLG concluded that possessing the unconsented and unethically retained remains, as well as continuing to use them in a digital format, represented "extremely poor judgment and gross insensitivity to the moral, social, and political implications of their conduct" (Tucker Law Group 2021: 76). Crucially, the TLG found that the retention, digitization and use of these remains did not violate the museum's existing Policy Statement on Human Remains. The report concluded that multiple members of museum leadership were aware of the provenance and continued use of the remains, but University Officers and Administration were not. This example illustrates that many institutions do not have a comprehensive inventory of their total collection, and either do not know the provenance of their entire skeletal collection or are consciously disregarding ethical conduct regarding these remains, the standards and regulations of which vary institution to institution.

Following this discovery multiple organizations called for a national movement to inventory every museum and university skeletal collection for the remains of Black individuals, enslaved African peoples, and their descendants. The Association of Black Anthropologists, the Society of Black Archaeologists and the Black in Bioanthropology Collective released a unified statement calling for this national audit (ABA 2021). American legacy skeletal collections continue to store and utilize the unconsented remains of African Americans, including enslaved people and their descendants (Justinvil and Colwell 2021). Authors Justinvil and Colwell aptly point out that those institutions and the researchers within them benefit from the size and prestige of those collections. Additionally, they highlight the need for

legislation protecting African American gravesites and remains, akin to NAGPRA, which would offer legal protection and be an advocating force for repatriation of these remains. During the 1990's legal battle for ethical excavation on the African Burial Grounds Project, Dr. Michael L. Blakey shared this same sentiment, stating that if there were laws protecting the remains of Black people, multi-year activism by the descendent community would not have been necessary to hold those in power accountable for protecting and preserving those remains (Blakey 2010). Justinvil and Colwell (2021) note that without national legislation, work that aims to find posthumous justice for the remains of African American people and identify burial sites in need of protection, will be "unorganized and inconsistent" (2021). This sentiment is reinforced by decades of evidence, before the passing of NAGPRA, of Indigenous tribal leaders continuously asking for the remains of their ancestors and cultural artifacts to be repatriated, only to be turned away (Colwell 2017). It was only with the legal support of NAGPRA legislation, as well as widespread public pressure, that progress towards repatriation truly began.

Multiple authors have specifically explored the history of unconsented acquisition and posthumous exploitation of African American and enslaved African bodies and skeletal remains (Halperin 2007; de la Cova 2019; Justinvil and Colwell 2021; Williams and Ross 2021). While a comprehensive national survey has not yet been conducted, it is estimated that U.S. skeletal collections are storing thousands of African American skeletal remains (Dunnavant *et al.* 2021). In her analysis of the Robert J. Terry Anatomical Skeletal Collection, Dr. de la Cova states, "These individuals, although legally dissected, did not consent to the anatomization of their bodies. Their experiences and the use of their bodies in medical dissection speaks to broader issues in American society tied to class, race, and structural violence. Historically, African Americans were more vulnerable, and targeted more often than whites in regard to anatomization and medical experimentation... Ultimately, anatomical [skeletal] collections demonstrate the continued exploitation of Black bodies in early 20th century American medicine" (de la Cova 2019: 151).

Legal Authority Versus Ethical Responsibility of Digitization

As conversations continue on this topic we must consider legality versus ethicality, and that our current laws may not yet reflect what we want to consider modern ethical treatment of human remains. What is legal is not always ethical. Digital bioethics are evolving in the 21st century, and as Thomas and Krupa state, "[Bioarchaeology] must no longer limit itself to "legislated ethics" but rather embrace proactive ones" (2021: 353). Laws regarding human remains are often reactionary, and the 3D digital bioethics dilemma presented here may warrant updating our current laws around treatment of human remains in the U.S.

One stark international example of unethical legality stems from the Holocaust, when between 1933 and 1945 the National Socialist regime of Germany executed minimally 30,000 citizens for "high treason," a condemnation which included political opposition to the Nazi party. The German Ministry of Education decreed that the remains of these executed "criminals," as well as bodies funneled from concentration camps and prisons, would be sent to anatomy labs for dissection, research and curation. "Jewish skulls" and "Polish skeletons" sourced from these executions were also legally sold for profit during this time (Hildebrandt 2008). Hildebrandt (2008) suggests that researchers need to critically examine the power and opportunity given to us by the legal system, and question the source and historical context of the biological material we study.

Rather than offering posthumous protection, U.S. laws concerning human whole-body and skeletal remains have consistently aided in, and even emboldened, the targeted acquisition of remains from marginalized populations. Chip Colwell's book "Plundered Skulls and Stolen Spirits: Inside the Fight to Reclaim Native America's Culture" (2017) recounts the brutality of the Indigenous American genocide,

and the ways in which early U.S. law encouraged unethical skeletal collection. In the late 1800's as American museums began establishing skeletal collections, the U.S. Surgeon General ordered military personnel to "aid in the progress of anthropological science" by obtaining Indigenous remains (Colwell 2017: 85). Scalps, genitalia, and the skeletal remains of infants, women and men were taken from battlefield sites of massacred Indigenous peoples, and remains were stolen from cemeteries, supplying museum collections across the country. Gulliford (1996) provides a powerful metric that speaks to the targeting of marginalized individuals' remains, that in the mid-1990's Indigenous people made up an estimated 1% of the U.S. population, but they represented over 50% of the human remains in the Smithsonian collections.

Many unethically obtained remains, divorced from their provenance, still exist within institutional collections across the U.S. and have the potential to be digitized without this historical contextual information being passed on to 3D model users. Scientists sometimes view themselves as morally-neutral caretakers of institutional collections or believe that we are temporally exempt from the unethical behavior of past generations. But by continuing unconsented use of remains collected unethically, are we not perpetuating the exploitation of those individuals? And if a steward benefits financially (employment) and through recognition within their field (publications) through use of those remains, one could argue that we are not morally neutral, but are complicit in the system that built these unconsented collections in the first place. There are significant ethical considerations we need to confront about the ways in which we continue use of these remains, what studies are allowed to be done with them, and the scope to which digital reconstructions should be created and shared publicly.

The "Vienna Protocol" provides established guidelines for handling human remains associated with the Holocaust and can inform this discussion on prohibiting further use of human remains that represent victims of genocide, violence and oppression in the U.S. (Hildebrandt 2021; Polak 2021). The Vienna Protocol was collaboratively created by a team of international experts including Rabbi Joseph A. Polak the Chief Justice of the Rabbinical Court of Massachusetts, as well as anthropologists and historians. It details a recommended protocol through the Jewish faith for appropriate interaction and reburial of remains stemming from the Holocaust. While it approaches this topic through a religious lens, the authors state that it is "a universal document that can be considered as a model for people of other faiths and beliefs" (Polak 2021: 75). Regarding digital derivatives for medical education, Recommendation #10 states that "There is a rich Jewish legal literature on the impermissibility of photographing the dead... this might extend to histology slides and similar minute samples" (Polak 2021: 82-83). Recommendation #12 references use of images of Jewish human remains for medical education and the purposes of saving a life. In this instance they invoke the Untermann Protocol, which requires contextual life history information to be included with the image so that the dead may be afforded dignity. These guidelines echo those of many digital-anatomy ethicists in the call for contextual information to be included in 3D Model Descriptions, to avoid further exploitation and erasure of life history (Ulguim 2018; Alves-Cardoso and Campanacho 2022).

While institutions and individual researchers currently can legally possess, digitize and disseminate 3D models of human remains known to be from ethically protected populations, we suggest that ethical responsibility prohibits digitization of these individuals. Digital models are valuable and effective teaching tools, the need and use of which increased exponentially during the Covid-19 pandemic (Spiros *et al.* 2022). However, obtaining ethically sourced 3D osteological models can be accomplished through existing body donation programs which require informed consent by the donor. There are multiple Forensic Anthropology body donation programs across the U.S. (University of Tennessee, Texas State University, and University of Florida to name a few) in which donors provide documented informed consent for the use of their physical remains. We advocate that wording be added to informed consent

paperwork to include explicit consent for digitization and public dissemination so that this material can be used for educational purposes and research.

This transition away from using unprovenanced bioarchaeological and anatomical human remains, towards donor-consented remains mirrors the field of Anatomy. Many anatomical programs have already transitioned into exclusively using voluntary donors rather than accepting unclaimed and unconsented remains (Hildebrandt 2008). These programs, which require fully informed donor consent, could fill the need for normative digital models, as well as exemplars for pathology and trauma. Currently researchers still debate what the fate of unprovenanced bones in skeletal collections should be. Should they be deaccessioned or continue to be used for their education value? (Coman *et al.* 2022; Cornwall *et al.* 2022). Current bioethical conversations could mark a moment in our history where we see a shift towards solely donor-consented remains in modern Anthropology teaching collections as well.

Personhood Versus Objectification

Much debate has occurred about the acquisition, possession and display of physical human remains, but less attention has been given to the issue of whether the same rules apply to their digital representations. At what point, if any, is the human body relieved from its rights of personhood and bodily autonomy? Do fleshed remains, skeletonized remains or digital derivatives of those remains (2D-images, x-rays, 3D-models, etc.) carry with them the same rights as they did in life? Balachandran (2009) claims that human remains defy simple categorization in this debate of object versus personhood, making these conversations often contentious. Because they are not physical human tissue, digital derivatives are easier to objectify than fleshed or skeletonized remains. This question must be explored within the bioethics conversation surrounding digitization because it will affect legal and ethical protections afforded to 3D models, as well as the living communities those remains stem from. Although digital derivatives can feel far removed from the immediate concerns of ethical treatment of physical remains, some people may feel that any continued use of unethically obtained remains, even in digital form, is a perpetuation of the core issue: institutions putting scientific curiosity before the individuals they study.

Kreissl Lonfat and colleagues (2015) propose that we can avoid causing posthumous harm to the deceased individuals that we study by protecting them from both physical harm and from any harm to their living identities. "Harm" in this digital context could be seen as divorcing the life history from the physical remains of ethically protected populations, furthering the bodily exploitation experienced in life, or caused from acquisition without consent. Kreissl Lonfat *et al.* offer that we can show respect to the remains we steward by "becoming a safeguard of the fulfillment of their posthumous interests" (2015: 1176).

The crux of this article is that marginalized individuals within U.S. skeletal collections, whose communities and bodies were exploited in life and in death, should not be digitized for further unconsented use. A counter argument to this, is that digital material can be a powerful resource to counteract the erasure of our national history, as a country and also of our academic fields (Bouton 2018; Hildebrandt 2021). Bijl (2012) reminds us that images of colonialism can be vital reminders of violent histories that aren't being taught (Bijl 2012). Harries *et al.* state that "the value of photographs is argued to lie precisely in their capacity to elicit a sense of ethical proximity with the imperial past, thereby countering a tendency towards 'aphasia' or 'ignorance' regarding the colonial histories of European nations" and by extension American colonialism (Harries *et al.* 2018: 12). Harries *et al.*, continue to say that it "implicates us, who discover or make such images and would choose to present it to the public, as well as any who view that image, in the long legacy of dispossession and violence which gave rise to the very possibility of that image..." (Harries *et al.* 2018: 19). Within this lens, it is entirely possible that 3D models of ethically protected populations could serve as the solution to the erasure of historical violence that these

populations experienced. Crucially this decision must be led by descendant communities, who consent and desire for their ancestors' remains to be used in this public educational format. Community-led solutions are key, as was evidenced in the African Burial Ground Project (Blakey 2010).

Existing Ethical Guidance on Digitized Remains

When this work was initially presented at the 2021 "AnthroEthics in the 21st Century" conference, there was minimal field-wide guidance on the ethics of digitizing human remains from the major U.S. archaeological, anthropological and anatomical organizations. Today, there is still no mention of digital ethics or best practices for 3D models of human remains in the American Association of Biological Anthropologists'(AABA) "Code of Ethics," the Society for American Archaeology's (SAA) "Principles of Archaeological Ethics," or on the Paleopathological Association website (AABA 2023; SAA 2023, AAA 2023; PPA 2023). The American Association for Anatomy's (AAA) "Policy on Legacy Anatomical Collections" requires that 3D models should be included in required inventories for legacy anatomical collections (AAA 2023). The absence of specific guidance regarding digitization highlights the need for, if not a field-wide consensus, then institutional guidance on digital ethics concerning models of human remains, with special consideration paid to ethically protected populations.

Recommendations on the use of digital images published by the International Federation of Associations of Anatomists are focused primarily on images and models created from modern human body donor programs (IFAA 2023). They place strict limitations on distribution of those images to protect the dignity of the deceased individuals, but they acknowledge that historical collections with no evidence of consent might be used in educational settings, in collaboration with descendant communities, where the history and ethics of their acquisition can also be presented to provide context. The British Association of Biological Anthropology and Osteoarchaeology (BABAO) have published a "Guidance Document on Digital Imaging" which explicitly details the ethical reasoning and ramifications behind producing and sharing 3D models (BABAO 2019). However, it does not yet directly address digitization within the historical context of collections acquired without consent and/or composed of individuals stemming from communities that experienced genocide, violence and oppression. Instead, this document cites Ulguim (2018), stating that the individual uploader should take "situational" variables into account about the "local sensitivities and historical information" (BABAO 2019: 7); again, leaving the decision up to the individual steward whether it is appropriate to share models of ethically protected populations. The organization cautions members that inclusion of contextual information is vital in these circumstances and stewards should share their justification for creating the model, and perhaps limit the distribution of that model.

In recent years multiple authors have provided excellent guidelines for ethical 3D behavior, notably Schug *et al.* 2021, Ulgium 2018, Hassett 2018, and Hirst 2018. Schug *et al.* 2021 provides a 22-point recommendation list of comprehensive guidance broadly applicable to many collections. They recommend that a) before scanning, responsible parties should consider whether the remains were legally acquired, b) descendent communities should be consulted (if possible) before archaeological remains are scanned, c) the ethical standards of professional organizations should be amended to reflect biodigital concerns, and d) the spirit of NAGPRA should be honored until the law can be amended to include digital derivatives of Indigenous remains. Ulguim (2018) contributes that contextualizing information and metadata should be provided, and that it's essential to consider the political and cultural history of these data, and who we ultimately aim to serve with digitization. Hassett (2018) cautions against the ease with which human remains can be released online in perpetuity and urges stewards to consider the "intended use community" of their content (2018: 237). Finally, Hirst (2018) highlights an "alarming lack of ethical or legal guidance regarding 3D digital data" and calls for more standards and regulations for digital content (2018: 275).

Alves-Cardoso and Campanacho (2022) conducted a survey on public perception towards the use of 3D models of human remains. A sample of 312 Portuguese, Brazilian, Spanish and Belgian individuals were polled. Results showed that 43% of participants considered 3D replicas to be the same as real bone. Eighty-seven percent (87%) of participants stated that they would be comfortable with their family members remains being digitized. We suggest that this study on the continued use of unconsented material be repeated in the U.S. with the inclusion of an educational statement on the history of U.S. skeletal collections. It could explore potentially differing perspectives from a) the general public, b) descendent communities of ethically protected populations, and c) those within academia. Additionally, language could be added inquiring how participants from the general public would feel if skeletal remains of a family member were digitized without their knowledge or consent. Past studies have shown that while the general public is typically in favor of the educational use and display of human remains, individuals with biological or cultural ties to the remains, unsurprisingly feel much more protective (Blakey 2010; Harries *et al.* 2018; BABAO 2019).

Due to the dearth of ethical regulations for the digitization of skeletal remains, researchers are forced to ground their justification for digitization in existing regulations for physical remains. For example, Principle #3 of the SAA's (2021) "Statement Concerning the Treatment of Human Remains" states that "archaeologists should make every effort to consult, collaborate, and maintain communication with descendant communities" and "archaeologists should follow best practices and uphold the highest ethical standards when working with human remains". Similarly, the AABA Code of Ethics states that scientists "must not exploit individuals, groups, animals, or cultural or biological materials," and "anthropological researchers must do everything in their power to ensure that *their research does not harm the safety, dignity, or privacy of the people with whom they work*, conduct research, or perform other professional activities" (AABA 2003). Distribution of digitized remains from ethically protected populations, collected without informed consent, threatens the dignity promised above.

Recommendations

Legacy skeletal collections held by U.S. institutions were largely built from the unconsented remains of the most marginalized communities in our country. These collections include the unconsented skeletal remains of enslaved peoples, African Americans, and Native Americans, among others, whose remains were targeted by the founders of Anthropology, Archaeology and Anatomy. Knowing this, any further use of these remains should be critically evaluated. We recommend that remains known to belong to these ethically protected populations not be digitized or shared publicly without descendent-community support. We must acknowledge that these digitization decisions will affect modern living communities, and therefore stewards of human remains who digitize and disseminate 3D models of skeletal remains are encouraged to consider the following recommendations. Numerous authors across multiple fields of study have already called for the creation of an ethical framework to deal with the current "digitization dilemma" that we face. They have begun to provide suggestions on best-practices of the digitization of unprovenanced or unethically collected remains (Hassett 2018; Ulgium 2018; BABAO 2019; Schug *et al.* 2021; Alves-Cardoso and Campanacho 2022). The following prompts may help individual researchers evaluate a path forward for their collection.

1. **Best Practices: Field-wide best practices should be established to regulate the digitization and dissemination of all legacy skeletal material, including remains acquired unethically and/or without consent.** We encourage a collaborative effort between the major U.S. institutions and organizations of members that store and use skeletal remains (American Association for Anatomy, American Association of Biological Anthropologists, American Academy of Forensic Sciences, Society for American Archaeology, etc.). These varied groups bring unique perspectives that will inform well-rounded regulations of digital derivatives.

2. Inventory: **Prior to digitization, adequately inventory your skeletal collection.** This inventory should include both the physical remains in your collection, and also the digital derivatives that have already been created.
    a. **Evaluate the "consent status" for each individual in your collection.** Determine whether the remains are unconsented, donor-consented, family-consented, consented by the descendent community, or were given legal permission for use by a Medical Examiner. Consider whether the language of the consent that was given specified "public use" as well as academic. Additionally, if you intend to make 3D models of skeletal remains publicly available and downloadable, explicitly confirm the donor's agreement for public digital sharing of 3D models.
    b. **Evaluate the "ethically protected population" status for each individual in your collection.** If remains of ethically protected populations are discovered, we suggest that they not be digitized or shared publicly without prior consultation with descendant communities.
3. Awareness: **Institutions should ensure that all individuals interacting with skeletal remains (teaching, research, etc.) are aware of the provenance/history of the collection.** This practice constitutes informed use of potentially unethically collected remains. Institutions can also consider a public acknowledgement of the individuals in their collection, and how they came to be there.
4. Biodigital Code of Ethics: **Within your institution, create or update a Biodigital Code of Ethics specifically for the digitization of human remains in your collection.** This code should reference the requirement of a complete physical and digital inventory, as well as the assessment of consent status and ethically protected population status for each individual. Potential limits on access to the digital derivatives should be addressed.
5. Descendant Communities: **Ethics conversations about the fate of legacy collections should include and center voices from known and potential descendent communities.** This community-centered paradigm has been successfully modeled in the work of the African Burial Ground Project (Blakey 2010). Flewellen and colleagues state that "We cannot in good faith claim an interest in accessing the past without serious engagement with communities that bear the unequal burden of its consequences in the present" (2021: 231).
6. Contextual Information: **When uploading 3D models and other digital derivatives for access online, Model Descriptions should include available contextualizing information about the consent status or life history of the individual.** This allows the user to be informed about the history of the individual whose images they're using. If no contextualizing information is given alongside material known to be unconsented or unethically acquired, stewards are not truly providing potential users with the details needed to make an informed decision about the ethicality of using that material.
7. Consent for Future Acquisitions: **Existing skeletal collections may acquire consented remains from modern donor-consented collections for future teaching and research purposes.** These consented collections contain remains donated directly by the deceased or their family with associated paperwork indicating explicit consent to digitize skeletal material and share it publicly. We encourage the use of explicit language in future donor consent forms addressing the publication of digital derivatives.

Conclusion

In this paper we aim not to present our own code of ethics, but to continue the discussion on best ethical practices in digitizing human remains that may represent ethically protected populations. We encourage all researchers who digitize skeletal remains to create and regularly reassess their Biodigital Code of

Ethics to meet the shifting baseline of modern ethical standards in the digital era. These ethical codes should take into account our field's history of skeletal acquisition without consent, and the current and future escalation of 3D digitization. Digitization is a powerful and democratizing educational tool that will be increasingly utilized in the upcoming decades. It will undoubtedly aid in public outreach and education, the inclusion of historically excluded researchers, and will increase the potential accessibility of human remains to researchers across the world. However, digitization and dissemination of that work must be done in a way that honors life histories of the deceased without erasing them. This could be done by forfeiting the digitization of inappropriately collected human tissues and pursuing repatriation and deaccessioning, or at minimum, by including contextual information and the consent status in metadata alongside published 3D models.

Researchers and curators of skeletal collections in the fields of Archaeology, Anthropology, Anatomy and beyond, are accountable to the people that we study. It is our responsibility to minimize posthumous harm and to honor their life history by not decontextualizing their remains without great ethical consideration. It is the authors' hope that our field chooses to confront the immediate issue of digital bioethics with the historical awareness and transparency lacking from the practice of skeletal collection at its inception.

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Chapter 9

Perceptions on the Study of 3D Replicas of human remains in Biological Anthropology: A Public-Based Survey from the United States

Vanessa Campanacho and Francisca Alves Cardoso

Introduction

Third-dimensional (3D) modeling is here to stay. It is a high point of today's technological development and is used in various activities, from the public to the private spheres, including the commercial sector, heritage institutions, and academia. Third-dimensional technologies have been used in humanities research and education since the 1980s in a wide range of scenarios (Muenster 2022), but the development of the technology also brought complexity and raised other issues that need addressing. These include more technical aspects related to the need for adequate equipment, costs, infrastructure, and specialized skills, but also ethical issues liaised with easy access, dissemination, and ownership (Muenster 2022; D'Andrea *et al.* 2022).

The use of 3D modeling in cultural heritage has been substantial based on the argument that it adds to data collection, items documentation and replication, aiming for reconstruction and conservation, and dissemination in academic and non-academic contexts (Ioannides *et al.* 2014; Spena and Bifulco 2021). Recently, many papers have addressed 3D modeling in cultural heritage, showcasing overviews of 3D importance and contributions (e.g., Barrile *et al.* 2022; Gaspari *et al.* 2022; Mendoza *et al.* 2023). These references are only a small part of all that has been written and explored on the subject, but they are a strong statement on the fact that 3D technology has secured its place in cultural heritage.

Within cultural heritage, ancestral human remains deserve particular attention as they are the remains of people who died, not objects. For this study, human remains were defined as osteological human remains (i.e. bones), however, human remains are all that originate from human tissues, be it bone, teeth, or other elements. They have an added complexity with legal and ethical issues that need to be considered (see Squires *et al.* 2022) and that must, and in most cases are, incorporated into the discussion of 3D digitization of human remains (Alves-Cardoso and Campanacho 2022a).

The use of 3D technology associated with human remains, like contexts of cultural heritage, aim mostly at data collection, preservation, conservation, and dissemination. Of all, preservation is used as a significant banner because human remains held in institutions, museums, and universities are often subject to continuous handling, as these are used in teaching alongside research. Consequently, and over time, damage and loss of some elements (such as teeth, phalanges, and other small bones) happen (Alves-Cardoso and Campanhacho 2022a; Bowron 2003; Henderson and Alves-Cardoso 2018; Roberts 2019; Schug *et al.* 2021). The significant importance of access to human remains and subsequent research and teaching opportunities has prompted the creation of virtual repositories and digital collections, including in the U.S.. These include database repositories like Morphosource, as well as virtual collections, such as the Subadult Virtual Anthropology Database, and the New Mexico Decedent Image Database (Boyer *et al.* 2016; Berry and Edgar 2021; Stull and Corron 2022).

There has been an extensive debate, in Europe, on the implications of 3D of human remains, alongside their display (Errickson and Thompson 2019; Jenkins 2010; Geisen 2013; Swain 2016, amongst many others). The authors themselves have dwelled on these subjects exploring the Portuguese opinion on creating, using, and disseminating 3D models of human remains (Alves-Cardoso and Campanacho 2022a). It was the first study of such nature conducted in Portugal, and it added to the overall perception of Europeans on these matters. Overall, the 3D creation and dissemination of human remains is well regarded, but these need to be accompanied with contextual information, and access limitations need to be included. This latter observation agrees with the fact that many (43%) viewed 3D replicas as the same as real bone (Alves-Cardoso and Campanacho 2022a).

This manuscript explores the view of US residents on the study of 3D replicas of human remains associated with the discipline of biological anthropology. This research is based on previous research conducted by the authors on the Portuguese community, and for that reason, comparisons will be made (Alves-Cardoso and Campanacho (2022a). These are further comprehensive considering the long-standing relationship between the U.S. and Portuguese academia when it comes to the study of human remains linked to the scientific field of biological anthropology and forensic anthropology (Alves-Cardoso and Campanacho 2022b; Campanacho and Alves-Cardoso 2023).

This manuscript will add to the ongoing discussion on the use and curation of human remains for research and teaching in the U.S. (Schug *et al.* 2021; Bryson and de Leon, this book). In later years, there has been increased scrutiny on displaying and curating human remains by U.S. museums and other institutions, mostly universities (e.g., American Museum of Natural History, the Mutter Museum, in Philadelphia, the Penn State University) (Small 2023), with museums taking renewed approaches to the stewardship of human remains in their collections. Care and attention towards human remains have been gaining momentum since decades have passed after the 1990 Native American Graves Protection and Repatriation Act (NAGPRA), facing the reality that despite NAGPRA there continue to be many Native American, Native Hawaiian, and Alaska Native human remains kept by museums, universities, and federal agencies. The relevance and importance of assessment of public inquiry is that opinion-making often leads to public policies, and public information is key in cases including sensitive heritage and collections (as exemplified by reference to many newspapers, and magazine articles[1]). Such is the case of human remains and, by extension, of 3D models based on human remains. The fact is that 3D models will be scattered on the internet for anyone to access, use, remix, and be creative on, with or without consideration for the fact that these models are replicas of past people, and the fact that some remains were incorporated into collections without consent may pose a significant number of problems. But most importantly, it raises many ethical issues that cannot be ignored. For example, living relatives and/or communities associated with human remains may have strong feelings against them being digitalized and disseminated online. Also, when it comes to many ancestral remains, no consent was obtained (for various reasons). Hence, arguments of preservation, better analysis, science sharing, and dissemination need to be carefully considered, and, ideally, discussed with associated communities or remains' custodians.

[1] These are only a few of the press releases on this matter: The Associated Press, 2023, Penn Museum reburies the bones of 19 Black Philadelphians, causing a dispute with community members: https://www.nbcnews.com/news/nbcblk/penn-museum-reburies-bones-19-black-philadelphians-causing-dispute-com-rcna137086 (accessed, 23rd March 2024); Field Museum, 2024, Field Museum Alters Cultural Galleries in Response to Updated Federal Regulations: https://www.fieldmuseum.org/about/press/field-museum-alters-cultural-galleries-in-response-to-updated-federal-regulations (accessed, 23rd March 2024); Geoffrey Thün and William Secunda, Vice Presidency for Communications, University of Michigan, 2024, Statement on Native American Ancestral Human Remains and Objects: https://publicaffairs.vpcomm.umich.edu/key-issues/statement-on-native-american-ancestral-human-remains-and-objects/ (accessed, 23rd March 2024)

Materials and methods

Survey

Data were collected between October 2018 and April 2020 through an online survey for US residents distributed via Google Forms on various social media platforms (i.e. 214 Facebook groups, Twitter, Instagram, and LinkedIn). The survey consisted of 18 questions adapted from the survey distributed to Portugal residents by Alves-Cardoso and Campanacho (2022a).

The survey was divided into three sections with non-mandatory questions, allowing participants to respond to the questions they were willing to address or felt comfortable with. The first section of the survey consisted of six questions asking participants about their gender identification, age, education, occupation, religion, and citizenship. To ensure participant anonymity, no other personal information was requested. In section 2, participants were asked five questions about their previous experience with visualization and creation of 3D models of human remains. To assist participants who had never seen a 3D model, a description of what a 3D model is and how it is created was included in the survey. However, since the goal was to understand participants' prior experience, images of a 3D model were not included to avoid influencing participants' responses, especially when asked if they had ever visualized 3D models of human remains. The third and final section asked participants seven questions regarding their opinions on the creation, use, and dissemination of 3D models of human remains.

Social media comments

As the survey's posts received comments on different social media platforms, an overall analysis was performed as it provided additional opinions on the digitization of human remains. To protect social media users' privacy and safety, their identity was not disclosed, and their comments were not transcribed in this chapter. The authors did not engage with the comments on the social media platforms to avoid swaying the opinion of the survey participants.

Statistical analysis

Descriptive statistics were performed for each question. The number of individuals per question varied when compared to the overall number of participants since participants could decline to answer questions, and some of the questions were multiple-choice. Based on the sample occupational profile, participants were categorized into a binary variable: specialist and non-specialist occupations. Specialists, such as anthropologists, biologists, and archaeologists, are likely to handle 3D models of human remains in the workplace. Non-specialists included individuals who do not work with 3D models of human remains, such as farmers and funeral directors. Some of the occupational terms used by participants were vague (e.g., retirees), and for this reason, they were excluded from the occupational analysis but kept in the overall analysis.

A Chi-square test was used to determine whether there were statistically significant differences of opinion between gender, education, occupation, and religious groups. Few participants identified as LGBTQ+ ($n = 8$). Due to the limited number of participants identifying with non-binary gender, the gender analysis considered only women's and men's data. A Mann-Whitney U and Kruskal-Wallis one-way analysis of variance were computed to evaluate differences of opinion according to age. JASP version 0.17.1 and Microsoft® Excel® 2019 were used for the statistical analysis, with the statistical significance set at $p \leq 0.05$.

Results and discussion

Section 1 – Demographic information about participants

Between October 2018 and April 2020, 356 individuals residing in the United States participated in this study. The number of participants does not represent the US society entirely, especially as the sample was skewed towards a specific demographic group, as described below. Nevertheless, the data collected can provide a general idea of Americans' opinions regarding the digitization of human remains. The breakdown of the sample profile by demographic groups was:

A. **Citizenship:** Most participants (n = 299, 87.7%) were US citizens. The second-largest group of participants (n = 23, 6.7%) were from various European countries. The remaining participants were citizens from other North American countries (n = 11, 3.2%), South America (n = 3, 0.9%), Australia (n = 2, 0.6%), South Africa (n = 1, 0.3%), South Korea (n = 1, 0.3%), and Native American[2] (n = 1, 0.3%). Twelve participants also held dual or even triple citizenship from North America, Europe, Israel, or South Africa. Fifteen participants did not disclose their citizenship.

B. **Gender:** Most participants (64.3%, n = 222) identified as women, 33.3% (n = 115) as men, and 2.3% (n = 8) as LGBT+. Eleven participants did not disclose their gender identity.

C. **Age:** Participants were between 16 and 76 years old (Figure 1), with an average age of 38 years (Table 1). When the analysis was broken by gender, it showed, on average, that men were older than women and LGBT+ individuals (Table 1). The decline in the number of participants with age may be linked to older individuals being less willing to fill out online surveys (Mulder and de Bruijine 2019). Seven participants did not disclose their age.

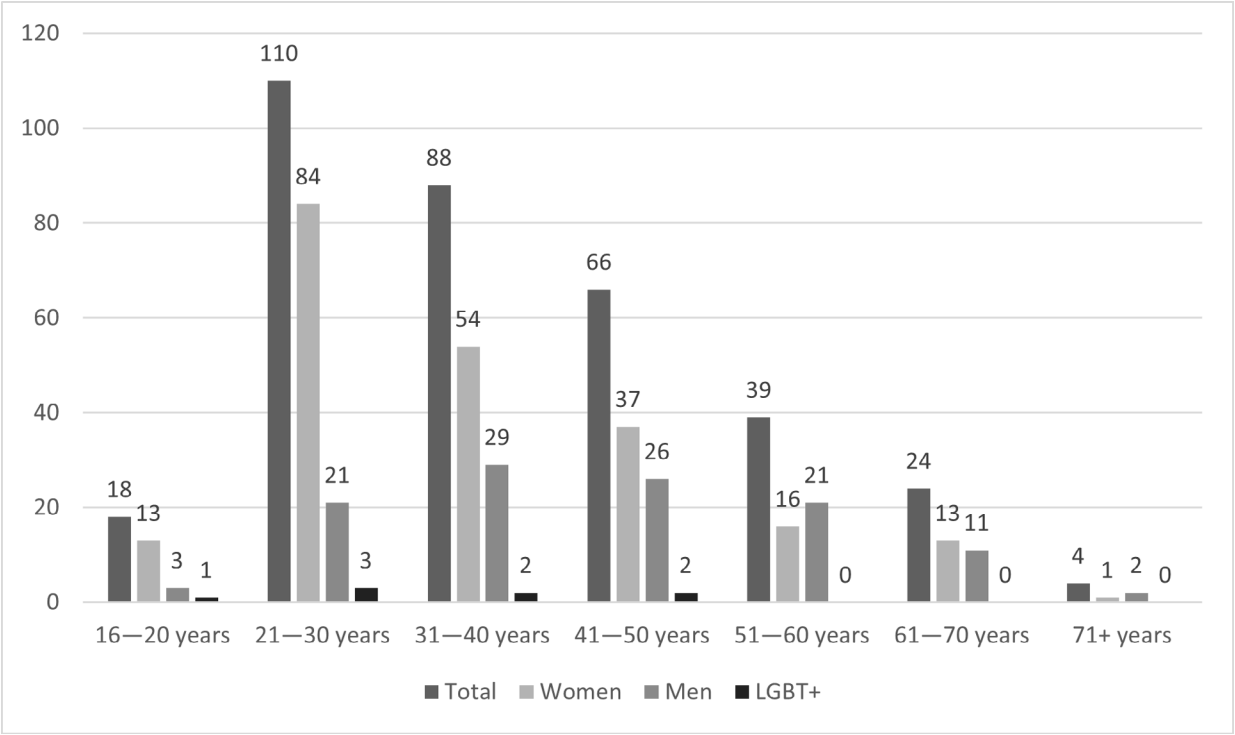

Figure 1 - Age distribution for the total sample and per gender.

[2] As expressed by the participant.

TABLE 1 - DESCRIPTIVE STATISTICS OF THE AGE DISTRIBUTION (IN YEARS) FOR THE TOTAL SAMPLE AND PER GENDER.

Sample	N	Mean	SD	Median	Minimum	Maximum
Total	349	38	13.7	36	16	76
Women	218	35	12.7	32	18	72
Men	113	43	14.1	42	16	76
LGBT+	8	33	10.1	30.5	20	48

Legend: SD - standard deviation

D. **Education:** Almost 90% of participants had a higher education diploma (Table 2). Possibly reflecting a greater willingness by individuals with a higher education degree to participate in surveys than those with a high school diploma (Singer *et al.* 2000; Mulder and de Bruijine 2019). Individuals with a higher education were on average older than those with a high school diploma (Table 3). This is to be expected, given that some participants were too young to have a university degree at the time of the survey. Four participants did not disclose their educational level.

E. **Religion:** Approximately two-thirds of the participants did not hold a religious belief (Table 4). Religious and non-religious groups shared a similar average age, 39 and 38 years, respectively (Table 5). Twenty-four participants did not disclose their religion.

TABLE 2 - FREQUENCY AND PERCENTAGE OF PARTICIPANTS ACCORDING TO THE ACADEMIC DEGREE FOR THE TOTAL SAMPLE AND GENDER.

Sample	High school diploma		Higher education	
	N	%	N	%
Total (N = 352)	50	14.2	302	85.8
Women (N = 221)	31	14.0	190	86.0
Men (N = 112)	17	15.2	95	84.8
LGBT+ (N = 8)	0	0	8	100

TABLE 3 - DESCRIPTIVE STATISTICS OF AGE DISTRIBUTION (IN YEARS) FOR PARTICIPANTS ACCORDING TO THE ACADEMIC DEGREE.

Academic degree	N	Mean	SD	Median	Minimum	Maximum
High school diploma	50	32	16.9	21	16	76
Higher education	295	39	12.9	36	20	76

Legend: SD – standard deviation

TABLE 4 - FREQUENCY AND PERCENTAGE OF PARTICIPANTS ACCORDING TO RELIGIOUS BELIEF FOR THE TOTAL SAMPLE AND GENDER.

Sample	With a religious belief		Without a religious belief	
	N	%	N	%
Total (N = 332)	101	30.4	231	69.6
Women (N = 209)	64	30.6	145	69.4
Men (N = 107)	33	30.8	74	69.2
LGBT+ (N = 8)	3	37.5	5	62.5

Table 5 - Descriptive statistics of age distribution (in years) for participants according to religious belief.

Education group	N	Mean	SD	Median	Minimum	Maximum
With a religious belief	50	39	14.9	37	16	76
Without a religious belief	295	38	13.5	35	18	76

Legend: SD – standard deviation

Table 6 - Frequency and percentage of participants according to occupation.

Sample	Specialists		Non-specialists	
	N	%	N	%
Total (N = 285)	134	47.0	151	53.0
Women (N = 179)	87	48.6	92	51.4
Men (N = 90)	40	44.4	50	55.6
LGBT+ (N = 7)	3	42.9	4	57.1

Table 7 - Descriptive statistics of age distribution (in years) for participants according to occupation.

