

# Intersectionality and trauma analysis in bioarchaeology

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## Abstract

Intersectionality, the theory named by Kimberlé Crenshaw, outlines how multiple elements of an individual's social identity overlap to create and preserve societal inequalities and discrimination. Recently bioarchaeology's engagement with intersectionality has become increasingly explicit, as the field recognizes the lived experience of multiple axes of an individual's identity. Evidence of trauma can remain observable in an individual's skeleton for years, making it an ideal subject of study for intersectional analyses in bioarchaeology. Using contrasting case studies of two individuals who died in hospitals and were unclaimed after death, we explore the theoretical and methodological application of intersectionality to investigations of accidental and interpersonal trauma. Differences in identities and structural inequalities affect bone quality and health outcomes. As we demonstrate, a broken bone is the intersecting result of biological, histomorphological, sociocultural, and behavioral factors. This approach allows for a better acknowledgement of the inherent complexity of past lives, elevating and amplifying previously silenced voices. In this way, intersectionality in bioarchaeology demands social justice.

## KEYWORDS

context, fracture, identity, institution

## 1 | INTRODUCTION

Bioarchaeology explores the lives of past peoples through multidisciplinary scientific investigation of their skeletal remains. There have been significant advances in the discipline since the term bioarchaeology was coined by Jane Buikstra in the 1970s, including more nuanced approaches of understanding that move beyond binary comparisons of male/female (Agarwal & Wesp, 2017; Geller, 2016) and urban/rural (Betsinger & DeWitte, 2020; Klaus et al., 2017). Complicating, problematizing, and questioning what we think we know about past lives demonstrates our respect to the individuals whose remains we have the privilege of studying and our commitment as a field to social justice. Intersectionality theory recognizes that individuals have multiple dimensions to their social identities (e.g., social race, gender, age, socioeconomic status), which overlap and interact to create and preserve societal inequalities and discrimination (Collins, 2015; Crenshaw, 1989).

The theory originated in Black feminist and law scholarship as a means of framing and understanding the unique experience of Black women in the United States (Crenshaw, 1989, 1991). Responding to what sociologist Patricia Collins describes as the acceptance and “institutionalization of intersectionality” (2015, p. 6) in the academy since the early 2000s, represented by numerous publications, conferences, and courses, and calls by scholars such as Maria Franklin (2001) to incorporate Black feminist theory into social archaeological questions, bioarchaeology's engagement with intersectionality theory has become more explicit in recent years (Boutin, 2016; DeWitte & Yaussey, 2020; Torres-Rouff & Knudson, 2017).

In this article, we aim to provide a critical review of the concept of intersectionality and its application to trauma interpretation in bioarchaeology using two case studies of individuals from differing geographical and temporal contexts. Both are persons of low socioeconomic status who died in public hospitals, whose skeletons

demonstrated injury recidivism—two or more injuries with a mixture of antemortem healed, healing, and/or perimortem trauma—and whose remains were unclaimed after death. The first, a male from the Robert J. Terry Skeletal Anatomical Collection, has detailed individualized contextual information, which contrasts with an unclaimed female individual from the Royal London Cemetery (curated by the Museum of London Centre for Human Bioarchaeology). The two cases illustrate the possibilities of using an intersectional analysis to deepen our understandings of past lives by examining trauma. We explore theoretical and methodological applications of intersectionality to investigations of accidental and interpersonal trauma, circumstances with the potential to affect all human communities both past and present. Our goal is to provide an intersectional framework that bioarchaeologists can utilize and illustrate the ways this is aligned with current clinical practice and socio-cultural studies.

## 2 | DEVELOPMENT OF INTERSECTIONALITY

Intersectionality developed from the foundational work of Black feminist scholars in the 1960s and '70s, leading to Kimberlé Crenshaw naming the theory and using it to explore the unique, “multiply-burdened” position occupied by Black women in the United States (Crenshaw, 1989, p. 140, 1991; Collins, 1998, 2003). Patricia Collins notes that “intersectionality is not simply a field of study to be mastered or an analytical strategy for understanding; rather, intersectionality as critical praxis sheds light on the doing of social justice work” (2015, p. 16). It is not enough to use the term; this theory demands the user think intersectionally about the power differentials inherent in society (Cho et al., 2013).

