REVIEW ARTICLE

# Reorienting Bioarchaeology for an Era of Reconciliation

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**ABSTRACT**

Anthropology, in general, has recently been working toward reworking their systems to be better suited to the needs of descendent communities. Bioarchaeology, however, has been slower to adopt these efforts. In the spirit of reconciliation, it is important for all disciplines to self-reflect and critique the colonial systems that have been institutionalized their teaching and research. This paper serves as a theoretical exploration into the current practice of bioarchaeology and seeks to provide a theoretical model that could contribute toward the decolonization of the discipline to be appropriate for application in Canada. It discusses how to better orient theory to compliment ancestral knowledge and reorganize bioarchaeology so that it could be more useful to responding to the Truth and Reconciliation Commission of Canada Calls to Action (2015) and benefit the needs of descendants. It will proceed by reviewing the integration of social theory in bioarchaeology, providing a critique of the biocultural approach, and finish by proposing a theoretical model that seeks to contribute to the ongoing decolonization of bioarchaeology. The model that this paper proposes serves is a suggestion of how to better structure and conduct a project including ancient human remains to better optimize the application of archaeological theory as a compliment to traditional knowledge. It is formed on the bases of theories of personhood, shared histories, behavioral archaeology, and biocultural approaches to provide a pragmatic synthesis of theory for a community driven bioarchaeology.

*Keywords*: bioarchaeology, reconciliation, archaeological theory, community-driven practice

## INTRODUCTION

There is a recent focus in archaeology to decolonize and counteract the perpetuation of imposed colonial stereotypes (Atalay 2006; Harrison 2014; Supernant 2018). Some archaeologists have sought to reach these goals through collaboration, creating and employing Indigenous Archaeology as their main theoretical background (Lightfoot 2008; Nicholas and Andrews 1997; Nicholas et al. 2011). Divisions of bioarchaeology have recently been following archaeology by incorporating social theory, approaches which focus on the social experience of a person within a cultural system (Agarwal and Glencross 2011a), into research; however, it has not quite reached the same level of collaboration and deportation from strict processual thinking (Carr 1995; Meyer and College 2017). Moreover, bioarchaeological studies and social theory often have a habit of overlooking the personhood of the individual, the experience of people, and non-systemic human interactions (Fowler 2004). Objectifying practice through the imposition of strict theory makes bioarchaeology often unsuited to practice in Canada because it

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imposes generalized interpretations, often from one side of the colonial divide (Martindale 2014).

To strive toward a holistic, community-driven, impactful bioarchaeology, it is crucial to transcend the processual versus post-processual debate to encapsulate the most advantageous application of theory and approach for the purpose of meaningful practical research under the umbrella of a pragmatic synthesis in archaeology (McNiven 2016; Preucel 2006; Trigger 2006). Employing project-specific approaches will work to reconcile the turbulent past of bioarchaeology and direct its practices towardconstructive circumstances that go beyond excavation and focus more on the preservation and protection of burial contexts. The addition of project-specific methods will only enhance the efficacy and impact of future studies (Ames and Martindale 2014; Thomas 2016) and reintroduce bioarchaeological studies to Canada that are applicable to the Calls to Action set forth by the Truth and Reconciliation Commission of Canada (2015). Avoiding addressing the reorientation of the discipline in concordance with Canadian standards has driven bioarchaeology to be focused elsewhere than in Canada. Encapsulating this claim, Zuckerman and Armelagos (2011) indicate that "to constitute a socially and scientifically valid endeavor, anthropological research must be relevant to contemporary societies" (28).

Throughout the past decades there has been a spike in the adoption of biocultural approaches, or the incorporation of social theory in bioarchaeology (Agarwal and Glencross 2011a; Martin 2013; Zuckerman and Armelagos 2011). This has propelled the field from descriptive accounts of skeletal material into a conversation of the livelihood of past cultures (Buikstra 1977; Turner and Klaus 2016; Zuckerman and Armelagos 2011). This paper seeks to propose a theoretical model that holistically fuses biocultural and humanizing theory to form a framework to be manipulated by the needs of communities and strive toward the decolonization of bioarchaeology as practiced in Canada. This framework will address the preservative limitations of the archaeological record, consider the chemical analysis of bone, and go beyond scientific deductive practices to analyze the cultural and social climate in which people lived. For paleo-projects, this will be a way to better optimize material and knowledge; for historical projects, this will advance the cohesion of archaeology with indigenous communities. Moreover, it will address the limitations of bioarchaeological knowledge and emphasize the integral role of expert and informed positions in making inferences (Milner and Boldsen 2014; Weise et al. 2009). This paper will propose a new synthesis that goes beyond typical bioarchaeological analysis to fully incorporate archaeological theory and ancestral knowledge, from the stage of project conception, on the material basis of ancient human remains.