Occupational group	N	Mean	SD	Median	Minimum	Maximum
Specialists	134	35	12.4	32	16	72
Non-specialists	150	39	15.2	36	18	76

Legend: SD – standard deviation

F. **Occupation:** Slightly more than half (53%) of the participants were non-specialists, who were on average older than specialists (Tables 6 and 7). Sixteen participants chose to keep their occupation private; and 55 participants were excluded from the analysis due to the provision of vague occupational information that could not be clearly categorized as either into specialists or non-specialists.

Section 2 – Visualization of three-dimensional models of human remains

Figures 2 and 3 provide descriptive statistics regarding the visualization of three-dimensional models of human remains (survey section 2), while Table 8 presents the results of the Chi-square test. Survey responses exhibited similarities across various demographics—age, gender identity, religion, and occupation—with minor yet notable divergences in opinion, primarily among educational groups.

Approximately 61% of the respondents (Question 1, Figure 2) reported viewing at least one 3D model of human remains online. However, fewer participants have created and/or shared 3D models (respectively 28.2% and 38.6%: Questions 2 and 3, Figure 2). Specialists and individuals holding a higher degree showed a significant engagement with 3D models of human remains compared to other participants. In addition, specialists created and shared more 3D models than non-specialists. This is to be expected as specialists are more likely to interact with digitized human remains in a professional or educational setting compared to high school graduates or non-specialists. The fact that nearly 40% of participants shared 3D models of human remains, including those created by a third party, may raise concerns regarding accessibility, consent from descendants and custodians, ownership, and copyright. While debates over the ownership and copyright of 3D models of human remains have been ongoing (see Hirst *et al.* 2018; Smith and Hirst 2019; D'Andrea *et al.* 2022), it appears that institutions and curators of the collections have generally been lagging in establishing formal guidelines on this matter. Smith and Hirst (2019) revealed that only 40% (n = 50) of American and UK institutions surveyed on 3D digital data of human

remains possessed formal agreements. Especially considering that US intellectual property laws may determine ownership based on how a 3D model diverges from the original. Despite acknowledging this difference, property laws do not specify how much a 3D model must deviate from the original element to be regarded as a separate creation (Smith and Hirst 2019; D'Andrea *et al.* 2022). Also, alongside legal

Question & Options	Total		Gender					
			Women		Men		LGBT+	
	N	%	N	%	N	%	N	%
1) Have you ever seen a 3D model of human skeletal remains online?	356	100	222	100	115	100	8	100
Yes	218	61.2	129	58.1	77	67.0	2	25.0
No, I have only seen two-dimension (2D) pictures of human bones online	102	28.7	70	31.5	28	24.3	4	50.0
No, I have never seen 2D or 3D images of human bones online	36	10.1	23	10.4	10	8.7	2	25.0
2) Have you ever created a 3D digital model of human skeletal remains?	216	100	128	100	76	100	2	100
Yes	61	28.2	31	24.2	27	35.5	1	50.0
No	155	71.8	97	75.8	49	64.5	1	50.0
3) Have you ever shared a 3D digital model of human skeletal remains online (e.g., repository, news article, institutional website)?	215	100	127	100	76	100	2	100
Yes	83	38.6	50	39.4	29	38.2	0	0
No	132	61.4	77	60.6	47	61.8	2	100
4) In which online source have you seen and/or shared a model of human skeletal remains?*	203	—	118	—	73	—	2	—
News website	55	27.1	27	22.9	24	32.9	1	50.0
Social media (e.g., Facebook, Twitter)	79	38.9	43	36.4	28	38.4	1	50.0
Museum website	79	38.9	50	42.4	23	31.5	2	100
University and/or research centre website	109	53.7	64	54.2	39	53.4	2	100
3D models online repository (e.g., SketchFab, Morphosource)	106	52.2	58	49.2	40	54.8	2	100
Not listed	20	9.9	11	9.3	7	9.6	0	0
5) Which 3D images of skeletal remains did you saw and/or shared online?*	213	—	126	—	75	—	2	—
Human skeletal remains from Native Americans	23	10.8	12	9.5	9	12	0	0
Human skeletal remains of individual(s), not from Native Americans communities, that have passed away more than 100 years ago	107	50.2	62	49.2	39	52	2	100
Unknown human skeletal remains of individual(s) that have passed away less than 100 years ago	62	29.1	29	23.0	27	36	1	50.0
Identified human skeletal remains of individual(s) that have passed away less than 100 years ago without disclosing identity. By known identity we mean that the name, age and sex is available	41	19.2	20	15.9	18	24	1	50.0
Identified human skeletal remains of individual(s) that have passed away less than 100 years ago with disclosed identity	21	9.9	9	7.1	11	14.7	0	0
I do not recall	47	22.1	35	27.8	9	12	0	0
Not mentioned	32	15.0	17	13.5	12	16	0	0

Figure 2 - Descriptive statistics for the total sample and gender groups for the survey's Section 2 - Visualization of three-dimensional models of human remains. Only the individuals who responded "yes" to question 1 are included in the descriptive statistics for questions 2 to 5. Figure legend: N = Frequency; % = Percentage; SD = Standard deviation;/— = 100% was not assigned since participants could select multiple answers to the question.*

issues, it is essential to incorporate the desires of descendant communities into copyright discussions concerning 3D models of human remains (Ulguim 2018; Schug *et al.* 2021).

As per the study conducted by the authors, with similar research questions, it was observed that Americans interacted with 3D models of human remains (Questions 1 to 3, Figure 2) more than the Portuguese did (Alves-Cardoso and Campanacho 2022a): i.e. 61.2% of the Americans respondent to the survey had visualized a 3D model, compared to only 43% of the Portuguese; 28.2% of the Americans had created at least one model and 38.6% had shared models, as opposed to 11% and 24% of Portuguese. American institutions maintain a high level of collaboration with Portuguese academia (Alves-Cardoso and Campanacho 2022b; Campanacho and Alves-Cardoso 2023). Although Portuguese biological anthropology boasts an international standing (Alves-Cardoso and Campanacho 2022b; Campanacho

Question & Options	Education				Religion				Occupation			
	High school		Higher education		Religious		Non-religious		Specialists		Non-specialist	
	N	%	N	%	N	%	N	%	N	%	N	%
1) Have you ever seen a 3D model of human skeletal remains online?	50	100	302	100	101	100	231	100	134	100	151	100
Yes	20	40	197	65.2	54	53.5	148	64.1	109	81.3	59	39.1
No, I have only seen two-dimension (2D) pictures of	18	36	83	27.5	32	31.7	64	27.7	23	17.2	63	41.7
No, I have never seen 2D or 3D images of human bo	12	24	22	7.3	15	14.9	19	8.2	2	1.5	29	19.2
2) Have you ever created a 3D digital model of human skeletal remains?	20	100	195	100	54	100	146	100	108	100	59	100
Yes	1	5	59	30.3	11	20.4	44	30.1	31	28.7	10	16.9
No	19	95	136	69.7	43	79.6	102	69.9	77	71.3	49	83.1
3) Have you ever shared a 3D digital model of human skeletal remains online (e.g., repository, news article, institutional website)?	20	100	194	100	54	100	145	100	108	100	58	100
Yes	3	15	79	40.7	17	31.5	57	39.3	44	40.7	18	31
No	17	85	115	59.3	37	68.5	88	60.7	64	59.3	40	69
4) In which online source have you seen and/or shared a model of human skeletal remains?*	20	—	182	—	53	—	136	—	101	—	57	—
News website	5	25	50	27.5	16	30.2	34	25	21	20.8	19	33.3
Social media (e.g., Facebook, Twitter)	7	35	72	39.6	17	32.1	54	39.7	37	36.6	22	38.6
Museum website	6	30	73	40.1	19	35.8	54	39.7	42	41.6	16	28.1
University and/or research centre website	6	30	103	56.6	23	43.4	77	56.6	60	59.4	21	36.8
3D models online repository (e.g., SketchFab, Morpl	13	65	92	50.5	23	43.4	74	54.4	63	62.4	22	38.6
Not listed	2	10	18	9.9	8	15.1	12	8.8	11	10.9	6	10.5
5) Which 3D images of skeletal remains did you saw and/or shared online?*	20	—	192	—	53	—	144	—	106	—	57	—
Human skeletal remains from Native Americans	1	5	21	10.9	7	13.2	11	7.6	9	8.5	7	12.3
Human skeletal remains of individual(s), not from Native Americans communities, that have passed away more than 100 years ago	5	25	101	52.6	25	47.2	75	52.1	55	51.9	23	40.4
Unknown human skeletal remains of individual(s) that have passed away less than 100 years ago	3	15	58	30.2	15	28.3	39	27.1	30	28.3	14	24.6
Identified human skeletal remains of individual(s) that have passed away less than 100 years ago without disclosing identity. By known identity we mean that the name, age and sex is available	2	10	38	19.8	8	15.1	26	18.1	19	17.9	7	12.3
Identified human skeletal remains of individual(s) that have passed away less than 100 years ago with disclosed identity	3	15	18	9.4	6	11.3	12	8.3	9	8.5	3	5.3
I do not recall	8	40	39	20.3	11	20.8	33	22.9	17	16	19	33.3
Not mentioned	2	10	30	15.6	8	15.1	21	14.6	17	16	5	8.8

*Figure 3 - Descriptive statistics for education, religion and occupation groups for the survey's Section 2 - Visualization of three-dimensional models of human remains. Only the individuals who responded "yes" to question 1 are included in the descriptive statistics for questions 2 to 5. Figure legend: N = Frequency; % = Percentage; SD = Standard deviation; */— = 100% was not assigned since participants could select multiple answers to the question.*

and Alves-Cardoso 2023), research on 3D modeling is a relatively recent topic of study among Portuguese early career scholars and students (e.g., Campanacho 2016; Godinho *et al.* 2018; Coelho *et al.* 2021; Godinho *et al.* 2022) than among American scholars.

A slight majority of participants reported viewing an online 3D model of human remains on university or research center websites and through online repositories (Question 4, Figure 2). An equal proportion of participants (38.9%) visualized 3D models on museum websites and social media platforms. The reduced visibility of these models on museum websites, compared to university and research center websites, might be due to a more mindful exhibition of human remains recently adopted by museums (Williams and Atkin 2015; Tzortzi 2018). While 3D models of human remains on social media are easily available to everyone, they often raise ethical concerns due to the lack of restrictions, particularly regarding consent (or the lack thereof) (BABAO 2019; Wild 2020; Schug *et al.* 2021; Alves-Cardoso and Campanacho 2022a).

Half of the most widely viewed 3D models were from unidentified individuals deceased over a century ago (50.2%, Question 5, Figure 2); whose family or community connections are difficult to establish. Although temporal distancing may be used as an interpretative argument of the results, it should never be the primary justification for displaying 3D models of human remains, as it does not eliminate any potential ethical issues (ICOM 2004; Gazi 2014).

Section 3 – Participants' opinions regarding three-dimensional models of human remains

Descriptive statistics for section 3 questions can be seen in Figures 4 and 5, and Chi-square test results can be found in Table 9. The participants showed a positive attitude towards the 3D digitization of human remains, with 89.5% open to the idea of consenting to digitizing their own or their family members' remains (Question 6, Figure 4). Among demographic groups, a higher proportion of participants possessing advanced education, specialist occupations, and non-religious beliefs (Table 9), and older individuals (Mann-Whitney U = 3913, p = 0.011; Question 6, Table 10) significantly favored digitizing their remains.

Table 8. Chi-square test results for Section 2 - Visualization of three-dimensional models of human remains.

Group	Question	$\chi 2$	df	p
Gender	Have you ever seen a 3D model of human skeletal remains online?	2.529	2	0.282
	Have you ever created a 3D digital model of human skeletal remains?	2.996	1	0.083
	Have you ever shared a 3D digital model of human skeletal remains online (e.g., repository, news article, institutional website)?	0.029	1	0.864
Education	Have you ever seen a 3D model of human skeletal remains online?	17.923	2	**< 0.001**
	Have you ever created a 3D digital model of human skeletal remains?	5.751	1	**0.016**
	Have you ever shared a 3D digital model of human skeletal remains online (e.g., repository, news article, institutional website)?	5.075	1	**0.024**
Occupation	Have you ever seen a 3D model of human skeletal remains online?	56.188	2	**< 0.001**
	Have you ever created a 3D digital model of human skeletal remains?	2.846	1	0.092
	Have you ever shared a 3D digital model of human skeletal remains online (e.g., repository, news article, institutional website)?	1.519	1	0.218
Religion	Have you ever seen a 3D model of human skeletal remains online?	4.696	2	0.096
	Have you ever created a 3D digital model of human skeletal remains?	1.886	1	0.170
	Have you ever shared a 3D digital model of human skeletal remains online (e.g., repository, news article, institutional website)?	1.032	1	0.310

Question & Options	Total		Gender					
			Women		Men		LGBT+	
	N	%	N	%	N	%	N	%
6) Would you be ok with your skeleton and those of family members being 3D digitalized after death?	353	100	220	100	114	100	8	100
Yes	316	89.5	196	89.1	104	91.2	7	87.5
No	37	10.5	24	10.9	10	8.8	1	12.5
7) Should 3D digital replicas be considered as being the same as the original human bone and thus with the same ethical considerations regarding their display online?	355	100	221	100	115	100	8	100
Strongly agree	82	23.1	53	24.0	24	20.9	1	12.5
Somewhat agree	85	23.9	64	29.0	18	15.7	3	37.5
Neither agrees nor disagrees	37	10.4	25	11.3	11	9.6	1	12.5
Somewhat disagree	87	24.5	55	24.9	26	22.6	3	37.5
Strongly disagree	64	18.0	24	10.9	36	31.3	0	0
8) Should 3D models of human remains be displayed online for:*	353	—	221	—	114	—	8	—
The greater public for non-educational purposes	89	25.2	44	19.9	40	35.1	3	37.5
The greater public only for educational purposes	279	79.0	176	79.6	89	78.1	8	100
Research in anthropology, biology, anatomy and medicine	310	87.8	93	42.1	100	87.7	8	100
No, 3D models of human bones should never be available online	9	2.5	7	3.2	2	1.8	0	0
9) In which platforms could 3D models of human bones be available?*	339	—	211	—	111	—	7	—
News website	111	32.7	62	29.4	41	36.9	4	57.1
Social media (e.g., Facebook, Twitter)	87	25.7	47	22.3	33	29.7	4	100
Museum website	287	84.7	187	88.6	86	77.5	7	100
University and/or research centre website	330	97.3	208	98.6	105	94.6	7	100
3D models online repository (e.g., SketchFab, Morphosource)	276	81.4	176	83.4	85	76.6	7	100
Not listed	16	4.7	6	2.8	9	8.1	0	0
10) Should there be some control over how the 3D models of human bones are disseminated?	335	100	209	100	109	100	7	100
No, digital 3D models should be freely available on any online platform	157	46.9	88	42.1	57	52.3	6	85.7
Yes, there should be a registration and login to access the 3D model online	178	53.1	121	57.9	52	47.7	1	14.3
11) Should available online digital 3D models of human bones be possibly downloaded for personal use by the greater public?	341	100	213	100	110	100	7	100
Strongly agree	61	17.9	25	11.7	30	27.3	2	28.6
Somewhat agree	81	23.8	48	22.5	27	24.5	4	57.1
Neither agree nor disagree	54	15.8	36	16.9	18	16.4	0	0
Somewhat disagree	71	20.8	52	24.4	16	14.5	0	0
Strongly disagree. The digital 3D models of human remains should only be used for research.	74	21.7	52	24.4	19	17.3	1	14.3
12) Should a description/context of 3D models of human bones be always associated with the models?	340	100	212	100	111	100	7	100
Strongly agree	172	50.6	102	48.1	66	59.5	2	28.6
Somewhat agree	93	27.4	66	31.1	20	18.0	3	42.9
Neither agree nor disagree	55	16.2	33	15.6	18	16.2	1	14.3
Somewhat disagree	13	3.8	9	4.2	3	2.7	1	14.3
Strongly disagree	7	2.1	2	0.9	4	3.6	0	0

*Figure 4 - Descriptive statistics for the total sample and gender groups for the survey's Section 3 - Participants' opinions regarding three-dimensional models of human remains. Only the individuals who did not reply "No. 3D models of human bones should never be available online" to question 8 are included in the descriptive statistics for questions 9 to 12. Figure legend: N = Frequency; % = Percentage; SD = Standard deviation; */— = 100% was not assigned since participants could select more than one answer to the question.*

Most participants agreed that 3D models of human remains should be handled and displayed online primarily for research and educational purposes. This viewpoint may be influenced by the belief held by 47% of participants that 3D models share an equal status with human remains, thus warranting similar ethical considerations. A significantly larger proportion of younger participants (Kruskal-Wallis = 31.952, df = 4, p < 0.001; Question 7, Table 10), religious individuals and women (Table 9) regarded

Question & Options	Education				Religion				Occupation			
	High school diploma		Higher education		Religious		Non-religious		Specialists		Non-specialists	
	N	%	N	%	N	%	N	%	N	%	N	%
6) Would you be ok with your skeleton and those of family members being 3D digitalized after death?	49	100	300	100	101	100	228	100	133	100	149	100
Yes	37	75.5	276	92.0	83	82.2	213	93.4	126	94.7	129	86.6
No	12	24.5	24	8.0	18	17.8	15	6.6	7	5.3	20	13.4
7) Should 3D digital replicas be considered as being the same as the original human bone and thus with the same ethical considerations regarding their display online?	49	100.0	302	100	101	100	230	100	134	100	150	100
Strongly agree	9	18.4	72	23.8	33	32.7	46	20.0	37	27.6	27	18.0
Somewhat agree	14	28.6	71	23.5	17	16.8	64	27.8	34	25.4	36	24.0
Neither agrees nor disagrees	9	18.4	26	8.6	10	9.9	23	10.0	12	9.0	18	12.0
Somewhat disagree	12	24.5	74	24.5	24	23.8	53	23.0	35	26.1	38	25.3
Strongly disagree	5	10.2	59	19.5	17	16.8	44	19.1	16	11.9	31	20.7
8) Should 3D models of human remains be displayed online for:*	49	—	300	—	101	—	229	—	134	—	149	—
The greater public for non-educational purposes	9	18.4	78	26.0	29	28.7	56	24.5	24	17.9	46	30.9
The greater public only for educational purposes	36	73.5	240	80.0	75	74.3	186	81.2	114	85.1	112	75.2
Research in anthropology, biology, anatomy and medi	43	87.8	263	87.7	80	79.2	211	92.1	126	94.0	128	85.9
No, 3D models of human bones should never be available online	2	4.1	7	2.3	5	5.0	4	1.7	3	2.2	3	2.0
9) In which platforms could 3D models of human bones be available?*	45	—	290	—	95	—	222	—	128	—	144	—
News website	14	31.1	96	33.1	33	34.7	74	33.3	39	30.5	51	35.4
Social media (e.g., Facebook, Twitter)	10	22.2	76	26.2	22	23.2	62	27.9	30	23.4	40	27.8
Museum website	37	82.2	247	85.2	75	78.9	193	86.9	111	86.7	122	84.7
University and/or research centre website	44	97.8	283	97.6	92	96.8	217	97.7	125	97.7	140	97.2
3D models online repository (e.g., SketchFab, Morpho	35	77.8	237	81.7	73	76.8	184	82.9	105	82.0	115	79.9
Not listed	1	2.2	15	5.2	2	2.1	13	5.9	5	3.9	6	4.2
10) Should there be some control over how the 3D models of human bones are disseminated?	45	100.0	286	100	95	100	218	100	130	100	141	100
No, digital 3D models should be freely available on any online platform	18	40.0	138	48.3	50	52.6	98	45.0	52	40.0	72	51.1
Yes, there should be a registration and login to access the 3D model online	27	60.0	148	51.7	45	47.4	120	55.0	78	60.0	69	48.9
11) Should available online digital 3D models of human bones be possibly downloaded for personal use by the greater public?	46	100.0	291	100	95	100	223	100	130	100	143	100
Strongly agree	7	15.2	52	17.9	20	21.1	37	16.6	10	7.7	33	23.1
Somewhat agree	13	28.3	68	23.4	23	24.2	53	23.8	32	24.6	34	23.8
Neither agree nor disagree	9	19.6	44	15.1	12	12.6	37	16.6	20	15.4	21	14.7
Somewhat disagree	8	17.4	63	21.6	18	18.9	50	22.4	36	27.7	24	16.8
Strongly disagree. The digital 3D models of human remains should only be used for research.	9	19.6	64	22.0	22	23.2	46	20.6	32	24.6	31	21.7
12) Should a description/context of 3D models of human bones be always associated with the models?	46	100.0	290	100	95	100	223	100	130	100	144	100
Strongly agree	19	41.3	152	52.4	51	53.7	112	50.2	77	59.2	59	41.0
Somewhat agree	15	32.6	77	26.6	24	25.3	60	26.9	29	22.3	47	32.6
Neither agree nor disagree	10	21.7	44	15.2	14	14.7	37	16.6	17	13.1	27	18.8
Somewhat disagree	1	2.2	12	4.1	5	5.3	8	3.6	7	5.4	5	3.5
Strongly disagree	1	2.2	5	1.7	1	1.1	6	2.7	0	0	6	4.2

*Figure 5. Descriptive statistics for education, religion and occupation groups for the survey's Section 3 - Participants' opinions regarding three-dimensional models of human remains. Only the individuals who did not reply "No. 3D models of human bones should never be available online" to question 8 are included in the descriptive statistics for questions 9 to 12. Figure legend: N = Frequency; % = Percentage; SD = Standard deviation; */— = 100% was not assigned since participants could select more than one answer to the question.*

Table 9. Chi-square test results for Section 3 - Participants' opinions regarding three-dimensional models of human remains.

Group	Question	χ2	df	p
Gender	6) Would you be ok with your skeleton and those of family members being 3D digitized after death?	0.375	1	0.540
	7) Should 3D digital replicas be considered as being the same as the original human bone and thus with the same ethical considerations regarding their display online?	23.891	4	**< 0.001**
	10) Should there be some control over how the 3D models of human bones are disseminated?	2.998	1	0.083
	11) Should available online digital 3D models of human bones be possibly downloaded for personal use by the greater public?	15.458	4	**0.004**
	12) Should a description/context of 3D models of human bones be always associated with the models?	9.771	4	0.044
Education	6) Would you be ok with your skeleton and those of family members being 3D digitized after death?	12.38	1	**< 0.001**
	7) Should 3D digital replicas be considered as being the same as the original human bone and thus with the same ethical considerations regarding their display online?	7.033	4	0.134
	10) Should there be some control over how the 3D models of human bones are disseminated?	5.182	3	0.159
	11) Should available online digital 3D models of human bones be possibly downloaded for personal use by the greater public?	21.195	12	**0.048**
	12) Should a description/context of 3D models of human bones be always associated with the models?	21.783	12	**0.040**
Occupation	6) Would you be ok with your skeleton and those of family members being 3D digitized after death?	5.404	1	**0.020**
	7) Should 3D digital replicas be considered as being the same as the original human bone and thus with the same ethical considerations regarding their display online?	6.85	4	0.144
	10) Should there be some control over how the 3D models of human bones are disseminated?	3.336	1	0.068
	11) Should available online digital 3D models of human bones be possibly downloaded for personal use by the greater public?	14.216	4	**0.007**
	12) Should a description/context of 3D models of human bones be always associated with the models?	14.574	4	**0.006**
Religion	6) Would you be ok with your skeleton and those of family members being 3D digitized after death?	9.804	1	**0.002**
	7) Should 3D digital replicas be considered as being the same as the original human bone and thus with the same ethical considerations regarding their display online?	8.407	4	0.078
	10) Should there be some control over how the 3D models of human bones are disseminated?	1.565	1	0.211
	11) Should available online digital 3D models of human bones be possibly downloaded for personal use by the greater public?	1.999	4	0.736
	12) Should a description/context of 3D models of human bones be always associated with the models?	1.636	4	0.802

such models as equivalent to human remains. The gender divide on opinion was notable: while 53% of women viewed 3D models and human remains equally, only 36.6% of men agreed. Consequently, women were more cautious concerning the ability for the general public to download 3D models of human remains for personal use, with 48.8% opposing such access compared to 31.8% of men. Additionally, a significant number of younger participants were against the premise of the public downloading 3D

models (Kruskal-Wallis = 21.403, df = 4, $p < 0.001$; Question 11, Table 10). These results mirror Alves-Cardoso and Campanacho (2022a) research in Portugal, where more women than men also acknowledged an equivalent status between the models and the original human remains. Women's empathic response might stem from their higher caregiving responsibilities for children and the elderly compared to men, possibly prompting a heightened sense of respect towards the deceased. Regardless of how these models are categorized, Márquez-Grant and Errickson (2017) argued that they should be treated with the utmost dignity and respect as they derive from deceased individuals.

Regardless of participants' viewpoints on the status of 3D models, most agreed that a registration and login system should be implemented to grant access to 3D models accompanied by contextualized information (Questions 10 and 12, Figure 4). This consensus is particularly significant among younger individuals on using a login system (Mann-Whitney U = 15360, $p = 0.030$; Question 10, Table 10).

Contextualized information accompanying 3D models should be detailed, non-sensationalist, and include an ethical statement addressing data sharing and 3D printing (BABAO 2019; Schug *et al.* 2021). Digitalization of decontextualized individuals, especially from marginalized communities, can be problematic. It is crucial to abstain from creating 3D replicas or engaging in their sale as such actions might perpetuate a cycle of exploitation for marginalized groups (Schug *et al.* 2021; Alves-Cardoso and Campanacho 2022a).

Social media perceptions

From October 2018 to April 2020, fifty-seven public comments were made on the survey posts across various social media platforms. Most of the comments (n = 23) were from individuals who had a favorable view regarding the 3D digitization of human remains, as it was seen as less controversial with a high educational valor, especially for older remains. Although they viewed the topic favorably, two social media users expressed concerns, respectively, about the 3D scanning of Native Americans and licensing, with the latter seen as a way to discourage the use of 3D models outside the donor's wishes.

The second-highest number of comments (n = 13) clustered criticism of the survey's design, use of Google Forms, and the platforms through which it was distributed. For example, one user expressed concern for the word 'remains' on the survey's title due to its morbid nature. Another considered that this should only be deliberated among scholars without involvement from the public. However, exclusion of the public from discussions about their bodies or of family members' bodies and remains, may potentially lead to further mistrust, exploitation, and disempowering of individuals, especially from marginalized groups (Kitchin, 2000). Additional criticism focused on the lack of questions on the digitalization of Native Americans. The present survey aimed to get an overall assessment of public opinion on 3D digitization among American residents; however, the authors acknowledge that further research will be critical to address this issue with regard to the human remains of Native Americans. This is in line with the three negative comments that expressed Native Americans should never be digitized. Particularly since a native group may view 3D models to be an extension of their ancestors (Hasset *et al.* 2018). This is a concern that should be respected by researchers, especially considering that 10.8% of participants (Question 5, Figure 2) have visualized 3D models of Native Americans. Therefore, it is recommended to seek Native American descendent communities' consent in advance before digitizing their ancestors with the premise that their wishes should be honored at all times (Schug *et al.* 2021). According to Schug *et al.* (2021), if no descendant communities have been identified, the digitization of Native Americans should be postponed until an affiliation can be determined and consent obtained. Further recommendations and considerations on the digitization of marginalized individuals, including of Native Americans, can be found in Schug *et al.* (2021) and Bryson and DeLeon's chapter in this book.

TABLE 10. AGE DESCRIPTIONS FOR THE QUESTIONS WITH A SIGNIFICANT P FOR THE CHI-SQUARE AND KRUSKAL-WALLIS TEST.

Question & options	N	Mean	SD	Median	Minimum	Maximum
6) Would you be ok with your skeleton and those of family members being 3D digitized after death?	—	—	—	—	—	—
Yes	313	38	13.7	36	16	76
No	34	33	12.9	31	18	72
7) Should 3D digital replicas be considered as being the same as the original human bone and thus with the same ethical considerations regarding their display online?	—	—	—	—	—	—
Strongly agree	79	35	11.3	32	18	62
Somewhat agree	85	33	11.6	31	18	76
Neither agrees nor disagrees	35	42	15.8	40	20	76
Somewhat disagree	85	40	13.8	40	16	72
Strongly disagree	64	44	14.3	44	18	72
10) Should there be some control over how the 3D models of human bones are disseminated?	—	—	—	—	—	—
No, digital 3D models should be freely available on any online platform	156	40	14.7	37	18	76
Yes, there should be a registration and login to access the 3D model online	173	36	12.7	34	16	76
11) Should available online digital 3D models of human bones be possibly downloaded for personal use by the greater public?	—	—	—	—	—	—
Strongly agree	59	43	14.0	41	18	70
Somewhat agree	79	36	13.9	33	16	76
Neither agree nor disagree	52	43	15.8	44	18	76
Somewhat disagree	71	34	11.4	31	19	62
Strongly disagree. The digital 3D models of human remains should only be used for research	73	37	12.1	35	19	65

Legend: SD- standard deviation

Neutral comments (n = 6) were also received as users did not divulge their opinion, but, for example, shared the survey with other users or with their students. In addition, the survey received rude comments (n = 2), a Latin Bible verse stating that all is vanity (n = 1), indecisiveness (n = 1), questions about how the 3D scanning of human remains would work either for their body or from a systemic standpoint (n = 4), banter between users about a previous comment (n = 2), and confusion about what was asked of the survey (n = 2).

Conclusion

Those with the privilege of accessing ancestral human remains share an ethical responsibility to handle and treat them with care and dignity. The same must apply to digitalized human remains. Transitioning toward digital access and dissemination of human remains has a clear advantage, as it adds to preserving the original remains as a non-destructive method. It can also be viewed as democratizing access to human remains. Digital copies serve important educational and research purposes, especially considering that some countries may have limited access to remains. However, this process also needs to consider ethical and legal aspects of the study and research dissemination. Contextual information and permissions are key issues often taken for granted. These include attentiveness to institutional and governmental policies, alongside copyright laws (which will vary between countries) on the curation

of human remains and associated data – including 3D imaging; but above all, a sense of responsibility and ethics, to build a positive relationship with any living descent and/or communities related to the remains, aiming to minimize any harm and maximizing benefits of 3D models sharing (as per CARE principles - Collective Benefit, Authority to Control, Responsibility, and Ethics: Carol *et al.* 2020).

On the issue of the study of 3D replicas of Human Remains in biological anthropology in the US, 356 people took the interest and time to participate, with an average age of 38 years old. Mostly identified as women (64.35), the majority (69.65) disclosed no religious belief, and almost 90% had a higher education degree. Also, there was an equilibrium between people classified as specialists and non-specialists, being the former individuals most likely to handle 3D models of human remains in the workplace, such as anthropologists, biologists, and archaeologists. Although the responses were heterogeneous, overall, there was a positive trend towards digitalising human remains, especially when associated with research and education purposes: science and education were key favoring arguments on creating digital copies. Also, awareness was expressed that these 3D models are those of people, and ethical concerns about access and handling were expressed. Hence, although 3D modelling and digital technologies are becoming major research and teaching tools, it is also true that care and responsibility is needed, especially towards the remains of marginalized individuals.

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Section III

Ethical issues on research and training

Chapter 10

Ethics in interdisciplinary research within the context of traumatic histories and memories

Cláudia R. Plens and Paulo Sergio Delgado

Introduction

Since the mid-20th century, the fields of forensic anthropology and archaeology have been consolidated as significant tools for examining forensic cases and specific situations of humanitarian interest.

In the Western legal system, the search, retrieval, recording, analysis, and interpretation of various pieces of material evidence comprise the entirety of the investigated scenario. These measures are imperative for the recovery and preservation of pertinent information. This procedure ensures the integrity and legitimacy of the data until the judicial phase through the chain of custody (Melbye and Jimenez 1997; Haglund 2001; Crist 2001; Mires and Scott 2019; Congram 2019; Heilik 2019; Plens and Souza 2022).

Throughout history, social segments that were marginalized by colonial and neocolonial processes have experienced human rights violations. The majority of them involve complex scenarios and deeply rooted oppressions in society, primarily stemming from historical and systemic omissions by the state. This scenario involves multiple parties, and evidence is often covered up or concealed institutionally (Plens and Souza 2022).

In this context, indigenous peoples are the most vulnerable social segment, given the colonial process that usurped and impacted their original territories, disrupting the social structures of these communities. According to Resolution 169 of the International Labor Organization (ILO), indigenous peoples are among the most vulnerable and disadvantaged populations in the world and experience the violation of all their essential rights (Permanent Forum on Indigenous Issues 2006; Cunneen 2007; Plens 2022).

In Brazil, indigenous peoples face all three forms of violence defined by Galtung (1990): direct violence, cultural violence, and structural violence. Direct violence involves actions with the direct and immediate aim of causing physical harm. Cultural violence utilizes aspects of a culture to legitimize violence in either its direct or structural forms. It employs symbolic violence, which is more diffuse, to justify and legitimize the perpetuation of violence with societal support. Lastly, structural violence results from unequal distribution policies that limit people's access to essential resources, such as education and health, necessary for a good quality of life.

Throughout the Americas, European colonization has had a profound and enduring impact on the organizational and social structures of indigenous peoples, leading to significant human rights violations and ethnocides. Nonetheless, historical instances of violence that resulted in the loss of life often lack tangible evidence for investigation through forensic archaeology and anthropology (e.g., many cases of indigenous case of ethnocides). For instance, the acidity of the soil in many Brazilian regions prevents the preservation of skeletons from historical periods (Ernani 2008; Pereira 2022).

Moreover, within indigenous communities, research on ancestral remains is often obstructed by beliefs regarding the afterlife, leading to societal disapproval of such studies. In these cases, it is imperative, within the current academic landscape, to adopt interdisciplinary approaches for investigating crimes whose consequences extend beyond the past and directly affect descendants today.

Besides the structural violence that perpetuates diffuse, yet forceful, forms of violence between past and present generations, the absence of access to the materiality of direct violence often results in memories and traumas being the only elements that endure into the present. Given the previously mentioned limitations of forensic archaeology and anthropology methods (e.g., absence of bone conservation and inability to conduct forensic analysis), researchers often resort to accessing collective memory (Halbwachs 1990) through interviews as the primary means to document these events.

This chapter aims to discuss the ethics surrounding the relationship between researchers and their subjects, when working with narratives of violence and trauma, stemming from events like territorial dispossession, murder, and torture of indigenous peoples. Researchers engaged in field research and dialogue with indigenous peoples must be well-versed in the historical context under investigation and the interviewees' forms of social organization. This understanding is fundamental to establish empathy and acceptance and, more importantly, to comprehend the meaning of narratives from the other's subjectivity. The trauma perspective can be reframed as a methodological tool for developing a descriptive language encompassing human suffering, as well as fostering interventions aligned with a human rights perspective. This seeks to create conditions promoting and ensuring "dignity, justice, respect, diversity, and equality among human" (Carello *et al.* 2019: 2).

Thus, our endeavor is to comprehend how traumatic experiences provide insights into the processes of violence endured by indigenous peoples. Through the analysis of data derived from research involving two populations—the Guarani Ñandéva and the Tapayuna, both victims of the colonial and neo-colonial processes—we advocate not only for this information to serve as a subject of academic knowledge but, more significantly, as a means to bolster the ongoing struggle for justice and the recognition of their rights. This advocacy is grounded in an ethical approach to the development and production of research.

With this in mind, the purpose of this chapter is not to debate ethical issues supported by the supervisory entities. It concerns the practical attitude of the researcher when interacting with the communities involved, so that, throughout the research and after its conclusion, dialog between the participants and respect for their rights can be maintained (Cardoso de Oliveira 2010: 29-30). This practical stance includes considerations about the ethical and moral obligations inherent in anthropological practice, especially in relation to the truth, to those being researched, and to society. Some of these considerations involve questions about "what" and "how" to publish, to ensure that publication does not harm the subjects being researched (Cardoso de Oliveira 2010: 30-36).

Furthermore, understanding and respecting the dynamics of communication and language is an essential ethical-anthropological aspect, especially in interactions with societies that have a strong oral tradition (Ouriques Ferreira 2010: 143). Therefore, for the rights of the participants to be effectively protected, the researcher must engage in a double process of understanding and being understood, to navigate the nuances of the language and oral tradition of the peoples studied and adjust their methodologies to better fit their cultural contexts (Briggs 1986; Ouriques Ferreira 2010: 143).

Traumatic memories

The concept of traumatic history refers to the description of a collective and multifaceted suffering that has been felt and transmitted between the generations of a community united by a common identity or

by shared circumstances (Brave Heart and DeBruyn 1998; Gone 2013). Initially used to understand the experiences of the descendants of Holocaust survivors (Kellermann 2001), the concept has been applied in recent decades to describe the experiences of colonized indigenous groups around the world (Mohatt 2014).

In this sense, the documents produced by the investigation of traumatic memories serve as crucial tools for understanding the circumstances of the period under examination. However, it is widely acknowledged that written documents inherently reflect the perspective of the author, and moreover, they may omit inconvenient data (Trigger 1983; Funari 2007). Even when attempting to interpret events "between the lines" of narratives within historical documents, the outcome remains inherently partial due to the complexity experienced by the involved agents, particularly in the case of the indigenous peoples (Trigger 1983). For this reason, the use of alternative sources, such as material culture and orality, becomes essential for achieving a more comprehensive analysis of events from diverse perspectives.