Said, 1983, p. 227), speaking of literary theories, discussed the mutability of theory and its ability to travel between disciplines; as a theory shifts environments, it can be “transformed by its new uses, its new position in a new time and place”. Intersectionality has certainly traveled, but perhaps uncritically; Kimberlé Crenshaw has noted that she does not recognize the use of the term in many works which cite her foundational papers (Guidroz & Berger, 2009). Thus, it is not enough to “add intersectionality and stir”; there is a distinct need to use the theory in research projects that appreciate the complexity of intersectionality (Collins, 2015). Hancock (2007a, 2007b) discusses intersectionality as a research paradigm, one that has particular “attentiveness to causal complexity” (2007a, p. 251), and can be used to study the complex identities of groups including, but not limited to, women of color. Bowleg (2008) emphasizes that regardless of the methods being used, researchers must not only comprehend the contexts of the persons they study, but they should “[interpret] their data within the context of sociohistorical and structural inequality” (p. 321). People may negotiate and navigate a range of circumstances, but not every part of a person's identity is inherently relevant to each situation they face (Collins, 1993).

## 3 | BIOARCHAEOLOGY AND INTERSECTIONALITY

Bioarchaeology recognizes the complex lived experience influenced by multiple axes of individuals' identities; the field is ideally situated to make powerful contributions as a tool of social justice. Human skeletal remains can provide rich datasets concerning stress, health, and disease; previous engagements with biocultural contextualization (e.g., Agarwal & Glencross, 2011; de la Cova, 2010, 2011, 2012; Goodman, 1998; Gowland & Knüsel, 2006; Harrod et al., 2013; Martin et al., 2013; Scott & Buckley, 2010; Stone, 2016; Zuckerman & Armelagos, 2011; Zuckerman & Martin, 2016) demonstrate both a willingness and ability to appreciate the intertwined biological and cultural aspects that affect individuals. Grauer (2012) has argued that paleopathologists need to move beyond a processual theory approach that equates pathological lesion frequencies in skeletal samples with status and health without consideration of cultural and sociopolitical context. This limited theoretical engagement denies the complexity of embodied lived experiences. The biocultural perspective recognizes the interplay of biology and culture in humans' responses to stress (Armelagos et al., 1976; Goodman et al., 1988). Intersectionality extends biocultural understandings of past lives by engaging with multiple axes of identity, stress, and inequality when they can be ascertained and recognizes these “distinctive dynamics at their multi-dimensional interface” (MacKinnon, 2013, p. 1019). Boutin (2017, p. 400), however, cautions that we should avoid projecting contemporary ideals of identity, such as age, sex, and status, into the past or assume they “were salient in a society so distant in time and space from our own.”

Bioarchaeologists have increasingly addressed the aspects of individual embodied identities that may be understood from the analysis of human skeletal remains with associated context (e.g., Agarwal, 2016; Boutin & Callahan, 2019; Buikstra et al., 2011; de la Cova, 2011, 2012; Harrod & Stone, 2018; Meskell & Joyce, 2003; Stodder & Palkovich, 2012). Discussions of the life course, with a focus on age as an aspect of identity (Gowland, 2006, 2017; Sofaer, 2011), gender (Geller, 2008, 2009; Hollimon, 2011; Perry & Joyce, 2001; Sofaer, 2006), ethnogenesis (Hu, 2013; Klaus & Tam Chang, 2009; Stojanowski, 2005; Sutter, 2009), marginalization (de la Cova, 2019; Mant & Holland, 2019; Zuckerman, 2017), structural violence (de la Cova, 2017; Klaus, 2012; Knüsel & Smith, 2014; Martin & Harrod, 2015; Pérez, 2012; Watkins, 2018) and personhood (Boutin, 2016) enrich the discussion of past lives. The intertwinings of these identities, such as age with gender and socioeconomic status (Gowland & Thompson, 2013), represent steps toward a more explicit engagement with intersectional analyses.

In recent years, intersectionality has been applied in bioarchaeological research to untangle the effects of factors such as diet, childhood stress, and occupational hygiene upon past individuals' health (e.g., Dent, 2017; Gowland et al., 2018; Hughes-Morey, 2016; Ives & Humphrey, 2017; Newman & Gowland, 2016). However, few works explicitly name and foreground the principles of intersectionality theory (e.g., Byrnes, 2017; Torres-Rouff &

Knudson, 2017; Yaussy, 2019). These recent investigations demonstrate the importance of an intersectional approach that places value on understanding the interactions between, for example, status, the cultural construction of identity, frailty, and disability. Zuckerman and Crandall (2019) review the concept, highlighting the interpretive depths that may be plumbed when the intersections of biological sex, gender, sexuality, health, and disease are considered in bioarchaeology. Geller (2016) cites intersectionality as a means of engaging clearly with feminist theory moving bioarchaeologists “beyond essentialized or deterministic presentations of Woman” (p. 146). Kjellström employs an intersectional approach to analyze violence in medieval Sweden, teasing apart the contributions of gender, age, and status to violence-related injuries recorded in the skeleton. She notes the critical importance of incorporating historical context and material culture, since “making a social analysis of a sample out of context is meaningless” (2013, p. 239).