In response to Agarwal and Glencross's (2011b) book *Social Bioarchaeology*, Schiffer's (1975) *Behavioral Archaeology*, and the existing *biocultural* approach in anthropology, the following proposed theoretical model will seek to conceptualize calls for the inclusion of social theory within a new cohesive framework that incorporates both the social and the scientific in bioarchaeological research. The proposed model begins with the determination of project intentions, focused around four components (environmental contexts, human biology, social determinants, cultural systems) that help direct the researchers toward available sources of data. Data from these four components are then considered in a reciprocal nature, each affected by and affecting other components. Finally, derived from behavioral archaeology, cultural and environmental alterations to the human remains are observed to round off interpretations. The proposed incorporation of this model will aim to develop a practice-specific pragmatic approach for use in community-driven bioarchaeological contexts. Essentially, this model is a logical

approach that is often applied informally in archaeology but has not been conventionally or ubiquitously adopted into a theoretical model. Throughout this paper, the discussion is centred around archaeological theory as a way to compliment traditional knowledge. Therefore, even though theory is the main focus, this model serves as an avenue by which supplementary data can be obtained in contexts where the exploration of archaeological knowledge is wanted by descendants.

## A CALL FOR SOCIAL THEORY IN BIOARCHAEOLOGY

Decades after its processual conception (Buikstra 1977; Martin, Harrod, and Pérez. 2013; Nystrom 2018), the recent direction of bioarchaeology, or social bioarchaeology, has diverted from focusing on descriptive accounts of paleopathological lesions, demographics, and skeletal features to accessing the social and cultural underpinnings of such evidence (Agarwal and Glencross 2011a; Buikstra 1977; Trigger 2006; Turner and Klaus 2016; Zuckerman and Armelagos 2011). With the addition of social theory and the adoption of holistic methods, bioarchaeology has begun to counteract its originally crude and over-simplistic views of identity (Larson 2002; Turner and Klaus 2016). Martin, Harrod, and Pérez (2013) highlight this call for rapprochement in that "bioarchaeology research needs to be guided by an ethos of responsibility and ethics, and that can only be sustained if social theory and ethics are embedded in the ways that it is taught to future generations of bioarchaeologists" (243). Despite these strides toward a social bioarchaeology, much of the field still leans toward processual, hypothesis-driven approaches. Many leaders in bioarchaeology remain divided in this sense due to the lack of structure behind social theory in a biological setting.

Perhaps the slowness of bioarcheology to reorient toward a more post-processual model is rooted in the biological regularities of the human skeleton and the scientific nature of such evidence. Therefore, bioarchaeologists are dealing with one of the most direct sources of life in archaeology and are less prompted to expand into the social realm (Meyer and College 2017). The human skeleton, however, is not independent of social and cultural modelling and provides a unique window into the past (Larson 2002). In their book *Social Bioarchaeology*, Agarwal and Glencross (2011a; 2011b) posit that human remains represent a final expression of the social context of the culture they represent. They conceptualize a social bioarchaeology as "reconstructing the biological footings of the skeletal body and cultural framework that has together created the social spaces and the social creatures that inhabit them" (Agarwal and Glencross, 2011a, 3). To do so, bioarchaeologists have been integrating social theory into their interpretations. For example, we see social theories applied to the study of sex, gender, and identity (Holliman 2011; Zakrzewski 2011); the spatial analysis of the social organization of ancient cemeteries (Ashmore and Geller 2005); the study of the stigmatization and care for those with disabilities or diseases (Roberts 2011; Tilley 2015); and even the re-examination of mortuary interpretations and basic bioarchaeological units such as age (Rakita and Buikstra 2005; Sofaer 2011). This list is not even remotely exhaustive; however, it does exemplify that all aspects of bioarchaeological study can be undertaken through, and benefit from, the lens of social theory.

Many aspects of human life, such as individual and group identity, cannot be studied independently from social theory and community engagement. Strict processual methods do not consider the people behind the human remains and the multi-dimensional life history that the remains represent. Although still based in evolutionary theory (Huss-Ashmore 2000), the studies of both ancient and modern human remains are now undebatably integrating cultural factors into their studies in some form

(Turner and Klaus 2016). The inclusion of social theory adds to the dietary, health, and diverse breadth of information that is represented by human remains (Agarwal and Glencross 2011a; Larson 2002). There is, however, a need for an integrative approach that considers multidisciplinary, multi-evidenced, multi-theoretical approaches that incorporate study beyond physical remains (such as oral history, ethnography, agency, social memory, etc.; Thomas 2016). Moreover, this need extends to the gap in social theory that often negates the personhood of human remains (Fowler 2004). These changes in scope and practice toward a socially focused analysis that compliments traditional knowledge have been largely adopted in anthropology and are becoming more popular in bioarchaeology; however, their application in the latter has not been as succinct.

## THE BIOCULTURAL APPROACH

Derived from Livingstone's (1958) seminal paper, *Anthropological Implications of Sickle Cell Gene Distribution in West Africa*, and the *New Archaeology* movement in the 1960s (Blakely 1977; Buikstra 1977; Turner and Klaus 2016; Zuckerman and Armelaglos 2011), the integration of cultural factors as stressors for adaptation has run rampant through the field of anthropology (Zuckerman and Martin 2016). Livingstone (1958) considered the unusual spread of the sickle cell gene from a perspective beyond that of strict scientific selection to conclude that it was a response to the heightened instances of a strain of malaria (*Plasmodium falciparum*) in humans as a result of the population spike during the Agricultural Revolution, a cultural change. From this came the revolutionization of anthropological thought and epidemiological studies toward the consideration of culture as a mechanism that imposes selection rather than as a variable independent to human biology, which resulted in the development of the *biocultural* approach (Blakely 1977; Zuckerman and Martin 2016).