In the context of past crimes intentionally left unrecorded to avoid inculpatory evidence, scrutinizing the content between the lines and addressing documentary gaps can serve as a pathway to critically analyze these events. This approach, while valuable, does not preclude the possibility of broadening investigative sources for a more comprehensive understanding. In this sense, orality emerges as a valuable tool to be added, allowing for the exposure of facts from diverse perspectives within the same community. Thus, the History of the Present Time carries significant political implications. Within this domain, where subject and object coexist within the same temporality, ongoing events are processed, offering insights into narratives that are not yet concluded. This dynamic has profound epistemological consequences for the knowledge we aim to construct (Fico 2012: 45). In the exploration of events related to violence and trauma, testimonial accounts play a crucial role as analytical keys for understanding conflicts (Fico 2012: 50).

While accounts of violence have historically been utilized as resources for comprehending violent events, it was particularly in the 1980s that post-traumatic stress disorder (PTSD) began to be systematically employed by various political, clinical, and humanitarian frameworks. The primary objective of incorporating these accounts was to guide coping responses to processes of traumatization, recognizing that consequences affecting the biological body also impact the psyche (Reis and Ortega 2022: 2). Traumatic memory may develop as a result of events affecting the biological body, but it can also manifest without direct physical injury, arising from exposure to varying degrees of violence. Consequently, when trauma extends beyond individual experience, the depth of its impact unifies the cumulative experiences of multiple generations (Reis and Ortega 2022: 7).

Listening to accounts of trauma serves as a means to evaluate and shed light on suffering among clinically and politically marginalized individuals (Fassin 2004; Fassin and Rechtman 2009). In this regard, Harris and Fallot (2001) differentiate between trauma-specific services and trauma-informed care. While the first targets the treatment of trauma symptoms, the latter seeks to comprehend how violence, victimization, and other forms of trauma affect individuals, families and communities. Furthermore, trauma-informed care employs this understanding to implement practices and policies aimed at preventing further harm and promoting healing and recovery. It is within the framework of trauma-informed care that the narrative of trauma is articulated. Here, the concept of historical trauma entails the association between psychological trauma and historical oppression, manifesting on in individual symptoms and adverse effects on family, communal, and societal well-being (Fallot 2019: ix). Among researchers, there is an acknowledged impact of traumatic historical events, particularly in indigenous populations. In this context, colonial and neocolonial processes have generated intergenerational trauma, resulting in ongoing social and health issues for descendants (Weaver 2019: 78).

Thus, safety, reliability, choice, collaboration, and empowerment emerge as the five fundamental elements in the development of interviews aimed at documenting instances of violence. The goal is to establish a context of well-being and control for the victim while fostering a relationship that avoids replicating past experiences of betrayal (Fallot 2019: ix). These elements provide essential foundations for conducting ethnographic research in diverse contexts. It is crucial to distinguish between types of scientific research. Although all of it is (or should be) based on ethical principles—as well as the codes of ethics of each professional category involved in scientific production—every kind of research has different objectives. For instance, the research with the Guarani Ñandéva was carried out to address a state demand—to produce reports supporting the recognition of territories for that ethnic group. On the other hand, research with the Tapayuna falls under academic production, aimed at addressing questions outlined in a research project registered at a federal university. Nevertheless, academic research can also inform state decisions regarding indigenous peoples.

The Guarani Ñandéva – revisiting traumatic stories and memories

The primary aim of the data generated in the research with the Guarani Ñandéva was to produce Detailed Reports on the Identification and Delimitation of Indigenous Lands (Relatórios Circunstanciados de Identificação e Delimitação de Terras Indígenas, RCID). These reports were specifically requested by the National Indian Foundation (FUNAI) and later utilized to support the territorial claims of the Guarani Ñandéva. In this context, the researchers in fieldwork sought to engage various agents who have undergone diverse social situations marked by violence and the expropriation of their territories throughout their life trajectories.

Considering the linguistic and cultural singularities of the Guarani, these individuals are categorized into the Kaiowá (or Paî-Tavyterã, based on self-identification), Mbyá, and Ñandéva subgroups—the latter identifying as Chiripá, Ava Katu Etê and Ava-Guarani. All the groups equally belong to the Tupi Guarani linguistic branch. Due to historical factors and internal mobility dynamics, the Guarani are distributed across the states of Mato Grosso do Sul (Guarani-Kaiowá or Paî-Tavyterã, Guarani Ñandéva), Paraná, Rio Grande do Sul, Espírito Santo, Santa Catarina and São Paulo (Guarani-Ñandéva e Mbyá). According to Schmitz (1979: 57), the present-day Guarani subgroups originated in the "tropical scrublands that cover the basins of the Upper Paraná, the Upper Uruguay and the edge of the southern Brazilian plateau". Moreover, data from archaeological research, as indicated by Smith (1978) and Susnik (1979-80), suggests migratory flows dating between 1000 BC and 1200 BC in a north-south direction.

The RCID research specifically focused on the Guarani Ñandéva predominantly situated in the southern cone of the state of Mato Grosso do Sul, along the right bank of the Iguatemi River—a tributary of the Paraná River. The researchers chose to employ interviews, travel on local roads that cut through the claimed areas, and construct genealogies with the aim of comprehending the claims for territorial recognition, the occupation and spatial distribution of the Guarani Ñandéva, and alliances established through the construction of kinship, respectively.

The research identified three major events that have generated, and continue to generate, traumatic stories and memories among the Guarani Ñandéva. The missionary work conducted by the Spanish Jesuits, extensively documented in colonial period literature (e.g., Brand 1997, Schmitz 1979, Mura 2006, Susnik 1979, among others), significantly influenced the ways and forms of social organization among the Guarani. This process resulted in various ruptures and discontinuities in the Guarani way of life. Despite resistance, the Guarani reconfigured their social organization, albeit with losses.

Following the termination of Spanish rule on the South American continent during the emancipation of its colonies into national states, violence against the Guarani persisted. The newborn republics maintained

the preceding approach in their interactions with and treatment of the indigenous peoples. In the case of Brazil, the proclamation of the republic did not signify a departure from prior representations and conceptions of indigenous peoples. Grounded in positivist philosophy, the establishment of the Indian Protection Service (SPI) simply updated assumptions that had already prevailed during the colonial and imperial periods. In an effort to integrate the Indian into the national community, the Brazilian state waged, as described by Lima (1995:118), a conquest war resulting in territorial losses, genocides, and attempts to suppress and erase ethnic and cultural diversity within the nation-state.

At the end of the 19th century and the beginning of the 20th century, the imperial and republican governments granted the traditional territories of the Guarani to the Matte Larangeiras Corporation for yerba mate exploitation. In this context, the SPI's efforts in the region were limited to reserving eight plots of land, each measuring one league square (equivalent to 3,600 hectares), to gather all the Guarani, including both the Ñandéva and the Kaiowá. However, the reserved plots did not align with the traditional form of Guarani territorial occupation, nor did they cover all the Guarani Ñandéva groups spread throughout the southern cone of the state of Mato Grosso do Sul. Throughout the 20th century, many macro-family groups resisted the compulsory transfer to the SPI-designated plots (Brand 1997).

Following the end of the yerba mate exploitation concession by the Matte Larangeiras Corporation, the region became occupied by non-Indigenous individuals, either through direct land sales by the state of Mato Grosso[1] or land grabbing. From the 1980s and 1990s onwards, the implementation of the sugar-alcohol industry in the region intensified, and later, this industry, along with the production of other commodities (mainly soy and corn), expanded by turning to exports (Mura 2006).

The research with the Guarani Ñandéva was grounded in five steps between 2008 and 2013, aiming to understand the traditional forms of territorial occupation and the traumatic conditions resulting in repeated dispossession of the Guarani. The narratives of various forms of violence obtained through interviews were not confined to the past, as ongoing violence persists due to the actions of jagunços[2] and gunmen, with the complicity of local power, in the region. Two significant events marked the research with the Guarani. The first occurred at the outset of the research in 2008, during an interview with D. L. S., a ñanderu (pray-er, shaman) from one of the groups claiming a tekohá[3]. R. O., over 60, was translating D. L. S.'s narrative. After recounting a history marked by years of violence and forced displacements, D. L. S. ended with a compulsive cry, accompanied by other Guarani Ñandéva present during the interview. Recalling all the violence endured over the years proved to be a challenging task for both the elder individuals and the younger ones.

The second event occurred in 2009 during another fieldwork occasion. During that time, members of the Technical Group (Grupo Técnico, GT) resumed their research to identify and delimit another tekohá of the Guarani Ñandéva. Weeks before the researchers' arrival, members of some Guarani Ñandéva macro-family groups attempted to return to their traditional territory, from which they had been expelled several decades ago. In the course of this action, the indigenous individuals were violently attacked, beaten, and shot with rubber bullets fired from firearms by jagunços. As a result, the group dispersed and sought refuge in a riparian forest near where the camp was being set up. After the group was reassembled, it was discovered that two adult men, teachers in the village of Pirajuí (municipality of Paranhos, Mato Grosso do Sul), were missing. The federal government was contacted and police forces mobilized to locate the missing individuals. The body of one of the teachers was found tied to a tree

[1] At the time, the administrative boundary of the state of Mato Grosso included the present-day Mato Grosso do Sul. The political division of the states only occurred in 1977, during the government of Ernesto Geisel. However, the division was only implemented in 1979.

[2] Men providing private security services outside the bounds of the law; paramilitaries or militias.

[3] Category that designates a portion of the macro territory under the control of certain macro-family groups. In free translation, "tekoha" means "the place where our way of being is realized".

branch in one of the region's streams. Professor Genivaldo Verá's autopsy report indicated that he had been beaten and shot in the back with a large-caliber firearm, and his body was later thrown into the creek. The body of the other teacher was never located and the murderers were not identified.

The Tapayuna – humanitarian crisis and traumatic memories

The research with the Tapayuna took less time compared to the research duration with the Guarani Ñandéva, totaling ten days. In this context, beyond the reports collected during interviews, additional sources and documents, such as documents kept by the Brazilian government, religious missions, and non-government organizations (NGOs), were explored to comprehend the trajectory of events involving violence, traumas, and omissions by the Brazilian state in relation to the protection of indigenous peoples. The research conducted with the Tapayuna is currently ongoing, however, it has already resulted in a publication by Bigio *et al.* (2023).

The Tapayuna, or Kajkwakhratxi, as they identify themselves, are also known as "Beiços-de-pau" due to the lip bungs they wore before contact. According to Camargo (2015), their language belongs to the Jê family within the Macro-Jê branch. Initially, the Tapayuna coexisted with the Kĩsêdjê, forming an ethnic unit in the region where the Tapajós River originates. Subsequently, the Tapayuna relocated to the area of the Arinos River and the interfluve with the Sangue River (Lima 2019; Bigio *et al.* 2023). In contrast, the Kĩsêdjê took the Xingu River, and after contact in the late 1950s, they were resettled to the Xingu Indigenous Park. Eventually, they managed to reclaim their traditional territory and currently reside in the Wawi Indigenous Land.

In the 1940s, government incentives to exploit rubber led to a wave of migration into Tapayuna territory. During that period, under the Getúlio Vargas government, the Brazilian state initiated a program to colonize Central Brazil called the "March to the West", with the goal of occupying the so-called "demographic voids". Through this program, colonization companies acquired extensive land areas to be allocated and resold to private individuals. This situation resulted in an increase in the influx of migrants, impacting the territory of the Tapayuna and other ethnic groups residing in Central Brazil. As a result, conflicts between migrants and various ethnic groups escalated. In the absence of state intervention, missionary efforts, particularly those of the Jesuits affiliated with the Prelacy of Diamantino, made numerous attempts to "pacify" various indigenous peoples in the region as a means of resolving conflicts, including the Tapayuna (Lima 2019).

The rubber boom, driven by the incentive to exploit rubber, further intensified the occupation of indigenous territories in Central Brazil. Due to the high demand for latex on the global market, especially with the American blockade of Asian production areas, the Vargas government established the Rubber Credit Bank to promote rubber exploitation in the Amazon region, encompassing native rubber plantations along the rivers forming the Tapajós (Bigio *et al.* 2023). This new rubber cycle spurred the migration of nordestinos[4], who began working as rubber tappers in the Legal Amazon (Lenharo, 1986). As they entered the forests to extract latex, these "rubber soldiers", as they came to be known, often clashed with the indigenous peoples of the region. In retaliation, the owners of the rubber plantations started to attack various indigenous groups perceived as hindrances to the rubber tappers' endeavors (Lenharo 1986).

In the case of the Tapayuna, among the instances of violence documented in the consulted literature and survivors' accounts during interviews, it is crucial to highlight the crime of attempted genocide committed by Benedito Bruno Ferreira Lemes. At the time, Benedito served as the mayor of Diamantino

[4] People who live in the northeastern region of Brazil. The Brazilian Northeast is composed of the states of Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe.

and was the proprietor of a rubber plantation situated in the traditional territory of the Tapayuna. In the 1950s, the rubber tapper ordered his employees to distribute pure sugar to the Tapayuna, but the sugar was mixed with arsenic on an island in the Arinos River with the aim of exterminating the indigenous people (Lima 2019).

In the second half of the 1960s, the Tapayuna faced pressure from both rubber tappers and private colonization companies already present in the region, spurred by the occupation projects initiated by the civilian-military government. During this period, the Tapayuna were often observed in ravines along riverbanks and even agreed to receive "gifts". An illustrative incident occurred in 1967 and 1968 involving a speedboat owned by the company Conomali - Colonizadora Noroeste Matogrossense S/A, responsible for developing an area where the municipality of Porto dos Gaúchos would be established (Lima 2012, 2019; Pacini 2021). Towards the end of the 1960s, the Tapayuna began visiting the headquarters of farming companies, which were increasingly prevalent in the region. On one of these "visits", they purportedly became victims of another extermination attempt when, following a hunt between cattle peões[5] and Tapayuna, they were served poisoned tapir meat.

The interlocutors interviewed, survivors of that episode, began narrating the violence suffered during these contact episodes. This event marked a process of dispersal, which, coupled with flu and measles epidemics, resulted in a trail of deaths, decimating entire villages, as described by Antônio de Souza Campinas[6] (1971), a FUNAI employee.

In 1969, a group of Tapayuna started frequenting the headquarters of the Fazenda ABC and were later relocated by a FUNAI official, João Américo Peret, to a more distant point on the farm. Peret's intention was, from this contact, to visit the other Tapayuna villages and persuade the population to live in the Attraction Post he had created. About a month after settling at the Attraction Post, Peret agreed to receive a group of journalists to cover the pacification of the Tapayuna, who were portrayed in the national news as cannibals, savages, primitives, among other adjectives selected by the sensationalist media (Bigio *et al.* 2003). The journalists' visit resulted in one of the most serious humanitarian crises faced by indigenous people in Brazil in the second half of the 20th century. It so happened that, among the journalists, there was an individual with flu-like symptoms, yet his presence among the Tapayuna was permitted. As a result, the flu spread throughout the population gathered there. Those with strength left the place and returned to the villages, causing the flu to spread to numerous villages.

The final toll was staggering: from a population initially estimated at around a thousand people, later between three and four hundred, there were 44 survivors (Bigio *et al.* 2023). At the time, the failure of the expedition led by Peret prompted the president of FUNAI to request that the Anchieta Mission provide assistance to the survivors who were still ill. In September 1969, the missionaries, then under the leadership of Father Iasi, shifted their focus to working with the Tapayuna.

Despite unsuccessful attempts to contact the Tapayuna, who refused to engage with non-indigenous people, be they missionaries, government agents, or settlers establishing themselves in their territories, the missionaries assisting the Tapayuna planned to build a base of operations far from the FUNAI post. The new location was intended to receive the survivors and be closer to the villages that refused to make contact. However, contrary to the objectives of the missionaries at the forefront of caring for the Tapayuna—to keep them in their traditional territory—the Jesuit leadership, in collaboration with FUNAI and the Villas Boas brothers, decided, against the Tapayuna's wishes, to transfer them to the Xingu Indigenous Park (PIX). At the end of April 1970, the Tapayuna faced degrading conditions,

[5] People who work on farms and take care of cattle.

[6] "Relatório da Operação Tapaiuna ou Beiço de Paú" (sic) presented to FUNAI and reproduced by Bigio *et al.* (2023).

hunger, and thirst as they were transported to Cuiabá. In the city, they were loaded onto Brazilian Air Force planes and taken to PIX. Contrary to ILO Convention 107, which prohibits the removal of "tribal" peoples from their traditional territories, this act meant that the Tapayuna were dispossessed of their traditional territory by the Brazilian state (Valente 2017; Plens 2022; Bigio *et al.* 2023).

Ethics in research involving traumatic situations

As previously highlighted, the interviewees lived through the events narrated. During the interviews with both the Guarani Ñandéva and the Tapayuna, it became evident that recalling the violence they suffered brought moments of sadness, where emotions were expressed through tears. In the case of the Tapayuna, the conclusion of the interviews was marked by collective weeping, interspersed with questions about why they had been subjected to such violence. While revisiting situations of violence was exceedingly painful for the interviewees, it also sparked hope for reparations from the state. Both the Tapayuna and the Guarani Ñandéva are currently engaged in efforts to reclaim their traditional territories, and they believe that sharing their stories with researchers can be an additional tool in this ongoing struggle. Thus, although the act of remembering entails moments of pain and suffering for both the older and younger generations, glimpses of hope in returning to traditional territories can be discerned.

It is in this context that we observe a profound level of trust placed in the researcher during the interviews. The research relationship with the Guarani Ñandéva has been, and continues to be, characterized by expectations regarding the outcomes of the work conducted by the GT. This was evident during an official ceremony marking the initiation of work by other GT in the state of Mato Grosso do Sul. The ceremony, attended by numerous shamans from the Guarani Ñandéva ethnic group, featured an intense ritual accompanied by rhythmic singing with the mbaraka (rattle), wherein they sought protection for the GT team. In these instances, the interviewees are not passive participants in the research process. Beyond their expectations and hopes for the outcomes, there is a dynamic process of closely monitoring the developments and products generated by the research.

Regarding the research with the Guarani Ñandéva, the outcome comprised six RCIDs, submitted to FUNAI. In this context, it can be seen that the research work has an impact on all sectors of the community that was the object of the study. The participants understood that the results of the research could influence the group's future in terms of recognition of their traditionally occupied territory. Thus, we could see the commitment of all the community members to collaborate with the researchers. Throughout the research, we strategically chose to talk to the community elders, since they are the guardians of the collective memory and have a more extensive experience of traumatic memories. In order to make the elders feel more at ease, it was suggested that they share their stories in their mother tongue, rather than Brazilian Portuguese, and then translate them for the researchers with the help of younger people. The trust placed in the researchers by the Guarani Nãndéva and the Tapayuna did not imply that they considered them to be authorities. This trust resulted in a partnership in which the knowledge, history and traumatic memories of the interlocutors were discussed in dialogue with the researchers' technical knowledge and their experience in ethnographic research. Therefore, researchers do not assume the role of authorities or agents of change, but only contribute to this by establishing dialogic relationships with the interlocutors.

Research with the Tapayuna follows a different dynamic from that with the Guarani Ñandéva, as it seeks to reconcile the interests of both the Tapayuna and researchers linked to the Federal University of Mato Grosso (UFMT). The compulsory relocation of this ethnic group to the Xingu Indigenous Park in the 1970s almost resulted in their extermination. Despite this, after a demographic recovery in the last ten years, the Tapayuna have organized themselves politically, collaborating with various agents of civil

society and the Brazilian state itself to return to their traditional territories. One of the strategies they have adopted is to welcome researchers from universities, especially federal ones, to conduct research and disseminate their results both within and outside academia. The aim is for this research to reach opinion-forming centers and sectors of the Brazilian judiciary. In this context, the ethical assumptions of anthropological research, in accordance with the 2011 Code of Ethics of the Brazilian Anthropology Association (ABA), guided the study. In any research situation, it is the right of the interlocutors to have access to the objectives and results of the research, as established by this code. The Tapayuna were aware that the research was not being carried out for the Brazilian state, represented by FUNAI. However, they hope that the results will be disseminated through scientific articles, dissertations, theses, among others, in order to give greater visibility to their demands. They also hope that this research can be used by FUNAI in the process of demarcating their territories. The researchers' lived experiences and shared insights emphasized that it is impossible to remain immune or indifferent to the recorded instances of violence in the two highlighted research situations. Anthropology has long transcended scientific objectivism while maintaining its scientific nature. Theoretical and methodological principles underscore that anthropological research unfolds through an encounter of subjectivities. Consequently, remaining indifferent to narratives detailing the types of violence faced by the interlocutors is unfeasible. However, this intersection of subjectivities must adhere to ethical considerations to prevent asymmetrical relationships that could result in varying forms of power dynamics over the other.

Some simple actions were crucial to overcoming distances and asymmetries: adopting non-formalized forms of dialogue and using more colloquial language; accepting the environment suggested by the interlocutors, such as under a tree; taking part in tereré[7] circles (in the case of the Guarani Ñandéva) or sharing meals with members of the household group that hosted the researchers (in the case of the Tapayuna). In addition, understanding and respecting the community's daily routines was extremely important during the research process. Finally, social relations during research become less asymmetrical when the researcher chooses to consider the interviewees not just as informants, but as interlocutors, thus enabling a dialogical relationship (Cardoso de Oliveira 1998).

There are situations where ethics goes beyond merely externalizing sensitivities or empathizing with the pain of others. As per a personal communication from a researcher, she recounts an experience in a village while conducting research on the nutritional status and growth of Xavante children using anthropometry. Upon entering a home, the researcher encountered a severely malnourished child. In a scenario governed by scientific objectivism, one might dispassionately conclude that the child is malnourished, and that would be the end of it. However, the researcher's response was to promptly refer the case to the health team operating in the village where the research was being conducted. As Silva (2015: 155) points out, "(...) every social research relationship is, first and foremost, a human relationship". Anthropological work is characterized by relationships of alterity and reciprocity.

When recording, systematizing, and publishing interviews, whether for academic or technical purposes, it is imperative to clarify that the research does not intend to speak for the interlocutors but to speak about them, based on their consent. The researcher must be mindful of the historical, political, and socio-cultural conditions surrounding the research community, seeking not only specific data to address academic inquiries or legal demands but also engaging in a broader understanding. In this context, the relationship between the researcher and the interviewee should evolve through multiple dimensions, broadening the knowledge base to provide answers that benefit the community.

[7] Tereré is a beverage made with yerba mate (Ilex paraguariensis) and widely consumed among the Guarani Ñandéva. Unlike chimarrão, which uses the same plant and is prepared with hot water, tereré is made with natural or cold water.

Research lacking engagement with these issues will fail to generate knowledge that serves the community's interests. In interviews involving traumatic stories, an interdisciplinary approach is essential, where all participants are cognizant of historical, political, and socio-cultural factors. It should not be merely multidisciplinary, with each researcher focusing on specific technical issues for a report, without addressing the broader causes and consequences of the events under investigation. Throughout the interviews, the researchers involved must possess prior knowledge of the community's activities to engage holistically with individuals sharing their most traumatic stories.

Whether for academic research or report preparation, conducting interviews necessitates an understanding of the interviewees' historical trajectory and forms of social organization. In this scenario, the objective is to cultivate a sense of empathy, creating an environment where the interviewees feel welcomed and understood. The goal is to establish a secure space that encourages individuals to share traumatic and intimate stories, ensuring that the content is handled in a sensitive manner.

It is not uncommon for researchers to operate in indigenous contexts without a comprehensive understanding of the historical and contemporary issues affecting these communities. Consequently, any research involving traumatic histories in indigenous settings, whether forensic or cultural, should adhere to the principle that field researchers are well-informed about the context in which they are immersed. By doing so, the outcomes of such research can go beyond merely addressing the demands of mainstream society. Instead, it has the potential to generate a narrative that authentically represents the interviewees and contributes to a deeper understanding within non-indigenous society.

Conclusion

Brazil has legislation that regulates ethics in research involving indigenous populations, ranging from the need for authorization from government bodies and community authorities to individual consent for interviews[8]. However, there is no consensus on the operationalization of protocols for ethical compliance in research involving traditional populations in the various areas of knowledge. There is a polarization between the biomedical areas and the human sciences; however, there is also a significant effort on the part of researchers to broaden the debate, promoting reflections that can contribute to drawing up protocols that offer greater security both to traditional populations, the object of the research, and to the researchers themselves[9].

The research presented seeks to adhere to the principles of the ABA Code of Ethics. To this end, meetings were held with the communities to present the objectives of the research, and the results were then shared with them. In the case of the Guarani Ñandéva, the RCIDs were presented to and approved by the communities before being handed over to FUNAI. As for the research with the Tapayuna, the first product, a printed book, was delivered to the community. In addition, public book releases are being planned for 2024 and copies of the book are being distributed to government bodies and other entities.

Research involving traditional peoples who have experienced traumatic histories and memories plays a crucial role in various areas of knowledge. Not only do they provide visibility to the historical situations of violence faced by the communities, but they also contribute to their processes of struggle in search of reparation from the Brazilian state, which was complicit in the events that led to different forms of violence. In addition, these studies reveal the obscurities and silences of the processes of violence perpetrated by the state and agents of capital against traditional populations. Beyond that, their results

[8] Brasil. Lei nº 6.001, de 19 de dezembro de 1973. Brasil. Ministério da Saúde/Conselho Nacional de Saúde - Resolução nº 304, de 09 de agosto de 2000.

[9] FLEISCHER, Soraya; SCHUCH, Patrice (orgs.). Ética e regulamentação na pesquisa antropológica. Brasília: Ed. UnB; Letras Livres, 2010.

not only strengthen the interlocutors' processes of resistance, but also encourage national society to reflect on its own constitution, highlighting the various interests at stake in the process of state formation.

Tackling these issues in research requires, in addition to ongoing discussions about the best ethical conduct, that researchers have the historical and anthropological background to explore issues related to traumatic history. The absence of this framework can have an impact on the effectiveness and sensitivity of the interventions and approaches proposed in research and practices related to the historical traumas faced by these communities. In the different research processes with indigenous populations, when conducting interviews with a historical focus, it is essential to identify, recognize and respect the different forms of narratives, considering their oral traditions, mythology and their own interpretation of past events. The historical approach must be based on dialogue and the collection of narratives in a specific cultural context, taking into account the oral transmission of knowledge and valuing native perspectives on their own past. The challenge arises when research needs to integrate these perspectives in an ethical and equitable manner. The mismatch often stems from a lack of in-depth understanding of indigenous histories and cultures on the part of researchers, generating disconnection and mistrust. It is therefore essential that researchers are open to intercultural learning, establish collaborative partnerships with indigenous communities and act to promote an environment of mutual respect and appreciation of indigenous perspectives.

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Chapter 11

Bioarchaeology, ancient DNA and the respect for the dead: ethical challenges in a South American perspective

Gabriel Frassetto Raimundo and Mercedes Okumura

Introduction

The role played by ancient DNA (aDNA) studies in bioarchaeology has increasingly grown over the years. Providing information such as age, health, and nutrition, the field contributes to the understanding of ancient populations, including their demographic and social structure. As a matter of fact, aDNA studies have been characterized as "revolutionary", not only contributing to the study of the past but, even further, being responsible for resolving "long standing disputes in archaeology" (Downes 2019). For instance, aDNA was used to investigate – and solve – the maternity of the last Danish Viking King (see Dissing *et al.* 2006).

Nevertheless, despite this "revolutionary status" (see Booth 2019; Reich 2018: 276), the field has come under considerable scrutiny. Limitations concerning sample size, for example, have often been pointed out (Bolnick *et al.* 2016; Raff 2019; Sirak and Sedig 2019). Furthermore, multiple ethical and bioethical debates encompass topics such as consent (both from the living and the dead), the roles of multiple stakeholders, and biocolonialism (Kaestle and Horsburgh 2002; Tsosie *et al.* 2020). Instances of destructive analysis of human remains, conducted without the consent or permission of the deceased's descendants, have sparked controversy. Despite the publication of multiple guidelines and legislation – such as the Vermillion Accord on Human Remains, of 1989; the Native American Graves Protection and Repatriation Act (NAGPRA), of 1990; and the International Council of Museums (ICOM) Code of Ethics, of 2004 – there is still no unanimity in certain aspects of the handling of human remains. Multiple frameworks for aDNA research have also been proposed (see, for example, Hublin *et al.* 2008; Bardill *et al.* 2018; Wagner *et al.* 2020), but a consensus on the matter is, still, nonexistent. Moreover, the expansion of aDNA research into the Global South emphasizes the necessity to consider local specificities. The diversity of cultural, political, and social contexts has been an important topic of discussion in recent years (see Ávila-Arcos *et al.* 2022). In that sense, the goal of this chapter is to present an overview of some ethical concerns in aDNA research, focusing on the relationship with human remains, based on a South American perspective. Additionally, it explores some perspectives on the duties of the living towards the dead.

The study of human remains

Researchers working with human remains are growing aware that, among other things, those once living individuals hold great religious, symbolic, and cultural importance. Therefore, this kind of research needs a proper justification, which usually is that such studies can potentially generate useful knowledge to modern human groups (Walker 2000). Different authors (see Lonfat *et al.* 2015; Scarpulla *et al.* 2023) have explored the Declaration of Helsinki in order to address the respect towards the dead – although specifying that it lacks a focus on the treatment of the deceased. Lonfat *et al.* (2015) discussed the potentiality of deceased people being subjected to harm. Culminating in a researcher's responsibility and duty towards the dead, the authors argue for two pathways in which a deceased person could be harmed: one concerning their bodily integrity, and the other, personal identity. The first is considered

as "the fundamental right of a person to decide the treatment of their own body" (Lonfat *et al.* 2015: 3), which does not end with death, as the authors invoke documents such as the aforementioned Universal Declaration of Human Rights of 1948, and the International Covenant of Civil and Political Rights, of 1966. In the second category, Lonfat *et al.* (2015) included topics such as the break of promises or wishes, the destruction of reputations or the undermining of a person's achievements. The authors further argued that those duties have multiple layers and are under an ethical dilemma of universal validity.

Walker (2000: 20) emphasized that "the ethical principle that human remains should be treated with respect and dignity is consistent with, and can be seen as an extension of, respect for human dignity". The author suggests that researchers and other stakeholders (including descendant groups) need to dialogue and find a mutual understanding regarding the significance of human remains. However, the challenge persists in determining what can be considered respectful, as the concept varies widely across different cultures. Walker (2000) then advocates for a preservation ethic, which means that researchers must work to preserve as much as possible of the knowledge obtained from studies of human remains, as well as of the human remains themselves. On the other hand, Clegg (2020) stressed that, in certain instances, the generation of knowledge alone is insufficient to justify the research involving human remains, and that there are two important issues to be taken into account. The first issue is natural justice. According to the author, if descendants of the individuals removed from cemeteries or burial grounds want them to be returned, they should be – regardless of any great benefit of using them to generate scientific knowledge (Scarre 2009). The second is the issue of consent. Most human remains curated at museums today were removed from burial grounds without any consent given by the persons themselves or by their relatives.

A concerning issue arises, then, as the notion that museums curate a considerable amount of native American collections without the knowledge of living communities comes to light (Cury 2020). Native (or nonoccidental) people were traditionally represented in collections as "the others", with many belongings looted to fill such collections. Cury (2020) underscored the importance of museum collections as they are related to identity, memory, self-affirmation, and the fight for rights. In that sense, the author establishes that there is an institutional responsibility to inform about and give access to such collections. This might include a more active participation of native communities in curatorial work, in the study of collections, or the creation of exhibitions, for example. Such participation is regarded as a form of strengthening the political organization, highlighting self-representation, and introducing, in the curatorial dimension, native communities' values, narratives, and knowledge. In the South American context, Politis (2001: 97) noted that the "dialogue between archaeologists and Indigenous peoples in the region has always been difficult, erratic, distant, and basically absent". Traditionally, excavations were conducted without due consideration or consulting of the people culturally and historically connected to such places. In this context, there is an ongoing need to confront challenges rooted in the lasting colonial legacy, which continues to affect museological institutions across the Global South. For instance, according to Russi and Abreu (2019), Brazilian museum collections have diverse sources, especially those related to Indigenous groups. Among other origins, they derive from anthropological research, purchases, donations, and the looting of native communities. It is important to notice, nonetheless, that social movements have steered changes in this scenario in the last decades of the 20th century. For instance, these movements advocated for changes in exhibitions and objects repatriation (Russi and Abreu, 2019).

Controversial cases (such as the one in Argentina involving Chief Inakayal) highlight the multitude of issues surrounding Indigenous remains in South America. Chief Inakayal and another Chief, Foyel, were imprisoned in 1884 after "they went to parley with a National Commander who had located a fort in their land" (Politis 2001: 98). The government later sold their lands, and Chief Inakayal died on September 1888 in the Museo de la Plata. After his death, his remains were displayed in the museum's Anthropological

Galleries, at the Museo de la Plata, until 1940. It was only in 1991 that a new law (proposed by Senator H. Solari and approved by the National Congress) supported the return of Chief Inakayal's remains to his descendants. In 1994 he was, then, repatriated and buried in his homeland. A representant of the Museo de la Plata joined in the oversight and safeguarding of the urn with his remains, and the institution also offered apologies to Chief Inakayal's descendants. However, this return faced opposition from some archaeologists. They advocated for the 'indivisibility of the collections', arguing for the museum's property rights and patrimony over the rights of the Indigenous communities. Archaeologists were also concerned that this case could open a precedent for other repatriations, resulting in the "spoliation not only of other human remains, but also of the entire archaeological collection" (Politis 2001: 99). The Academic Council of the Facultad de Ciencias Naturales de la Universidad de La Plata had already declined to repatriate the remains of another Indigenous chief in 1992, based on the notion that "archaeological collections were public property which belong to the nation and therefore cannot be claimed as part of the private dominion" (Politis 2001: 99). Despite such controversy, the reburial of Chief Inakayal received wide national press, and even garnered public support, as non-Indigenous individuals also expressed the belief that the chief's remains should be returned to his descendants (Politis 2001).

This example reflects a broader discourse on collaborative efforts between Indigenous groups and institutions in South America. In Brazil, Cury (2020) presented a case of collaborative work between Indigenous groups (namely, Kaingang, Guarani Nhandewa, and Terena) and the Museu de Arqueologia e Etnologia (MAE-USP). The focus of this work lies in the decolonial process and the social role of the university museum. Through dialogue and collaboration, the project strived to reconnect the communities with MAE's Indigenous collection, while also aiming to address the aspirations of these groups (which included visibility, recognition, and self-representation). The Indigenous groups later named the exhibition as "Resistência já! Fortalecimento e união das culturas indígenas – Kaingang, Guarani Nhandewa e Terena", translating to "Resistance now! Strengthening and uniting indigenous cultures – Kaingang, Guarani Nhandewa and Terena". Integral to this collaboration was the active involvement of the Indigenous communities as curators, participating in decision-making processes to achieve a balance between the museum's expectations and their own. This approach aimed to establish trust with the native communities, wherein they took on responsibilities in research, collection choices, and the creation of texts and labels for the exhibition. Cury (2020) asserted that this represents a pursuit of reconciliation and the fostering of a connection between museum agents and Indigenous people. It emphasized engaging in conversations with native communities, rather than merely speaking about or for them. Other Brazilian institutions, such as the Museu de Arqueologia e Etnologia from the Universidade Federal do Paraná (MAE-UFPR), the Museu de Arqueologia e Etnologia from the Universidade Federal de Santa Catarina (MArquE-UFSC), the Museu Nacional (MN-UFRJ), and the Museu Paraense Emílio Goeldi, have also participated in similar activities involving Indigenous collaborations (Cury 2020). Additionally, it is also fundamental to acknowledge initiatives such as museums organized by native communities. In Brazil, these initiatives date back to the 1990s. Museu Magüta was the first, being established in 1991, followed by the Museu Kanindé, in 1995 (Cury 2020).

Who are the stakeholders?

It has been proposed that the study of human remains is important because it brings evidence for the lives of past peoples (Mays 2021). This is particularly important for human groups who are underrepresented in history, given an absence of historical records due to their deep chronologies, lack of documentation and/or historical erasing. In the last two decades, discussions regarding decolonial practices, indigenous rights, and bioethics have posed multiple questions about the practices of acquisition of such remains. A significant emphasis is placed on the controversial notion of the "ownership" of skeletal collections (and how acquisition, care, and use can be considered as minimally acceptable under current standards).

Nevertheless, in some places, current descendants can represent a vast and diverse group. Clegg (2020) explored the practicality of consulting every descendant of someone alive around 5,000 years ago in Britain; this potentially large number of people could make the endeavor scientifically unfeasible. Another problematic can emerge in selecting which individual or group can represent the entirety of once living people (Fox 1997). In this case, some institutions are consulting with a wider group of stakeholders, including people who live in the vicinity of a given place (repository or archaeological site), as well as the general public (Bienkowski 2009). The displacement of many Indigenous populations from their original places in historical times, as a result of government policies, might also limit the attention of such groups to potential local archaeological heritages. Processes of Indigenous identity erasure deeply marked South American countries, often favoring the notion of white, European descending nations (see Tamburrini *et al.* 2023 and Politis 2001 for examples). In some contexts, native groups still struggle with more urgent issues; in Brazil, they still find themselves under a multitude of forms of violence, the dismantling of indigenous policies, restrictions on their freedom and exercise of human rights, the denial of their identities and other forms of social harassment (Guajajara *et al.* 2021; IPRI 2021: 20; Burckhart 2023). Furthermore, the amount of indigenous ancestry (Kehdy *et al.* 2015), as well as the perceptions of (self-reported) identities (Santos *et al.* 2009) vary according to each geographical region. Given the unfortunate fragile situation of such groups in terms of government policies, scientific studies involving ancient human remains that might be related to such groups (or archaeological heritage in general, see Green *et al.* 2003 for an example) have not been a priority.