Furthermore, bioarchaeological research is embedded in its own social and political context, which may create additional intersections that the researcher must factor in. Scholars must be knowledgeable of not only the origins of the individuals they study, but their actual physical origins and contextual factors that resulted in their amassment. These aspects qualify as additional intersections that must be considered when examining past and historical groups. For example, de la Cova (2019, 2020), Watkins (Watkins, 2018; Watkins & Muller, 2015), and others (Hunt & Albanese, 2004; Muller et al., 2016) acknowledge the marginalized individuals who comprise the key American anatomical collections upon which biological anthropology has built its reporting standards. While bioarchaeological interpretation will never be comprehensive, since we “face bones, not people” (Fahlander, 2012, p. 139), an intersectional approach allows for a better acknowledgement of the inherent complexity of lived lives. Use of this theory elevates and amplifies the voices of those who have been silenced, recognizing the complexity of past lives and highlighting bioarchaeology's opportunity to engage in social justice.

#### 4 | COMORBIDITIES: INTERSECTIONAL IDENTITIES WRITTEN IN BONE

Intersecting factors and structural inequalities can impact not only physical health, but osteological health. The effects of structural inequalities on health outcomes is an area of great clinical interest as complex social interactions have repercussions on both physical and mental health (Bowleg, 2012; Hinze et al., 2012). Studies in population health (Bauer, 2014), sociology of health (Sen & Iyer, 2012; Veenstra, 2011), epidemiology (Marcellin et al., 2013a, 2013b), and psychology (Stirrat et al., 2008) have employed an intersectional approach to understanding health, acknowledging that not all aspects of an individual's social identity will equally influence their health outcomes. This is especially true of fracture trauma, which can be the intersecting result of biological, histomorphological, sociocultural, and behavioral factors.

Bone records subtle details about an individual's life. Indeed, at a microscale there are variations found in bone due to multiple intersecting aspects of individuals' identities. Sexual dimorphism in osteon size has been described in several studies as a potential proxy for increased body mass and physical activity in males (Dominguez et al., 2016; Mulhern & Van Gerven, 1997), though this has not been found universally (Pfeiffer et al., 2006; Stout & Lueck, 1995). Stout et al. (2019) reviewed the sexual dimorphism found in radial expansion and trabecular bone loss with age, finding that male maintenance of structural bone strength likely influences the lower incidence of male osteoporotic fractures. Studies of bone quality and microstructure with increasing age underline the fact that aging bones do not remodel with the same mechanical benefits as youthful bone (Martin, 1993) and osteon size tends to decrease with age (Stout et al., 2019). Accumulating microdamage in aging bone affects loading potential and fracture risk (Stout et al., 2019). Schlecht et al. (2012) found a difference in osteon size between those with full mobility in comparison to quadriplegic individuals. Beyond age, biological sex, potential disability, and various biocultural factors also influence an individual's bone health, including pregnancy and breastfeeding, as well as lifestyle choices (e.g., exercise, smoking, drinking) (Agarwal, 2008).

Bone health has a complex interplay with multiple aspects of an individual's identity. The foundations for long-term bone health are initiated upon conception and continue throughout the life course (Pawley & Bishop, 2004). The relationship, for instance, between vitamin D levels and fracture risk is complicated. Clinical investigations of osteoporosis and vitamin D deficiency have produced mixed findings (Lockau & Atkinson, 2018). Clinically, the vitamin D status of a person is assessed by measuring serum 25-hydroxyvitaminD (25(OH)D) levels. These are widely considered to be the best measure of nutritional status, with a half-life of 2–3 weeks, but this remains a relatively narrow window and an indirect measure of bone health (Jones et al., 2015). Vitamin D deficiency has been linked to a variety of socioeconomic and cultural factors (see Brickley et al., 2020, Boxes 5–2), including: child abuse or neglect (Hutchinson, 2008); high socioeconomic status (Hutchinson & Stapleton, 1924); and cultural differences in clothing and outdoor activities (Brickley et al., 2014). Ryan et al. (2012) found a relationship between lower bone mineral density and vitamin D deficiency with increased risk of forearm fracture in African American children, noting a range of potential risk factors for this understudied group in contrast with white children, including low daily intake of dairy products (fortification of milk is mandatory in the United States; Jones, 2018) and calcium as well as higher body mass index.