Agarwal and Glencross (2011a) describe the biocultural approach as "best exemplified in population-based bioarchaeological studies that strive to interpret indicators of health and disease as adaptive responses of the skeleton to large-scale change," (1). More generally, Zuckerman and Martin (2016) say that "the biocultural approach attends to both the intertwined biological and cultural aspects of any given human phenomena" (7). This approach is a direct result of an attempt to expand the processual views of science to incorporate cultural environments alongside natural environments. Herein culture is rationalized as both an evolutionary stressor and a social phenomenon as a way to liaise processual and post-processual agendas.

Thomas (2016) employs a biocultural model in his anthropological work on Quechua culture in Peru as a method by which to weave social theories, disciplines, and sources of evidence to achieve practically meaningful research for the sake of the people. In this anthropological setting, the biocultural approach is extremely useful; however, this has proven harder to employ in a bioarchaeological context. Returning to Agarwal and Glencross's (2011a) definition of a biocultural approach to bioarchaeology and its current model, it is evident that it employs an adaptationist perspective and dehumanizes culture into both an adaptive mechanism and active agent imposing selection rather than a function of people. In this sense, it neglects the main constituents of personhood and agency. Their inclusion of culture into a processual framework attempts to analyze post-processual ideas through a scientific lens which, frankly, limits the role of the people who are represented by the remains. Herein culture is considered either a buffer or a stressor (Martin, Harrod, and Pérez 2013; Zuckerman and Armelagos 2011), which is a fairly inhuman way of conceptualizing a framework made up of the lives of past

people. This incorporates cultural context more than social variables. Social aspects of human culture are often acted out for reasons other than functionalist adaptations to stress or in response to environment. Motivation forms the basis of most human agency, and the actions, beliefs, and relationships between individuals shape the personhood of the people who make up the culture in question (Fowler 2004). For example, there is bioarchaeological evidence that illustrates that past people often took care of injured members of society (or people with disabilities or illnesses) which demonstrates notable acts of altruism and compassion (Tilley 2015). These acts would not have been advantageous at the individual or group level of selection under an adaptationist paradigm.

The biocultural approach is optimized in historical and ethnohistorical studies that look at quantifiable phenomena such as ancient health, development, violence, stature, demography, etc. (Turner and Klaus 2016). As such, it is optimized for studies that look at the physiological or biological evidence of cultural and environmental stress (Blakely 1977). The feedback-oriented framework of the biocultural approach assigns the role of culture within a continuous cycle that incorporates the previous stresses as new aspects of the cultural and natural environment (Martin, Harrod, and Pérez 2013; Zuckerman and Armelagos 2011). This approach also neglects the reciprocity of factorial and stress influences by considering them in a cyclical, forward-moving, teleological fashion.

In Yanagisako's (2005) work *Flexible Disciplinarity: Beyond the Americanist Tradition*, he critiques the biocultural approach for prioritizing adaptationist thinking and needing to be expanded to shed its reductionist title (quoted in Zuckerman and Armelagos 2011). The proposed model functions under the same critiques but does not share his position that this is an example of a four-field approach distancing specialized aspects of anthropological research. On the contrary, it argues that the biocultural approach is a noteworthy attempt to interlace processual and post-processual schools of thought into a conversation of human and cultural evolution, but it simply neglects the post-processual focus on the people behind the systems. Such a reorganization of anthropological thinking into an organized model that activates human impact is beneficial; however, this could be taken one step further in bioarchaeology by rehumanizing culture with studies of personhood to compliment traditional knowledge. The human experience encompasses both behaviour and culture and can only be fully conceptualized when these aspects are considered concurrently. Moreover, the strategy of broadening research questions, as in biocultural studies (Zuckerman and Martin 2016), threatens the ability to consider the person rather than the process and thus risks falling back into the processual paradigm of generalizing and dehumanizing the past. Thomas (2016) challenges academia to "work with the social and natural sciences towards ends that truly *serve humanity*," and to "reevaluate their construction of *truth* and *whom it serves*," (30, emphasis added).

## A MODEL TOWARD DECOLONIZATION

Upon the reanalysis of anthropology as a discipline (and therefore archaeology and bioarchaeology) in this era of reconciliation, it is crucial to employ solution-focused thinking and implement inclusive models that go beyond consultation and activate the role of communities in their own research (Harrison 2014; Rico 2017). Moreover, this assures that communities, whose perspectives on the past are often not considered as expertise, are partners in making informed inferences (Rico 2017). In this sense, a consultant role is employed by the archaeologist rather than by the community (Köpe 1997). Harrison (2014) discusses the concept of *shared histories*,

contending that to cease the imposition of harmful stereotypes, research needs to stop being approached from either the side of the "Colonizer" or the "Colonized." This, however, does not mean disregarding the historic unequal balance of power and violence towards an end of cultural appropriation. It means that co-operation under a common goal is the avenue by which the totality of human history can be approached without reinforcing colonial narratives (Harrison 2014; Hillerdal, Karlström, and Ojala 2017).