When researchers of ancient human remains mention 'stakeholders' or 'interested (external) parties,' 'Indigenous groups' is often the initial association. However, it is possible to encompass a much broader diversity of groups that might be interested in engaging with such remains. Different institutions present distinct definitions of stakeholders (Woodhead 2013), including 'actual and cultural descendants, legal owners and the worldwide scientific community' (MEG 1991, principle 1.3); 'genealogical descendants, cultural communities, custodians and the scientific community' (DCMS Guidance 2005, 8); and 'the national government or the diplomatic representatives of the country in which the claimants normally reside' (British Museum 2006, 7). In some cases, institutions recognize the scientific community as one of the many interested parties when dealing with human remains. Lately, these discussions have included other groups who were also historically disenfranchised for their ethnicity, class, gender, or religion, among other elements, as well as historically famous individuals (Geller 2021: 123).

Despite that, in many places, it is not clear which groups would be related to these human remains, and their engagement with the once living varies greatly. For example, in England, the public seems to be comfortable and very interested in exhibitions featuring human remains or archaeological excavations where human remains are being exhumed, even when these are (at least in a historical way) related to them. Such experiences have been reported by the Museum of London following the exhibition "London Bodies", including human remains from prehistoric times to historical period (Swain 2016; Tatham 2016) and the excavation of the Oakington Anglo-Saxon cemetery (Sayer and Sayer 2016). However, the UK public responses to more recent human remains might be different from what has been observed for remains from "the distant past" (Sayer and Sayer 2016). There are exceptions, including requests from Peruvian groups to the American Museum of Natural History to display Peruvian mummies (however, the museum denied the requests, Stutz 2016). The same museum made an exception for the exhibition of a miner from Chuquicamata, following the wishes of the Chilean state (Stutz 2016). In Brazil, certain Indigenous communities have advocated against the public display of human remains. For example, Kaingang spiritual leader Dirce Jorge Lipu Pereira recounted a disheartening experience at an exhibition that displayed an Indigenous skull, emphasizing the emotional toll of seeing an ancestor presented in such a manner. Interestingly, despite Dirce Pereira's opposition to the exhibition of bodies (and photographs, as an extension of personal representation), she argued that human remains

should be curated with care and respect for research (Pereira, Melo 2020). Furthermore, she presented concerns about museums lacking suitable conditions to house ancestral remains, and advocated for their curation in institutions that can provide what she defines as "proper care". She specifically praised the approach of the Museu Índia Vanuíre, located in Tupã (Sao Paulo state) expressing trust in their ability to appropriately house and curate their ancestors (Pereira, Melo 2020). Susilene Elias de Melo, Dirce's daughter, also presented concerns about the inappropriate curation of remains, and further argued against museums that do not consult with Indigenous peoples regarding exhibitions. Both of them emphasized that human remains are not objects, but human beings that deserve respect (Pereira, Melo 2020). Nevertheless, it is fundamental to recognize that there is no singular opinion or worldview on the matter. Even within the same country, consensus regarding the exhibition of Indigenous remains may be absent. For instance, Babosa *et al.* (2020) presented a case concerning Brazilian Jenipapo-Kanindé and Kanindé communities. After performing religious rites, the spiritual leaders argued for the display of an urn containing human remains. The rationale behind this request was that it was the deceased's wish to be displayed.

The curation and study of ancient human remains might present itself as a challenge with diverse regulatory hurdles. Many regions grapple with these challenges, lacking robust legislation to address, for instance, the claims of indigenous groups regarding the proper care of their ancestors. Despite this, even if many countries do not have robust (if any) legislation to support those claims, the United Nations Declaration of the Rights of Indigenous Peoples (2007) stated that such groups have the right to preserve and access their religious and cultural sites. Additionally, it recognizes their right to the repatriation of their bodies. No specific mention regarding the scientific study of these human remains was made, but some stewardship can be inferred from the text. On the other hand, the ICOM Code of Ethics for Natural History Museums stated that 'where extant representatives of the cultural groups exist, any display, representation, research and/or deaccession must be done in full consultation with the groups involved' (ICOM Code of Ethics for Natural History Museums 2013, Section 1, D). On that note, there are countries in which the legislation does not support the engagement of indigenous groups with archaeological elements (including ancient human remains). Londoño (2021) asserted that in Latin America, archaeological artifacts are considered to belong to the State, contrasting with situations in the "Anglophone world". This circumstance poses challenges for Indigenous claims regarding objects and human remains. Whereas native communities from the US are backed by policies like the Native American Graves Protection and Repatriation Act (NAGPRA), in Brazil, there is no legal support that allows indigenous groups to own archaeological materials. This certainly hampers, at least partially, the engagement of such groups to most scientific projects (Endere *et al.* 2011). Conversely, according to Ávila-Arcos *et al.* (2022: 1-2), in Chile there are "specific institutions dedicated to the research, conservation and protection of anthropological, archaeological, historical, and cultural heritage" – in which the role of the National Monuments Council must be emphasized. A key point, therefore, is the multifaceted nature of human remains treatment in South America. Despite that, Indigenous remains still play a significant role in supporting their identity and decolonizing historical narratives, and there are persistent efforts to strengthen repatriation acts (Londoño 2021). In addition, it is important to notice that NAGPRA is still under diverse critiques. For instance, Native Americans pointed to an unclear definition of the term "human remains" and what it encompasses; one argument centers on a lack of clarity if the category includes teeth and hair, for example (Tsosie *et al.* 2020).

Moreover, Global South institutions responsible for regulating access to heritage or archaeological collections may face challenges regarding their budget, effective enforcement strategies, and/or clear regulations and requirements (Ávila-Arcos *et al.* 2022). Another striking difference between Central/South America and North America is the role and awareness of museums and collections regarding scientific studies. Whereas in North America most museums present policies on the use (including

destruction) of human remains for scientific purposes, many institutions from Central and South America lack personnel with such expertise (Okumura and Raimundo 2021, 2022). According to Alpaslan-Roodenberg *et al.* (2021: 42), in Argentina, for example, one can find the problematic that "a legal mandate that community consent must be obtained to carry out any project involving Indigenous heritage is not always followed". Cases such as the "Llullaillaco mummies" excavation, on the Argentina–Chile border, can give rise to concerns about potentially unethical scientific practices. Controversial issues arose from the research team's partial fulfillment of legal authorization conditions, the lack of consulting with local native people (which led to a lawsuit by the Kolla indigenous community 'Los Airampos'), and limited interaction with local archaeologists – excluding archaeologists and anthropologists from the Universidad Nacional of Salta, the province were the mummies were found (Politis 2001). Therefore, we believe that in such contexts, bioarchaeologists must involve both indigenous groups as well as employees of local museums. Additionally, Tamburrini *et al.* (2023) discussed the establishment of ethical guidelines for aDNA research, noting that many have been formulated by researchers from the Global North. Thus, they emphasize the necessity for equity and decoloniality. In this scenario, we argue for the importance of recognizing the specificities and multiplicities of South American realities. We also argue that even in cases where a lack of policies regarding aDNA research can be identified, researchers can (and should) work towards a way in which ethical principles are followed.

Regardless of inexistent legal guidelines, there have been some successful initiatives regarding consultation with native groups in Brazil. For example, the approval of aDNA analyses of a historical skeleton from a Kaingang burial was obtained after conversations between researchers and the Kaingang community from the indigenous land "Vanuíre" (Ferraz *et al.* 2023). The authors seek several permits, including, but not limited to, for material exportation (from the Instituto do Patrimônio Histórico e Artístico Nacional), and sampling access from Museu de Arqueologia e Etnologia (MAE-USP). Several academic institutions were also consulted. A key aspect of this study resides in the dialogue with the Kaingang community and their spiritual leader, who oversaw the team's request. This process included a detailed presentation of all aspects of the study, as desired by the Indigenous community. After following internal community consultation, permission was granted to include data from the Kaingang sample in the study.

Ethical issues and the study of human genomes

At the beginning of the 1990s, the main debates regarding ethics and genetic research revolved around the Human Genome Diversity Project, including topics like genetic enhancement, genetic essentialism, as well as commercialization, patenting, and DNA banking (Knoppers and Chadwick 2005). According to Daar *et al.* (2005: 41), genomics and genomic knowledge have global public goods characteristics, meaning that the benefits of such public goods are non-excludable (it can be enjoyed by all) and non-rivalrous (the consumption by one individual does not deplete the good and does not restrict the consumption by others). Accordingly, global goods refer to something not limited by national boundaries. UNESCO (1997) declared the human genome as a common global heritage of humanity. Genomic data is usually available to the public through online databases, and therefore can also be considered as a public good. However, in practice, genomics is a public good only to the countries that are able to access genomics knowledge and carry on genomics research – meaning that many countries, especially developing countries, can be left behind. A lot of investment has to be made to allow a country to be able to access and generate genomic knowledge, including education and training, access to scientific publications, and research infrastructure (Daar *et al.* 2005: 42). Proposals like the Global Genome Initiative (https://naturalhistory.si.edu/research/global-genome-initiative) can be important to foster partnerships between developed and developing countries, including people from academia, private sector, governments, NGOs, and media (Daar *et al.* 2005: 43), as long as such enterprises do not feed colonialist views. Moreover, the principle of citizenry has become an important topic in bioethics

and genetics. Such principle should necessarily include a reasonable public understanding of science and has developed into themes like public 'consultation', 'engagement', and 'involvement'. The principle of citizenry also involves the relationship between collective identity and genetic heritage (Knoppers and Chadwick 2005). Universality also needs to be addressed, as well as the implications between such concept, international human-rights law, and cultural diversity (Knoppers and Chadwick 2005). While there is a need to look beyond borders, the ethical guidelines need to be fair to all and compatible with the plurality of values and interests of the international community (Unesco 2003).

Nonetheless, concerns about the access to genomic data have been expressed, such as by USA native Americans (see Tsosie 2020), who perceive a possible occurrence of biocolonialism. Concerns regard questions on accessibility, ownership, governance, and native empowerment due to unrestricted data availability. It is important to notice how, historically, the conflict of indigenous participation in genetic research has been conceived as rooted in their beliefs and culture – seldom acknowledging the risks faced by such communities due to lacking ethical and/or legal guidelines for their protection (Schroeder *et al.* 2006). Concerning aDNA studies, results may (even inadvertently) lead to negative outcomes, such as contradicting Indigenous community histories. Data derived from this kind of research can also unveil information about descendant communities, posing a risk to community or individual identities, which in some cases might be stigmatizing (such as revealing genetic susceptibilities to diseases). On that note, Susilene Elias de Melo, a member of the Brazilian Indigenous group Kaingang, asserts that Indigenous peoples have their own questions about their ancestors, just as researchers do. However, in her perspective, if those researchers are unable to address the questions coming from native communities, they should refrain from proceeding with the research, in order to avoid disturbing the ancestors (Pereira, Melo 2020).

On the other hand, it is essential to acknowledge the plurality of views within the field. In certain instances, ancient DNA research might be considered a valuable tool to establish a connection between contemporary populations and their ancestral roots. In Colombia, for example, the European impact on the gene pool and population structure of present-day indigenous peoples is considered unknown, and there is an absence of data about the ethnic diversity prior to the Spanish conquest. Therefore, aDNA has been characterized as possibly helpful to address this situation. Research focusing on ancient population genomics can be a valuable resource for recovering genetic and biological information about native peoples. This approach might be useful to enhance the understanding of biological diversity and population dynamics of Colombian native communities (Murillo 2016: 77-78).

In the context of bioarchaeology and aDNA studies, initiatives such as the one showcased by Tamburrini *et al.* (2023) demonstrate significant ways in which researchers can engage with Indigenous populations to address the bioethical challenges of the field. In 2022, a workshop took place in Trelew (Chubut Province, Argentina), aiming to foster the integration of genomic science and indigenous knowledge. Focusing on native communities, it sought for a better communication of aDNA results, while also being a platform for sharing and exchanging knowledge, perspectives, experiences, and concerns related to ongoing genetic research. In order to inform such communities, descriptions of aDNA studies involving ancestral populations were included, and multiple steps of scientific endeavors were addressed (the methodology employed, the extent and limitations of the tools utilized, and the permissions granted by regulatory entities, for example). Importantly, key concepts (such as mtDNA inheritance and the concept of aDNA and its form of obtention) were addressed to ensure the understanding of these fundamental ideas. The participants were also introduced to topics such as how the work with archaeological remains of ancestral individuals is conducted and the ethical-legal framework within which they operate. After the workshop, an anonymous survey was conducted to gather the opinions of the attendees. Notably, the feedback from participants underscored, among other themes, the significant contribution to comprehending and reconstructing family histories through maternal/paternal genetic genealogy.

They also emphasized the contribution to the knowledge of their ancestors' past (Tamburrini *et al.*, 2023).

Finally, we argue for the creation of ethical guidelines for aDNA research in the countries in which they are still absent. From a Brazilian standpoint, we emphasize the significance of these guidelines – as studies have been, and still are, conducted in the country despite the lack of such policies. Therefore, we underscore the development of guidelines through a collaborative dialogue involving various stakeholders, based on respect for human rights, dignity, and cultural diversity. Although we recognize the multiple challenges associated with constructing and implementing such guidelines (while also considering the variety of scenarios globally), we advocate for the establishment standards that embody the ethical considerations necessary for scientific endeavors.

Conclusion

This chapter presented some of the complexities in bioarchaeology and ancient DNA research. As the disciplines intertwine, the need for robust ethical guidelines emerges as a key aspect, alongside the respect for human dignity, plurality, and cultural diversity. Such aspects are pivotal in order to better include the multiple stakeholders involved in the field. Moreover, the multitude of global scenarios highlight the universality of ethical challenges, while simultaneously emphasizing specificities, as presented in the South American context. In conclusion, there is, still, much to discuss and develop in terms of bioethical frameworks that encompass the ethical responsibility surrounding the study of human remains. A collaborative, diverse, and inclusive effort is fundamental for the multifaceted nature of bioarchaeology studies.

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Chapter 12

The Bioethics to be Considered for the Killed in Action Recovery and Identification Project of Korean War Casualties

Hyejin Lee and Dong Hoon Shin

Introduction

Even when skeletal remains are found and no other evidence is present, the use of anthropological techniques may aid in the identification of an individual. Forensic anthropology is not limited to missing persons or crime scenes. Forensic expertise is also required to identify the soldiers or civilian workers of the military when the battles caused massive casualties and their remains were left unattended for a long time. In such cases, several soldiers' skeletal remains are often found together when killed in fierce combat. Close cooperation between military authorities and anthropologists is crucial because a holistic approach that comprehensively considers biological, and contextual evidence is needed to correctly identify the soldiers missing or killed in action. In this chapter, we would like to describe the efforts of biological anthropologists and the South Korean government to find the remains of missing soldiers of the Korean War and describe some ethical considerations derived from the project.

War Casualties and Anthropologists

In modern warfare, numerous young soldiers and civilians were sacrificed as states engaged in total war, using any means necessary to win. In the second half of the 20th century, efforts to commemorate and identify missing soldiers and civilians led to the enactment of laws in many countries. (Marquez-Grant *et al.* 2020). The agencies dedicated to the excavation and identification of human remains at the battle fields were also established (Lee 2022).

The United States is a leading country in this field. The United States officially established the American Graves Registration Service (AGRS) in 1917 before entering World War I (Lee 2022). Since World War I, the U.S. Army has partially solved the identification problem by introducing an identification tag, which was quite effective but far from perfect (Lee 2022). Since World War II, the U.S. military has enlisted the help of forensic anthropologists in cases where identification tags could not be helpful. In particular, during the Korean War, innovative developments were made in the excavation, identification, and repatriation of soldiers' remains. Anthropologists gained a lot of experience and knowledge through analysis of the remains of soldiers at the time (Coleman 2008).

In 2003, the U.S. defense authorities established Joint POW/MIA Accounting Command (JPAC) to solve overlapping problems and maximize efficiency. In 2015, the JPAC was developed to the current Defense POW/MIA Accounting Agency (DPAA). More than 150 forensic anthropologists and support staff are working for the DPAA (Belcher *et al.* 2021; Lee 2022). The U.S. system of scientifically identifying and returning soldiers who were killed or missing in action to their families has greatly inspired other countries. South Korea was one of such countries.

Korean War

The biggest part of the work of excavation, identification, and repatriation of the remains of Korean military troops is related to the Korean War (1950-1953). After liberation from Japan in 1945, two

Figure 1 - A memorial monument for unidentified students who died as volunteer soldiers during the Korean War. The monument is located in the National Cemetery in Seoul. Excavation and identification of the remains of student volunteers killed at the battlefield during the Korean War is one of MAKRI's important tasks.

governments were established on the Korean Peninsula. There was an ideological conflict between the two regimes as North Korea adopted a communist system and South Korea favored a liberal democracy. On June 25, 1950, the Korean War began with a full-scale invasion by the North Korean military, and in the early stages of the war, the South Korean military retreated due to their inferior numbers and equipment. However, due to the participation of the United States and other allies, the situation was reversed. The North Korean military was forced to retreat to the border with China, but the Chinese military intervened in a surprise move, leading to a stalemate on the front line positioned halfway through the Korean Peninsula. 'The Korean War lasted for three years until a ceasefire was reached, which remains in effect to this day.

This war had done enormous damage to the newly independent country. Nearly all of the infrastructure was destroyed, and the death toll, including civilians, reached nearly one million in South Korea alone. This war did a lot of damage to the army, too. In the case of the South Korean military: 137,899 dead; 450,742 wounded; 24,495 Missing in Action (MIA); and 8,343 Prisoners of War (POW). As for the United Nations military, 37,902 dead; 103,460 wounded; and 9,767 POW (Park 2014).

The U.S. government is continuing to investigate the missing soldiers who have not been identified under the supervision of the DPAA (Belcher *et al.* 2021). On the other hand, little work was done to identify Korean soldiers who died during the Korean War. As Korea's economic situation improved dramatically in the late 20th century, it was strongly argued that the identity of missing soldiers of the Korean War should be repatriated to their family. In fact, among the soldiers and civilian volunteers killed during the Korean War, the number of remains that have yet to be recovered and identified is thought to be about 123,000 (Yonhap News Agency 2020). A national project to excavate the soldier's remains and successfully return them to their families is thus being carried out by a government agency of the Ministry of National Defense: MND Agency for Killed in Action & Identification (MAKRI) (Lee 2022). To honor them, memorial monuments for unidentified soldiers or students who died during the Korean War have been erected by the South Korean government. (Figure 1).

The Project of Ministry of National Defense Agency for Killed in Action & Identification (MAKRI)

The MAKRI's works began in April 2000 originally as part of a project to mark the 50th anniversary of the Korean War. Initially, it was planned and conducted as a pilot project for only three years by the Korean Army headquarters. Due to the project's high achievements, the management was transferred from the Korean Army headquarters to the Ministry of National Defense in January 2007. In the same year, MAKRI was launched as an independent institution exclusively dedicated to the recovery and identification of missing soldiers of the Korean War (Lee 2022; Figure 2). In March 2008, the Korean War Remains Excavation Act was passed, thus securing a legal basis for all subsequent projects. In January 2009, an independent agency headquarters was built within the Seoul National Cemetery, and a Central Inspection Center equipped with state-of-the-art analysis facilities was also established therein. Two months later, a pan-government cooperation was conducted under the Prime Minister's Directive, and

Figure 2 - Ministry of National Defense (MND) Agency for Killed in Action & Identification.

a consultative body was formed for government-related ministries. In the following year, the Killed in Action Total Information System (KIATIS) was developed for Korean War missing soldiers (Ju *et al.* 2017).

Excavations at Battlefields

MAKRI is a rare organization in the world except for the U.S. military DPAA, as it is responsible for overseeing the overall work of excavation, identification, and repatriation of soldiers' remains to their family. Initially, forensic assessment consisted only of the identification (sex & age at death) of the remains. But recently, facilities for genetic identification have been set up, thus contributing greatly to confirming the identity of the missing soldiers' remains by DNA analysis (Lee 2022).

The investigation units led by archaeologists are conducting the excavation in the battle fields of the Korean War with the cooperation of military authorities every year. So far, a total of 12,930 soldiers' remains were retrieved from the battlefields. Among them, 11,174 were of Korean troops and 29 were of allied forces, including from the U.S. military. The MAKRI also recovered 1,727 remains of North Korean and Chinese troops out of humanitarian motives (MND Agency for KIA Recovery & Identification 2023).

Anthropological Analysis

All recovered remains of the killed in action (KIA) soldiers are maintained at the MAKRI headquarters until a positive identification is made. The first thing that takes place in the process of identification, and after excavation, is the analysis of the history of the Korean War. A list of candidates and related information useful for identification is made through historical documents. Family members' oral histories about missing soldiers are considered as well in the analysis. If personal items are found on the battlefields, they are also investigated to help determine nationality or personal identity. Once the soldiers' remains are excavated and secured, anthropological profiles such as sex, age, height, and other identifiable traits are recorded by forensic anthropologists. The individuals' pathological and traumatic lesions are also recorded.

DNA Analysis

When the macroscopic skeletal analysis is completed, analysis of short tandem repeats (STR) and single nucleotide polymorphism (SNP) is conducted to estimate the soldier's genotypes through DNA analysis (Ministry of National Defense 2022a). Genetic testing is carried out in an independent laboratory set up at MAKRI that is committed to maintaining a level that meets international standards of genetics labs (Ministry of National Defense 2022b). The use of DNA tests for personal identification is very encouraging, but there are inevitable difficulties for Korean war casualties. During the early period of the Korean War, many enlisted South Korean soldiers were sent to the front, leaving little information to help identify them when they were killed in action. Therefore, there is a lack of information about the missing or dead soldiers; making it difficult to identify them even if their remains are recovered from battlefields and anthropological examinations (both gross and genetic) are conducted.

Therefore, the South Korean government currently recommends that the bereaved families of the Korean War casualties who wish to identify the remains of the deceased submit their DNA samples for comparison. From 2003 to December 2022, over 80,000 DNA samples were collected from the relatives (Ministry of National Defense 2022b). By comparing the DNA profiles of the bereaved families whose sons, brothers, fathers died or remained as missing soldiers, a larger number of human remains were identified, and the number is increasing rapidly every year. By December 2022, a total of 204 soldiers were positively identified, and their remains returned to their families and buried in the National Cemetery (Ministry of National Defense 2022b; Figure 3).

The Missing Soldiers Back Home

In MAKRI, we have a dedicated department that manages and analyzes historical and genetic information from the soldiers' bereaved families. Now let's look at two examples of missing soldiers found through the MAKRI project. The missing soldier A was born in 1924 and worked as an employee of the district office before marrying his wife in 1944. After the outbreak of the Korean War, he volunteered to join the Korean army in 1951. At that time, the front line was in a stalemate, and his division was placed at the forefront, and the struggle for high ground continued. In the process, 90 South Korean soldiers were killed in action, and he is believed to have been one of the casualties. The remains of soldier A were excavated in 2017 along with an identification tag and other objects. The preservation state of the identification tag was far from perfect so DNA analysis was conducted. The daughter of the missing soldier had already registered her DNA profile to find her father's remains. A father-daughter relationship was confirmed by comparing their DNA profiles. At that time, the wife of the missing soldier was still alive, still waiting for her husband after raising their daughter by herself. The missing soldier was buried in the National Cemetery after consultation with the bereaved family (Ministry of National Defense 2017).

In 2008, Soldier B's remains were recovered by MAKRI. He was married to his wife while working in a lumber mill. When the Korean War broke out, he voluntarily joined the South Korean army at the age of 27. His wife was reportedly pregnant at the time. Reports stated Soldier B participated in the counter-offensive operation of 1950 but was killed in action in October of that year. His remains were not recovered at the time, and only a KIA notice was delivered to his family. When the remains of the missing soldier were discovered, it was not possible to identify him through traditional anthropological techniques. The situation changed when his son voluntarily participated in a genetic sampling in 2017 to find his father's remains. And among the recovered missing soldiers' remains, Soldier B could be

Figure 3 - Korean War Memorial at Seoul National Cemetery. The names of the dead and missing soldiers are recorded, but some of the remains among them have not been identified yet.

confirmed as his father by genetic analysis. The remains of Soldier B were also buried in the National Cemetery after consultation with the bereaved family (Ministry of National Defense 2018).

Currently, many missing soldiers of the Korean War are being identified in almost the same way by MAKRI. Family links continue to be established between bereaved families and missing soldiers through anthropological gross examination, the consultation of war history, and genetic analysis.

Considerations about Possibly Ethical Issues

The MAKRI project has been highly respected by Korean society for returning missing soldiers' remains to their long-awaited families. In particular, anthropologists participating in this project are well aware of the various ethical problems that can arise in forensic work. Nevertheless, the project is not free of ethical concerns as it involves research on human remains and sensible contact with the missing soldiers' families and counterparts involved in the Korean War. We would like to briefly summarize this subject as follows.

The Issue about DNA Sampling

As mentioned before, missing soldiers who participated in the Korean War left little data to aid in their identification. Therefore, even if the remains of a soldier were found at the battlefields and DNA was successfully extracted, little genetic information is available for comparison. Currently, the only way to identify a soldier from whom a genetic profile could be attained is to compare it with the DNA of the bereaved family. Therefore, the Korean government and MAKRI are making as much effort to collect samples of bereaved families as they do to excavate the remains. In MAKRI, the professional manpower for this work is composed of twice the number of people in charge of excavation at battlefields.

However, more than 70 years after the Korean War, it is by no means easy to collect the DNA of the bereaved families. The parents' generation, who have the highest genetic relationship with the dead, have almost all died, and the brothers of the missing soldiers still alive is also decreasing. Although the generation of children is more likely to be alive, most of the soldiers were in their late teens to early 20s at the time of their death, so most were unmarried and had no children. Therefore, the main targets of the sample collection of bereaved families should be still surviving brothers or their nephews. It is true that the younger generation of bereaved families also actively cooperates with DNA analysis because Korean society has maintained the tradition of large families and values family ties very much until relatively recently. This friendly cooperation helped MAKRI to identify a larger number of missing soldiers than expected.

However, for people today who are sensitive to personal information being disclosed without consent, it may not be an easy decision to provide their genetic profile to find the remains of their uncles who died before they were even born. Actually, genetic data obtained through the MAKRI project is not used for purposes other than identification of missing soldiers. For example, DNA samples and associated data are eliminated from the system once a soldier is identified and returned to their family. Efforts should be continuously made to keep ethical standards for the collected and curated samples of genetic analysis in this kind of project.

The Issue about the Soldiers of Foreign Countries

International wars, like the Korean War, involved soldiers from many countries, therefore the remains of soldiers identified are not only of Korean descent. For this issue, military personnel, archaeologists, anthropologists, and DNA researchers form the committee to estimate the soldier's nationality by

examining war history, ID tags, clothing, and DNA haplogroup, etc. The Korean War has been in a state of cease-fire for the past 70 years, thus the estimation of nationality to classify friendly and enemy soldiers is still important.

First of all, if it is determined to be a South Korean military, they will be maintained in the MAKRI's central inspection center until accurate identification can be made. When identification is made through forensic anthropological investigation, the decision on the burial site and funeral procedures will be made at the will of the bereaved family. In fact, if the family wishes, the soldiers can be buried in the National Cemetery, with the full expenses being covered by the South Korean government.

If the deceased are identified as soldiers from allied countries, a decision must be made regarding repatriation. The U.S. government always requires repatriation of remains when the excavated ones are those of US troops. Accordingly, South Korea conducts a joint investigation of remains with the DPAA anthropologists of the United States.

On the other hand, many European countries, and the Commonwealth of Nations, maintain a non-returning tradition (Lockyer and Davis 2020). Therefore, the allied soldiers from countries other than the United States are buried in a U.N. cemetery in Busan, South Korea, rather than being repatriated to their countries. During the burial process, we honor the dignity of allied soldiers by following their nation of origin's funerary rituals, all expenses covered by the Korean government.

Taken together, it is necessary to understand the decision concerning repatriation of the soldiers from foreign countries based on their own tradition of ethical concerns for missing soldiers. Since each country has a different tradition of respecting soldiers who served their country, this issue is a matter that must be decided by a sufficient understanding of the country's cultural traditions.

The Issue about Research on Human Remains

In the process of identifying the remains, valuable anthropological findings can be found. We note that most of the remains from battlefields are subject to projectile trauma (by gunshot or other trauma by explosives) due to the nature of their deaths in combat. Since gun ownership is prohibited in Korea, there are few gunshot incidents or accidents. In particular, the reports from our investigation will be of great help in recovering the remains of missing soldiers in the future. This is because the weapons used in the 1950s were different from those used today. Nevertheless, considering the social respect for the remains of Korean War casualties, there may be a negative view of regarding them as a kind of research subject. It is necessary to reconsider whether it is truly unethical to report the analysis results obtained in the process of anthropological works without applying a destructive analysis method to human bones.

Conclusion

It's already been 70 years, but the Korean War remains a big wound for most Koreans. Millions of families still have their parents and brethren in North Korea, and many of the soldiers who participated in the Korean War are still missing. These memories may disappear someday, but at least not yet. There are many Korean people who have lost their loved ones to the war, and want their remains to be returned to bring them closure. In this sense, the MAKRI project to identify missing soldiers of the Korean War, can be said to be very meaningful from a humanitarian perspective. There have been no major ethical problems in the MAKRI project so far as those involved in this project are continuously paying attention to potential ethical issues. Nevertheless, there are a few points that we should consider, for which we have described in this chapter. Recently, a number of victims or casualties have frequently occurred due

to mass murder crimes, natural disasters, and terrorist incidents. Since such mass disasters and wars, identification of the missing people becomes important in both legal and humanitarian aspects, active academic exchanges of anthropologists about ethical concerns will be needed.

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Chapter 13

Ethical Considerations for Working with Human Remains in Sicily: Case Studies and Professional Approaches

Dario Piombino-Mascali, Johnica J. Winter, Heather Gill-Frerking and Kirsty Squires

Introduction

Recently, important reflections on ethical issues related to the study of mummified human remains have been published (Alberti *et al.* 2009; Kaufmann and Rühli 2010; Charlier 2014; Piombino-Mascali and Gill-Frerking 2019; Gill-Frerking 2021; Mytum 2021; Piombino-Mascali *et al.* 2021; Squires and Piombino-Mascali 2021). In particular, significant advances in the fields of paleoradiology and paleogenetics have contributed to the gradual abandonment of the broader scientific community's most invasive techniques traditionally used to study mummies. These shifts toward less damaging protocols are especially important for the field of mummy studies because mummified human remains are integral to cultural heritage and should be properly documented, protected, and memorialized (Lynnerup 2007; Oh 2019). Furthermore, mummies are human remains, and, as such, deserve to be treated with the same respect and dignity as any recently deceased human. The storage and display of mummies in museums have led to numerous debates, discussions, and reviews, both within the museum and in broader academic communities, some of which involve the general public (e.g., Fowler 1996; Gill-Robinson 2004, 2009; Day 2014; Nilsson Stutz 2016; Biers 2019; Monza *et al.* 2019; Quorum 2019; Ciliberti *et al.* 2020).

Given that Sicily has many historic sites safeguarding a vast number of mummies, the island has an important place within the vibrant and developing context of mummy studies. The Sicilian mummies are associated with a tradition of funerary practices that involved the display of human corpses as a sign of social distinctiveness (Piombino-Mascali 2018). These mummified human remains, along with any associated artifacts, are part of the local ethnographic heritage. As such, the mummies are protected by the Italian government, which ensures the protection of cultural items and ancestors throughout the territory, via the work of local superintendencies (Piombino-Mascali and Zink 2011). Despite the significance of these mummies, they were often subjected to questionable practices by researchers (as discussed later in this chapter), and at times even to acts of vandalism. For example, the famous mummies of Savoca have been damaged with green paint (Todesco 1993-1994), and the decedents housed in the Capuchin Catacombs of Palermo were manipulated for the purposes of tourism, for example by moving them from their original locations to corridors or rooms relating to their demographic attributes such as children in the 'children's room' (Farella 1982).

While Sicily is part of Italy, it has autonomous standing to make political decisions, including those regarding its own cultural heritage. In Sicily, mummies are considered ethnoanthropological assets, and because they are not excavated, they do not fall under the purview of archaeologists. In 2011, the Sicilian Region created an Honorary Inspectorate for Mummified Bioanthropological Heritage, which was granted to, and is still held by, Dr. Dario Piombino-Mascali. This position was intended to complement the work carried out by the competent superintendencies present in the nine administrative provinces of Sicily. This new collaborative framework allowed the inspectorate and the superintendents in each province to work together to ensure the accuracy of all research findings related to the study of

mummified human remains in Sicily and to address any irregularities related to the transportation, study, and possession of these human remains in a cohesive and transparent manner.

As an honorary inspector, it is still necessary to secure permission from the legal custodians of any mummies prior to carrying out research (e.g., Piombino-Mascali and Zink, 2023). These permissions must always be granted by the correct, legal custodians responsible for the mummified individuals, and all requests must be supported by the government after regular applications. The appropriate approvals were granted to Dr. Piombino-Mascali and his team because they had the experience and the highly specialized skills necessary for the safe, accurate, professional, and ethical analysis of mummified individuals. Herein, we provide examples of cases where human remains in Sicily were mishandled or subjected to research practices of an irregular, unethical, or dubious nature. Our discussion of these cases is intended to support researchers and curators in safeguarding these important and unique mummies.

From Sicily to France...and Back

In the winter of 2008, an assemblage of mummified and skeletonized human remains, dating to the Modern Age (1700-1800 C.E.), was discovered behind a brick wall in the crypt of the Mother Church of Randazzo, in the province of Catania (Charlier and Lo Gerfo 2011). Following this discovery, the parish official requested permission to bury those remains in a common ossuary at the local cemetery. As a result, two physicians from the Bureau of Legal, Fiscal, and Forensic Medicine of the Local Health Unit of the nearby city of Bronte inspected the finds. The physicians attempted to differentiate the skulls from the long bones. The long bones were buried, while the skulls were temporarily placed in a room of the Randazzo cemetery, where they remained temporarily available to local authorities (Diocese of Acireale, unpublished report, 13 January 2012). When human remains of historic interest are found in Sicily, it is required that the appropriate superintendent for the province of discovery be notified. It is the superintendence officials that then usually undertake the inspection and documentation of the reported remains. In this case, the inspection and documentation were instead conducted by medical examiners, and the Superintendent for the Cultural and Environmental Heritage of Catania was never notified (Superintendence for the Cultural and Environmental Heritage of Catania, document No. 24785, 22 December 2011). The reason for this oversight may be accidental as the researchers may have been unfamiliar with legislation and protocols when studying human remains in Italy. Although the purpose of this examination was to proceed with the interment of the remains in the cemetery, they were instead transferred to France, without any permission from the Sicilian Region. Subsequently, a traveling exhibition called "The Mirror of Time" was opened in Saint-Jean-de-Côle in 2011 (Charlier and Lo Gerfo 2011). This exhibition, organized by French and Sicilian scholars under the patronage of the French Ministry of Culture, focused on the anthropological and paleopathological study of these remains, including over one hundred human skulls from Sicily, and a mummified infant (Charlier and Lo Gerfo 2011). Soon after this exhibition was opened, the superintendent learned of these activities, namely the examination, removal, and transfer of human remains discovered within her jurisdiction. Although this was done in good faith by the researchers, this was carried out without appropriate permissions or approval, and the mummies were then transferred across international borders. Upon further investigation into the matter, the local diocese claimed to be uninformed about the fate of the remains after their transfer to the cemetery. A formal investigation was initiated by the Department of Cultural Heritage and Sicilian Identity to identify those responsible for the irregularities described above. In 2013, while the investigation was in progress, the local press reported on the return of the remains to Italy by train, and on their repatriation to the city of Randazzo (Guidotto 2013). Interestingly, the exhibition had been used as a forum for researchers to discuss the ethical principles concerning the exposure of human remains (Charlier *et al.* 2014). The evident lack of communication between all

stakeholders led to tensions among the different parties involved, although no action was considered to be necessary after the repatriation.

The Traveling Heads

The Capuchin Church of Comiso (province of Ragusa), built in the seventeenth century, includes a mortuary chapel that houses the mummified remains of 46 individuals that span the eighteenth and nineteenth centuries. These bodies were placed in wall niches, and some are labelled with their name and date of death. Those mummies without any identification are likely to be even older, possibly dating as far back as the building of the church itself. All individuals are wearing religious clothes, except for one, who is dressed in civilian clothes. The inspection of these bodies revealed that the mummies were afforded so-called spontaneous-enhanced mummification, which involved a process whereby bodily fluids were drained from the body. This was a typical practice of Sicily and southern Italy during that time period (Piombino-Mascali *et al.* 2012). The chapel also contains a large number of disembodied skulls. Remains consisting only of the head had been preserved as a symbol of social identity. An investigation of the mummies was performed by a team from the University of Pisa in 1987 (Fornaciari 1998). During this investigation, one skull belonging to an adult male that showed evidence of trepanation was transported to the Museum of Pathological Anatomy at the University of Pisa (Germanà and Fornaciari 1990). While it is typically an accepted practice for finds of this type to be temporarily transferred for research purposes, the skull was accidentally kept in Pisa and was eventually de facto incorporated into the Pisan collection (Ciranni and Bevilacqua 2002). The current church official at Comiso was unable to identify any documentation related to the transport or retention of the skull (Father Girolamo Alessi, personal communication, 28 December 2017). The remains were part of an ethnographic collection in the church, which is protected by cultural heritage law (see Piombino-Mascali and Zink 2011) and therefore cannot be separated from it. In spite of this, the skull was not returned to the church's collection and remained part of the Pisan collection until recently. Ultimately, the Sicilian Region should have been more diligent in ensuring all relevant legislation had been followed in this instance.