New literature suggests a link between traumatic events, psychological stress and the increased risk of fractures (Möller et al., 2009; Pedersen et al., 2016; Yu et al., 2012). For example, Jiang et al. (2018), in a Denmark population-based cohort study, found a relationship between posttraumatic stress disorder and increased fracture risk to the neck, spine, pelvis, shoulder, humerus, forearm, hand, wrist, and femur. The relationship among psychosocial constructs and progressive frailty in older adults is under investigation; studies suggest that

perceived control and psychological well-being mediates the effects of chronic stress (Gale et al., 2014; Mooney et al., 2018). Stout et al. (2019) detail the effects of infections, cancers, remodeling imbalances, metabolic disorders, and collagen disorders on bone's histomorphology and resulting ability to handle mechanical stress. Chronic health challenges can "[change] the material properties associated with bone's internal histological structures" (Stout et al., 2019, p. 125), affecting cell activity and intrinsic strength. Compromised and chronic elevated immune responses both have negative effects on bone healing, such that individuals who are HIV-positive and those with lupus, rheumatoid arthritis, or diabetes can suffer from impaired fracture healing (Al-Sebaei et al., 2014; Briot et al., 2017; Claes et al., 2012; Kayal et al., 2007; Richardson et al., 2008). Older individuals are more likely to suffer nonunion and fracture healing tends to be slower than in younger individuals (Baht et al., 2018). Further, biocultural behavioral factors such as poor diet, alcohol consumption, smoking, and lack of exercise also increase the risk for fracture (Keyes et al., 2011; Stults-Kolehmainen & Sinha, 2014; Torres & Nowson, 2007).

## 5 | TRAUMA

Skeletal trauma results from the interaction of multiple aspects of identity, reflecting relationships between bone quality at a microstructural level, an individual's physical and mental health, lifestyle choices, and forces in the physical environment. Since evidence of trauma may remain observable in the skeleton for many years following an incident, skeletal trauma is an ideal way to approach intersectional theory in bioarchaeology. Trauma may be represented by one acute incident (appearing in the skeleton as antemortem or perimortem trauma) or by repeated insults (multiple antemortem traumata or a mixture of antemortem and perimortem trauma). Studies of violence are numerous in bioarchaeology, discussing the effects of warfare, interpersonal, and ritual violence on individuals' bodies in varied geographic and temporal contexts (e.g., Knüsel & Smith, 2014; Martin et al., 2012; Redfern, 2016; Smith, 2017; Tung, 2012; Walker, 2001). Violence is "a form of intersectional discrimination" (Kjellström, 2013, p. 239),

because violence is multifaceted and may be motivated by multiple aspects of an individual's identity. The culturally mediated relationship between gender and violence is acknowledged in bioarchaeological work taking a biocultural approach (Martin & Harrod, 2015). Martin et al. (2010), studying Ancestral Pueblo remains from La Plata Valley, discovered differing patterns of nonlethal cranial trauma in the female skeletal sample. These differences, when considered alongside mortuary treatment and enthesopathies—changes in muscle attachment sites—suggested the presence of two distinct groups of women occupying the same space, one local and one captive. The authors note that "violence is highly relational...and it depends on context, sex, age, life history and social status" (2010, p. 15). Hollimon (2017) highlights the potential of identifying nonbinary genders in the bioarchaeological record by examining trauma in sexed skeletons. Individuals displaying trauma patterns more commonly found in another sex's context (e.g., sexed males showing female trauma patterns) may provide clues as to cultural concepts of the individual's gender in their society. Appreciating the skeletal evidence of differential access to resources, unequal workloads, and structural violence burdening some members of a society due to their gender and/or status is a key contribution of bioarchaeological trauma analyses and represents a move toward more consistent engagement with intersectional theory. After all, bones do not always break due to intentional violent incidents. Accidental trauma can be equally revealing of an individual's intersecting identities, particularly in reference to their lifeways and access to health care (Mant, 2016, 2019, 2020).

## 6 | FRAMING INTERSECTIONALITY ANALYSIS WITH SKELETAL COLLECTIONS

Four key steps that can be employed to successfully investigate intersectionality across a range of bioarchaeological studies have been identified (de la Cova, 2020). This cross-disciplinary methodological approach incorporates anthropological, biological, historical, and sociopolitical lines of data and may be applied to skeletal samples with varied levels of individualized contextual information (Table 1). Beyond these four steps, it is critical to cite the foundational literature

**TABLE 1** Intersectional approach to skeletal collection analysis (after de la Cova, 2020)

Step	Action and dataset(s)
1—Research and determine cultural, social, political, and historical context	Grave goods, material culture, folklore, mortuary treatment, newspapers, historical documents, censuses, knowledge of nearby regional sites (including paleopathological, biometric, DNA, isotopic data)
2—Blinded biological and palaeopathological assessment of the skeleton(s)	Skeleton(s)
3—Unite contextual information with skeleton(s)	Age, biological sex, socially ascribed gender, ancestry/population group/origins/culture (or socially ascribed race), socially ascribed status, and all other additional demographic information that can be ascertained from mortuary context is recorded and reassociated with the individual(s)
4—Palaeopathological and statistical analyses	Incorporation of critical data associated with the cultural, environmental, and sociopolitical contexts; researcher can see patterns in the data moving beyond the paleopathological into the social

of intersectionality, amplifying the voices of the Black feminist scholars who originally named and developed the theory (e.g., Collins, 2003; Crenshaw, 1989, 1991). Further, collaborating with scholars of varied backgrounds enriches the discourse surrounding past lives, particularly those affected by marginalization.