The Truth and Reconciliation Commission of Canada (2015) states that "[r]econciliation requires that a new vision, based on a commitment to mutual respect, be developed," (VI) and defines reconciliation as "the re-establishment of a conciliatory state," (6). Bioarchaeology has a tainted past of compromised (to say the least) ethics, especially when concerning Indigenous peoples in North America. This is similar to the origins of most anatomical and medical knowledge (Halperin 2007). Archaeology continues to change to suit the post-Truth and Reconciliation era (Supernant 2018), but bioarchaeology has yet to re-enter Canada under this new paradigm. Currently, bioarchaeology is often discouraged in Canada, causing research to be focused in other countries. Nicholas and colleagues (2008) state that the frequency of positive collaborative studies of human remains in Canada "will likely increase as greater understanding of Aboriginal concerns is reached by archaeologists, facilitated by new approaches and protocols regarding the study of human remains developed by First Nations in Canada and the United States" (234). Waiting on protocol and practice to meet the needs of descendent communities has resulted in bioarchaeology rarely addressing Canadian stories. Instead of avoiding sensitive areas, bioarchaeology as a discipline should be reorganized to serve as a community heritage management and mitigation resource that explores avenues that do not necessarily include excavation. A reorganization of focus would allow bioarchaeology to be reintroduced as a tool to manage, promote, and rekindle cultural linkages that were broken and discouraged by Canada's historically unjust treatment of Indigenous peoples (which falls exactly in line with the Calls to Action included in the *Final Report of the Truth and Reconciliation Commission of Canada* (2015). This reorientation is especially important to better respond to Calls to Action 73 through 76, which address the location, commemoration, protection, and reburial of the missing children from residential school cemeteries.

A great example of a recent Canadian bioarchaeological study that is fitting with these themes is the large-scale project addressing the recently uncovered ancient remains of Shuká Káa (Lindo et al. 2017). Each stage of the study was conducted in partnership with numerous First Nations, from seeking permission to conduct DNA analysis, to the interpretations intended for publication and the repatriation of the remains. The study found genetic continuities spanning over 10,000 years and contributed to knowledge about the peopling of North America and affiliated these Shuká Káa with modern Indigenous groups (Lindo et al. 2017). Another example, also from British Columbia, is the Journey Home Project between the University of British Columbia's Laboratory of Archaeology and the Stó:lō Nation (Schaepe et al. 2015). Herein ancestral remains were returned to the Stó:lō in a collaborative effort that developed a specific protocol that fit the needs (repatriation) and wants (information on the individuals to be repatriated) of the community. Bioarchaeology played a key role by providing profiles of these people, a process that was entirely directed by the community with the consultation of bioarchaeologists (Schaepe et al. 2015). These are both excellent examples of how bioarchaeology can be reoriented to work in Canada, in a way that is relevant to and conducted with First

Nations communities to access the deep history of Canada.

Akin to archaeology, bioarchaeology can be adapted into a serviceable avenue to address the marginalization and suppression of Indigenous culture (Lewis 2018). This consultant approach would guide what questions were to be asked within the aims of the project and the partnership with the community, optimizing the meaningfulness of its impact (Köpe 1997). Structured properly, bioarchaeology is an avenue by which Canadian stories can be told, repatriation can be prioritized, and heritage can be preserved. Moreover, archaeology and bioarchaeology are perfectly situated to be able to corroborate Indigenous heritage as an expert witness, legitimizing non-Western views in a Western legal system (Hogg and Welch 2020; Martindale 2014). For example, archaeological data was among the evidence used to argue the Supreme Court of Canada case of Tsilhqot'in Nation versus British Columbia. Herein the Tsilhqot'in Nation sought Aboriginal title and received a successful judgement with the help of archaeological data that illustrated their long-standing occupation of their traditional lands (Hogg and Welch 2020; Tsilhqot'in 2014).

In many ways, the non-critical incorporation of non-pragmatic theory in archaeology dismisses the role of communities by limiting the potential for "alternative" (under Western philosophy) evidence. It also divides the discipline and restricts communication between academics of different theoretical camps (Ames and Martindale 2014). Beyond this, archaeological theories developed in a certain area often weaken as they are applied to different cultures (Perry 2018). This is also the case, to come extent, for general archaeological theory being imposed onto bioarchaeology. Analogies crumble without continuity, laws of behaviour are unrealistic, and generalizations marginalize communities. Bioarchaeology straddles the processual and post-processual divide and has been trying to transcend this barrier since the introduction of the biocultural model. In order to best manage the limitations of the bioarchaeological record, it is important to tailor research questions, and thus the research methods and theories employed. The reality that different theoretical camps cannot incorporate all archaeological scenarios does not mean that they need to be discarded; it means that they need to be modified to fit specific contexts (Trigger 2006). A *pragmatic synthesis* of archaeological theory has been proposed for archaeologists to be better able to suit their community-driven research and contributions to the discipline and to manage the limitations of theory and archaeology (Martindale 2014; Preucel 2006; Trigger 2006). It is under this guise that this model is based, tying together the most suitable aspects of different theories to be applied as complimentary tools for the sake of the project. Due to the relative lack of bioarchaeology-specific theory, this discourse will incorporate archaeological theories employed in a bioarchaeological setting.