Interestingly, a similar fate awaited a cranium in a later case. In 2004, a calotte showing lytic lesions compatible with a metastatic carcinoma was taken from the crypt of the Capuchin Church in Savoca (Ventura *et al.* 2008). Following a request regarding the missing remains in 2015, officials from the Department of Cultural Heritage and Sicilian Identity with the cooperation of the Paleopathology Division of the University of Pisa and the Superintendents for the Cultural and Environmental Heritage of Ragusa and Messina launched an initiative to locate both finds. The remains were found and on two separate occasions returned to their places of origin. In these cases, they were subsequently made available for the public to view in their original places of interment.

Mummies Go to the Hospital

In the spring of 2016, a preliminary survey to assess the state of preservation of two naturally mummified male adults took place in Modica, province of Ragusa. These mummies, which dated to the nineteenth century, were housed in the Church of Saint Anne, a religious structure that dates from the seventeenth century (Superintendence for the Cultural and Environmental Heritage of Ragusa, document No. 2293, 13 October 2016). While one medical doctor within the project team had considerable experience in the field of paleopathology, none of the other researchers involved had expertise in the area of mummy conservation. Therefore, the study was carried out without the appropriate level of experience and knowledge essential for the proper handling of these mummified remains (Carboni 2018). First, the transportation logistics of the two mummies were made by the personnel of a funeral home, disregarding the basic transport policies for ancient human remains as cultural heritage (Carboni 2018). Additionally, the need for appropriate wrapping materials and containers, essential in the movement of human

remains to prevent physical damage, was never considered. Secondly, the mummies were transported to a local hospital for the purpose of an exploratory investigation. Recent studies have demonstrated that the contamination of mummified crypt remains by microorganisms presents potential risks for the living (Piñar *et al.* 2013; 2014). Depending on the type of materials present (e.g., clothing and filling of individuals), micro-climatic conditions, and exposure to environmental pollution, the premises where mummies are stored may provide suitable conditions for the growth and development of microorganisms, thus posing threats to the health of specialists conducting scientific analyses (Tarsitani 2005). Given the nature of these risks, it is therefore paradoxical to bring historic remains into healthcare facilities where immunocompromised individuals may be present. Furthermore, given that biodegradation of deteriorating ancient remains occurs as a result of exposure to living microorganisms, these ancient bodies may also be at risk of unnecessary acceleration of biodegradation when examined in such environments. In order to avoid any potential hazards to the remains or to those studying them, previous studies on Sicilian mummies have made exclusive use of portable X-ray and CT equipment instead of performing this type of research in hospitals or other inappropriate locations (Piombino-Mascali *et al.* 2012; Panzer *et al.* 2015; Squires and Piombino-Mascali 2021, 2024). In this particular case, local authorities were notified. After it came to light that a previous case involved taking mummified remains to a hospital (i.e., the Queen of the Moors case), a protocol for proper handling of mummies was developed to serve the purpose of avoiding similar situations in the future (Ventura *et al.* 2022).

A Matter of Permission

In the summer of 2012, a well-known German newspaper reported on an interdisciplinary research project involving the mummies of the Capuchin Catacombs of Palermo, a funerary complex that houses over 1,200 mummies and 600 coffins (Piombino-Mascali 2014). The project included experts in both archaeology and forensic biology, and was supported by a respected German foundation (Habekuss 2012). Beyond the fact that the article omitted any reference to previous research, it was clear that the project discussed in the article, which included a substantial amount of physical sampling, lacked formal permission from the local superintendent. The Capuchin Friars hold all decision-making powers regarding the mummies at this site and, in this case, permission had only been granted for photography and videography within the crypt. The archaeologist involved in the project had been made aware of these limitations and had assured the scientific curator of the site that their intentions were to undertake simple documentation (Jörg Scheidt, personal communication, 3 April 2012). Despite these agreements, the expedition deliberately undertook physical sampling of many of the mummies. In all, more than 600 bodies were examined without permission from the Capuchin Friars. Nearly half of the bodies appeared to show some form of damage, some of which may be attributable to insect activity (Benecke 2016). Numerous insects and other arthropods were recovered and subsequently analyzed by this research team at their home institution in Germany. As previously mentioned, all this work took place without the knowledge of either the Superintendent for the Cultural and Environmental Heritage of Palermo, or other researchers officially involved in the study of the Palermo mummies. In fact, another project on biodeterioration, which had obtained official permissions from the friars and the government, had already begun in 2008. The official project focused on the environmental aspects of the site and included an entomological survey (Pinar *et al.* 2013; 2014). The official researchers promptly informed the German newspaper, which kindly rectified the information (Willmann 2012). Nevertheless, the unauthorized survey results were subsequently published and partly compromised the originality of the official project (Benecke 2016; Baumjohann and Benecke 2019). This further highlights the need for academic journals to require authors to submit proof that they were granted permission to analyze human remains in their research (Squires *et al.* 2022a; 2022b).

A Mummy Issue

In the summer of 2008, within the framework of the Sicily Mummy Project, several embalmed cadavers of the aforementioned Capuchin Catacombs were investigated radiologically, a common approach in the study of artwork, artifacts, and mummified bodies. Among the individuals examined was the child mummy of Rosalia Lombardo, the Sicilian "Sleeping Beauty" prepared in 1920 by Sicilian embalmer Alfredo Salafia. Rosalia's remains had been "temporarily" placed at the site where she still lies today (Piombino-Mascali *et al.* 2009). Radiological analysis of this individual allowed researchers to view, to some extent, the preservation of tissues and the presence of the liver and brain. It should be noted that the mummy has never been removed from the sealed coffin in which they were originally placed. During that same year, a correspondence between the research team and relatives of the mummy resulted in an entrusted mandate. This mandate gave the research team official responsibility for research with the intention of involving the family in all aspects of both the conservation and the scientific study of this individual (Piombino-Mascali 2009). The mandate and the task of investigation were revoked by Rosalia's sister in late 2010, and these measures were followed by a lawsuit against "unknown defendants" for damage, fraud, and defamation. In particular, the scholars were implicitly accused of causing color alterations affecting the face of the embalmed body (Brunetto 2012). However, these changes had already been highlighted by the scholars themselves before the radiological study was initiated (e.g., Brunetto 2008; Piombino-Mascali 2020; Piombino-Mascali and Zink 2023). Having established that the legal custodians of the mummy are the Capuchin Friars exclusively, the Superintendent for the Cultural and Environmental Heritage of Palermo authorized some additional CT analyses to be carried out in the winter of 2010. These examinations allowed the researchers to carefully study the child's body, and to hypothesize the cause of death (Panzer *et al.* 2013). Beginning in 1920, the mummy was subjected to changes in temperature, exposure to light, oxidation, flash photography, and the high moisture of the Capuchin Catacombs (Samadelli *et al.* 2013). These conditions caused degradation to Rosalia, which concerned the friars and curator. These environmental conditions have led to degradation of many mummies within the Catacombs; an issue that is currently being addressed by the involved stakeholders (Squires and Piombino-Mascali 2021). In late 2011, the coffin of Rosalia Lombardo was placed in a new glass case saturated with nitrogen to prevent further damage to the mummy. To date, the new vitrine works perfectly, and has counteracted much of the degradation phenomena (Piombino-Mascali 2020). In 2013, the case pursued by the Lombardo family was permanently withdrawn by the court on the basis that they did not identify any criminal activity involving Rosalia's remains.

Salafia's Secret Recipe

The research on Rosalia Lombardo, and in general on the mummies of Sicily, is connected to other cases where conflicts of interests were not declared and personal hostilities amongst different scholars affected research projects (Piombino-Mascali and Zink 2023). In a recent overview of crypt mummies, two researchers stated that the formula of the embalming fluid used by Alfredo Salafia to preserve Rosalia Lombardo remained "unpublished" (Nerlich and Bianucci 2021), but the formula has been reported in its entirety in both a peer-reviewed scientific article and in a book on the subject (Piombino-Mascali 2009; Piombino-Mascali *et al.* 2009). In this overview, Nerlich and Bianucci (2021) stated that the "unreleased" formula was used for an experiment that had "failed" according to an undocumented personal communication provided to them by Dr. Arthur Aufderheide. An experiment was conducted to replicate Salafia's formula in 2008 in Rosemont, Illinois. The experiment was a simple embalming procedure that utilized most of the same ingredients used by Salafia during his career. However, zinc salts, which were essentially the main preserving agents of Salafia's fluid, had to be excluded from the experiment because these salts are now illegal in the U.S. (Melissa Johnson, personal communication, 7 September 2008). Footage obtained during the experiment was eventually included in the National Geographic documentary titled Italy's Mystery Mummies, in which Dr. Arthur Aufderheide himself took

part. The success of the experiment was shown publicly in this documentary and was endorsed by Dr. Aufderheide (Piombino-Mascali and Zink 2021). The book chapter by Nerlich and Bianucci (2021) also incorrectly claims that the Sicily Mummy Project has so far only focused on a few case studies. Since 2008, the Sicily Mummy Project has actually included analyses of several individuals (see Piombino-Mascali 2018 for a summary). An additional chapter from the same authors incorrectly attributes a statement about Salafia being consulted for the preservation of Vladimir Lenin in 1924 to Dr. Piombino-Mascali (Bianucci *et al.* 2021). This information was provided by a relative of the embalmer, Ernesto Salafia Parisi, during a 1992 interview, but has never been substantiated by researchers, including Dr. Piombino-Mascali, who has stated publicly that this is an urban legend about Salafia (Caruso 2013). The many flaws of the aforementioned chapters were met with formal requests for correction. These requests were denied by the book's publisher stating that these issues should instead be raised in other scientific platforms or publication outlets (Alexandra Westcott Campbell, personal communication, 5 July 2021). Additional questions regarding Sicilian mummies were raised by the same group of contesting authors in other publications. These questions were eventually addressed in a subsequent peer-reviewed article (Piombino-Mascali *et al.* 2021).

The Beautiful Angelina

The Monumental Cemetery of Catania was built in the second half of the nineteenth century. Inside a historic family chapel in this cemetery lies the embalmed body of a young adult named Angelina Mioccio, who died in 1911 (Jannello 2013). This private chapel is in poor condition and the body of the young female lies in a wooden coffin placed past the gate in a burial recess located on the right side of the chapel. One side of the coffin is made of glass (although it is currently broken) to allow viewing of the mummified body. In 2010, a local newspaper, La Sicilia, took an interest in Angelina (Jannello 2013). The case was reported to both the regional and the city authorities in order to develop a plan to conduct an appropriate study and begin a conservation project (Jannello 2013). Since then, efforts have been made to trace the current owners of the tomb, so that careful planning can be made to protect this important artificially mummified individual (Rossella Jannello, personal communication, 26 January 2022). Unfortunately, very little progress has been made to date. This is primarily due to the difficulty of reconstructing the history of the burial from an administrative point of view. While it is known that the current owners of the tomb are relatives of Angelina, it is unclear exactly which relative is legally permitted to provide access to her or give permission for the conservation of the site.

Interestingly, from the silent presence of Angelina rose a kind of popular devotion, explicitly manifested by floral tributes addressed to the mummy, which to some extent harks back to that of the "angelitos milagrosos" of South America (Ceruti 2012). This type of devotion is a topical form of religious syncretism characterized by the veneration of natural mummies of sub-adult individuals. In this phenomenon, both Catholic beliefs about the sanctity of incorrupt bodies and pre-Hispanic ones see children as intermediaries between the earthly and the divine dimensions (Ceruti 2012). Bodies of immature individuals are therefore venerated because they are considered capable of fulfilling the demands of the living. These bodies become surrounded by many soothing or congratulatory objects, including religious items, holy images, and even toys (Ceruti 2012). Regardless of the reasons behind the modern-day veneration of Angelina, we must emphasize that the absence of any form of surveillance in the chapel or the cemetery, alongside the attention drawn to this case by the media, led to the occurrence of a Kafkaesque event. In this case, a 39-year-old man from Catania claimed to have dreamed of Angelina and to have received several requests from her (Jannello 2013). As a result of his dreams, the man decorated the grave with various objects, including a doll, fake flowers, a seashell, and a candle holder. What was of particular concern in this case was the supposed manipulations of the mummy that the man carried out in an attempt to restore the body to its original form. These modifications threatened to cause irreparable damage to the mummified remains, and violated the laws of the Italian

State, both in terms of manipulation of cultural heritage and violation of a tomb (Godart 2021). Owing to this man's actions, the cemetery prevented access to Angelina's grave. Despite great interest in the mummy of Angelina Mioccio, and the publication of newspaper articles (Leocata 2013a; 2013b), her mummy has yet to be conserved and displayed to appropriate standards.

Conclusion

The cases described in this brief review contextualize some of the ethical issues associated with the scientific study of mummies in Sicily. Ancient and historic human remains are protected by the Italian State through laws governing cultural heritage (Piombino-Mascali and Zink 2011). As discussed above, the most appropriate means of performing a study, or transporting and transferring human remains to their final destination, as defined by researchers, the Sicilian government, and caretakers have been disregarded in some cases. Such disregard has led to damage of these precious human remains, strained relations with community stakeholders charged with caring for such remains, and unnecessary risks to the individuals conducting research on the remains. These malpractices, to some extent, may be expected by foreign researchers who are not directly aware of the specific requirements dealing with cultural heritage assets in another country. Therefore, it is vital that any scholar studying in a foreign country make themselves familiar with the appropriate laws, regulations, policies, and procedures surrounding the handling, examination, analysis, and transportation of ancient and historic human remains. The understanding and application of Italian laws and regulations are fundamental and essential for scholars and officials working with human remains from Sicily.

In at least one of the cases discussed in this review (the mummies of Modica) the institution responsible for the protection of the mummies appeared to have acted nonchalantly, perhaps because the mummified remains are not always viewed with the same reverence as archaeological objects (e.g., material culture) that fall under the institution's protection. The final two cases discussed in this review demonstrate the importance of the concept of "ownership" of dead bodies. Modern law indicates that a corpse is a *res extra commercium* (Salaris 2007) meaning that it cannot be owned or inherited. Instead, it is expected that the burial is cared for by family members or other stakeholders. The case of Rosalia Lombardo demonstrates how unexpected conflicts between relatives and the legal caretakers of the deceased can lead to tensions that affect the conservation of culturally significant mummies. Because Rosalia's remains are part of a larger collection of mummies with historic and ethnographic value that are curated by the Capuchin Friars, she is considered a cultural asset entrusted to their care. Legal proceedings surrounding this case were able to show that the relative's accusation regarding illegal research activities was groundless (Piombino-Mascali 2018). With the permissions of the Friars, scientific examinations and advanced curatorial techniques were used to better preserve this unique mummy. That being said, where relatives of the deceased are known, they should be consulted when research takes place as they ethically have the right to have a say in what happens to their deceased family members (Squires *et al.* 2019). The case of Angelina Mioccio exemplifies how difficulties in tracing the owners of a private tomb can also affect the research, conservation, and protection of a body. All the cases discussed in this review are united by failures to follow laws and guidelines that govern working with historic human remains in Italy. They are also characterized by misunderstandings or inabilities to recognize the significance of what these findings represent to science and to the cultural heritage of a region, lack of transparency in research, and miscommunications regarding the way that human remains should be treated, valued, and preserved from cultural, legal, and ethical perspectives.

Recommendations for Researchers

The authors propose several suggestions for other researchers who plan to work with mummies and other human remains.

- Researchers involved in any project working with human remains should have suitable qualifications and experience for the research to be undertaken.
- Mummy studies is, by its nature, a multidisciplinary field that requires cooperation of numerous specialists, depending on the purpose and goals of the research. It is critical that every member of a research team investigating human remains has the appropriate knowledge and, ideally, experience, to both contribute to the research and to ensure the protection of the mummies.
- All research projects should possess the necessary authorization prior to undertaking any research, especially when invasive and/or destructive sampling is part of the proposed research program.
- If the research is taking place in a foreign jurisdiction, researchers should make themselves familiar with the local laws and regulations related to the study, handling, and display of human remains in that area, including any relevant cultural considerations. Where possible, they should include a local team member to ensure research adheres to local laws and regulations, and respects local customs, beliefs, and traditions.
- It is essential that the researcher contacts and collaborates with whoever is directly responsible for the human remains and receives official written permissions from all necessary individuals, institutions, and agencies.
- Researchers should avoid exploratory studies and should instead present a fully developed plan of research that includes reasonable hypotheses, research goals, methods of investigation and analysis, and a plan for documentation and storage of samples and results. They should also consider the long-term implications of the research and develop their plans accordingly. These plans should include strategies for the dissemination of results, whether through exhibition, conference presentation, or publication, and the identification of specific collaborator responsibilities.
- Ethical approval should be sought for any research involving mummified remains from the researcher's home institution or curating institution. If no ethics committees are in place, an ethics statement should be composed and submitted alongside the project proposal to the curator of an assemblage, superintendence, or curating body (e.g., see Squires *et al.* 2022a; 2022b).
- Where known, relatives should be consulted about research and conservation plans that may potentially involve their deceased family member(s), particularly if destructive sampling forms part of a research proposal. In cases where there are no known relatives, researchers should do their best to locate descendants as they have a right to know that their deceased relative is on display, requires conservation, and/or is the subject of a research project.
- Finally, while it seems obvious, we cannot overstate the importance of remembering that all human remains must be treated with respect. Mummies are physical remains of ancient or historic human beings. These individuals had families and unique life histories. Their deaths do not erase their humanity. They must not be viewed solely as research specimens and researchers should strive to understand these individuals in their archaeological, historic, and cultural contexts.

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Chapter 14

The Use of Craniometric Data in Biological Anthropology: Ethical Considerations

Sarah Poniros

Introduction

Biological distance, or "biodistance," is a measure used in both biological anthropology and forensic anthropology as a means of understanding diversity in past populations. Generally, biodistance analyses employ multivariate statistics to explore genetic and phenotypic similarities and differences between past people and groups of past people. Many different types of data can be used to conduct a biodistance study including, but not limited to, cranial non-metric traits, craniometric measurements, 3D craniofacial morphological data, cranial morphoscopic traits, dental non-metric traits, dental morphological measurements, and mitochondrial DNA (Pilloud and Hefner 2016). While the study of biodistance in a multivariate way is fairly new, the use of cranial size and shape to classify humans has a long and problematic history. Therefore, many scholars are hesitant to employ biodistance analyses in their work, despite evidence that many of these methodologies can provide useful data about past populations.

Since its foundation, craniometric data in particular has been historically misused to promote racism and prejudicial treatment of certain ethnic groups (Gould 1996). However, it is undeniable that humans of different ancestral origins may have different craniofacial structures, and that those differences are recognizable to the naked eye (Brebner *et al.* 2011; Stepanova and Strube 2012; Gwinn and Brooks 2015; Ficco *et al.* 2023). Many, more recent, scholars have attempted to reframe craniometric analysis by comparing crania of unknown origin to predetermined "populations" of crania using multivariate analysis software (Wright 1992, 2012; Jantz and Ousley 1992, 1996, 2005; Ousley and Jantz 2012). Jantz and Ousley, scholars who have done extensive work in the field of biological distance analysis, argued that these statistical approaches reflected significant geographic patterning in human variation, but also agree that are still phenotypic differences within groups and overlapping among groups (2009). These programs are certainly a vast improvement on the pseudoscientific methods of the past by taking a far more exploratory approach. They also address many of the reasons that craniometric analysis can work effectively by highlighting that population affinities do have some basis in shared evolutionary histories (Ousley *et al.* 2009). However, many subsequent studies have found that these software programs fall short in accuracy (Elliott and Collard 2009; Antón *et al.* 2018; DiGangi and Bethard 2020). Population affinity is far more complex than these software programs can investigate because these software programs are designed to classify unknown crania into "known" populations, rather than being truly exploratory by investigating inherent affinities in past populations. By doing so, these programs ignore the microevolutionary forces and historical events that have shaped phenotypic variation in humans (Ross and Pilloud 2021). Furthermore, these programs may have, inadvertently and unintentionally, fallen short in the ethical treatment of biodistance data by attempting to classify individuals into a predetermined—and likely inaccurate—"population," whose parameters are defined only by the standards of a few scholars (Ross and Pilloud 2021).

For these reasons, the ethical considerations associated with the continued use of craniometric biodistance analyses in both forensic and bioarchaeological contexts are significant. However, there

are promising multivariate techniques along the horizon that may address those ethical concerns by focusing on population structure, microevolutionary events, and moving away from classification in favor of exploring population affinities rather than defining them (Ross and Ubelaker 2019; Poniros 2021; Ross and Pilloud 2021). If so, there may be a more ethical way for biological anthropologists to study the existence and experience of diversity. This study aims to explore whether it is possible to effectively and ethically study population affinities in past populations simply by exploring cranial phenotypic variation without presuppositions.

Important definitions

Before continuing, it is necessary to define some important terms as they relate to biodistance analyses. The terms "ancestry" and "race" are mentioned regularly in studies of biodistance. Though these words are interconnected, they are not interchangeable. Ancestry refers to a person's lineage. Ancestry is, therefore, closely tied to kinship relationships and DNA, but it is essential to remember that many of the past populations subjected to craniometric analysis do not subscribe to modern beliefs regarding the inheritance of traits and DNA (Isaac 2004; Mattingly 2013), and that not all familial relationships in past populations were based on heredity, as is also true today. It is, however, common for biological distance analyses to be labeled as "ancestry estimation" techniques. This can lead to confusion with some readers who interpret "ancestry estimation" as "kinship relationship estimation." Instead, the preferred modern term is "population affinity," (Ross and Pilloud 2021) which refers to a shared evolutionary history, which is closely related to the phenotype—a person's outward appearance—as is the case with craniometric variation (Relethford 2016; Mays 2021). The size and shape of a person's cranium is, of course, largely inherited, but some similarities in cranial size and shape can also be shared by a larger number of people whose ancestors lived in similar climates for a multitude of generations (Ross and Ubelaker 2019; Ross and Pilloud 2021). Therefore, "population affinity" will be used throughout the current study.

Furthermore, the topic of "race" must be addressed in relation to biodistance analyses. The modern notion of "race" as four or five inherent groups of people has no basis in biology whatsoever (Fuentes *et al.* 2019). Many scholars have confirmed that genetically, there is very little difference between populations. Visible and genetic traits certainly vary, but these differences occur in gradual steps, often called "clines," as the geographic distance between populations increases. Factors like climate, gene flow, and other evolutionary mechanisms drive these clinal variations (Relethford 2009; Ousley *et al.* 2009; Edgar and Hunley 2009; Ross and Pilloud 2021). Many institutions, including the American Association of Biological Anthropologists, assert that biological race does not exist–it is a purely social construct, albeit a social construct that can, and does, have biological, social, and health implications for many people (Fuentes *et al.* 2019). In other words, these racial differences have no basis in inherent biological traits, but the social ramifications of racism—the prejudicial treatment of a group of people based on their perceived social race—can absolutely have an impact on the biology of a group of people (Fuentes *et al.* 2019).

That being said, "racism" in the modern sense is inherently similar to discrimination in many past populations (Isaac 2004). Many conflicts and discriminatory practices of the past have been fueled by perceived visual differences between groups of people (Isaac 2044), often between imperialist powers and the individuals that suffered under their colonialism (Mattingly 2013). This would indicate that a major piece of the human experience is tied to perceptions of diversity, and biodistance analyses could serve as a useful opportunity to explore how phenotypic variation may have been perceived by past people.

What is craniometric data?

Craniometric data is a form of biological distance data relating to measurements that aim to convey the overall size and shape of a person's cranium. As a biodistance measure, craniometric data is intended to better understand how evolutionary mechanisms and gene flow have contributed to biological differences between geographically separated peoples (Ross and Pilloud 2021). Collecting craniometric data involves taking a series of cranial measurements related to the size and shape of an individual's skull (Howells 1973, 1989, 1996). These measurements essentially statistically represent a 3D model that mimics the cranial and facial structure of that individual. There are many guides to assist researchers in standardizing cranial measurements (Jantz and Ousley 1992, 1996, 2005; Wright 2012). It is common practice to use the guidelines in Wright's guide to using CRANID6, the most recent version of CRANID (2012).

Since these measurements represent the size and shape of a person's cranium to a certain degree, they are, in effect, data on the phenotypic features of that cranium. Of course, phenotypic variation is one of the hallmarks of biodistance data (Pilloud and Hefner 2016). Observing craniofacial variation with the naked eye has been proven many times over to elicit neurological recognition responses in humans (Brebner *et al.* 2011; Stepanova and Strube 2012; Gwinn and Brooks 2015; Ficco *et al.* 2023). Modern psychologists found that cranial size and shape, especially in the facial region, were the features most likely to elicit racial categorization in modern humans, even more so than skin color (Brebner *et al.* 2011; Stepanova and Strube 2012; Gwinn and Brooks 2015). So, craniometric variation is often used as a biodistance measure, particularly as a means of describing and exploring diversity in the past.

Historical use of craniometric data

Though techniques, agendas, and overall impressions on the validity of craniometry have greatly changed since its inception in the 18th century, any study of craniometry would be remiss without mentioning the questionable. Early researchers in the field, like Paul Broca (1824-1880), Arthur Comte de Gobineau (1816-1882), and Samuel George Morton[1] (1799-1851), often skewed and distorted craniometric data to inappropriately establish the superiority or inferiority of social "races" (Gould 1996; Weisberg and Paul 2016; Geller 2020). In the mid-1800s, measuring as a form of "objective" data collection became increasingly popular, and cranial size and shape were some of the most used forms of data. At the same time, theories concerning evolution were also burgeoning, and scholars were quick to seek a means of "objectively" measuring the inequalities between people of different races and sexes, despite the fact that Darwin's theory of evolution by natural selection was inappropriately interpreted by these early anthropologists (Gould 1996; Armstrong-Fumero 2014). Craniometric variation quickly became a widely used technique for champions of Social Darwinism, the idea that natural selection is the cause of "natural" hierarchies in human "races", and eugenics, the idea that only those humans with "desired" traits should reproduce. Darwin himself commented on the misuse and misunderstanding of his theories (Gould 1996; Armstrong-Fumero 2014).

One of the main issues with these studies is that the "scholars" did not test a hypothesis. Rather, they accepted a widely-held—albeit incorrect—belief, that humans are inherently unequal, and used

[1] It is worth noting that Samuel George Morton is further condemned for his unethical procurement of human remains for study. Morton's collection of crania includes over 50 enslaved people born in African nations and brought to the United States against their will, over 100 Indigenous American skulls obtained from the remains of military conflicts between colonists and indigenous peoples (Geller 2020; Mitchell 2021), which are among over 1,000 total crania unethically obtained from around the world (Geller 2020; Weisberg and Paul 2016). In 2020, Morton's collection was removed from display at the Penn Museum in Philadelphia, Pennsylvania. Many call for the repatriation of these crania, and though many crania are set to be repatriated in the coming years, the museum has not agreed to return all of the skulls. Many of these individuals continue to be used in museum projects and research inquiries despite significant backlash (Mitchell 2021).

craniometric data as "proof" that their belief was true. Data were manipulated to justify their assumption that northern European men were the superior human group (Gould 1996; Armstrong-Fumero 2014; Garcia and Hamilton 2023). This outdated practice is referred to as phrenology, which is the use of cranial measurements to infer a person's intelligence or moral capacity (Garcia and Hamilton 2023)[2]. Though this belief system is obsolete and no longer accepted by the scientific community, many still associate craniometry with social racism. In fact, there are recently published, peer-reviewed works that still confuse craniometry with phrenology (Kennedy *et al.* 2013), despite the fact that craniometric variation is no longer used for those purposes in valid scientific studies.

Significant changes occurred in the field of anthropology by the early twentieth century. Franz Boas (1858-1942), who is often referred to as the father of modern anthropology, conducted studies in an effort to determine whether an individual's genetics or environment had a larger effect on his or her phenotype. Boas was one of the first to conclude that parallels in outward physical appearance may not always be a result of genetic affiliation, but also a result of shared environment (Boas 1939). His ideas sparked a new wave of anthropology that sought to test, and eventually disprove, the theories behind eugenics and phrenology (Wald Sussman 2014). More recent studies have found that cranial size and shape are much more highly correlated with genetics than environment and that any changes to cranial size and shape in the children of immigrants due to environmental changes are negligible in comparison to the size and shape similarities they display to their parents (Sparks and Jantz 2002; Roseman and Weaver 2004; Hubbe *et al.* 2009; Spradley and Weisensee 2017). However, Boas' questions represent an important shift in anthropological thinking and many of Boas' students went on to become prominent anthropologists and built upon these theories with concepts that are still widely accepted to this day (Ousley *et al.* 2018). These anthropologists were instrumental in disentangling craniometric variation from social Darwinism, proving that phenotypic variation can be studied without racial biases.

The current state of craniometrics

By the late 1960s, anthropologists began using craniometric data in a way that looks quite similar to how anthropologists use it today. At this time, statistical computer programming became more readily available to the average researcher, which allowed anthropologists to begin employing multivariate statistics to analyze large datasets. W.W. Howells, in particular, was a champion of this advancement and used it to create the most extensive dataset of cranial measurements from all over the world to date (Howells 1973, 1989, 1996). Howells took up to 82 measurements each from 2,524 crania, deriving from 28 populations[3]. These populations range from the 6th century BC to the 1950s and were selected to represent as many geographic areas as possible (Howells 1973, 1989, and 1996). He demonstrated that multivariate means of relating populations to one another—specifically multivariate discriminant functions and factor analysis—are far more effective and objective than using one or two measurements per cranium (Howells 1973).

[2] Though phrenology is no longer an accepted practice in the scientific community, it is useful to provide more background on its harmful use in the past. From the mid-1800s to the early 1900s, the propagation of phrenological theories had an immense impact on ideas of "scientific" racism, criminal behavior, and inheritance (Thompson 2021). As phrenology gained popularity, so did the idea that one could predict future criminal behaviors based on the size and shape of a person's cranium. Because people of color were (and remain) disproportionally incarcerated, and these "criminals" were the subject of phrenological analyses, these studies ultimately fueled racist tropes that radically racialized criminality (Thompson 2021). It is impossible to discern the extent to which this had an effect on current politics, but it seems that though phrenology faded, it had a lasting legacy in the modern justice system (Thompson 2021).

[3] Unlike Morton, W.W. Howells did not physically collect crania for his own repository. Rather, Howells traveled the world to gain access to existing collections, most of which were kept in their own country of origin (Howells 1992). It is unclear how these museums and collectors obtained their crania. Additionally, Howells leaves behind a distinctly different reputation than Morton for other reasons as well. Howells aimed to disprove the existence of scientific "races" and instead aimed to explore the extent of human phenotypic variation both within and among populations (Godfrey 2008), in stark contrast to Morton's aims.

A key conclusion of Howells' work was support for the hypothesis that cranial variation between populations exists in clines and clusters, not as four distinct "races" (Howells 1973: 151). Though this study is now almost 50 years old, Howells' conclusions that cranial phenotypes vary globally at population-specific levels—and can be observed through multivariate statistical methods—are continually upheld in modern studies (Ishida *et al.* 2009; Ousley *et al.* 2009; Wright 2012).

Howells' dataset, which is now available as an open-access resource, is the basis for two well-known computer programs, CRANID (Wright 2012) and Fordisc (Jantz and Ousley 2005), that seek to compare crania of unknown population affinity to the "known" crania in Howells' 28 populations, as well as some additional populations added later by Wright, Jantz, and Ousley in their respective studies. Both programs are widely used by bioarchaeologists and forensic anthropologists alike because they are a user-friendly way to incorporate multivariate comparisons for those who are less comfortable using statistics. Users employ CRANID and Fordisc for a multitude of purposes.

In forensic investigations, Fordisc's cranial estimation component is used to help identify unknown victims and compare them to descriptions of missing persons (Ousley *et al.* 2009; Spradley and Weisensee 2017; Jantz *et al.* 2018). Though DNA analysis is available to forensic anthropologists who are investigating the death of an unknown individual, many people have never provided a reference DNA sample to CODIS[4] and, therefore, it is unlikely to find a match for that individual. Furthermore, the CODIS database uses biological parameters such as age-at-death, biological sex, and estimated population affinity (though they use the term biological ancestry), to help narrow down a DNA search, which means that the more accurate the biological profile, the more likely forensic anthropologists are to find a DNA match for the unknown deceased (Spradley and Weisensee 2017). Though familial DNA can be used for comparison, which is referred to as a "family reference sample," or "FRS," using biological parameters for the deceased yields far more accurate results (Spradley and Weisensee 2017). Moreover, forensic anthropologists can only collect family reference samples if they have an idea of who the unknown deceased might be—otherwise researchers would not know which families to test for samples. It's important to note here that estimating population affinity and DNA analyses very often go hand-in-hand in forensic science—it is unusual to use one method without the other, except in cases when DNA is unavailable (Cunha and Ubelaker 2020).

In biological anthropology and bioarchaeology contexts, both CRANID and Fordisc are employed for many reasons. Firstly, data such as age-at-death, biological sex, stature, and certain pathology data are highly correlated to population affinity (Spradley and Weisensee 2017; Musilová *et al.* 2019; Decker 2023). Some studies use CRANID and Fordisc to find a repatriate indigenous remains, especially individuals of indigenous American nations being held by various museums across the United States (Fforde *et al.* 2023). Notably, many of Samuel Morton's ill-gotten crania have been repatriated this way (Geller 2020; Mitchell 2021). Finally, many bioarchaeologists simply use the programs for their intended purpose: to estimate the population affinities at a given cemetery to determine if migration and, subsequently, diversity, is present at the site in question (Leach *et al.* 2010; Aronsen *et al.* 2019). Migration, diversity, and the experience of these events has been a popular topic of study in bioarchaeology, as these are significant human experiences that allow researchers to better understand the lives and hardships of the individuals they study (Redfern *et al.* 2016; Aronsen *et al.* 2019, Poniros 2021).

Each program allows the user to input 30-40 measurements from a single cranium—30 for CRANID and 40 for Fordisc (Wright 2012; Ousley and Jantz 2005), which can be difficult considering the poor preservation

[4] CODIS is an acryonym for the Combined DNA Index System, a program run and maintained by the United States Federal Bureau of Investigation (FBI). It serves as a repository of DNA data to compare against samples from unknown deceased and unknown possible suspects in a crime. This repository is made of collected samples from convicted offenders, unsolved crime scene evidence, and missing persons (Bureau of Justice Statistics, bjs.ojp.gov/glossary/codis)

of many archaeological skeletons, but the statistical tests will run even if a few measurements are unavailable on a given cranium. Each program will compare the measurements of the unknown cranium to over 2,500 crania of known origin and determine which population is most similar to the unknown cranium, thus implying that the unknown individual may share a population affinity with those in the known population. These programs also include a "best fit" feature for unknown crania that do not appear statistically similar to any of the 74 reference populations. Furthermore, the programs have a "nearest neighbor" function that shows which individual an unknown cranium is most similar to in terms of size and shape (Wright 2012; Ousley and Jantz 2005).

At one time, these programs were considered to be a hallmark of biodistance analysis. However, critiques have gained traction in recent years, with many scholars finding statistical inaccuracy issues. Earlier critiques found that the accuracy of both CRANID and Fordisc significantly decreases if an individual does not fit within one of the reference populations (Elliott and Collard 2009). While this may seem obvious, these findings highlight the fact that there are countless ancestral populations in the world, and trying to fit an unknown individual into one of 40 populations is, more often than not, bound to yield inaccurate results. One study used CRANID to classify crania of known origin that were not part of Howells' reference collection (Kallenberger and Pilbrow 2012). They found that if a cranium does not belong to one of the populations to which is it being compared, is of mixed population affinity, or is from a contemporary population, there is a significant chance that CRANID will inaccurately classify the individual in question (Kallenberger and Pillbrow 2012). In other words, the "best fit" feature for crania outside of the reference populations is statistically unsuccessful.

Many studies also found that CRANID and Fordisc accuracy was significantly reduced if the test cranium did not include all 40 required measurements, which makes the software unsuitable for incomplete, damaged, or poorly preserved remains. CRANID6, the most recent version of CRANID, has a linear discriminant analysis test that will only produce results if there are no missing variables for the unknown cranium. Its nearest neighbor discriminant analysis test only allows two missing variables (Wright 2012). However, studies have shown that this nearest neighbor test is statistically inaccurate even for crania that are only missing a single measurement (Elliott and Collard 2009).

Furthermore, geographical locations where inward migration occurred are likely to have an increase in individuals of mixed population affinity, which is also an issue for CRANID and Fordisc (Elliott and Collard 2009; Kallenberger and Pilbrow 2012; Dudzik and Jantz 2016; Hughes *et al.* 2018). CRANID has less of a capacity than Fordisc to classify mixed population affinity, but Fordisc relies upon modern examples of mixed population affinity to make classifications and, therefore, may not provide a viable basis of comparison for past people of mixed population affinity (Elliott and Collard 2009; Kallenberger and Pilbrow 2012; Sierp and Henneberg 2015), which is a particular concern for bioarchaeologists. In fact, studies using skeletons of known population affinity have shown that if these known individuals do not adhere to parameters of just one CRANID population—thereby excluding individuals of mixed population affinity—the test itself has a 39 percent chance of correctly assigning the cranium to a similar population (Kallenberger and Pilbrow 2012; Sierp and Henneberg 2015). In brief, because testing has identified issues with classifying individuals not represented by the reference samples, identifying individuals of mixed population affinity, and because missing data significantly affects the accuracy of these programs, CRANID and Fordisc simply are not realistic for most ancient skeletons.