Understanding, as comprehensively as possible, the context in which an individual lived (Step 1) is critical to formulate hypotheses on the above intersecting variables. While this framework is based upon the study of anatomical collections—where age, sex, social race/ancestry, and social status at death are known—analyses of trauma presence and distribution may be still completed using individuals from an archaeological or historical context prior to ascertaining a biological profile and other intersecting variables. In this way, the researcher's findings are unbiased during the blinded assessment of the skeleton (Step 2). All demographic information that can be ascertained is then recorded and reassociated with the individual (Step 3) before the lines of data are united for final analyses (Step 4). When the skeletal analysis is paired with the broader contextual information a richer picture emerges of past individuals that allow us a better approach in understanding a person's lived experience.

These steps were undertaken in the analysis of the following two case studies of individuals of low socioeconomic status with evidence of multiple traumatic incidents who died in public hospitals and were unclaimed at death. Despite differing geographies, temporal periods, and contrasting amounts of individualized contextual information, the analysis of the multiple intersecting axes of these individuals' identities underlines the strength of bioarchaeology in uncovering details of past lives.

## 6.1 | Case Study 1 Robert J. Terry skeletal anatomical collection

de la Cova's (2010, 2011) original studies on trauma among African American and white males in the Hamann-Todd Human Osteological Collection and Robert J. Terry Skeletal Anatomical Collection, although not explicitly stated, utilized an intersectional approach to comprehend differences in trauma among these two groups. This was facilitated through multidisciplinary methods utilizing skeletal analyses, historical/documentary research, and sociocultural context to examine the impact social race and culture had on trauma patterning. Results illustrated that white males had more fracture trauma, with patterning suggestive of ritualized boxing or interpersonal violence. African American males contrasted with significantly fewer bone fractures, but higher rates of interpersonal violence associated with gunshot trauma (de la Cova, 2010). A further examination of the birth origins of the sample revealed that most of the African Americans were Southern in-migrants associated with the Great Migration (de la Cova, 2010, 2011). Historical research revealed that Southern-born African Americans were used as strikebreakers during this era, especially in Cleveland, Ohio and St. Louis, Missouri, the towns associated with the Hamann-Todd and Terry collections.

These differences would not have been observed had an intersectional approach that factored in social race, birth origins, historical context, and sociopolitical climate not been taken. This theoretical application can be utilized further to better understand the social circumstances, via an osteobiography, that resulted in trauma presence and fracturing patterning in one male from the Terry Collection (Table 2).

TC 361, a white Missourian male referred to hereafter as JL, had multiple instances of trauma, with clear evidence of recidivism (Table 2). While it cannot be ascertained exactly when each of JL's fractures occurred, his actively healing rib fractures are clear evidence of recidivism (Mant, 2019). Furthermore, his trauma patterning suggests evidence of interpersonal violence, including his nasal, maxilla, zygomatic arch, ribs, and fifth metacarpal fractures. However, his linear cranial fractures are indicative of blunt force trauma and possibly caused by "direct impact with an object, such as a weapon used in assault or a portion of an automobile frame during an accident" (Galloway & Wedel, 2014, p. 138) or may have resulted from an accidental fall or forces applied to other parts of his head. JL's rib and metacarpal trauma may have also been caused by interpersonal violence or an accident, such as a fall.

Knowledge about JL's historical context allowed for a cross-disciplinary intersectional analysis, which provided comprehensive information about his lost identity and shed light on his injury recidivism. A complex picture of his life emerged that revealed how personal tragedies and drug dependence resulted in his repeat trauma and death. Morgue and death records indicate that JL was a 67-year-old divorced male born in Missouri in 1859. He died in St. Louis City Hospital #1 from delirium tremens, with bronchopneumonia listed as a contributing factor. Two key intersecting factors in JL's life are revealed: first, he struggled with substance abuse—delirium tremens is a withdrawal symptom of alcohol dependence. Second, he died impoverished in the public hospital for poor whites and was unclaimed at death.