A theoretical model more suited to decolonization, such as the proposed, would comingle theory to best optimize project goals and place a strong focus on the consideration of, and search for, personhood. Promoting research in this way would likely result in more meaningful studies of past life. Personhood is the strategy of an individual to navigate and shape the cultural structure of their social interactions (Fowler 2004). A theoretical approach already known to bioarchaeology that focuses on the individual for detailed account of dynamics within a population is the *bioarchaeology of individual life history*, an approach that considers the individual as evidence of the inner workings of a population and as an important unit of society (Zvelebil and Weber 2013). This approach, however, is rooted in processualism and focuses on osteology, bone chemistry analyses, and genetic studies (Zvelebil and Weber 2013). Nevertheless, the bioarchaeology of individual life

histories is relevant to this paper as the proposed model will employ this general avenue of thinking while focusing on personhood, weaving archaeological theory into a net tailored to the research question. A pragmatic synthesis of theory is crucial to achieve this because things such as personhood, ideology, and social relationships are difficult to infer from material culture. In his book *The Archaeologies of Personhood*, Fowler (2004) mentions that personhood is often excluded in social archaeology and theory but should be considered in how individuals reciprocally interact and change alongside their culture and personal relationships. Information on personhood can manifest in the archaeological record through things such as practice, kinship, gendered materials, skeletal modification, exchange, life stage, and social stratification (Fowler 2004). Similar approaches and evidence are also interpreted into a *bioarchaeology of community* (Becker and Juengst 2017).

The proposed model provides a framework under which to undertake bioarchaeological research that is constructed in the interests of the communities who benefit from the specific project. It will offer a framework under which to incorporate theory as supplementary materials and be able to structure future bioarchaeological studies for successful outcomes such as the Shuká Káa (Lindo et al. 2017) or Journey Home (Schaepe et al. 2015) projects. It does not contend that bioarchaeology should be imposed, but rather that such tools should be accessible and optimized to benefit descendants. This could include the repatriation, preservation, or excavation of human remains, especially those who are at risk. This model seeks to manage the bioarchaeological record by whatever mitigation strategy is best suited, beyond solely the realm of exhumation. This would include the incorporation of interdisciplinary sources and cooperation between the four fields of anthropology, extending beyond strict bioarchaeological methods. The proposed model could also be applied more generally to the archaeological record; however, the scope of this paper solely considers its employment in a bioarchaeological setting.

*Framework*

The following model intends to provide a series of steps to be employed in conjunction with the descendent community and members of a team to narrow down a desired impact. First, the overarching research intention must be identified. That could be the preservation, salvage, repatriation, or study of both physical and knowledge-based heritage from a bioarchaeological or mortuary setting. It is the statement of these intentions that determines the emphasis placed on each of the four components of study (which will be outlined in the following section), and therefore the bank of theoretical background that could contribute. Second, depending on the goals of the project, the scope can be narrowed. In the realm of doing research for research's sake, one might try to completely incorporate the material under a more general research question (as in the biocultural model). This, however, can be harmful because the scope of study greatly influences the visibility of social and cultural dynamics (Meyer and College 2017). More specific research questions tailored to meaningful goals will be better suited to their specific context. The compilation of goals will build to a larger scope if so desired. Under this framework, the focus is on serving the needs of the community and emphasizing minimally destructive avenues (McNiven 2016; Thomas 2016). This model suggests that, if a broader picture is desired, this be approached in terms of differing aims so that specific considerations can be made when integrating both alterations and components of study (explained further in the following sections). Finally, interpretations must employ dialectic logic (Nuzzo 2010) and be made in a circuitous fashion (similar to a positive feedback loop, but

without order or sequence). Unlike the existing biocultural approach, the goal is not to impose social theory onto physical theory (or vice versa), but rather to present both as evidence that reciprocally influence a holistic interpretation as they would have in life.

Interpretations should be made by looking at a bank of scientific, social, and knowledge-based information compiled using various theoretical approaches. Under this framework, motivation alters the focus of the research, and the accessibility of past resources (according to temporality) alters the weight of study components and alterations (further explained in the following sections). The focus will not be on "culture" as a deterministic factor but rather will include the people within the culture and their social agency. The further the site dates from the study, the heavier the reliance on concept-based theory to unearth social aspects of human life. For more historic cases, an ethnographic or knowledge-based perspective approach would complement this. To do so, the ongoing integration of ethnography, as well as Indigenous oral history and perspective, as *capacity-building* evidence is crucial (Rico 2017). Without this, we are back to treating culture as an impersonal entity as in the biocultural approach.