Finally, the ethicality of these programs must be discussed. While they appear to be objectively comparing crania against reference populations and letting data drive the results, there is inherent subjectivity in the original reference populations. The question must be asked: who decides how many populations there are in the world, and what is the dividing line between these "populations?" Howells' dataset, which is the core reference database for both CRANID and Fordisc (Wright 2012; Ousley and

Jantz 2005) contains "populations" that span from the 6th century BC to 1950 AD, during which time over 2,500 years' worth of migration and gene drift occurred. People living in 200 AD, for example, would have lived in a world with vastly different populations and, therefore, population affinities than those in nearly all of the reference populations for CRANID and Fordisc (Poniros 2021). Furthermore, many of these reference populations were delineated based on their geographic location at death, which was certainly the case for the skeletons buried at the Poundbury Roman Camp (Wright 2012). The Poundbury Roman Camp is a site that was added to the CRANID database later, by Richard Wright himself, and labeled "Romano-British" (Wright 2012). It is a cemetery used by the nearby military camp Durnovaria, present day Dorchester, and there is ample evidence to suggest that regiments from many areas throughout the vast Roman Empire (Poniros 2021). Using the measurements from Wright's own data collection, multivariate statistical analysis found that there was a great deal of population diversity in the skeletons of Poundbury (Poniros 2021), which suggests that it is not suitable as a reference population. It is very likely that many other "reference" populations in these datasets have similar levels of inherent diversity, making these studies far less objective than originally thought. So, the use of these programs begs many poignant questions: is it ethical to compare an unknown individual to reference populations that may not accurately represent populations that existed during their lifetime? And, is it ethical to treat reference populations as a cohesive unit without knowing its inherent genetic diversity or level of incoming gene flow?

Where do we go from here?

Though the statistical concerns with classification software programs are significant, there are also conceptual concerns particularly relating to their use with past populations. Clearly, these modern techniques are not used as a means to justify racism, but they do have the same outcome of classifying individuals into possibly inappropriate categories and implying that this categorization is meaningful (Poniros 2021). For example, both databases for CRANID6 and Fordisc comprise 74 populations that represent a mix of prehistoric, ancient, medieval, and modern individuals (Wright 2012; Jantz and Ousley 2005). This categorization appears logical because it is instinctive to describe the ancestral differences of past people in terms that a modern individual can understand. In fact, this is the very reason it works so well for modern forensic cases in which a victim needs to be identified (Ousley *et al.* 2009). However, this approach does a disservice to anthropological and archaeological studies of diversity in the past because it forces modern notions of "race," ethnicity, and population affinity on ancient populations by comparing unknown crania to known crania and known populations that were not even in existence in the same time period. Furthermore, it presents population affinity as something fixed and knowable, when, in reality, population affinity is a relative concept. These parameters set in place by classification software like CRANID and Fordisc require us to determine exactly how far back in time we need to go in order to deem that a population is "ancestral." Yet, in the same breath, these programs ask us to accept that a given population is ancestral at the time period in which the individuals in the reference dataset lived, despite the fact that these reference populations lived in vastly different time periods and may have had greater levels of gene flow than previously thought.

On the other hand, cranial size and shape are the most "visible" traits related to genetics available in the archaeological record. In other words, cranial size and shape differences are traits that could have possibly been noticed by ancient people, whereas studies that include data like aDNA and dental nonmetric traits (Relethford 2016; Pilloud and Kenyhercz 2016; Dunn *et al.* 2019) are modern inquiries that require scientific investigation or, at least, an understanding of genetic variation, which the vast majority of past populations do not have. Of course, there are many accounts of ancient people from many different regions and time periods recognizing the differences in others and tying these differences closely with other ethnic and genetic groups (Isaac 2004; Mattingly 2013), but the only truly visible trait to these ancient people (that is also visible to archaeologists) was outward-projecting

phenotypic variation, such as craniofacial variation, rather than less obvious—yet more highly related to genetics—traits like dental nonmetric variation (Relethford 2016; Pilloud and Kenyhercz 2016; Dunn *et al.* 2019). Of course, things like dress, language, and other elements of culture would have also been visible to past people, but these aspects of identity are often not visible in individual burials. It is clear that craniometric variation exists and that it has ties to population affinities (Relethford 2004; Pilloud and Hefner 2016; Dunn *et al.* 2019) Furthermore, it is both visible in life and quantifiable in the archaeological record, so it appears to be one of the few methods that can bridge the gap between modern knowledge of genetics and past experiences of diversity.

There are many scholars who believe that studying cranial variation in humans is a slippery slope that may lead to giving unwarranted support to the biological race concept, a theory that has long been disproved (Bethard and DiGangi 2020; Ross and Williams 2021). However, most of these critiques are not relating to craniometric analyses, but rather cranial morphoscopic analyses, which asks the user to grade, rather than measure, a few distinct craniofacial traits, which serves to force unknown crania into a very broad category that is often associated with a social race (Hefner 2016). While this may be mildly useful in forensic contexts as a last resort for identifying unknown remains, it is not a substitute for objective statistical analysis. These authors agree that morphoscopic traits should not be used in forensic or bioarchaeological contexts and that approaches need to be catered towards understanding microevolutionary events, including gene drift (Bethard and DiGangi 2020; Ross and Williams 2021). There is a general understanding that population affinity is often an important piece of a person's identity, but scholars want to ensure that this data is treated ethically, so as to avoid misinformation and to be exceptionally clear that biological races do not exist (Bethard and DiGangi 2020; Ross and Williams 2021). So, even though there are issues associated with craniometric variation, it is important to find a means of studying phenotypic variation in past populations to better understand diversity among ancient people while avoiding the pitfalls of craniometric classification.

Moving forward

If we want to continue to study human diversity—which, at its core is inherently anti-racist—there needs to be a shift in how this data is treated. We need to move away from classification of any kind, and move towards an exploratory approach (Dunn *et al.* 2019; Poniros 2021). This exploratory approach should include other important identity factors such as migration data, significant historical events, and social hierarchies which all often have an impact on reproduction and, therefore, genetics in past and present populations (Dunn et al, 2019; Bethard and Digangi 2020; Poniros 2021). Because cranial variation is the only marker of perceived diversity that is both visible to past people and present researchers, we must work towards a way to treat craniometric variation as an insight into perceived diversity, not as a fixed measure of population affinity that is compared to other reference populations.

To do so, instead of classifying each cranium into a previously studied population, crania can be compared to one another to determine whether there are any phenotypic outliers or significant groupings within the population, similar to the successful studies by Howells (1973, 1989, 1996) and Ishida *et al.* (2009). Cranial measurements can, therefore, serve as a measure of diversity within the population while avoiding the concerns associated with classification, a method that is gaining popularity with scholars (Kranioti *et al.* 2018; Weisensee and Spradley 2018; Poniros 2021). However, this involves going back to basics and employing multivariate statistics.

One promising multivariate statistical technique for this task is K-means cluster analysis based on Mahalanobis distance measures (Poniros 2021). This technique allows anthropologists to explore the inherent phenotypic diversity at a given site, without comparing that data to "known" populations. The results often split into two main groups: local males and local females. Then, there are outliers of a

certain biological sex that do not conform to the groups of similar cranial size and shape. Those outliers are then considered to be possible migrants to the area, or the children of migrants (Poniros 2021).

Of course, there are still pitfalls to this type of inquiry. As a general rule, multivariate statistical tests work best when the number of samples—in this case, individuals—exceeds the number of observations—in this case, measurements. So, it is preferable to have a larger sample size, which may be difficult to obtain in cemeteries or burial sites with poor preservation. In these cases, it is possible to use only craniofacial measurements in the dataset as a means of trying to include more individuals in the study, though the results are not as robust as they are when using all 40 measurements (Poniros 2021).

This method alone does not attempt to determine the origins of those migrants. Rather, it seeks to explore the inherent diversity at that site. However, this method cannot be used in isolation. It is essential to compare the results to contextual clues regarding migrant groups in the region and explore the implications of being a possible foreigner to that region. In this way, it is possible to explore the experience of diversity for these people, rather than attempting to classify them into "populations" that may not have even existed while they were alive.

Conclusion

There is no doubt that biodistance studies, particularly those relating to craniometrics, have some ethical concerns that are often a major deterrent for biological anthropologists wishing to study diversity in past populations. Craniometric analysis has had a long and problematic history and, though it seems that modern methods have addressed those issues, many studies inadvertently fall victim to similar ethical dilemmas. Some studies found that classification software programs are statistically inaccurate unless all of the strict conditions are met (Elliott and Collard 2009). Other studies have found that crania of mixed population affinity struggle to fit into any reference populations, which would disqualify a staggeringly high number of the human population from these analyses (Kallenberger and Pilbrow 2012; Sierp and Henneberg 2015). Aside from these accuracy concerns, there is also the issue of ethicality. Is it ethical to push unknown crania into inappropriate reference samples in an attempt to define their population affinity (Poniros 2021)? These are all valid concerns for the future of craniometric analysis.

However, there must be a way to ethically address these concerns, as diversity was, and remains today, an essential part of the human experience. Despite its problematic past, cranial metric variation can be explored ethically and scientifically, so long as traditional classification methods are avoided. By choosing an exploratory, multivariate approach, rather than a classification approach, it may be possible to address issues of statistical inaccuracy as well as the ethical concerns of classifying an individual into a population that may not represent their actual ancestral origins or affinities.

Ultimately, the goal of a biodistance study is to understand if there was phenotypic variation at a given site and, if so, how this variation would have affected the people in question. To treat cranial measurements—and other markers of phenotypic variation—ethically, it is essential to adhere to those basic questions, without moving past the scope of what phenotypic data can reliably imply.

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Chapter 15

Historical and Modern Human Dissection Practices for Anatomy Education

Amy C. Beresheim

Introduction

Human dissection contributes to the improvement of anatomical knowledge and has been a hallmark of medical training for centuries (Gregory and Cole 2002; McLachlan and Patten 2006; Ghosh 2015; Brenna 2021). Today, dissection continues to be touted as an active form of learning that also promotes medical professionalization (Rizzolo 2002; Pawlina 2006; Estai and Bunt 2016; Ghosh and Kumar 2019). Despite a significant reduction in the time dedicated to anatomy instruction over the past few decades, most medical schools still incorporate some form of dissection into their curriculum (Habicht *et al.*, 2018; McBride & Drake, 2018; Pan *et al.*, 2020; Smith *et al.*, 2022). This chapter provides a summary of the history of human dissection in anatomy education, spanning from ancient Greece to the present day. Key figures, events, and geographic areas will be used to illustrate how the role of gross anatomy developed and evolved in conventional medicine. In the process, this review explores major shifts in the procurement of bodies from executed criminals to willed anatomical donors, and the changing legal and ethical considerations surrounding human dissection in its societal context. While the narrative remains largely Eurocentric, several scholars are actively working to understand and promote anatomical discoveries made in China (Shaw and McLennan 2016; Shaw *et al.* 2022), India (Loukas *et al.* 2010; Jacob 2013), and the Middle East (McCumber *et al.* 2007; Shoja and Tubbs 2007; Alghamdi *et al.* 2017).

Societal norms guide human actions, including those that pertain to the treatment of the dead. Thus, dissection practices and associated laws and ethical standards are not static. They change in response to current events and social ideology. Historically, challenges arose because the need for dissection stood in opposition to predominant religious and moral views, which often regarded it as a transgression against the sanctity of the human body (Comer 2022). Dissection was either altogether forbidden or was restricted to the bodies of ostracized or marginalized individuals. Today, these dilemmas are still present in certain parts of the world (Dasgupta 2004; Gangata *et al.* 2010; Anyanwu *et al.* 2011; Halou *et al.* 2013; Riederer 2016; Gurses *et al.* 2018; Naidoo *et al.* 2021; Kramer 2024). Although many institutions and organizations now rely on the generosity of fully consented individuals for anatomical body donation, the industry is largely unregulated, and a significant proportion of the global cadaver[1] supply continues to be derived from unclaimed bodies or from the commercial sale of willfully donated individuals. Unclaimed bodies are those that have not been taken into possession by a family member or the next of kin. This can happen for various reasons, including if the deceased individual has no known relatives, if their family is unable or unwilling to claim the body, or if the identity of the deceased is unknown. While this review does not make direct recommendations for best practices, it directs readers to helpful resources to guide the ethical acquisition and ongoing use of bodies in anatomical dissection. The modern ethical framework is grounded in the principles of autonomy and respect, and it is fully

[1] The word "donor" is the preferred term, as it emphasizes autonomy and dignity for the dead. However, the word "cadaver" is used sparing but intentionally throughout this manuscript as it remains both a legal and historical term. It is used only in instances where individuals have not given informed consent (e.g. executed or unclaimed individuals), and their bodies were intentionally disrespected or dehumanized. The pejorative nature of the term is meant to draw attention to unethical practices.

contingent upon public trust. Wherein, autonomy is defined as the right of an individual to freely decide and act without being coerced or forced by others.

Anatomy and Human Dissection in the Ancient World

The origins of medicine are early and ambiguous. All ancient people developed ways of treating illness and injury, which would have necessitated some rudimentary understanding of anatomy. However, the first accounts of human dissection for the explicit purpose of pursuing anatomical knowledge appear much later in history.

Herophilus of Chalcedon (335 – 255 BCE) is considered one of the great physicians of antiquity, practicing medicine in the city of Alexandria (present-day Egypt) during the reign of the first two Ptolemaic Pharaohs (Bay and Bay 2010; Serageldin 2013). He is often credited with performing the earliest known systematic dissections of the human body. Of note, records from ancient Babylon indicate that the bodies of condemned criminals were being used in some form of dissection during the Achaemenian Dynasty (648–330 BCE) (Shoja and Tubbs 2007). It is also important to consider that Herophilus's studies were not entirely novel as they were informed by papyri detailing the work of Egyptian physicians and embalmers (Loukas *et al.* 2011). Supported by royal patronage, Herophilus is thought to have dissected over six hundred bodies in his lifetime. He is also accused of conducting vivisections of condemned criminals, but this remains contentious and is most likely a historical fabrication (Scarborough 1976). Numerous landmark anatomical discoveries have been attributed to Herophilus, many involving the nervous system, but unfortunately his descriptive works have all been lost (Bay and Bay 2010; Serageldin 2013).

The unique social climate in Ancient Greece fostered the rise of human dissection as a scientific practice. The Ancient Greeks believed in the separation of the soul from the body and the cessation of pain after death (Von Staden 1992; Santoro *et al.* 2009). Further, a fixation on the human form was ubiquitous at this time and is likewise notable in athletics and the arts (Horton 2015). Dissections by Herophilus and his younger contemporary, Erasistratus of Ceos, were short-lived, however, as pervasive religious and moral views eschewed the desecration of the human body. Just 50 years or so after its inception, human dissection became illegal under Roman rule (Calkins *et al.* 1999). In concert, a new generation of empiricist physicians popularized the belief that there was little utility in anatomical study (Von Staden 1992). Although animal dissections would periodically be performed by several scholars in the following centuries, human dissections would not resume for another 1500 years.

The Resurgence of Human Dissection in Europe During the Middle Ages (476-1500 CE)

Medicine and the study of anatomy advanced without human dissection. Claudius Galen (129 – 216 CE), a Roman gladiatorial physician from Pergamon (present-day Bergama, Turkey), is famous for his extensive and often theatrical public dissections of pigs and Barbary macaques. Drawing upon these experiences, Galen wrote treatises that would serve as the most influential source of anatomical knowledge for over a millennium (Ghosh 2015; Brenna 2021). Consequent to the widespread introduction of Christianity during the Middle Ages, physicians in Europe were limited to referencing previous works as human dissection was considered blasphemous and effectively prohibited. Galen's writings were translated into Arabic during the 9th century and were subsequently adopted in North Africa, the Middle East, and India. While anatomical discovery continued to develop outside of Europe (Leiser 1983; Shoja and Tubbs 2007; Alghamdi *et al.* 2017), there is not yet strong evidence of human dissections occurring during the Islamic Golden Age (622-1258 CE) (Mitchell, 2016; Savage-Smith, 1995).

Beginning in the 11th century, religious ideological developments began to soften social resistance to human dissection in Europe. The body parts of saints came to be seen as desirable relics, often believed to be imbued with miraculous healing properties, such that dissection was first reintroduced as a means to preserve and disseminate these human remains (Parks 1995). By the 12th and 13th centuries, it was also not uncommon for the bodies of high-ranking individuals to be eviscerated and dismembered for travel and delayed burial, sometimes to multiple places (Prioreschi 2001). Early preservation and maceration techniques such as salting and boiling facilitated their transport. These practices, collectively known as Mos Teutonicus (Latin for "German custom") became so frequent, and their accounts so gruesome, that in 1299, Pope Boniface VIII forbade dissections with the express purpose of preserving bodies for distant burial (Parks 1995). Nonetheless, the opening of a body after death continued to be an important funerary practice throughout the Middle Ages (Parks 1994).

During the high medieval period (1000-1300 CE), autopsies for both medicolegal and public health inquiries were legitimized, and in many cases, were conducted at the behest of the individual or their family (King and Meehan 1973; O'Neill 1976; Parks 1994). The first universities were likewise formed, commencing the regulation of medical teaching. Between roughly 985 to 1125 CE, the Schola Medica Salernitana (Salerno, Italy) reportedly used pig dissections to instruct students in anatomy (Mitchell, 2016). The scientific value of a dead body and religious perspectives on human dissection continued to evolve, leading to a gradual expansion of the permissions granted to medical practitioners. In 1231, during his reign as Holy Roman Emperor, Frederick II (1194–1250 CE) mandated the dissection of one individual every five years for the purpose of training physicians and surgeons. Similar legislation was passed in other European countries, but strict limitations were placed on the number of dissections that could be performed and the provenance of bodies that could be used. Dissections were relatively infrequent and mainly involved the bodies of executed criminals that came from other regions. Over time, the bodies of poor individuals who died in charitable hospitals would become another important source for anatomical study (Ferrari 1987; Parks 1995). Medical practitioners were prohibited from securing their own bodies for dissection, and instead these were provided by the local authorities (Parks 1994; Vanneste 2010). Women's bodies may have been preferentially used at Italian universities as there was the transient belief that they did not have a soul (Frati *et al.* 2006), and according to some university-issued regulations, more people were allowed to attend their dissections (Vanneste 2010). At this early stage, the restrictions on dissection and the legal supply of bodies may have been somewhat incongruous with the demands of the growing medical establishment. In 1319, for example, four students of Alberto de Zancari (1280-1350 CE) of Bologna were prosecuted for disturbing a grave in order to obtain a body for anatomical study (Parks 1994).

In 1315, Mondino de Luzzi, is believed to have conducted the first public human dissection since the Hellenistic period at the University of Bologna (Mavrodi and Paraskevas 2014). University sponsored dissections, like this one, were highly ritualized. They involved several-day-long exhibitions in which a barber surgeon operated under the direction of a lecturer, who read from an authoritative text that was positioned at a distance from the body (Frati *et al.* 2006; Ghosh 2015). Time constraints were practical. Bodily tissues would be dissected according to their relative rate of decomposition, as reliable embalming techniques had yet to be developed (Mavrodi and Paraskevas 2014; Brenna 2021). Galenic teachings were so well-indoctrinated that any discrepancies were either attributed to the moral deviancy of the subject, or to a morphological change that had occurred over time (Frati *et al.* 2006). Nonetheless, these teachings were supplemented by Mondino's book Anathomia (De anatome), which was used throughout Europe as a practical manual of dissection during the 14th and 15th centuries (Infusino *et al.* 1995; Crivellato and Ribatti 2006). Anatomical illustrations, although not included in Mondino's book, also became popular in the late Middle Ages and began to be referenced alongside manuscript text (Calkins *et al.* 1999).

Human Dissection During the Italian Renaissance (1450-1650 CE)

Human dissection emerged as an important part of medical training during the Renaissance. By 1531, Pope Clement VII (1478-1534 CE) had accepted human dissection for anatomical study (Arráez-Aybar *et al.*, 2023). With the support of the church, the field of anatomy continued to develop around the transmission and interpretation of Galen's work. However, intellectual contributions from Islamic scholarship should also be recognized (Alghamdi *et al.* 2017), and were particularly influential at French universities (Vanneste 2010).

In 1543, after five years of meticulously dissecting both humans and animals, Andreas Vesalius (1514-1564 CE), a Flemish physician, published his pivotal treatise, *De Humani Corporis Fabrica*. This work included more than 300 hundred engraved illustrations, which were created through collaboration with several prominent artists at the time. Foremost among them was the Italian painter Jan Stephan Calcar (1499-1546 CE). *De Humani Corporis Fabrica* was widely disseminated thanks to recent advancements in printing technology (Calkins *et al.* 1999), positioning Vesalius at the forefront of anatomical study. Vesalius corrected some of Galen's erroneous teachings, inspiring a paradigm shift from the unquestioning reliance on ancient texts to learning through experiential study and firsthand observation (Ghosh 2015).

In 1594, at the University of Padua, Hieronymus Fabricius ab Acquapendente (1533–1619 CE) established the first permanent theater specifically intended for public dissection, thereby transforming anatomical instruction (Smith *et al.*, 2004). Dissection theaters were subsequently constructed at the University of Bologna in 1595, the University of Leiden in 1596, and the University of Paris in 1604 (Ghosh 2015). These buildings typically had concentric galleries such that hundreds of people were able to view the dissection table from a relatively close range (Smith *et al.*, 2004). In Italy, public support for the spectacle of human dissection is well-documented (Ferrari 1987; Frati *et al.* 2006). Although there were undoubtedly some social reservations at the time, Italians largely viewed the dissection of an executed criminal as somewhat redemptive, or at least a means to an end, with the benefit being the acquisition of knowledge (Comer 2022). Opponents were primarily concerned with violations of funerary practices or family honor and were not specifically objecting to the act of dissection. Given its importance, burial rites for the dissected were provisioned in cities such as Florence and Venice (Parks 1994). The public was likely much more wary of human dissection in other parts of Europe, particularly as there was uncertainty regarding the timing of death (Tarlow and Lowman 2018).

The demand for cadavers steadily increased among most European medical schools. While the legal supply of dead bodies appears to be stable throughout the Renaissance, it remained largely constrained by legal statute. In addition to the bodies of executed criminals, a few early laws (circa 1497 CE) permitted the use of unclaimed bodies in dissection (Parks 1994). In the advent of body shortages, physicians encouraged local participation by offering to pay for funeral costs and by pressuring families to have their relatives autopsied even when the cause of death was not suspicious (Parks 1994; Ghosh 2015). Although graverobbing was thought to be relatively rare at this time, there are several accounts of its occurrence. For example, Berengario da Carpi's (1460-1536 CE) anatomical investigations of the skull were primarily conducted on skeletal remains that had been taken from nearby cemetery ossuaries (Parks 1994). In *De Humani Corporis Fabrica*, Vesalius himself admits to acquiring women's bodies through graverobbing, reflecting the difficulty in obtaining them as women were seldom executed for capital crimes (Parks 1994).

Slightly preceding Vesalius, Leonardo da Vinci (1452-1519 CE) made his important illustrative contributions to the field of anatomy. Although much of his work would remain unpublished during his lifetime, their posthumous discovery would help popularize cross-sectional anatomy several centuries later (O'Rahilly 1993). Despite a papal decree that prohibited non-physicians from performing

dissections, da Vinci produced hundreds of anatomical drawings from approximately 30 postmortems. These bodies were largely derived from the crypt of Santa Maria Nuova (Florence, Italy), which da Vinci paid graverobbers to retrieve. Eventually, the Santa Maria Nuova hospital director would supply him directly (Perloff 2013). Other Renaissance artists were known to have performed dissections, and likewise would have been reliant on extralegal sources of cadavers (Ghosh 2015).

The Growth of the Medical Establishment in During the Enlightenment (1685-1815 CE): The United Kingdom as a Case Study

Between the 17th and 18th centuries, lawmakers attempted to meet growing dissection needs by increasing the size of the catchment areas from which bodies could be procured. For example, in 1636, a charter issued by King Charles expanded the pool of bodies available to Oxford University by including those executed within a 21-mile radius of the school, rather than solely those hanged within the city limits (Mitchell *et al.*, 2011). In a darker turn, Britain's 18th century penal code, monikered the "Bloody Code", substantially increased the number of offenses that were punishable by death. While this should have augmented the number of bodies eligible for dissection, most people convicted of a capital crime had their sentences reduced, such that executions paradoxically declined (Tarlow and Lowman 2018).

Under the reign of George II, the Murder Act was passed in 1752. It authorized the Company of Barber-Surgeons and the Royal College of Physicians to perform dissections on the bodies of hanged criminals. Although this was not altogether new, the act enabled judges to append dissection to criminal sentences, and it prevented the next of kin from reclaiming the dead body, thus removing any form of consent from the process (Riederer 2016). Another consequence of the Murder Act was that it powerfully reframed dissection as a punitive measure, ultimately eroding any public support for the practice (Tarlow and Lowman 2018). Posthumous punishments were highly visible, either through dissection or through gibbetting. Gibbetting involved displaying the decomposing body of an executed criminal in an iron cage, intending to serve as a deterrent to others (Tarlow and Lowman 2018). Previously, public reservations toward dissection had stemmed from traditional values such as the interference with funerary customs or the potential to harm family reputation (Parks 1994; Tarlow and Lowman 2018). After the Murder Act, public apprehension devolved into worries about being buried alive or vivisected. While historical accounts of the former are very rare (Shotwell, 2013; Bates, 2017; Cascella, 2016), there are at least 10 documented cases in which a living individual was mistakenly dissected after a failed execution (Dobson 1951). Dissection came to be viewed as a fate worse than death (Bennett 2018). In response, propaganda touting the importance of human dissection began to circulate (Smith, 1824), but it did little to abate intensifying public fear and infamy (Niemeyer 2015).

The Rise in Grave Robbing and Body Snatching in the Global North during the 19th Century

By 1828, there were an estimated 800 medical students in London alone (Mitchell *et al.*, 2011). At this time, the "Paris Method" of providing each student with their own body for dissection was popular (McLachlan and Patten 2006). The legal supply of dead bodies proved inadequate, leading to a burgeoning black market that was fueled by graverobbing and body snatching. Graverobbing involves the exhumation of a body from the site of interment, whereas body snatching involves the direct theft of a dead body, typically from a morgue (Highet 2005). Throughout the late 18th and early 19th centuries, there are numerous accounts of students, anatomists, and resurrectionists disinterring the bodies of the newly deceased for use in anatomical dissection (Frank 1976). The illegal body trade was an unsavory but lucrative business. Fees were considered high, with a body fetching up to 10 pounds (Comer 2022). One of the most infamous cases unfolded in Edinburgh, Scotland as William Burke and William Hare were convicted of murdering sixteen people through asphyxiation and selling the bodies of their victims to

the anatomist Robert Knox. This practice became known as "Burking". While rare, there are several accounts of this occurring elsewhere (Comer 2022).

There are reports of human dissections occurring in North America as early as 1638 (Brenna 2021), but pressing cadaveric demands did not begin until after the first formal anatomy course was taught at the University of Pennsylvania in 1745 (Tward and Patterson 2002). The 19th century saw a proliferation of medical schools in the United States, with the number increasing from four in 1800 to approximately 160 by 1900 (Hildebrandt, 2010). Graverobbing was rampant despite its illegality (Heaton 1943; Humphrey 1973). Dissection was also against the law in most states (Blakely and Harrington 1997), and at least two dozen anatomy riots are known to have occurred in protest between 1785 and 1852. The New York Doctors' Riot of 1788 is one of the most famous incidents, and was precipitated by the raiding of the African Burial Ground in Manhattan (Edwards 1951; Swan 2000; Sappol 2002). At this time, dissection could be interpreted as a penalty for poverty as the graves of the most vulnerable were preferentially targeted (Highet 2005; Davidson 2007; Halperin 2007). The bodies of dead slaves were often sold directly to medical schools without any form of consent as they were considered property that required disposing (Savitt 1982; Blakely and Harrington 1997). On the other hand, amid fears of dissection, the rich could afford to protect their dead by installing mortsafes or by hiring grave watchers (Highet 2005).

In 1825, Harvard University and the Medical Society of Massachusetts began a campaign to legalize dissection. The Massachusetts Anatomical Act was passed in 1831, establishing that unclaimed bodies could be used for anatomical dissection. Similar laws were passed in other states as well as throughout Europe (Jenkins 1913; Elizondo-Omaña *et al.* 2005). Anatomy acts ended body snatching and grave robbery, although their effect was not immediate (Jones and Whitaker 2012). Here, it is important to note that the legality of the body trade does not imply moral legitimacy (Anteby 2010). Anatomy acts usually lacked specifications for receiving, transporting, treating, preserving, and disposing of bodies, and they failed to mandate the maintenance of accurate identification records (Jenkins 1913). Although certain laws did include provisions for willed donations, they were relatively rare and had minimal impact on encouraging participation. They also did little to put an end to the exploitation of the poor. Anatomy acts primarily led to the increased use of unclaimed bodies for education and research purposes. The bodies of indigents who died in prisons, poorhouses, hospitals, or mental asylums were indiscriminately used in dissection (Jones and Whitaker 2012). Administrators even had financial incentive to transport unclaimed bodies to medical schools as it allowed them to recover certain costs associated with poor relief (Mitchell *et al.*, 2011).

The growth of the abolitionist movement and changing perspectives on capital punishment further encouraged the use of unclaimed bodies throughout the 19th century (Hildebrandt, 2008). Certain anatomy acts explicitly forbade the bodies of executed individuals from being used in dissection. (e.g., Warburton Anatomy Act of 1832) (Ghosh 2015). Regrettably, setbacks emerged during the first half of the twentieth century with the rise of the National Socialist Party in Germany. Due to punitive Nazi legislation, and practices such as euthanasia and execution, the bodies of Nazi victims became available for anatomical education and research. An estimated 35,000 bodies were supplied to the 21 anatomy departments in Germany at this time (Hildebrandt, 2020, 2023). In response to these and many other atrocities, the Nuremberg Code of Ethics emerged. It established contemporary ethical standards for medical practice and research, encompassing the principles of autonomy and informed consent (Moreno *et al.* 2017).

The Transition to Willed Body Donation in the United States During the Late 20th Century

Unclaimed bodies remained the primary source of cadavers used in the United States until 1968, when a major shift towards volunteerism occurred after the adoption of the Uniform Anatomy Gift Act (UAGA).

The UAGA established the rules for consent regarding both organ and whole-body donation, although organ donation receives greater legislative focus (Dalley *et al.* 1993). The UAGA has been revised several times, most recently in 2006, and all states have now enacted some form of the law (Verheijde *et al.* 2007). It outlines who can donate, the methods by which donations can be made, and the permissible uses of anatomical gifts. The UAGA also conferred property status upon the human body, granting a new privilege that honored a donor's preferences to be upheld in court, even if the donation was opposed by the next of kin after their death (Sadler *et al.* 1968; Dalley *et al.* 1993; Hulkower 2016). However, the UAGA does not expressly forbid the use of unclaimed bodies in anatomical dissection, nor the commercial sale of human body parts for education and research. In fact, most state laws governing anatomical donation continue to allow the use of unclaimed bodies (Caplan and DeCamp 2019). In the few states where the sale of human remains has been made illegal, there are issues of enforcement (Halling and Seidemann 2016).

It is worth noting that protections under the UAGA extend to the incarcerated. The bodies of prisoners, even those executed for crimes, either require informed consent from the individual prior to their death, or from the next of kin upon their death. While legal, scholars argue that executed prisoners should never be used for anatomical dissection given the history, the ethics of capital punishment, and the potential abuse of governmental power (Comer, 2022; Hildebrandt, 2008).

In the United States, the transition to willed body donation happened quickly during the latter half of the 20th century. Several social forces helped to facilitate this change. The supply of unclaimed bodies had already started to decline by the end of the Great Depression, as institutions like poorhouses were phased out with increased governmental participation in social welfare, and as general prosperity increased (Ghosh 2015). The number of unclaimed bodies was further reduced by new laws that provided options for indigent burial, the introduction of Social Security Death Benefits in 1950, and better systems for contacting the next of kin (Lederer and Lawrence 2022). Negative sentiments towards body donation also began to wane. Successful corneal transplants in the late 1930s, and blood drives critical to the war effort in the 1940s, were particularly influential in changing American perspectives on anatomical gift-giving (Lederer and Lawrence 2022). Positive news stories and increased public awareness of body donation were extremely influential. For example, nearly a decade before the UAGA, the University of California Los Angeles (UCLA) medical school announced that it was able to fully support its dissections through their willed body donation program thanks to local advocacy and campaigning (Lederer and Lawrence 2022).

The United States underwent a population boom in the 1950s and saw rapid scientific advancements that were driven by digital information and technology, ubiquitous across all fields. With the advent of new embalming techniques, the funeral industry rapidly expanded, and the cost of their services increased (Mitford 2000). Cemetery space became increasingly constrained as the American population continued its trend toward urbanization. Both body donation and cremation became more affordable alternatives, contributing to a shift in the spiritual significance of the body in the eyes of the public (Garment *et al.* 2007).

Humanistic endeavors undertaken by medical schools further helped to reduce stigma and mitigate fears of dissection. For example, beginning in 1965 in the United Kingdom and during the early 1970s in the United States, memorial services are held at the conclusion of most anatomy courses (Warner and Rizzolo 2006). These ceremonies honor the dead and express gratitude for the invaluable gift of body donation, which helps to strengthen ties with the community and spread awareness of body donation programs (Štrkalj *et al.* 2020). For the most part, these ceremonies are organized by students, and they tend to be non-denominational or secular in nature (Jones, Lachman, & Pawlina, 2014). By the mid-1980s, nearly all American medical schools relied on willed anatomical donors for their dissections

(Lederer and Lawrence 2022). Today, rather than a punishment, body bequeathal is generally viewed positively by both the donors and their recipients (Arráez-Aybar, Bueno-López, & Moxham, 2014; Asad, Anteby, & Garip, 2014; Cornwall, Perry, Louw, & Stringer, 2012; Cornwall, Poppelwell, & Mcmanus, 2018; Ganapathy, Joy, Rout, & Gaikwad, 2023; Jiang *et al.*, 2020; Smith *et al.*, 2023).

Current Body Donation Practices Across the Globe: Ethical Considerations

To facilitate the ethical procurement, use, and disposal of anatomical body donors, several advisory groups have issued guidelines. In 1991, the American Association of Clinical Anatomists (AACA) first published a statement expressing disapproval of third-party body brokers (Cahill and Marks 1991), and subsequently issued their full recommendations for best practices in 2008 (Champney 2011). The American Association for Anatomy (AAA) followed suit with less detailed recommendations in 2009, as did the International Federation of Associations of Anatomists (IFAA) in 2012 (IFAA, 2012; Štrkalj *et al.*, 2020). In 2020, the AAA formalized the Human Body Donation Taskforce with the expressed purpose of drafting guidelines. These were released to the membership in late 2023. In all cases, it is important to note that these are living documents that have and will continue to be revised over time. Typically, these guidelines consider four major themes: (1) the respect for the dead (2) the informed consent of the donor and the family, (3) comprehensive and transparent information about the process from body donation organizations, and (4) societal input on the proper and legal handling of willed bodies (Champney, 2019; Winkelmann, 2016). Additionally, practices should be grounded in the principle of beneficence—the idea that benefits should be maximized while minimizing harm (Rajagopal and Champney 2020). Readers are encouraged to refer to these documents directly for more information.

Unfortunately, some best practices remain largely aspirational. Body acquisition patterns vary dramatically by country and region, and there are no global standards or established databases for tracking this information (Štrkalj *et al.* 2020). Finding both an adequate and representative supply of willed body donors remains an ongoing challenge, particularly in areas where religious or aesthetic taboos persist (Dasgupta 2004; Gangata *et al.* 2010; Anyanwu *et al.* 2011; Halou *et al.* 2013; Riederer 2016; Gurses *et al.* 2018; Naidoo *et al.* 2021; Kramer 2024). In the United States, unclaimed bodies still constitute an estimated 12.4% of the supply (Caplan and DeCamp 2019). Although there has been a significant reduction in the use of unclaimed bodies in North America, Western Europe and Australasia, they remain the major or exclusive source of cadavers in most other parts of the world (Habicht *et al.* 2018). However, it is important to recognize that some individual institutions have recently prioritized the transition to willed body donation (Kramer & Hutchinson, 2015). The ongoing use of unclaimed bodies in anatomy education and research is incompatible with the modern ethical framework, given that these individuals have not given their expressed permission (Kahn *et al.* 2017).

Absent or inadequate legislation creates a significant barrier to developing willed body donation programs. Unfortunately, the legalization of body donation is often a slow progress, such that many countries continue to rely on unclaimed bodies or the bodies of executed criminals due to these bureaucratic constraints (Riederer 2016; Štrkalj *et al.* 2020). Because of the lack of body donation programs in the Middle East, medical schools in the United Arab Emirates must resort to importing dead bodies from abroad (Harris *et al.* 1994; Naidoo *et al.* 2021). Considering the substantial effort and costs required to establish and maintain a willed body donation program, the continued reliance on imported donors may be the most financially advantageous option (Wingfield 2018). Nevertheless, in these situations, the logistical considerations to meet ethical standards increase significantly, especially as international arrangements typically occur through private companies. Body donors are separated from their protective communities and are often treated as commodities rather than individuals.