Historical records and local newspapers revealed that although JL died impoverished he was not born poor. His family resided in the rural St. Louis County town of Clayton, Missouri. JL's father, a farmer, was posthumously described as "one of the most prominent citizens of the county" (St. Louis Republic, 1897, p. 1), wealthy in property. JL's father's death appears to have triggered a lifetime of family conflict. A rift developed between JL and his older brother Bennett; the hostility erupted into violence on Sunday, October 24, 1897, when Bennett attempted to kill his mother by shooting her twice while under the effects of alcohol (St. Louis Post-Dispatch, 1897a, p. 10). Neighbors implied that the matriarch's shooting was the result of a "quarrel between the family over the management of the property" (St. Louis Post-Dispatch, 1897b, p. 5). The family's matriarch survived this incident, disinheriting Bennett and indicating that her wealthy estate and land be divided between her remaining sons, with each receiving one-fourth, and her two grandchildren one-eighth (St. Louis Republic, 1898).

After this family drama was settled through Bennett's arrest and brief imprisonment, JL resurfaced in the newspapers the next year,

**TABLE 2** Trauma patterning recording in case studies

Collection	Location	Injury stage
Terry Collection 361	Linear fracture radiating from the left temporal squama into the parietal bone	Healed
	Bilateral nasal bone fractures	Healed
	Right maxilla and the right nasal bone: resulted in impaction and lateral displacement, ultimately causing a traumatically deviated nasal septum	Healed
	Bilateral fractures of the zygomatic arches	Healed
	Right second rib, sternal end	Healing with hard callus formation
	Right third rib, sternal end	Healing with hard callus formation
	Right fourth rib, sternal end	Healing with hard callus formation; actively healing fracture at angle
	Right fifth rib, sternal end	Healing with hard callus formation; actively healing fracture at angle
	Right sixth rib, sternal end	Healing with hard callus formation; actively healing fracture at angle
	Right sixth rib, sternal end	Healing with hard callus formation; actively healing fracture at angle
	Left fifth metacarpal: oblique or spiral fracture that remodeled misaligned, shortening the bone	Healed
	Right radius—glass shard embedded in posterior surface	Healed and remodeled around glass shard
Royal London Hospital 247	Right radius, distal third (Smith's fracture and hairline fracture of distal articular surface)	Healed
	Right tibia, posterior aspect of lateral plateau surface	Perimortem

but not in a positive light. His wife Cecelia petitioned “the Probate Court of St. Louis County to inquire into the condition of the mind of her husband” who had “become mentally unbalanced from the use of alcohol” (St. Louis Post-Dispatch, 1899, p. 5). After this, little data exists of JL or Cecelia until February of 1908 when the *St. Louis Post-Dispatch* (1908, p. 13) reported that “the hat was passed” for Cecelia and her four children in the Dayton Street Police Court after her husband was “sentenced to the Workhouse under a \$500 fine for beating her” (St. Louis Post-Dispatch, 1908, p. 13). Her face was described as having “cuts from his blows” (St. Louis Post-Dispatch, 1908, p. 13). Sadly, JL had previously abused Cecelia in April of 1907 and “was released on his wife's plea...from the Workhouse. He at once went to Oklahoma” and had only been home for a few days before he abused her again (St. Louis Post-Dispatch, 1908, p. 13).

The 1910 census indicates Cecelia and JL remained married and were renting a house with their four children on Cozens Avenue, St. Louis (United States Census Bureau, 1910). However, 10 years later, JL's alcoholism and behavior appears to have taken a toll on his marriage as Cecelia was living with her children, including her eldest son's wife, and not JL (United States Census Bureau, 1920). They divorced sometime before JL's death in 1926. Furthermore, between 1920 and 1928, Cecelia remarried. JL's passing may have had little impact on the family as no newspaper memorial was written, nor was his body claimed.

As JL's identity was known, he can be researched in local newspapers and records tied to vital statistics. This allows the researcher to

pair primary and secondary sources, or use osteological, biographical, and sociocultural contextual data to better comprehend JL's fracture patterning using intersectionality. Unlike many in the Terry Collection, he was not born poor. It is clear he was born into a family wealthy in property. However, it is possible his life choices and abuse of others resulted in his poverty and unclaimed status. JL's encounter with violence, his dealings with his brother Bennett, and the loss of his parents may have spurred his reliance on alcohol. Either way, JL's alcohol dependency, which caused his death, was a lifelong issue that altered his personality, affected his marriage, and may have resulted in the loss of his inheritance. His fracture patterns are consistent with someone who either suffered accidental injuries or engaged with interpersonal violence. It is possible JL's drunkenness resulted in accidental fractures, as it is clear he engaged with violent interactions with others, including his wife. It should also be noted that alcoholism has deleterious effects on the skeleton, which can result in poor bone maintenance, increased fracture risk, and delayed fractured healing (Wang et al., 2020).