This model modifies the biocultural approach and incorporates specific aspects of *behavioral archaeology*. Stemming from the New Archaeology movement in the 1970s (LaMotta and Schiffer 2001), behavioral archaeology seeks to produce laws that can be applied to observe interactions between people and materials (behaviours) in the archaeological record (LaMotta and Schiffer 2001; Reid, Schiffer, and Rathje 1975; Schiffer 1975). Much like the biocultural approach, this nomothetic approach is based in processualism and attempts to explain human behaviour through the cross-cultural application of laws to observe more post-processual ideas (Trigger 2006). It functions under the guise that the archaeological record is a distorted view of past societies (Johnson 2010) and that *c-transforms*, the cultural alterations to archaeological sites, and *n-transforms*, the influences of environmental processes on the archeological record, must be entered into consideration (LaMotta and Schiffer 2001; Schiffer 1975). The model that this paper proposes takes inspiration from behavioral archaeology in incorporating the consideration of distortions and function under the goal to analyse human behaviour. The consideration of distortions is beneficial to any bioarchaeological study because the depositional process of human remains (e.g. mortuary tradition), and post-depositional taphonomy (e.g. diagenesis), can both provide and obscure information about the life of an individual. This model will, however, take into account Binford's (1981) most logical critique that contemporary c-transforms are not distortions at all but rather evidence of behaviour. In this sense, the proposed model will consider cultural distortions as culturally independent disturbances, such as site reuse by non-contemporary people, modern disturbances, etc. It will consider environmental distortions much like behavioral archaeology in the consideration of taphonomic processes that can either obscure or mimic bioarchaeological data. These lenses will be applied to holistic interpretations made based on the interplay of the components of the study. This model will also go against the behavioral approach's belief that past human life can be conceptualized into laws. Contrarily, it rests on the contention that neither approach nor theory can stretch the full breadth of the archaeological record. This is where the integration of informed inferences comes into play.

It is crucial to emphasize the importance of an informed or "expert" opinion in both traditional and social sciences (Buckberry 2015). For example, in a study of the accuracy of standardized methods for age-at-death estimations compared to sheer non-methodological expert estimations, results placed the two

approaches on par (Milner and Boldsen 2014; Weise et al., 2009). If even one of the basic tenants of bioarchaeological research (age-at-death estimation) is so unreliable and increasingly inaccurate when uninformed by expertise and demographic information (Milner, Wood, and Boldsen 2008), then why are more new methods and theories not taking this into account? Although we cannot fabricate more physical or documentary evidence out of thin air, we can take multi-faceted approaches to best inform ourselves before making circuit-like interpretations. An informed opinion is twofold and must bridge the gap between archaeological expertise and Indigenous expertise. To decolonize practice, it is not sufficient to simply consider the role of descendent communities: their direction must be the stimulus of research (Rico 2017). In this model, projects are community-driven, ergo they are stimulated and shaped by the needs of descendants with active roles.

The suitability of a theoretical framework will, logically, be highest in the context in which it was developed. Theory is an important basis on which to make informed inferences; yet imposing generalized aspects of theory based on a temporally, culturally, and geographically distant population threatens the archaeologist's ability to make sound inferences (Perry 2018). Therefore, the proposed approach posits that not only a four-field approach be taken, such as in the biocultural model, but also a multi-theoretical one that is tailored to specific studies. It is ignorant to believe that either a processual or post-processual approach will encapsulate the entirety of information accessible through the archaeological record. This will help to narrow the precision and the accuracy of claims through better consultation of sources. Often one approach (processual or post-processual) is imposed on the other after interpretation. In this model they are considered together before interpretation. Incorporating Indigenous perspectives as legitimate aspects of the discourse before interpretation will help combat the time-old dichotomy of academic and subject, text and practice (Rico 2017). In this sense Indigenous voices are not being represented by the archaeologist (Rico 2017); rather they are representing themselves with the support of bioarchaeology as a tool to supplement their claims. This paper suggests that more informed inferences and interpretations can be made under the proposed model. The goal of such is to be solution-focused, straightforward, and logical for the sake of concise, meaningful research.

*Components of Study*

The initial step of the proposed framework is to narrow the intentions of the project. Figure 1 illustrates the four component groups that this model incorporates. To avoid generalizing research for research sake, this model aims to be employed in a community-driven manner, focusing on bioarchaeology as a tool to benefit the wants and needs of the community or to react to modern destructive events. This embodies the concept that, as stated by Köpe (1997), "a balanced and successful relationship in archaeological development is not realized through implementation of a firm concept. Every new situation needs its specific approaches and solutions" (157). This approach to community-driven research rejects the strictly scientific proceedings of theory and embraces a solution-focused approach. Moreover, depending on the temporal realm of the project, only certain resources may be available. The cultural protocols of descendent communities will also direct what sources of data will be drawn upon and the trajectory of the project. For example, if ceremony is required at certain steps of the project, they will be prioritized before any project component.

Within the four components of the proposed model, there is a separation between cultural systems and social determinants. This divide is based on critiques of the biocultural

and behavioral approaches. Cultural system components include group adaptations to external stresses while social determinants comprise the inner workings of cultural systems that pertain to the people's relations with each other and their culture responding to internal stimuli. These components are not strictly limited to traditional bioarchaeological evidence but are broadened to other aspects of archaeological theory applied in bioarchaeological or mortuary settings.