The commercialization of dead human bodies constitutes another major area of ethical concern. In the United States, an estimated 20,000 body donors are required each year for medical school dissections (Becker and Elías 2007). These needs are largely met through the roughly 150 academically housed whole-body donation programs (Anteby 2010). Most state or institutionally sponsored body donor programs receive fewer than 250 bodies a year, with the number ranging from 32 to 1,500 donors (McCumber *et al.* 2021). However, the supply does not always satisfy the demand, especially as bodies are increasingly used for bio-skills training with emergent medical devices (Zdilla and Balta 2023). For-profit body donations fill the gap. These companies are commonly referred to as "body brokers". Even though they rely on voluntary donations, body brokers frequently employ unethical practices. They use manipulative advertising, lack respectful and transparent handling practices, and do not share proceeds with bereaved families (Champney *et al.* 2019; Champney 2016). Because of conflicting interests, it is argued that no profit or financial gain should be generated by any willed body donation program.

Given the complex history of dissection and the exploitation of marginalized groups within medicine more broadly, there is also a bias in modern body donor profiles. People who trust in the systems after death are the most likely to donate. For example, several American studies have demonstrated that educated White individuals over the age of 65 tend to be overrepresented in body donor cohorts (Lagwinski *et al.* 1998; Collins *et al.* 2018; Mueller *et al.* 2021). In contrast, Black individuals seem to donate less often, citing iatrophobia and racial discrimination as major barriers (Boulware *et al.* 2004; Siminoff *et al.* 2006). Similar trends are observed for other marginalized groups in China and South Africa (Morgan *et al.* 2013; Zhang *et al.* 2020; Kramer 2024).

Conclusion

Anatomy is among the oldest disciplines in medicine, and arguably one of the most controversial and ethically fraught. Despite over a 2500-year history of human dissection, widespread public support for whole-body donation is a relatively recent phenomenon, and only in certain parts of the world. A historical understanding of the field of anatomy is needed to appropriately frame past practices and to help guide the ongoing use of dead human bodies in medical education and research (Hildebrandt, 2010, 2019). The modern ethical framework surrounding whole-body donation emphasizes the principles of autonomy, informed consent, and respect for the dead. Currently, there are no federal or international agencies that monitor what happens to bodies pledged for use in medical education and research. However, several scholars and scientific organizations have issued recommendations for best practices that governments and institutions can collectively work towards achieving.

Societal support for human dissection has fluctuated over time, underscoring the importance of anatomists to anchor their work in sound ethical principles to maintain the integrity of their practice and uphold public trust. While many anatomy laypersons now view body donation as an altruistic act with scientific value (Moxham *et al.* 2016), the general favorability of the public is conditional and remains fragile. The stability of body donation programs is also contingent on public trust, making them vulnerable to the risks posed by publicized scandals (Garment *et al.* 2007). Sensationalist news stories are also problematic as they further exploit the individuals whose bodies were used in dissection for financial gain (Stephan and Fisk 2021). Anatomists and students can counter negative sentiments by maintaining high moral standards and by cultivating strong community relationships. Human dissection will always involve balancing the pursuit of anatomical knowledge with the wishes and dignity of the donors. To ensure the sustainability of the field and to avoid past transgressions, it is crucial that the latter takes precedence.

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Section IV

Professional issues in biological anthropology

Chapter 16

Is sexism a problem in the field of biological anthropology? The first survey conducted in Portugal

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Introduction

Peering into sexism and gender bias in scientific professions

Researchers only began examining the role of women in academia and science professions 30 years after the second wave of feminism, in the early 1990s. This may be due to the traditional focus of feminism on external oppression and discrimination. Besides, women have been known to internalize misogyny (Mann and Huffman 2005). One might assume that this time gap is due to the proximity of researchers to the subject matter or the male-dominated scientific environment. However, challenges researchers face when studying gender bias, such as difficulties in professional insertion, obstacles to career progression, and biased habits of citation and inclusion in research circles, must be considered (Wenneras and Wold 1997; Hart 2006; Holleran *et al.* 2011; Isbell *et al.* 2012; McGuire *et al.* 2012; Miliniak *et al.* 2013; Mitchell *et al.* 2013; van den Brink 2015; Kabla-Langlois 2016; Hinsley *et al.* 2017).

Measuring sexual harassment and abuse in the context of scientific work

In recent years, several studies have been done on sexism in academia, showing that this practice negatively affects the permanence and progression of women scientists in their careers (Komaromy *et al.* 1993; Holleran *et al.* 2011; Isbell *et al.* 2012; McGuire *et al.* 2012; Carr *et al.* 2016). However, except for the medical field (Komaromy *et al.* 1993; Settles *et al.* 2006), it was not until the beginning of the 21st century that specific topics of sexual harassment in the workplace began to emerge (Komaromy *et al.* 1993; Holleran *et al.* 2011; Isbell *et al.* 2012; McGuire *et al.* 2012; Carr *et al.* 2016). Most of these works have resorted to a survey conducted on workers in which they were asked directly or indirectly about harassment in the workplace, namely if they felt they had been the target of practices of whether labour or sexual harassment (Komaromy *et al.* 1993; Carr *et al.* 2016). The results were constant and transversal to several fields: women reported higher values of sexual harassment than men. It was also found that despite the frequency of harassment, complaints to superiors were infrequent (Komaromy *et al.* 1993; Carr *et al.* 2016). The fields of archaeology and biological anthropology are no exception, and several studies have been conducted on sexual harassment (Clancy *et al.* 2014; Meyers *et al.* 2015; Radde 2018; Mary *et al.* 2019; Coto-Sarmiento *et al.* 2020). In Europe, there is close collaboration between the two fields in both academic and commercial sectors. Additionally, in the US, they are considered subfields of anthropology. The joint presence of the two scientific areas exists because workers of these scientific fields are often together in both academic and commercial teams (Clancy *et al.* 2014). Exhibitions (e.g., "Archeo-sexism") (Mary *et al.* 2019), symposiums, and round tables were organized to warn about the problem, with a strong impact on both the generalist and specialized press (Clancy 2012a,b, 2013; Bohannon 2013; Jahren 2014; Ossola 2014; Simmonds 2014; Urry 2014; Grens 2019; Coto-Sarmiento *et al.* 2020), and the denunciation of harassment cases in scientific meetings and university research centres (Kilgrove 2019; Wade 2019). In several discussions, the problem of sexism (and, consequently, sexual

harassment) was viewed not only as a labour problem but also as an ethical issue (Wright 2008; Clancy *et al.* 2014; Radde 2018; Mary *et al.* 2019).

Following international studies on gender and abuse in science (Komaromy *et al.* 1993; Settles *et al.* 2006; Wright 2008; Clancy *et al.* 2014; Carr *et al.* 2016; Radde 2018; Mary *et al.* 2019; Coto-Sarmiento *et al.* 2020), this paper aims to: investigate the presence of sexist behaviours, harassment, and sexual abuse in the context of activities in biological anthropology in Portugal (both in commercial and academic circles); and to understand the consequences of such behaviours at both personal and professional levels.

Terminology

The terminology *sexism, sexual harassment*, and *abuse* are the subject of lively debate. To avoid ambiguities, this study assumed definitions given by institutions with broad social consensus. *Sexism* (as recommended by the Council of Europe, 2019: 10) was defined as "Any act, gesture, visual representation, spoken or written words, practice or behavior based upon the idea that a person or a group of persons is inferior because of their sex, which occurs in the public or private sphere, whether online or offline, with the purpose or effect of: i. Violating the inherent dignity or rights of a person or a group of persons; or ii. resulting in physical, sexual, psychological, or socio-economic harm or suffering to a person or a group of persons; or iii. creating an intimidating, hostile, degrading, humiliating, or offensive environment; or iv. constituting a barrier to the autonomy and full realization of human rights by a person or a group of persons; or v. maintaining and reinforcing gender stereotypes". In other words, sexual harassment and abuse always occur within the scope of a sexist logic, whether individual or collective (for example, the workplace environment).

The term *sexual harassment* was defined (by the Commission for Equality in Work and Employment, CITE) as "Systematically repeating suggestive remarks, jokes or comments about sexual appearance or condition; repeatedly sending unwanted cartoons, drawings, photographs or images from the Internet, of sexual content; making phone calls, sending letters, SMS or unwanted e-mails, of a sexual nature; promoting intentional and unsolicited physical contact, or excessive or causing unnecessary physical approaches; sending persistent invitations to participate in social or recreational programs, when the targeted person has made it clear that the invitation is unwanted; invitations and requests for sexual favors associated with the promise of obtaining employment or improving working conditions, job stability or professional career, and this relationship may be expressed and direct or implied".

The term *sexual abuse* was defined (by the Portuguese Victim Support Association, APAV) as "An unwanted sexual act or an attempt at an unwanted sexual act; an unwanted comment, contact or interaction of a sexual nature. One or more people perform these acts against another – the victim – without her will".

These definitions were made available at the beginning of the survey sections that concerned them.

Design

A questionnaire was prepared to be answered by any individual who had already studied or practiced biological anthropology in Portugal, using the "Google Forms" platform to ensure anonymity and protect respondents' identities. All data were securely stored and only the authors who have been granted access through password-protected controls are allowed to access the content.

The questionnaire was composed of six sections with 44 closed and open-ended questions, being the latter optional. The first section concerned personal information: gender, age, academic degree, current academic/working position, institution the respondent worked for, and work field.

The second section aimed to characterize the general work environment and experience of the respondents. It included questions about their recognition of sexism and sexual harassment, which were also asked in other parts of the questionnaire to understand their personal beliefs and real-life perceptions. Additionally, the existence and presentation of codes of conduct and policies against harassment in the workplace were addressed in this section.

The third section focused on sexism, investigating the existence of gender-based differences in work distribution and whether the respondents had experienced a sexist environment or situation.

The fourth and fifth sections, one on sexual harassment and the other on sexual abuse, inquired about the frequency of dealing with inappropriate conduct or sexual behaviours in the workplace. For cases of harassment and abuse, respondents were asked to provide additional details such as the hierarchical position and gender of the perpetrator, the victim's work position, the use of reporting mechanisms, and the level of satisfaction with the reporting outcome. Additionally, an open question allowed respondents to describe the strategies they adopted to address the situation.

Lastly, the sixth section tried to systematize what had been answered about "whether or not I was a victim of harassment," "having witnessed situations of harassment," and "having reported situations of harassment" within the scope of biological anthropology.

The complete questionnaire can be consulted in Appendix 1.

Dissemination

The survey was shared through social media groups dedicated to biological anthropology. Although the biological anthropology community in Portugal is relatively small, collaboration was also asked to the anthropology research centres and the Portuguese Anthropology Association to ensure wider dissemination of the survey. The online survey was open to responses between June and July 2020.

Ethical concerns

Before starting the survey, respondents were informed about the anonymity of the questionnaire (see Appendix 1). Respondents were also made aware of the survey subject and its potential to act as a "trigger", affecting their mental health.

Statistical analysis

Statistical analysis was conducted by using the IBM SPSS statistics® program (version 20.0), with the statistical significance of the recorded values tested with independent samples chi-square. The open responses were used to complement the key findings.

Results

A total of 57 questionnaires were answered. Respondents were mostly women (77.2%, n=44; men: 22.8%, n=13).

The best-represented age interval was 30-39 years (47.4%), followed by 40-49 years (26.3%). The least represented age interval was of those "with 60 years or older" (1.8%) with a single 60-year-old respondent (Table 1). The mean age of the respondents was 36.6 years, being the age range 24-60 years.

Regarding academic qualifications, most respondents had a master (MA) degree (54.4%), followed by a PhD degree (21.1%). Graduate students were 14% of the sample, whereas scholars with a post doctorate degree represented 10.5%. When asked about their current position, the respondents identified themselves primarily as PhD students (20.8%) or researchers (20.8%) (Table 2).

Table 1 - Gender and age distribution of the respondents.

	Gender	
	%	n
Women	**77.2**	44
Man	22.8	13
	Age	
20 – 29	17.5	10
30 – 39	**47.4**	27
40 – 49	26.3	15
50 – 59	70	4
= or > 60 years	1.8	1
Total	100	57

Table 2 - Respondents current position.

Current Position	%	n
Master student	9.4	5
PhD student	**20.8**	11
Researcher	**20.8**	11
Professor	9.4	5
Graduate official	9.4	5
Field assistant	5.7	3
Laboratory or field chief	11.3	6
Other position	13.2	7
Total	100	53

When asked about the institutions they used to work at, 62.5% of respondents answered “university”, and 51.8% “commercial archaeology companies” (Table 3). Regarding field of research, 82.1% of the respondents reported biological anthropology and 35.7% archaeology. Other fields were also mentioned (Table 4).

Table 3 - Respondents’ current institution.

Current Institution	%	n
University	62.5	35
Commercial archaeology companies	51.8	29
Municipality	35.7	20
State Heritage	14.3	8
Research Centre	32.1	18
Museum	3.5	2
Scientific association	1.8	1
NGO	1.8	1
Other	1.8	1

TABLE 4 - RESPONDENTS' FIELD OF RESEARCH.

Fieldwork	%	n
Biological anthropology	82.1	46
Archaeology	35.7	20
Forensic anthropology	21.4	12
Biology	12.5	7
Social and cultural anthropology	7.1	4
Other	7.1	4

Some questions concerned the working experience and environment. The variability of the work experience of the respondents fell between less than five working sites (38.6%) and more than 20 (21.1%) (Table 5).

TABLE 5 - NUMBER OF PLACES WHERE RESPONDENTS HAD WORKED IN BIOLOGICAL ANTHROPOLOGY.

Number of working sites	%	n
< 5	38.6	22
5 - 10	33.3	19
10 - 20	7.0	4
> 20	21.1	12

When asked about their perception of the men/women ratio at the workplace, 47.4% of the respondents indicated that the feminine gender was more present, 31.6% mentioned a similar number of individuals per gender, and 21% pointed out a male dominance (Table 6).

TABLE 6 - PERCEPTION ON THE MEN/WOMEN RATIO IN THE WORKPLACE.

Sex ratio	%	n
W > M	47.4	27
W = M	31.6	18
W < M	210	12

Some questions were designed to attest to a priori perceptions on the ability to recognize situations of sexism and sexual harassment. All respondents (n=57) answered that they were familiar with and knew how to recognize situations of sexism, and 98.1% stated their capacity to identify sexual harassment.

The questions about the presence of a code of conduct or policies against sexual harassment revealed a high percentage of workplaces that have not implemented such policies (Table 7).

TABLE 7 - EXISTENCE OF A CODE OF CONDUCT OR POLICIES AGAINST SEXUAL HARASSMENT IN THE WORKPLACE.

	Yes		No		No knowledge	
	%	n	%	n	%	n
Code of Conduct	22.8	13	73.7	42	3.5	2
Policy against sexual harassment	12.3	7	84.2	48	3.5	2

Sexism in the workplace

More than half (52.6%) of the respondents recognized the existence of a sexist workplace (50% of women and 61.5% of men). On the other hand, 38.6% had been the target of sexist behaviours (women: 43.2%; men: 23.1%) (Table 8). No significant differences were found between genders ($p>0.05$).

Table 8 - Existence of a sexist workplace or having been the target of sexist behaviours.

	Yes		No		No knowledge	
	%	n	%	n	%	n
Existence of a sexist workplace	52.6	30	42.1	24	5.3	
Women	50.0	22	45.5	20	4.5	2
Men	61.5	8	30.8	4	7.7	1
Been the target of sexist behaviour	38.6	22	57.9	33	3.5	2
Women	43.2	19	54.5	3	2.3	1
Men	23.1	3	69.2	9	7.7	1

Some of the answers to the open questions refer to the lower competence of male anthropologists (the 'minority gender' in biological anthropology in Portugal). Quoting[1]: "*A male anthropologist is seen as less competent by the heads in the context of archaeological excavations. They are more common in research and less in commercial archaeology*". On the other hand, there were sexist behaviours associated with women's lower physical capacity for the same task: "*More physical tasks, or considered traditionally male, are sometimes assigned to male workers, without taking into account the ability or willingness of women to perform them*". Also, women were referred to be more judged by their appearance (by both genders) in the biological anthropology workplace and less capable as managers: " *(...) comments on the physical appearance of women when they are not around (...) when a woman holds a position of authority: in these cases, I have seen serious resistance from workers in following orders or recognizing such authority*".

Sexual harassment in the biological anthropology workplace

Concerning sexual harassment in the workplace, 47.4% of the respondents stated having experienced inappropriate or sexual comments (e.g., on physical appearance or cognitive differences between the

Table 9 - Sexual harassment in the workplace questions.

	Less common		Moderately		Highly frequent	
	%	**n**	**%**	**n**	**%**	**n**
How often have you observed / heard other co-workers making inappropriate or sexual comments?	62.5	35	28.6	16	8.9	5
	Yes		**No**		**No knowledge**	
Have you ever experienced inappropriate or sexual comments, namely physical appearance, cognitive differences related to sexes, homophonic comments, or other jokes, while working in biological anthropology?	47.4	27	49.1	28	3.5	2
Women	**50.0**	22	45.5	20	4.5	2
Men	38.5	**5**	**61.5**	8	--	--
Master student	20.0	1	80.0	4	--	--
PhD student	**54.5**	6	45.5	5	--	--
Researcher	36.4	4	63.6	7	--	--
Professor	40.0	2	60.0	3	--	--
Graduate technician	20.0	1	60.0	3	20.0	1
Field assistant	**100**	3	--	--	--	--
Laboratory or field chief	**50.0**	3	33.3	2	16.7	--
Other position	71.4	5	28.6	2	--	--

[1] The quotes have been translated from Portuguese.

sexes), homophonic comments, or facetious comments (Table 9). The answers were not significantly associated with gender (X2=1.401; df=2; p=0.496) or the career position occupied by the respondents at the time of the harassment (X2=16.493; df=14; p=0.284). More than half of the PhD students (54.5%), all field assistants (100%), and half of the laboratory and field chiefs (50%) answered positively to this question.

The respondents who stated having been victims of sexual harassment were also asked on who was the perpetrator. Only 23 individuals answered this question. The most frequent answer was "a fellow worker" (69.6%), followed by "someone hierarchically superior" (60.9%) (Table 10). The answers showed that some respondents were harassed on multiple work occasions by different harassers. Of the 23 respondents who reported experiencing harassment, they were subjected to at least 49 instances of harassment. Harassers were mostly men (84.6%).

Table 10 - Reported hierarchy and gender of the sexual harassment perpetrators.

	%	n
Someone hierarchically superior	60.9	14
Fellow worker	69.6	16
Someone hierarchically inferior	52.2	12
Someone outside the team	30.4	7
Women	7.7	2
Men	84.6	22
Other	1.8	1
Unknown	1.8	1

Regarding the victim's work situation/position at the time of the harassment, most were researchers or field assistants (23.1%) (Table 11).

Table 11 - Victim's work situation/position at the time of the harassment.

	%	n
Undergraduate student	19.2	5
Master's student	15.4	4
Researcher	23.1	6
Field assistant	23.1	6
Post-doctorate	3.8	1
Graduate technician	15.4	4

Finally, no pre-established harassment reporting mechanisms were identified by the harassment victims in any workplace, although nine individuals (29%) stated not having knowledge on this subject. Only 36% of the victims claimed to have reported the harassment event, and none of them felt satisfied with its outcome (Table 12).

Some of the comments left by respondents suggest an unsafe work environment, especially in the commercial archaeology: " *(...) anthropologists are seen as 'fresh meat' (an expression of colleagues and not mine) in the context of archaeology works. They are also the subject of conversations on body or beauty. In the research area, the environment seems friendlier to me because many of the team-leaders are women*"; "*In the context of construction works involving frequent contact with workers from different areas (mostly men), women may be exposed to sexist comments and some harassment, which implies that they sometimes need to condition their clothing, posture, and behaviour on site. Gestures of sympathy and goodwill can raise other interpretations*".

TABLE 12 - VICTIM'S HARASSMENT REPORT AND OUTCOME SATISFACTION.

	Yes		No		No knowledge	
	%/n					
	%	n	%	n	%	n
Was there a mechanism to easily report the harassment?	0	0	71.0	22	29.0	9
Did you report what happened?	36.0	9	64.0	16		
	Neutral		**Unsatisfied**		**Very unsatisfied**	
If so, how satisfied were you with the result? *	55.6	5	22.2	2	22.2	2

* The answer choices "satisfied" and "very satisfied" were available but were not chosen.

Sexual assault in the workplace

Concerning sexual assault in the workplace, 12.3% of the respondents stated they experienced some kind of unwanted sexual contact. Most sexual assault victims were women (13.6%).

Faced with the question about the perpetrator of the sexual assault, only six answered. Like in the sexual harassment question, the answers were diverse, the more frequent being "someone hierarchically superior" and a "fellow worker" (each 33.3%) (Table 13). The aggressor was usually a man (87.5%).

TABLE 13 - PERPETRATOR OF THE SEXUAL ASSAULT EPISODE, HIERARCHY, AND GENDER.

	%	n
Someone hierarchically superior	33.3	2
Fellow worker	33.3	2
Someone hierarchically inferior	16.7	1
Someone outside the team	16.7	1
Women	12.5	1
Men	87.5	7

When asked about the victim's work situation/position at the time of the sexual assault, most were students (50%) or field assistants (25%) (Table 14).

TABLE 14 - VICTIM'S WORK SITUATION/POSITION AT THE TIME OF THE SEXUAL ASSAULT.

	%	n
Undergraduate student	25	2
Master student	25	2
Researcher	12.5	1
Field assistant	25	2
Graduate technician	12.5	1

Finally, no pre-established harassment reporting mechanisms were identified by the sexual assault victims in 70% of the workplaces. Only 42.9% of the victims reported a sexual assault occurrence (Table 15).

Table 15 - Victim's sexual assault report and outcome satisfaction.

	Yes		No		No knowledge			
	%	n	%	n	%	n		
Was there a mechanism to easily report the harassment?	30.0	3	70.0	7	0.0	0		
Did you report what happened?	42.9	3	57.1	4	---	---		
	Satisfied		**Neutral**		**Unsatisfied**		**Very unsatisfied**	
If so, how satisfied were you with the result?	33.3	1	---	---	33.3	1	33.3	1

Some final questions (Table 16) revealed that 24.6% had already suffered harassment within the scope of work in biological anthropology, 22.6% had already witnessed a situation of sexual harassment in the biological anthropology context, and 37.7% had been aware of an episode of sexual harassment by the victim herself (Table 16).

Sexual assaults reported were usually unwanted touching "My personal experience with physical contact was just unwanted touches but not explicit enough to support a formal complaint". In some instances, such situations escalated into stalking, ending with the victim giving up work and, eventually, quitting the profession: "I was harassed by my supervisor who was married. On another occasion, I went to a distant place with the foreman. When he stopped the car, he placed his hand on my thigh. (...) Very little has been done. I felt very disgusted and angry. A few months later, I left anthropology, and I don´t miss this environment at all".

Discussion

This study is the first attempt to investigate sexual harassment and abuse in the context of biological anthropology in Portugal. Although it is currently unknown if the analysed sample accurately represents the Portuguese professionals, as there has not been a comprehensive study of the field's history, the results are quite revealing. The survey confirms the existence of a sexist work environment in biological anthropology, with sporadic to frequent episodes of sexual harassment on both students and workers. Shockingly, more than 12% of respondents reported traumatic experiences of sexual assault in the workplace. These situations were referred to as ending in the alteration of place of employment, abandonment of profession, as well as depression and/or other problems in the personal life.

When compared to the results reported by other studies in other countries (Table 17), Portuguese results are somewhat intermediate, both globally and by gender, showing that the problem is not local but systemic, and prevention and action measures should be designed accordingly.

Table 16 - Sexual harassment final questions.

	Yes		No		No knowledge	
	%	n	%	n	%	n
Suppose we define sexual harassment not only as physical abuse but also as psychological, verbal, or persecution abuse. Do you consider that you have already suffered harassment within the scope of your work in biological anthropology?	24.6	14	75.4	4	0.0	0
Have you ever witnessed sexual harassment in your workplace in biological anthropology?	22.6	12	71.7	38	5.7	3
Have you ever have been reported episodes of sexual harassment in biological anthropology?	37.7	20	56.6	30	5.7	3

Table 17 - Summary of published results on sexual harassment and abuse (adapted with alterations from Voss 2021a: p.3).

Study	Type of Harassment	Total	Men	Women
			%	
Clancy *et al.* (2014)	Nonphysical	64.0	40.0	70.0
	Sexual assault	21.7	6.0	26.0
Meyers *et al.* (2015)	Nonphysical	68.0	46.0	75.0
	Unwanted sexual contact	13.0	8.0	15.0
Radde (2018)	Verbal (professionals)	39.0	19.0	51.0
VanDerwarker *et al.* (2018)				
	Physical (professionals)	12.0	5.0	19.0
Coto Sarmiento *et al.* (2019)	Nonphysical and physical		15.0	51.0
Jalbert (2019)	Sexual harassment	25.0	16.0	78.0
Present survey	**Nonphysical**	**47.4**	**38.5**	**50**
	Unwanted sexual contact	**12.3**	**7.7**	**13.6**

Following global recommendations, the suggestions by Voss (2001a,b), and the obtained results in the current survey, actions against harassment should include three lines of action: educational, preventive, and mitigating.

On the educational front, it is crucial to openly acknowledge sexism and sexual harassment as significant issues within different fields and scientific disciplines, specifically in biological anthropology in Portugal, raising awareness of possible victims and perpetrators.

The present survey was the first step in this direction but should not be an end. Its purpose is to generate discussion among bioanthropologists, other professionals, and researchers, share silenced stories, and contribute to a greater awareness of sexual harassment in scientific work environments.

To prevent such incidents, codes of conduct must be established within various organizations where biological anthropologists work, including companies, universities, research centres, laboratories, fieldwork campaigns, and scientific meetings. Portuguese law requires institutions with more than seven employees to have codes of conduct. Some still do not have them, breaking the law, and others do not disclose or discuss them with the employees. Therefore, measures to prevent or irradiate these behaviors imply a profound work of questioning and destroying the hierarchical and power structures on which the academy and work environment in general is based. These structures are fundamentally patriarchal and sexist, with centuries of roots, requiring enormous focus and energy to change them. Implementing measures that promote diversity and inclusion in management and decision-making roles is crucial to achieving this goal.

Furthermore, in case of harassment, managers (business, laboratory, or research centre head) should have pre-established action mechanisms in place. These should cover the reporting process but also the consequences for the harasser. Above all, the victim must always be protected and respected.

Secure reporting mechanisms should be developed. More than one person, preferably external to the team, should be responsible for receiving complaints by direct contact (email and/or phone). Reporting mechanisms and penalties for harassers should also be written into codes of conduct.

Conclusion

This is the first investigation that tries to measure the levels of harassment in biological anthropology workplaces, in Portugal. Unfortunately, the results show that sexual harassment and assault are frequent. It was observed that there is a significant lack of codes of ethics or conduct, as well as a lack of transparency in reporting channels, which discourages individuals from filing complaints due to fear of retaliation.

It must be remembered that what happens in the context of bioanthropology cannot be dissociated from the entire social structure in Portugal. In this sense, efforts to combat sexual harassment must be demanded at the level of anthropology, the supra structure, and all society fields. This work is considered crucial in initiating discussions among professionals in institutions and companies, leading to the implementation of preventing measures of harassment and sexual abuse in biological anthropology.

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Appendix 1 – Survey questionnaire[2]

STARQ (Sindicato dos Trabalhadores de Arqueologia, Portuguese Union for Archaeologists) together with CIAS (Centro de Investigação em Antropologia e Saúde - Universidade de Coimbra, Research Centre in Anthropology and Health, University of Coimbra) intends to study the presence of sexism and sexual harassment/abuse in the work environments of professionals from Biological Anthropology. These environments can be a laboratory, a research centre, or, in the cases of commercial work, the field or office.

The type of environment felt in the workplace has been discussed by biological anthropologists worldwide. As a result of these reflections, the demand for the creation of norms - such as Codes of Conduct or Ethics - has been increasing in institutions and companies.

Although there are some public and private debates in Portugal, the situation regarding sexual harassment and sexism in biological anthropology is still unknown. Because of that, STARQ and CIAS wanted to understand workers' different experiences in their work environment.

This survey was designed not only to quantitatively the real scale of problems but also to listen to workers' experiences of sexism/sexual harassment and ask for suggestions on creating a safer work environment for all. In other words, in addition to the data which helps to characterize the problem, our main goal is to gather stories to illustrate the issue to the state authorities (ACT, DGPC, CITE, Ministries, etc.), entrepreneurs, professors, managers of research centres and other researchers, workers, and students.

The results will be presented at the online congress, AnthroEthics in the 21st Century, that will take place on the BioantTalks, between September 28th and October 2nd (https://www.youtube.com/channel/UCtA4p5VzNSk2yYCdlrwrY0Q/featured?disable_polymer=1).

Who can answer? Who has already (or still) studied, investigated, or worked in Biological Anthropology.

What will happen: By submitting the survey, you are giving informed consent to participate in our survey. Please answer the questions as best you can. You can decide to end the participation at any

[2] The survey was translated from its original Portuguese version.

time or not to answer certain questions. We will keep your responses anonymous; the survey does not ask for personal identification. Anonymous results/comments will be the rule in disseminating results, whether oral, printed, or online. All data collected in this survey will remain confidential and protected by national and international law (Regulation (EU) 2016/679 of the European Union Parliament and of the European Union Council, of April 27th, 2016, on the protection of people regarding the processing of personal data and the free movement of such data and which recalls Directive 95/46/EC (General Regulation on Data Protection). Thus, by responding to this survey, you agree that such data will be processed for the abovementioned purpose and that all information provided is true.

Risks: We will ask about experiences of sexual harassment or assault that you have had in the past or are currently experiencing. These questions can act as a "trigger," and stimulating these memories can make you uncomfortable. If you feel that thinking about or sharing experiences about sexism, harassment, or sexual assault can harm your mental health, please consider not responding to the survey.

Benefits: characterization of a situation that has not yet been studied in Portugal in Biological Anthropology. We hope that the results of this research will stimulate a conversation about the presence and influence of sexism/sexual abuse in the workplace and its impact on the lives of professionals.

In case of doubt, contact: starq.arqueologia@gmail.com

Survey

Personal information
1) Genre:
[ ] Woman
[ ] Man
[ ] Nonbinary
[ ] Other

2) Age

3) Academic Degree
[ ] High school
[ ] Graduation
[ ] Master's degree
[ ] PhD
[ ] Post doctorate

4) Current position
[ ] Undergraduate student
[ ] Master's student
[ ] PhD student
[ ] Investigator
[ ] Professor
[ ] Senior Technician
[ ] Field Assistant
[ ] Field director
[ ] Another, which one?

5) What type of institution do you work with When you work in a laboratory/field work? (select all viable options)
[ ] University
[ ] Commercial archaeology
[ ] Townhall
[ ] Investigation Center
[ ] State institutions (DGPC, DRC, Institute of Legal Medicine, etc.)
[ ] Others, which?

6) What is your subfield:
[ ] Biological anthropology
[ ] Archeology
[ ] Socio-Cultural Anthropology
[ ] Biology
[ ] Others. Which?

General context

For these questions, consider all your working experience, regardless of your position.

7) How many workplaces have you worked/were you a student? (give an approximate number)

8) In all workplaces, what is the percentage of men managers?
[ ] 0 - 25
[ ] 25 - 50
[ ] 50 - 75
[ ] 75 - 100

9) In all workplaces, what is the percentage of women managers?
[ ] 0 - 25
[ ] 25 - 50
[ ] 50 - 75
[ ] 75 - 100

10) What were the proportions of women and men workers in your workplaces (give an approximate number):
[ ] More women than men
[ ] The same number of women and men
[ ] More men than women

11) Do you think you know how to identify situations of sexism?
[ ] Yes
[ ] No
[ ] I don’t know

12) Do you think you know how to identify a situation of sexual harassment?
[ ] Yes
[ ] No
[ ] I don’t know

13) Was a code of conduct presented to you at any of your workplaces?
[ ] Yes
[ ] No
[ ] I don't know

14) Was a policy against sexual harassment presented to you in any of your workplaces?
[ ] Yes
[ ] No
[ ] I don't know

Answer this set of questions based on your experiences

13) How often do you interact with your bosses compared to other colleagues?
[ ] Seldom
[ ] Rarely
[ ] Sometimes
[ ] Often
[ ] Continuously

14) Do you consider that superiors value your contribution to methods and organization of work?
[ ] Not at all valued
[ ] Occasionally
[ ] Valued with moderation
[ ] Highly value

15) What criteria do you think managers use to assess your performance? (check all that apply)
[ ] Competence
[ ] Potential
[ ] Productivity
[ ] Effort
[ ] Others. Which?

16) Have you ever felt that you were put to perform a certain task as a "punishment"?
[ ] Yes
[ ] No
[ ] I do not know

17) If yes, report the situation:

18) Do you think there are differences between men/women in the treatment, distribution of tasks, and approach of workers in your workplace?
[ ] Yes
[ ] No
[ ] I do not know

19) Which ones?

20) Considering that sexism is defined as any act, gesture, image, oral or written speech, practice, or behavior that is based on the belief of the inferiority of a person or group of people due to sex, which may be a public act or which may: 1 - Violate the dignity or rights of a person or group of persons; 2 - Causing physical, sexual, psychological or socioeconomic harm to a person or group and persons; 3 - Create an

intimidating, hostile, degrading, humiliating or offensive environment; 4 - Constituting a barrier to the autonomy or full realization of human rights of a person or group of persons; 5 - Maintain or reinforce gender stereotypes. (https://rm.coe.int/prems-055519-gbr-2573-cmrec-2019-1-web-a5/168093e08c)
Do you think you have already been the target of a sexist situation/work environment?
[ ] Yes
[ ] No
[ ] I do not know

Sexual harassment

(1. Systematically repeating suggestive remarks, jokes, or comments about one's appearance or sexual condition; 2. Repeatedly sending unwanted cartoons, drawings, photographs, or online images with sexual content; 3. Making phone calls, sending letters, SMS, or unwanted emails, of a sexual nature; 4. Promoting intentional and unsolicited or excessive physical contact or provoking unnecessary physical approaches; 5. Sending persistent invitations to participate in social or recreational programs when the target person has clarified that the invitation is unwanted; 6. Present invitations and requests for sexual favors associated with the promise of obtaining a job or improving working conditions, job stability, or professional career, and this relationship may be express and direct or insinuated, that is, all unwanted behavior of a sexual nature, whether verbal, non-verbal or physical, with the aim or effect of disturbing or embarrassing the person, affecting their dignity, or creating an intimidating, hostile, degrading, humiliating or destabilizing environment - CITE: https://assedio.cite.gov.pt/o-assedio-no-trabalho/atos-e-comportamentos-classificados-como-assedio-no-trabalho/assedio-sexual/)

21.1) How often did you observe/hear other co-workers making inappropriate or sexual comments?
[ ] Not often
[ ] Moderately
[ ] Frequently
[ ] Very frequent

21.2) Have you ever experienced inappropriate or sexual comments regarding physical appearance, cognitive differences related to gender, homophonic comments, or other jokes while working in the workplace?
[ ] Yes
[ ] No
[ ]I don't know

21.3) If so, who was the perpetrator? (In case it was more than one situation, just think of a specific situation and use the last question of this survey to report the set of experiences)
[ ] Someone superior to me
[ ] In the same position as me
[ ] Someone with a position inferior to mine
[ ] Someone outside the team

21.4) What was the gender of the aggressor?
[ ] Woman
[ ] Man
[ ] Nonbinary
[ ] Unknown (if the harassment was anonymous, for example)

21.5) What was your situation at the time of the harassment? (In case it was more than one situation, just think about a specific situation and use the last question of this survey to report the set of experiences)
[ ] Undergraduate student
[ ] Master's Degree student
[ ] Investigator
[ ] Field Assistant
[ ] Post doctorate
[ ] Senior Technician
[ ] Field director

21.6) Was there a mechanism to easily report this harassment?
[ ] Yes
[ ] No
[ ] I don't know

21.7) If yes, what was the mechanism?

21.8) Did you report what happened?
[ ] Yes
[ ] No

21.9) If you complained, what was your satisfaction with the result?
[ ] Very unsatisfied
[ ] Dissatisfied
[ ] Neutral
[ ] Satisfied
[ ] Very satisfied

21.10) What was your strategy for dealing with the situation?

Sexual Assault

(Sexual Assault is any type of violence of a sexual nature committed against another person, including forced sexual intercourse, forced nudity, inappropriate caresses, or forced kisses - APAV: https://apav.pt/care/index.php /sexual-violence-against-children-and-young people/what-is-sexual-violence)

22.1) Have you ever experienced physical, sexual harassment, unwanted sexual contact, or sexual contact in which you could not or did not give consent, did you think it would be unsafe to deny or not give your consent in the field of biological anthropology?
[ ] Yes
[ ] No
[ ] I don't know

22.2) If so, who was the perpetrator?
[ ] Someone superior to me
[ ] In the same position as me
[ ] Someone with a position inferior to mine
[ ] Someone outside the team

22.3) What was the gender of the aggressor?
[ ] Woman
[ ] Man
[ ] Nonbinary
[ ] Unknown (if the harassment was anonymous, for example)

23.4) What was your situation at the time of the incident?
[ ] Undergraduate student
[ ] Master's Degree student
[ ] Investigator
[ ] Field Assistant
[ ] Post PhD
[ ] Senior Technician
[ ] Field director

23.5) Was there a mechanism to easily report this situation of sexual assault?
[ ] Yes
[ ] No
[ ] I don't know

23.6) If yes, what was the mechanism?