## 6.2 | Case Study 2 Royal London Hospital, Centre for Human Bioarchaeology, Museum of London

In contrast with JL from the Robert J. Terry Skeletal Anatomical Collection, the following case study did not have detailed individualized records available for research. Using an intersectional approach in



reference to evidence of trauma, however, can still provide a focused image of a life, such as that of individual RLP05 247, whose body was unclaimed at the Royal London Hospital in 19th-century London, UK.

Older women in England were particularly negatively affected by English Poor Law legislation; from 1834 settlement rules dictated that a person could only apply for relief if they had proof of their parish of settlement. Married women could only seek relief in relation to her husband or male kin; a single woman, deserted wife, or widow might be physically removed to her husband's or father's parish of settlement if she sought poor relief, away from established social supports (Lees, 1998). Women were expected "to remain independent until age or infirmity prevented them from being so" (Levine-Clark, 2000, p. 117), though workhouses often counted many older women among their residents, individuals who had been refused outdoor relief. While occupational opportunities were severely limited for women and women's pay was limited to between 1/3 and 1/2 of what a male laborer earned (Gleadle, 2001; Thane, 1978), women at all ages consistently had a longer life expectancy than men (who were more likely to die from acute illness or accidents), and this difference was most acute in the poorest populations. Seeking healthcare could be a challenge, as private physicians' fees may be out of reach and poor relief was limited geographically. The voluntary general hospitals of London were designed to provide healthcare for those caught in this liminal situation and admitted those deemed to be "deserving" or "worthy objects of charity" (Woodward, 1974, p. 40).

The Royal London Hospital was a voluntary charitable hospital founded in east London, UK, in 1740. A patient could either gain admittance to the hospital by petitioning a subscriber, who made a charitable donation to the hospital and could recommend a certain number of patients annually, or petition the hospital directly by paying a penny (Woodward, 1974). While other contemporary hospitals charged "caution money," a nominal fee to cover the costs of bed linens and potential burial, the Royal London did not charge a burial deposit (Hart, 1980, p. 452; Fowler & Powers, 2013); thus, the hospital was attractive for those without a network to sponsor admittance. Hospital rules from 1762 state that "no woman big with child, no children under seven years of age (except in cases of compound fractures, amputations, or cutting for the stone) no persons disordered in their senses, or suspected to have Smallpox, Itch, or other infectious distempers, or who are judged to be in a consumptive, asthmatic, or dying condition" were to be admitted (London Hospital, 1762; qtd. in Hart, 1980, p. 448), though the presence of midwives and admitted children at the Royal London Hospital (Mant, 2018) suggests the rules were not always followed. Those who died under care and remained unclaimed by family or friends were buried at the hospital charity's expense; there is also evidence that some individuals were dissected and anatomized (Fowler & Powers, 2013; Howard, 1791). Such a fate was considered socially shameful and even the most hard-pressed families attempted to avoid charity burial (Fowler & Powers, 2013).

A Museum of London Archaeology excavation in 2006 uncovered burials dated between 1825 and 1841. Most were stacked in plain wooden coffins, though there was evidence of autopsy and anatomization in some graves, with elements from several commingled

individuals (Fowler & Powers, 2012). Individual RLP05 247 is an older (46+) female (Powers, 2012) with evidence of fracture recidivism (Table 2). The first, a Smith's fracture to the distal shaft of the radius, resulted in a severe impaction fracture of the right wrist and occurred some years before death, likely leading to secondary osteoarthritis. This fracture is common in older females (Dobyns & Linscheid, 1984) and often results from a fall onto the outstretched dorsum of the hand or onto a dorsiflexed wrist; a direct blow to the back of the hand or knuckles is an alternative explanation (Galloway, 2014a). In a 10-year study of individuals with distal radial fractures, Vogt et al. (2002) found that women with low bone mineral density, diabetes, and prior fractures were at a higher risk for distal radial fracture; further risk was present if they had impaired cognitive function. Unlike hip fractures, women with distal radial fractures had similar lifestyles and overall health status than those who did not suffer wrist fractures.

The second fracture incident is a perimortem intraarticular fissure fracture that appears on the center of the articular surface of the lateral condyle of the right tibia as a sagittal stepped fissure. In a modern clinical setting tibial plateau fractures are most commonly caused by knee hyperextension, lower limb twisting in older individuals, car accidents, falls from heights, or other blows to the lateral knee joint (Eiff et al., 2003; Galloway, 2014b). This type of fracture is more likely to affect the elderly, as the articulating femoral condyles tend to weaken less in comparison to the tibial condyles with age (Resnick, 2002). Since tibial plateau fractures are associated with high-energy traumatic events, resulting injuries may be severe. In the case of RLP05 247, the tibial plateau fracture most certainly led to her hospitalization and the accompanying injuries likely contributed to her death.