The biocultural approach, presented in the previous section, seeks to broaden research questions (Zuckerman and Martin 2016). The proposed model seeks to do the opposite, positing that a narrowing of research intentions or questions will result in more informed, community-practical, constructive inferences to be made in conjunction with existing knowledge or purpose. McNiven (2016) advocates that transcending theoretical divides creates the basis for a postcolonial discourse. Under narrowed research questions or purposes, larger-scale studies can also be addressed in terms of numerous small components compiling to form a bigger picture. These intentions will direct the project and how various components are weighted. For example, a project aimed to access or preserve cultural knowledge of a certain community would focus more on the social determinants and cultural system components, while a salvage excavation may focus more on recovering the information accessible from the physical evidence (such as the interaction between environmental context and skeletal remains). Intentions will also inform how alterations are interpreted, as will be discussed in the *Alterations* section. Moreover, the scope of study will be better informed for more specific research methods to be employed, avoiding unnecessary invasion or destruction. For example, if the intention of the study is to identify the limits of an unmarked cemetery, less invasive mapping and geophysical surveys will likely be sufficient. If the intention is to salvage a bulldozed cemetery, more extensive excavation and bioarchaeological analysis

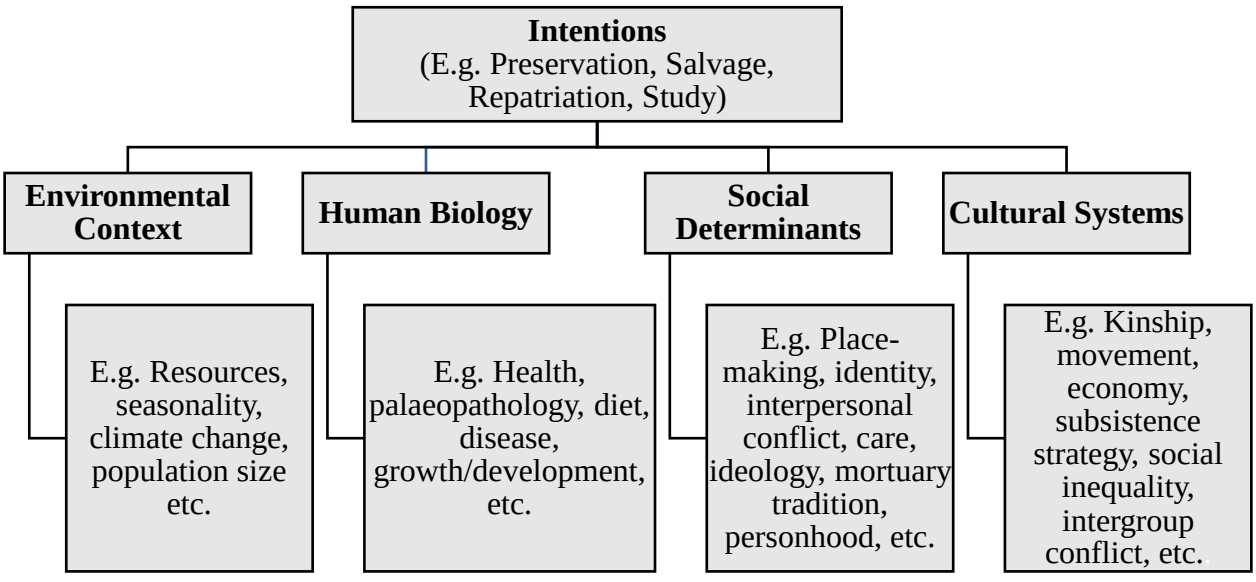


**FIGURE 1**—*Components of study*.

may be necessary. In this sense, the proposed model is not confined to strict bioarchaeological excavation, but rather it is employed as a mitigation strategy specific to bioarchaeological and mortuary sources. The consideration of intentions informs how an researcher interacts with bioarchaeological remains and influences how they analyze ancient behaviour. This requires a toolset of theoretical approaches, directed by collaboration.

*Interpretive Relationships & Reciprocal Interpretations*

Unlike the biocultural approach, the proposed model recognizes reciprocal relationships and multi-causative change. While the development of components introduces new pressures (social, environmental, cultural, and biological), this is done within an ongoing circuit instead of a strict feedback loop or cycle. The relationships that we see between components must be considered reciprocally when making interpretations. The inferences that inform these interpretations are based on focuses within the components and relay them onto each other without direction or order.

As illustrated in Figure 2, environmental context, such as resource dynamics, could cause cultural systems to adapt their subsistence patterns. These cultural adaptations, however, could impinge on the environment as well, such as population increase with the adoption of agriculture. Moreover, cultural systems influence, and are influenced by, other components of social determinants and biological needs. Following a unilinear pattern similar to the biocultural approach would neglect the reciprocal nature of multi-faceted influence, each influencing and being influenced by a circuit of component forces. Some of these forces work more quickly or gradually than others.

As with each step of the proposed process, this must be undertaken dynamically with the community with whom the researcher is working. A setting such as a round table discussion will allow all archaeological, oral, and traditional evidence to be interpreted within the purpose of the study and according to cultural protocols. Instead of imposing each of these onto each other, they are equally influential in the shared history or totality of the project. This is especially important in areas where science and traditional knowledge might not necessarily agree. In this reorientation of bioarchaeology, it is not the archaeologist who