23.7) Did you report what happened?

23.8) If you complained, what was your satisfaction with the result?
[ ] Very unsatisfied
[ ] Dissatisfied
[ ] Neutral
[ ] Satisfied
[ ] Very satisfied

23.9) What was your strategy for dealing with the situation?

24) If we define sexual harassment as not only physical abuse but something that can also involve psychological, verbal abuse, or harassment, do you consider that you have already suffered from harassment in the context of your work in biological anthropology?
[ ] Yes
[ ] No
[ ] I don't know

25) Have you ever witnessed a situation of sexual harassment in your workplace in the field of biological anthropology?
[ ] Yes
[ ] No
[ ] I don't know

26) Have you ever had episodes of sexual harassment reported to you in the field of biological anthropology?
[ ] Yes
[ ] No
[ ] I don't know

27) We would like to learn more about your experiences or reports about sexism, harassment, and sexual abuse in the context of biological anthropology. It will also be crucial to understand if you have been subject to any of the above-mentioned situations and their impact on your career, mental health, and personal life.

Please send us anything you think is important in the text box below.

Some relevant information:

- Acts and behaviors classified as harassment at work - https://assedio.cite.gov.pt/o-assedio-no-trabalho/atos-e-comportamentos-classificados-como-assedio-no-trabalho/
- APAV - Definition of sexual violence - https://apav.pt/care/index.php/violencia-sexual-contra-criancas-e-jovens/o-que-e-violencia-sexual
- Council of Europe Recommendations for the Prevention and Combat of Sexist Practices - https://rm.coe.int/prems-055519-gbr-2573-cmrec-2019-1-web-a5/168093e08c
- Survey of Academic Field Experiences (SAFE): Trainees Report Harassment and Assault - https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0102172#s5 - American Anthropological Association Code of Ethics - https://www.americananthro.org/LearnAndTeach/Content.aspx?ItemNumber=22869&navItemNumber=652#respectfulrelationships
- British Association for Biological Anthropology and Osteoarchaeology Ethics and Standards - http://archaeologicalethics.org/code-of-ethics/auto-draft-19/

Chapter 17

On Professional Ethics: An Insight into the Marginalization of Academic Mothers Post-lockdown

Vanessa Campanacho

Introduction

In March 2020, many governments worldwide implemented a mandatory quarantine in an effort to halt the spread of the highly transmissible and deadly airborne COVID-19 virus. The majority of the population had to quarantine at home, with the exception of essential workers. As a result, most workplaces and school buildings were temporarily closed, transforming homes into multifunctional spaces, serving not only as households but simultaneously as places of work and schools. The centralization of various activities in one physical location - the home - produced significant strains on parents, especially mothers of younger children, including academic mothers (Bender *et al.* 2022; Laçin-Şimşek *et al.* 2023; Prior *et al.* 2023). Primary caregivers, who are predominantly women[1], carry most of the homeschooling and the household chores, in addition to their professional responsibilities, all without the support typically provided by childcare facilities and/or extended family (Ségeral 2020/2021; Souto-Marchand 2021; Blithe 2022; Guyotte *et al.* 2023). While men did provide some level of childcare during the pandemic, the bulk of it fell to women (Willey 2020; Vomvoridi-Ivanovic and Ward 2021; Laçin-Şimşek *et al.* 2023). In addition, during the pandemic, pastoral and teaching responsibilities undertaken by women were intensified as students grappled with a new reality enshrouded in fear and worries (Górska *et al.* 2021; Docka-Filipek *et al.* 2023). This systemic imbalance allowed men more time to devote to their research and writing, as seen by the increase in the number of male publications submitted when compared to women during the pandemic (Squazzoni *et al.* 2020; Krukowski *et al.* 2021; Muric *et al.* 2021; Bargmann Madsen *et al.* 2022; Cui *et al.* 2022; Wright *et al.* 2022; Lee *et al.* 2023). The disparity in publications between genders[2] even made headlines in news outlets (e.g., Kitchener 2020; Vincent-Lamarre *et al.* 2020; Lea 2022; Reynolds 2022; Sanders 2022). Consequently, and unjustly, the research productivity of mothers suffered as their energy was depleted by the demands of the domestic sphere, teaching, and pastoral services (Górska *et al.* 2021; Willey 2020; Ségeral 2020/2021; Fulweiler *et al.* 2021; Vomvoridi-Ivanovic and Ward 2021). This left many mothers to experience a range of emotions including being overwhelmed, exhausted, fearful, depressed, resented, guilty, anxious, and frustrated with high costs to their overall well-being and mental health (Fulweiler *et al.* 2021; Vomvoridi-Ivanovic and Ward 2021; Bender *et al.* 2022; Docka-Filipek *et al.* 2023; Guyotte *et al.* 2023). This situation was even more taxing for single parents during the pandemic (Ségera 2020/2021) and mothers of children with (dis)abilities and health conditions (Muñoz *et al.* 2021). Leading to concerns about the long-term impact the pandemic may have on the academic career of mothers, particularly by those who are unemployed, precariously employed, or on the tenure track (Bender *et al.* 2022; Docka-Filipek *et al.* 2023).

During the pandemic, some institutions enacted temporary emergency protocols to mitigate penalties to academics' careers. These included suspending student evaluations and pausing or extending

[1] Although, this chapter employs the term 'women' in an inclusive manner to acknowledge the full spectrum of identities, most of the literature on the 'motherhood penalty' – including the studies referenced in this work - is routed on a gender dichotomy (i.e. man and woman) and heteronormative family structures (Prior *et al.* 2023). Thus, it is acknowledged that the discussed topics and proposed solutions do not fully encapsulate the experiences of individuals who do not identify within the binary gender or are in a heterosexual relationship.

[2] The reported publication gap between genders is limited to women and men.

promotion timelines (Vomvoridi-Ivanovic and Ward 2021; Bender *et al.* 2022; Prior *et al.* 2023). However, these measures were short-term solutions, and not specifically directed to parents (Vomvoridi-Ivanovic and Ward 2021; Prior *et al.* 2023). While the emergency protocols may have provided temporary support to mothers during the pandemic, the long-term consequences for mothers on employment, career advancement, and salaries, remain to be determined in years to come (Wiley 2020; Bender *et al.* 2022; Prior *et al.* 2023). The pandemic not only spotlighted the systemic inequities and barriers that academic mothers face, but it also exacerbated them (Górska *et al.* 2021; Willey 2020; Souto-Marchand 2021; Bender *et al.* 2022; Blithe 2022; Morin *et al.* 2022; Prior *et al.* 2023). Inequities and barriers are notably more pronounced for mothers who are Black, Indigenous, and Women of Color (BIWOC), LBTQ+, mothers with (dis)abilities, and first-generation academics (Fulweiler *et al.* 2021; Soares *et al.* 2021; Blithe 2022; Morin *et al.* 2022; Guyotte *et al.* 2023; Prior *et al.* 2023). BIWOC are often underrepresented in academia, typically occupying precarious positions, and can face a higher risk of being laid off due to budget cuts (Fulweiler *et al.* 2021).

While there have been few studies on the 'motherhood penalty' within the field of bioanthropology, the existing research mostly sheds light on the biases and challenges faced on conciliating motherhood with fieldwork (Lynn *et al.* 2018; Hodgkins and Thompson 2022). It is also worth mentioning the study of Wasson *et al.* (2008), who surveyed 943 members (including 66 bioanthropologists) of the American Association of Anthropologists (AAA) between 2005 and 2006. Wasson *et al.* (2008)'s findings revealed that women expressed a negative impact of motherhood on their career progression. Additionally, women reported experiencing a more negative workplace environment than men (Wasson *et al.* 2008). Research addressing the representation of women in bioanthropology and its subfields have either overlooked or only briefly mentioned the challenge of balancing motherhood and an academic career. Furthermore, much of this research is primarily centered on the United States, such as the works by Turner (1997, 2002), Antón *et al.* (2018), Turner *et al.* (2018), and Pilloud and Passalacqua (2022). Of these studies, only Turner *et al.* (2018) and Pilloud and Passalacqua (2022) mention motherhood as a factor of inequality. Turner *et al.* (2018) presented the personal narratives of 14 invited women on their career paths, which gave some insight into the struggles a few anthropologists faced as mothers, even though motherhood and career conflicts were not a central topic. In their 2022 study, Pilloud and Passalacqua explored the representation of women in forensic anthropology. Pilloud and Passalacqua (2022) concluded that while the number of women is higher at lower levels, their numbers tend to decrease with career progression. The authors attributed the 'motherhood penalty' as one of the reasons for this discrepancy in numbers (Pilloud and Passalacqua 2022). To the best of my knowledge, no study examined the conflicts between career and motherhood among bioanthropologists during the pandemic or the subsequent post-lockdown period. Given that the 'motherhood penalty' in bioanthropology has been sparsely documented, research from other disciplines can be used as a basis, as it is a pervasive issue across science. This chapter seeks to raise awareness of the structural biases and discrimination that mothers may encounter within academia, including in bioanthropology. Drawing upon existing literature, recommendations will be suggested to support mothers in bioanthropology, fostering a more equitable and ethical workplace. The aim is to assist in the creation of an environment where mothers are not only welcome but also actively supported, thereby promoting the production of scientific knowledge.

Structural sexism in academia

Women in academia can face structural sexism even before they become mothers, with gendered penalties, stereotypes, and barriers already in place that disadvantage women professionally. When an academic becomes a mother, these barriers can be further aggravated by new biases and obstacles. In this section, I will focus on the structural sexism that women might encounter in academia, while in the next section, I will discuss in more detail the 'motherhood penalty'. However, it is recognized that the experiences women face in academia are not universally identical, especially considering women are

not a homogeneous group. Women have diverse identities, with common and unique life experiences, which can even involve other types of discrimination.

The number of women earning degrees has been steadily increasing over the years (Gómez Cama *et al.* 2016; Ashencaen-Crabtree and Shiel 2019). For example, in 2014, women accounted for 73% of undergraduate anthropology majors, 71% of master's students, and 77% of doctoral students in the United States (Antón *et al.* 2018). However, with career advancement in academia, the number of women tends to decrease. More men occupy senior academic leadership positions or are full professors, while more women will either experience professional stagnation or leave academia (Aiston and Jung 2015; Andreou *et al.* 2022). This leads to salary discrepancies, as women tend to earn a lower wage, even when occupying the same rank as men (Monroe *et al.* 2014; Ashencaen-Crabtree and Shiel 2019). This trend is also observed in bioanthropology (Turner 1997, 2002; Antón *et al.* 2018; Lynn *et al.* 2018; Turner *et al.* 2018; Pilloud and Passalacqua 2022). Women are more likely to hold casual, non-tenure track and part-time positions in anthropological departments than men (Antón *et al.* 2018; Turner *et al.* 2018). Turner (1997, 2002) conducted surveys in 1996 and 1998 among members of the American Association of Biological Anthropologists (AABA, previously American Association of Physical Anthropologists). The surveys revealed gender inequalities in professional ranks, with a higher proportion of men holding tenured positions and professorships compared to women. A subsequent demographic survey of the AABA members conducted in 2014 showed a slight improvement in gender equity in the tenure-track positions, even though fewer women had a full professorship compared to men (Antón *et al.* 2018). The phenomenon of a decreasing number of women from entry-level positions to higher ranks, often referred to as the 'leaky pipeline', 'bottleneck', or 'glass ceiling', is attributed to a multitude of factors embedded in structural sexism. These factors include both implicit and unconscious biases, which can even be present among women themselves (Easterly and Ricard 2011).

Universities persist as gendered institutions, perpetuating the 'masculine ideal worker' stereotype linked to academic gate-keeping that hurts women and minorities, thereby impacting society and science (Ashencaen-Crabtree and Shiel 2019). What may seem like gender-neutral norms, such as hiring practices, salary negotiations, and tenure proceedings, are in reality gendered-biased (Hall 2010; Ford 2016). These norms were constructed based on an outdated male breadwinner model who works long hours without childcare responsibilities, which inadvertently places women with different life experiences at a disadvantage (Hall 2010; Ford 2016) and has led to the burnout of the academic staff (Forrester 2023). Additionally, academia often harbors gendered expectations on the roles women should undertake. Women are frequently perceived by colleagues, administrators, and students as the caretakers or 'academic mothers', due to the prevailing assumption they are inherently empathetic and caring (Aiston and Jung 2015; Hay 2016). Therefore, women are often expected to provide more pastoral services to students, perform more committee work without decision-making powers, and undertake more administrative tasks (Aiston and Jung 2015; Wasson *et al.* 2018; Docka-Filipek *et al.* 2023). Additionally, women can carry heavier teaching loads than men (Aiston and Jung 2015; Ford 2016; Gómez Cama *et al.* 2016). These responsibilities can hurt women's research productivity (Aiston and Jung 2015). Furthermore, pastoral, administrative, and teaching services often go unrecognized in terms of job promotion, as they are unrelated to research outputs (Ford 2016; Górska *et al.* 2021; Docka-Filipek *et al.* 2023). The performance and appearance of women are often subjected to harsher scrutiny by students (both men and women). Students hold high expectations for how academic women should dress and behave, often expecting them to fulfill emotional needs akin to those provided by a mother or girlfriend (Hay 2016; Ashencaen-Crabtree and Shiel 2019). Students' evaluations, which are highly valued in job promotions, have been found to judge women more harshly than men (MacNell *et al.* 2015; Mitchell and Martin 2018). These evaluations often display biases against women if students perceive that the instructor did not conform to their ideal of an 'academic mother' by not providing the

emotional support they expected (Hay 2016; Ashencaen-Crabtree and Shiel 2019). This is particularly concerning given that a larger proportion of women tend to occupy precarious positions (Ashencaen-Crabtree and Shiel 2019).

Women in academia can also feel compelled to constantly justify their presence, while also refraining from expressing dissatisfaction with work conditions for fear of retaliation (Acker and Armenti 2004). However, when women exhibit behaviors similar to men, they may be labeled as aggressive, difficult, rude, or irrational (Bentley and Garrett 2023). The policing of women's tone, including those in senior roles, can also discourage them from speaking up (Bentley and Garrett 2023). On the other hand, women's opinions and voices can often be dismissed compared to men (Settles *et al.* 2006). This can have a significant toll on women's physical and mental health (Acker and Armenti 2004). Especially considering that women may often endure worse workplace conditions, such as conflicts, gaslighting, marginalization, microaggressions, emotional labor, sexual harassment, isolation, and limited access to resources and mentoring. These conditions can significantly hinder women's career progression (Ashencaen-Crabtree and Shiel 2019; Ainslie 2023; Bentley and Garrett 2023). Yet, challenges to existing gender norms may result in backlash (Bentley and Garrett 2023). Hostile work environments can result in lower research outputs by women (Settles *et al.* 2006), and are among the primary reasons women leave academia, more so than work-life imbalance (Spoon *et al.* 2023). Sexual harassment is also a pervasive problem in academia, including in bioanthropology, and it has detrimental effects on women's careers and well-being (Clancy 2013, 2018; Clancy *et al.* 2014; Raff 2016; Wade 2019). For further insight, also see the chapter of Carvalho and collaborators in this book, who reported sexual harassment within the field of bioanthropology in Portugal.

The time allocated for research is not the sole factor that could potentially influence the productivity gender gap between women and men. Other biases and structural barriers related to the process itself, also play a significant role (Aiston and Jung 2015). For example, women are cited less frequently by men, who over-cite other men and themselves, while under-citing women (Andreou *et al.* 2022). This results in men having fewer collaborations with women (Andreou *et al.* 2022). In addition, women are less credited with authorship for their research contributions (Wasson *et al.* 2018; Ross *et al.* 2022). There is also a gender funding gap, as fewer women are the recipients of funding and awards. This disparity often reflects a less favorable assessment of women as researchers, which occurs irrespective of the quality of their proposal (Witteman *et al.* 2019). Also, women can receive fewer invitations to events than men. Turner *et al.* (2018) examined the number of women who were the first authors in communications at the AABA annual conference over the past 20 years, and the first authors on papers published in the American Journal of Biological Anthropology in 2016. Over the past 20 years, there has been an increase in the number of women as first authors in invited symposiums only in the subfields of genetics, paleoanthropology, and bioarchaeology, as well as in contributed talks and posters (Turner *et al.* 2018). Regarding the 2016 publications, 79% of women published on bioarchaeology, but for other bioanthropological sub-disciplines, the number of publications was either equal between men and women, or men published at a higher rate (Turner *et al.* 2018). The results show a level of inequality between genders, as while a higher percentage of AABA members are women, this is not reflected in research outputs (Turner *et al.* 2018).

In response to the issue of gender inequality, some professional anthropological associations have established dedicated committees. Two of the largest anthropological associations in the US, which also have international members and influence, are among them: the American Association of Anthropologists (AAA) and the AABA. The AAA established the Committee on Gender Equity in Anthropology in 1995 (originally named the Committee on the Status of Women in Anthropology) (Turner *et al.* 2018). The committee has since produced reports on gender and work climate (Wasson *et al.* 2008; Brondo *et al.* 2009). Furthermore, the AAA annually awards individuals whose work addresses gender disparities

(Turner *et al.* 2018). The AABA, founded in 1930, has had 48 presidents, of whom 11 have been women (AABA 2023a, 2023b). Notably, since the 2010s, most AABA presidents (6 out of 8) have been women (AABA 2023a, 2023b), indicating progress towards gender equity. The increase in the number of women serving as presidents in the AABA since the 2010s could potentially be linked to the formation of the Committee of Diversity (COD) in 2011, which subsequently established the Committee of Diversity Women's Initiative (COD-WIN) in 2014. COD-WIN aims to provide an official voice in AABA regarding women's professional concerns, training, and networking opportunities to early career researchers, as well as travel and child/elder care awards for conference attendance (Turner *et al.* 2018). Although steps have been taken towards addressing gender inequality, there is still considerable work to be done for bioanthropology to achieve true equity. This includes tackling issues such as the 'motherhood penalty', which will be discussed below.

The 'motherhood penalty': mothers as a marginalized group

Mothers often feel that their labor, expertise, and struggles are unrecognized, unheard, devalued, and (in)visible within the patriarchal system in academia and households (Vomvoridi-Ivanovic and Ward 2021; Guyotte *et al.* 2023). The dual demands of academia and child-rearing can leave mothers exhausted, with declining health and high levels of stress (Acker and Armenti 2004), especially when support systems are not in place through their partners, family members, and institutions (Comer 2006). This has given rise to the **negative stereotype** that mothers are less productive (Ainslie 2023). The early years of a child's life may **temporarily** impact a mother's productivity, networking, mobility, fieldwork, and travel opportunities (Lynn *et al.* 2018; Acker and Armenti 2004; Blithe 2022; Hodgkins and Thompson 2022; Torres 2023). However, studies have reported that over the span of their careers, mothers tend to be **more productive** than their childless colleagues (Joecks *et al.* 2013; Aiston and Jung 2015; Ainslie 2023; Torres 2023). Nevertheless, mothers have a lower chance to be hired for tenure track positions than fathers and childless scholars (Comer 2006; Ainslie 2023). Rivera (2017) witnessed discriminatory hiring practices against women, but not men, among junior faculty search committees at an undisclosed R1 university[3], going against discrimination laws and university policies. Preconceived biases led to the assumption that women in relationships would be less mobile and committed to work, due to stereotypes about motherhood (Rivera 2017). These assumptions persisted even when women did not have children. Further assumptions were made that women would prioritize their husbands' careers over their own, and thus it would be wasteful to offer the job to married women even when highly qualified for the position (Rivera 2017). When hired, mothers often face a pay penalty, and tend to occupy more precarious positions than childless women (Comer 2006; Correll *et al.* 2007; Kelly and Grant 2012; Jolly 2017; Doren 2019; Ainslie 2023). Mothers not only face a higher risk of demotion and of being fired, but they also hold fewer leadership positions, are presented with fewer opportunities, and are more likely to leave the profession (Cech and Blair-Loy 2019; Torres 2023). In addition, mothers are held to a "stricter performance standard" (Correll *et al.* 2007: 1320). The discrimination and biases mothers suffer are commonly referred to as the 'motherhood penalty' (Górska *et al.* 2021). Discrimination and biases steaming from the **false narrative** that mothers and pregnant women lack sufficient dedication to their work and research, and are perceived as less competent, a view also held by some women (Correll *et al.* 2007; Cech and Blair-Loy 2014; Rivera 2017; Górska *et al.* 2021; Blithe 2022). Given that mothers face greater penalties than childless women, Jolly (2017) advocated for the recognition of motherhood as a marginalized identity in its own right, considering motherhood is a major contribution to women's social and economic oppression and inequality.

[3] An R1 university is classified as a doctoral university with a very high research activity in the US, as defined by the Carnegie Classification®. More information available at https://carnegieclassifications.acenet.edu/

Due to the 'motherhood penalty', women may even find themselves hesitant to share the joys and challenges of motherhood, or even disclose their status as mothers (Acker and Armenti 2004). Almost equating motherhood to a taboo topic that is considered inadequate to be mentioned in academic circles (Acker and Armenti 2004). This reluctance can extend to the point of not using established policies such as paid leave, flexible arrangements or stopping the tenure time clock, steaming from fear that it may hinder their career (Acker and Armenti 2004; Comer 2006; Gerten 2011). Flexible work arrangements, or even just the mere perception of needing such arrangements, to attend to family or personal matters, are often seen through a negative lens (Cech and Blair-Loy 2014; Vomvoridi-Ivanovic and Ward 2021). This can lead to penalties, a phenomenon referred to as 'flexibility stigma', which can also affect men, but disproportionately affects mothers (Cech and Blair-Loy 2014). Hence, it is not surprising the reports indicate that fewer academic women are married, and have fewer children compared to academic men (Kelly and Grant 2012; Aiston and Jung 2015). Furthermore, women may plan the timing of their childbirth to minimize the disruption to the academic year and avoid potential backlash to their careers (Ollilainen 2019).

Conversely, fathers usually do not experience a 'fatherhood penalty', as they are often seen as more committed and productive in their work, which consequently leads to higher wages (Correll *et al.* 2007; Kelly and Grant 2012). While fathers today provide more childcare than their fathers did, households remain gendered spaces, where the majority of caregiving responsibilities and mental load still fall onto women (Comer 2006; Kelly and Grant 2012 Cech and Blair-Loy 2019). The differential treatment of mothers and fathers in academia is not solely related to the hyper-masculinization of the profession (Correll *et al.* 2007; Willey 2020). It is also influenced by the 'good mother myth', an ideology that perceives mothers as innate caregivers and nurturers, that can do everything alone on a self-sacrificing basis (Buzzanell and D'Enbeau 2009). Until recent times, the rearing of children was a communal responsibility. Our ancestors undertook childcare as a collective, besides mothers, ensuring the survival and societal integration of subsequent generations, playing a pivotal role in the continuation of our species (Hodgkins and Thompson 2022). However, in the majority of industrialized countries, the rearing of children is often at odds with economic and professional demands, and perceived as a 'nuisance' (Hodgkins and Thompson 2022) leaving mothers less supported.

Recommendations to empower mothers in academia post-lockdown

As described in the introduction, the Covid-19 pandemic brought an additional 'motherhood penalty' on top of the systemic discrimination and barriers academic mothers endure (Mavin and Yusupova 2020). Although the World Health Organization declared in May 2023 an end to the global health emergency phase associated with COVID-19 (Wise 2023), it will continue to have a long-lasting effect on the academic careers of mothers. Therefore, making even more visible the need to remove gender disparities in the scientific community (Noleto 2021). In academia, and subsequently, in bioanthropology, it is imperative to enforce professional ethics via a humanistic approach, empathy, collaboration, and empowerment. This should be rooted in the understanding that diverse life histories and paths can in the long run lead to fulfilling academic careers, as no single, predetermined path is inherently superior in the establishment of an academic career (Turner *et al.* 2018). However, meaningful changes will only occur when performed at the structural level through collective action, and not burden mothers with the expectation of simply working harder and being more confident (Hall 2010; Ford 2016; Ashencaen-Crabtree and Shiel 2019). It is crucial to ensure mothers receive the necessary support and are not subjected to either conscious or unconscious discrimination and biases. In this section, recommendations will be enumerated aimed at fostering a more equitable workplace environment for mothers in academia[4], which can be applied to bioanthropology:

[4] While the recommendations primarily address academic mothers, these can be applicable to all to a certain extent.

- **Support academic mothers by actively listening to their needs without judgment.** Understanding their specific needs at any given time can help establish the support system essential for mothers to thrive in science.
- **Hiring committees should give less weight to letters of recommendation during hiring procedures.** Letters of recommendation have been found to exhibit unconscious bias and stereotypes (Easterly and Ricard 2011), which can negatively impact the hiring of mothers.
- **Re-entry policies should be in place and enforced to assist mothers who are rejoining the workforce**, after spending the initial years of their children's lives and having less time for research.
- **When hiring, particularly for temporary contracts, the implementation of remote work should be considered if daily in-person attendance is not necessary**. Remote work can prevent mothers from being continually uprooted from their support communities and less financial burdens. Burgio *et al.* (2020) proposed 10 guidelines drawing from their experience as remote postdocs and principal investigators. The guidelines by Burgio *et al.* (2020) primarily emphasized the importance of a well-structured work plan, advocating for constant communication and full integration of remote postdocs into the research team and network opportunities.
- **Annual mandatory anti-bias training** should be provided to faculty, administrative staff, deans, and departmental chairs (Easterly and Ricard 2011; Gerten 2011). This is especially crucial for hiring committees for a fairer hiring procedure (Ford 2016; Rivera 2017).
- **Teaching schedules of mothers should align with the times their children are at daycare or school.** However, contingency plans should be in place, and technology should be provided to enable mothers to teach remotely, when necessary (Comer 2006), such as in instances when their child is sick.
- **Provide affordable, high-quality, and safe childcare services** onsite, or assist with subsidies for off-campus childcare, when such services are not subsidized by the government (Fulweiler *et al.* 2021).
- **Mothers on the tenure-track, especially post-lockdown, should be evaluated holistically** using more diversified criteria, such as contributions to departmental culture through pastoral services (Fulweiler *et al.* 2021). Tenure and promotion files should also include a statement addressing the inequalities mothers faced during the pandemic, which affected their productivity. This statement should be taken into consideration by the evaluation committee (Fulweiler *et al.* 2021).
- **Transparent and inclusive mentorship practices**, with mentors that support different lifestyles, personal choices, and family matters through open communication (Fulweiler *et al.* 2021). McGuire and Reger (2003) proposed a co-mentorship model that emphasizes cooperative relationships, in addition to the traditional mentoring system led by someone of a higher rank. This model fosters a healthier workplace environment by reducing dependency on a single mentor for both academic guidance and personal development, outside hierarchies based on rank, gender, and research fields. The co-mentorship model is particularly beneficial for marginalized individuals, and those who struggle to access or are excluded from informal academic networks (McGuire and Reger 2003).
- **Mentoring connections among mothers can be forged through formal and informal mechanisms**. For example, through happy hours, women's lunches, mentorship programs at professional associations, virtual networking events, and mentoring pairing programs at the departmental and faculty levels (Monroe *et al.* 2014; Turner *et al.* 2018; Bentley and Garrett 2023). In line with this, Turner *et al.* (2018) suggested the creation of a mentor training program by the AABA, aimed at enhancing individuals' mentorship skills and effectiveness.

- **Supporting mothers entails mentors actively incorporating their mentees into research team activities, interactions, and collaborations.** Mothers should also be encouraged and motivated to pursue awards (Fulweiler *et al.* 2021).
- **Mentors should be well-versed in policies impacting mothers**, which will equip them to guide their mentees through the system (Fulweiler *et al.* 2021).
- **Institutions should support making fieldwork more family-friendly, and accessible to mothers**. This can be achieved through financial and support structures provided by institutions and funding bodies. For example, institutions and funding bodies could cover childcare costs, travel expenses for family members, and fund shorter, more frequent fieldwork trips (Jenkins 2020).
- **Conferences should be made more family-friendly for mothers and caregivers by establishing an experienced committee** (Calisia and a Working Group of Mothers in Science 2018). The committee should ensure: 1) financial support for onsite childcare or the travel and housing of caregivers (such as family members or nannies); 2) suitable, clean, private, safe and comfortable lactation rooms equipped with a refrigerator and lockers; 3) a policy that accommodates families and discourages discrimination against mothers; 4) the organization of events during regular working hours when children are typically in daycare or school; 5) flexibility for parents to select their presentation time during early registration; 6) the organization of social network groups for mothers; 7) allow children to be present during networking events; 8) discounted conference fees for mothers that cannot attend the full event; 9) virtual attendance options (Calisia and a Working Group of Mothers in Science 2018; Fulweiler *et al.* 2021; Coombs 2023).
- **Double-blind review process for funding schemes and publications.** This process keeps the authors' biographical data unknown to the reviewers, helping to mitigate the influence of stereotypes and preconceptions against mothers in grant evaluations. As a result, reviews are more likely to focus on the scientific merit of the proposal (Andreou *et al.* 2022). A double-blind review process also increases the number of publications by women (Andreou *et al.* 2022).
- **Allocation of funds by universities and funding agencies to cover parental leave** for the principal investigator, post-doctoral researchers, and postgraduate students (Fulweiler *et al.* 2021).
- **Invite mothers to serve on the editorial boards of journals and scientific boards of professional societies** (Fulweiler *et al.* 2021).

Conclusion

Adherence to sexist belief systems, whether conscious or unconscious, does not benefit science or society at large. Given that these are constructed belief systems, they are not immutable or biologically predetermined. Therefore, they can be deconstructed and reimagined. It is essential to relinquish these entrenched belief systems in order to pave the way for a future guided by equitable values in academia. This shift will not only enrich the lives of academic mothers but also of the communities we engage with, and the next generation we are raising. Few studies have explored the challenges faced by bioanthropological mothers, particularly of BIWOC mothers. Thus, there is a need for more comprehensive research on this topic to better support mothers' career advancement.

Acknowledgments

This chapter is dedicated to all the scientist mothers struggling at the moment. To Julia who brightens my path in this world. My thanks to Francisca Alves Cardoso for her comments that helped improve this manuscript. I remain hopeful that an equitable system can be achieved in science, fostering a better world for mothers and our children. My faith in humanity remains unshaken.

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Chapter 18

Conclusion - Ethical discourses in biological anthropology: what does the future hold?

Vanessa Campanacho and Francisca Alves Cardoso

Biological anthropology has been undergoing a profound transformation. This change is not only due to the emergence of new methodologies and technologies but also due to a paradigm shift. The ongoing ethical discussions in various scientific venues, such as conferences, workshops, and publications, are largely responsible for this shift (e.g., Clancy *et al.* 2014; Passalacqua and Pilloud 2018; Turner *et al.* 2018; BABAO 2019; BioantTalks *et al.* 2021; Williams *et al.* 2021; Jackson *et al.* 2023). This book contributes to this discourse by delving into key topics within the curation and display of human remains, digital ethics, research and education, and professional issues.

Within the paradigm shift of the discipline ethical discussions, the acknowledgement of past wrongdoing by past key figures of the discipline of physical anthropology (now re-named biological anthropology) has been a major driving force for the reprisal of scholarly relationships with living and past communities, as well as *Homo sapiens* relationship with other living organisms and environment. The discipline name change is in itself an acknowledgement of a more inclusive, reflexive and critical discipline. Past scholarly work was a product of its time and initially rooted in racist and eugenic ideologies, as explored by some of this book's contributors[1]. Examples given include the biased craniometric analysis and collection of the remains of marginalized individuals without their consent and the constitution of scientific collections, such as those built by Samuel George Morton and similar anatomical school (Gould 1996; Muller *et al.* 2017; Lans 2018; Campanacho *et al.* 2021; Dunnavant *et al.* 2021; Williams and Ross 2022). Repatriating human remains is a crucial step in addressing and healing some of these past wrongdoings. Repatriation involves the returning of human remains to descendant communities, particularly of individuals from socially and/or economically marginalized groups who did not provide consent to be added to scientific collections. The repatriation process can positively impact descendant communities and societies, as it may aid in reconciliation, justice, and healing of generational trauma (Colwell 2019). For example, Chapter 2 by Heli Maijanen outlines the repatriation of the remains of the Sámi to their descendant communities in Finland.

It is not solely a matter of reckoning with past collection practices. Although the repatriation of individuals is a fundamental step towards reparation and an ethical appraisal of past collections and associated events (e.g., Dartmouth 2023; Marcus and St. Thomas 2023). Moreover, it is equally important to establish newer collections grounded on an ethical framework, avoiding incurring unintentional harm to family members still alive, as well as the overall community. This is applicable, for example, in the case of modern cemetery-based collections in which some legal systems allow for the creation of such collections without individuals' and/or living relatives' consent (Alves-Cardoso 2019; Alves-Cardoso and Campanacho 2021). It is important to establish future collections of human remains within a legal and ethical framework that focuses on the consent and trust of the communities involved, as exemplified by the donated collections in forensic taphonomic research centers (Campanacho *et al.* 2021; Gocha *et al.* 2021; George *et al.* 2022). Furthermore, the ongoing revision of curation practices is fundamental to uphold ethical standards, as discussed by Campanacho in Chapter 3 for poorly preserved individuals,

[1] For more information on the history of the Morton Collection and craniometric analysis, please see Chapter 14 by Sarah Poniros. For insights into past and current anatomical practices, consult Chapters 2 and 15, respectively by Heli Maijanen and Amy Beresheim.

and by Winter and Dyess in Chapter 4, on the medico-legal context. In addition, current anthropological research can also be a bastion to amplify the voices of communities that have endured hardships for generations. This is exemplified in Chapter 10 by Plens and Delgado. Through dialogue, Plens and Delgado honor and respect the native voices, using their anthropological research as a tool for justice and the recognition of the rights of two Brazilian indigenous communities. All of these efforts will, in turn, continue to have profound positive societal impacts and foster a more trustworthy relationship between all those actively engaged, whether from academia or society.

As already emphasized, legal aspects were also a prevalent topic in this volume. Institutions and researchers must uphold laws and regulations concerning the curation, treatment, and research of human remains and living individuals. Law and ethics can influence each other, but they are essentially different concepts. Therefore, compliance with the law and regulations does not necessarily equate to following ethical conduct, as highlighted above and in Chapters 4 and 6 by Winter and Dyess and Winter *et al.*, respectively. In such cases, rather than considering the letter of the law, one should follow the spirit of the law, allowing for a more community/personal-based approach to studying, collecting and applying science within the discipline of biological anthropology. Most importantly, a "do no harm" overarching approach should be key. Such an approach would fit the guiding principles of respect and dignity of researchers studying human remains and their communities, as expressed in this volume by many authors.

Another key point in this volume was the thoughtful consideration of the terminology and imagery employed by the authors when discussing ethics in biological anthropology. Words and images wield power, and depending on their message, they can either uphold or discriminate against individuals. Terms that evoke humanity should be the basis of anthropological writing and research, including when referring to human remains (Carlina Maria de la Cova, personal communication 2022). This careful use of terms and imagery should also exist outside academic circles. Our identity as researchers is deeply intertwined with a digital presence that extends across various platforms in public forums such as news outlets and social media, as explored by some of the contributors of this volume. Consequently, the choice of language and the creation and sharing of images, including three-dimensional replicas of human remains must be carefully considered not to evoke morbid and sensationalistic narratives, and further exploit marginalized groups. The goal is to educate while simultaneously ensuring the dignity and respect of the individuals under study and their respective communities, as discussed in Chapters 5 to 9.

Finally, the book touched on the fact that the current ethical discussions extend beyond the realm of research, teaching, and collection practices, also permeating workplace conditions in academia. Professional ethics is of paramount importance, particularly considering the challenges posed in workplaces that could potentially negatively impact careers, mental health, and scientific outcomes (Baer 1995; Settles *et al.* 2006; Antón *et al.* 2018; Ashencaen-Crabtree and Shiel 2019; Ainslie 2023; Bentley and Garrett 2023; Spoon *et al.* 2023). Hence, there have been calls for fostering equity in academia, which would involve structural changes in hiring procedures and support systems. This volume also addresses some of the professional issues academics may face, by shedding light on challenges academic women may encounter, such as the discrimination faced by mothers (Chapter 17) and those who have experienced sexual abuse (Chapter 16).

Ethical discourses in biological anthropology and associated fields have only just begun. Especially in light of the fast development of technologies that introduce new ethical issues, such as ancient DNA, as explored in Chapters 11 and 12 by Raimundo and Okumura, and Lee and Shin, respectively. As students and professionals unite in bringing more ethical and humanistic practices– especially in service to the individuals anthropologists study and their communities– this will greatly transform biological anthropology.

So, what does the future hold? Change. In a decade, our discipline will operate in different modes than it does today: may it be due to technological development, a more inclusive and critical consciousness of the self and humans' interconnection with each other and the environment, and/or a more acute ethical responsiveness of our actions and contributions as humans and scientists. So, what we should also be asking ourselves is: What will my main contribution be to this change?

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