While this individual does not have individually associated primary source or newspaper data, this older female's perimortem trauma still demonstrates the intersections of age, sex, and social status in her context. A historical examination of individuals who commonly sought care at the voluntary general hospitals of London reveals a heterogeneous mixture of wage laborers and those who intermittently sought poor relief or charity. An unexpected injury or illness could be devastating to those making their way through an "economy of makeshifts" (Tomkins & King, 2003, p. 1), particularly those that affected an individual's ability to walk (Mant, 2020). The socioeconomic label of *the poor* was "fluid and subjective" (Levene, 2006, p. ix), and the occupational activities of working-class women were "extremely chequered and highly diverse" (Gleadle, 2001, p. 22). Hazards of this period of rapid industrialization that could result in a severe tibial fracture are numerous, ranging from being struck by carts in crowded, narrow streets, falls from a height, or being kicked by cattle or horses (Mant, 2020). The streets of London were "a social space for playing and meeting, buying and selling, begging and stealing or simply standing and staring" (Spence, 2016, p. 113), a jostling environment that would have been familiar to this member of the working poor. Negotiating this crowded public space to live and work meant that vehicular accidents and falls were common hazards (Mant, 2020; Spence, 2016). This woman may have suffered her injury close to the hospital and been taken in directly, as the Royal London Hospital accepted fracture cases outside of set weekly admission days.

While it may not be possible to link specific biographical details to this particular individual, it is clear that at the end of her life she was severely injured and passed away in the hospital, unclaimed by friends or family. We may not know her name but evaluating the context of her fractures sheds a light upon older women navigating poverty in early 19th-century London, a group often left out of the dominant narrative of the industrial revolution.

Prehistoric skeletal assemblages present a challenge to intersectional interpretations. In cases without written context, a biocultural approach remains the best means of accessing past lives. The integration of social theory with skeletal analysis helps researchers move “from bones to behavior” (Grauer, 2019, p. 457). Multifactorial palaeopathological analysis integrated with stable isotope, material culture, and ethnographic datasets (e.g., Anderson et al., 2012; McClure et al., 2020; Novak et al., 2017) can provide insights into subsistence strategies, disease burden, and population dynamics; however, there will always remain aspects of past peoples' trauma experiences and contexts that we do not and cannot know. Even without associated written documentation of a specific individual or a time period, researchers can problematize and illuminate questions of past trauma, while continuing the paradigmatic shift beyond binary narratives.

While this discussion has focused on the accumulation of micro-trauma and potential manifestation of fractures via accidental injury, an intersectional approach could be taken to any of the topics that a biocultural approach has been applied to: violence (Grauer & Miller, 2017; Martin & Harrod, 2015; Redfern, 2016; Walker, 2001), isotopic studies investigating diet and or migration (Ikehara-Quebral et al., 2017; Katzenberg, 2012; Prowse et al., 2007), and metabolic diseases such as vitamin D deficiency (Brickley et al., 2014). As this article has illustrated in its summary and application of the theory, intersectionality's strength lies in its flexibility and the possibility to “[interrogate] one's own blind spots” (Davis, 2008, p. 77).

## 7 | CONCLUSION

Eschewing binary categorizations of identity and seeking interdisciplinary sources of information about the past resonate with intersectional analyses and will result in more nuanced understandings of past lives. Studying trauma provides a platform to ask critical questions such as: what circumstances and aspects of an individual's identity brought them to this particular incident? What do we know about their ability to seek care? How might their intersecting identities affect the intrinsic integrity of their bones? Details of the identified individual from the Terry Collection's domestic and addiction issues appear in contemporary newspapers providing individualized details which, when united with his skeletal remains, reveal the context of his recidivism. The older unidentified female from the Royal London Hospital skeletal sample likely had limited healthcare options and her final interaction with the medical system, remaining unclaimed and being buried at the hospital, helps us understand her social position at the end of her life. Bone health and identity are inextricably linked.

Acknowledging the behavioral, social, biological, and cultural factors which contributed to traumatic incidents deepens our understanding of these two disparate individuals. When using intersectionality theory in bioarchaeology it is critical to acknowledge and actively cite the foundational theoretical literature. Further, collaborating with colleagues with diverse backgrounds and lived experiences enhances bioarchaeology's commitment to social justice through welcoming and amplifying varied voices. Bioarchaeology as a discipline has embraced biocultural frameworks; intersectionality provides another way in to examining the complexity of past peoples.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTIONS

**Madeleine Mant:** Conceptualization; data curation; formal analysis; investigation; methodology; project administration; writing-original draft; writing-review and editing. **Carlina de la Cova:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; writing-original draft; writing-review and editing. **Megan B. Brickley:** Conceptualization; formal analysis; funding acquisition; investigation; methodology; writing-original draft; writing-review and editing.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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