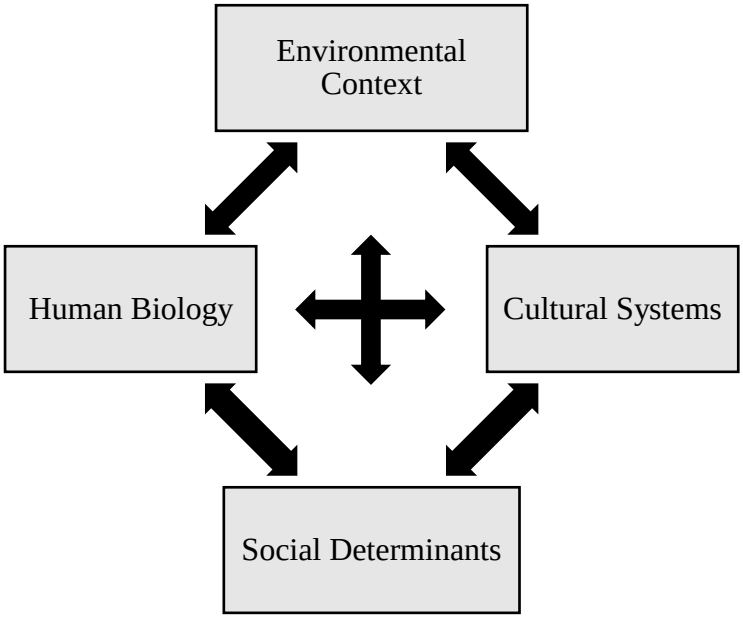


**FIGURE 2**—*Relationships between components of study.*

represents "fact," but rather the community who conceptualizes the study and voices its results in relevant, meaningful terms, this being the reason such work is being conducted in the first place.

*Alterations*

The consideration of the influential processes that have affected archaeological material between its deposition and the present is extremely important because no site is totally resistant to degradation processes (Binford 1981). Under behavioral archaeology, Schiffer (1975) describes c-transforms as "cultural processes responsible for forming the archaeological record" (839). Binford (1981) critiques this by inquiring into why cultural activity is seen as a distortion and not as viable archaeological evidence. Schiffer (1975) lends from the natural sciences and defines n-transforms in that they "describe the interaction between culturally deposited materials and environmental variables" (841). In Schiffer's seminal 1975 paper on behavioral archaeology, he notes that the c-transforms that he proposes are underdeveloped; therefore, unlike Schiffer's approach, my proposed model considers cultural distortions as alterations of the archaeological record by forces independent of the cultural scope of the study. It will consider environmental alterations, much like n-transforms in behavioral archaeology, as taphonomic processes that can either obscure or mimic bioarchaeological data. Figure 3 illustrates the interplay between environmental alterations, cultural alterations, and archaeological interpretations under the proposed model with the consideration that culture is one of the driving taphonomic factors (Lieverse, Weber, and Goriunova 2006) and that modern development is one of the largest threats to cultural heritage (Rainville 2009; UNESCO 2018).

Under this model, reuse by non-contemporaneous or temporally disparate populations would be considered an alteration if it does not apply to the scope of the project. Should it be incorporated within the scope, it would become a cultural system component. This is crucial in ontological studies, where interac-

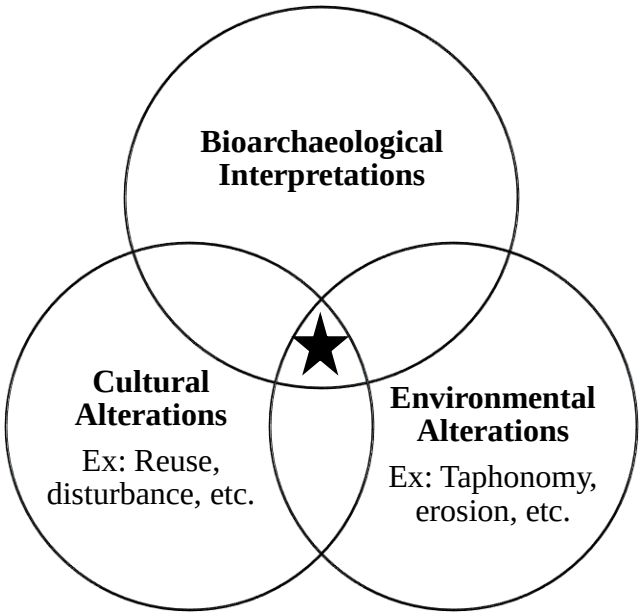


***FIGURE 3**—Incorporating distortions in the interpretation of archaeological remains. Considerations of what has happened between then and now. The starred area indicates the optimal situation of interpretations (although intentions may shift this).*

tions between the living and the dead continually reinforce and reform identity (Johnson 2016). Modern disturbances by way of development would qualify as a cultural disturbance while secondary burial would not and instead be part of social determinant and cultural system components. Of course, project specifics may weigh either environmental or cultural distortions more or less heavily based on the circumstances and condition of the remains.

## CONCLUSION

The shortcomings in the field of bioarchaeology that this model seeks to address under the era of reconciliation in Canada today are very much a reflection of the institution within which research is conducted that often does not foster non-scientific evidence-based research. Large-scale change is gradual, which is why we must constantly look to decolonize our own work and integrate social theory and traditional knowledge. Based on critiques of the biocultural model and behavioral archaeology, the proposed mode that this paper proposes seeks to develop a new way to structure bioarchaeological research to create informed inferences from a wide breadth of sources in a hope to decolonize the practice in lines with Harrison's (2014) Shared Histories.

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