Welcome Back to Caveman Times:
Social Consequences of (Mis)Representations of the Paleolithic

By

Jenna Hendrick

B.A., Binghamton University, State University of New York, 2016

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We acknowledge with respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

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Abstract

Among the American population, there is a general misunderstanding of human evolution and human life in the Paleolithic. Beyond the mechanics of biological evolution, there is confusion over what sorts of modern-day behaviors are vestiges from humans' evolutionary past. My master's thesis explores what kind of misconceptions about Paleo-life and human evolution circulate in popular discourse and where these misconceptions stem from. Drawing on the experiences of community members in upstate New York, I conducted a multimodal discourse analysis via surveys, interviews, and a reflexive media analysis to triangulate my findings. Through these two discourses – that of the everyday understanding of human evolution and Paleo-life versus what kinds of messages popular media portrays on these same issues – I determined that popular media constitutes a large resource of information gathering for the general public. Furthermore, the media highlighted by my research participants to exhibit themes of human evolution had clear messages on race, gender, and violence that research participants largely believe to be successful modes of "survival of the fittest" and thus cultural "survivals" from when we were evolving to our modern form. Participant and media messages regarding race, gender, and violence mirror the logics behind white American Exceptionalism; though these everyday epistemologies are argued by my participants to be biological in nature, they merely reflect today's values and are logics used to successfully participate in American society. That is to say, the repetitive, naturalizing messages portrayed by popular media on human evolution and paleo-life both construct and reify the popular understanding that modern concepts of race, gender and violence are biological and have led to the success of our species. With these findings, I offer science educators recommendations on how to best utilize edutainment to correct these outdated narratives.

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Chapter 1 : "Living in the Modern World with a Stone Age Brain"[1]

A majority of the American public doubts or does not understand the theory of human evolution. As of 2016, 42% of people in the United States held creationist views, in which the belief is that "God is personally responsible for the creation of man" (Bowler 1983:1); 31% believed evolution occurs under the guidance of a supernatural being; and a mere 27% of people believed in human evolution as a process of natural selection (Chang and Nowell 2016: 230). In 2019, one in five U.S. adults did not believe that life on earth had evolved over time and roughly half of the U.S. adult population only accepted evolution as an instrument of God's will (Masci 2019). Because of this, many states have fought the federal government over the teaching of evolution in school and schools that do teach evolution have only recently started to spend considerable time on it, increasing the length of attention paid to the topic by nearly 90% (Plutzer, Branch and Reid 2020 as cited in Reid 2020; see Chapter 2 for discussion). The insufficiency of education on human evolution has led to an "inadequate grasp of basic biological facts, concepts and principles related to evolution" ("Handling Challenges…" 2016) among non-academics. Ferrari and Chi (1998: 1234) argue the confusion surrounding human evolution lies in people's inability to grasp the underlying concepts and extensive time frame of evolution as well as their inability to reconcile organizational levels of evolutionary concepts.

Misunderstandings of and disbelief in human evolution is problematic due to the consequent misconceptions of what constitutes "human nature." Specifically, people often confuse the role of genetic variation with sociocultural processes of evolution, which 19th and

[1] Findley, Kate. 2019. "Evolution and Behavior: Fear, Aggression, and Overeating." *The Great Courses Daily* (blog). July 18, 2019. https://www.thegreatcoursesdaily.com/evolution-and-behavior-fear-aggression-and-overeating/.

mid 20th century discourses referred to as the changing complexity of a society or culture over time. In this view, there is a natural progression from "barbarism" to "civilization" (Redfern and Fibiger 2019: 62). In interpreting Darwin's theory of evolution, Herbert Spencer coined the phrase "survival of the fittest" in his 1864 *Principles of Biology* to explain this societal progression of simple to complex (Johnson 2010). These two ideas - biological and social evolution - combine in the troubling concept of Social Darwinism, which presents itself as the adaptation of the evolutionary phrase "survival of the fittest" to social contexts, in that certain people and groups become more powerful because they are innately "better." Since these early discourses of Social Darwinism, key evolutionary concepts such as variation, drift, adaptation and natural selection have been taken from biological models and have been applied to human and cultural life, thereby cementing the idea that human and cultural life are equal parts of the natural world and follow a natural order (Johnson 2010).

McCaughey (2008) posits that the linkage between culture and biological evolution provides an excuse for inappropriate social behaviors in contemporary society. People justify the ways they want to act by rationalizing how their unacceptable behaviors would have been favored in the deep past (Zuk 2013: 59). This reflects E.B. Taylor's nineteenth-century concept of cultural "survivals," defined as behaviors that once were adaptive and continue to persist despite their lack of modern use (Sussman 1999:456-457). In this view, it is biology's purpose and the first step in our inevitable unilinear cultural evolution from primitive/savage to civilized (Shanks and Tilley 1987). However, not all cultures around the world have followed the same series of transitions to a more "civilized" state, and instead embody certain cultural adaptations to their respective environments (see Chapter 2).

"[R]epresentation is seen as being a process that involves the production of meaning via the act of describing and symbolizing" (Moser 2001: 267), thus the popular media[2] representations of human life in the Paleolithic and human evolution convey particular messages to their consumers. Specifically, popular media often frame human evolution as unilinear and inappropriate behaviors – such as rape, violence, and discrimination - as evolutionarily advantageous (McCaughey 2008). Considering America's widespread consumption of popular media (Zeisler 2008: 2), it is no surprise that there is a striking parallel between public views of paleo-life and human evolution and popular media portrayals of paleo-life and human evolution (McCaughey 2008). Some scholars have noted popular media is in fact the primary source of information gathering for non-academics (Nichols 2017 as cited in Redfern and Fibiger 2019: 61) and that popular media information often goes unquestioned (Graham and Metaxes 2003; Geeng, Yee, and Roesner 2020). Indeed, with the inaccessibility of many scholarly resources (due to paywalls, academic language, and inefficient circulation), popular media is often the most understandable method of information gathering for a lay audience (see Chapter 2).

Unfortunately, gathering one's information from popular media can be problematic. Frequent popular media themes of paleo-life emphasize male dominance and importance via large game hunting and women's subsequent subservience (Pollak 1991; and Gifford-Gonzalez 1993; McCaughey 2008; Solometo and Moss 2013), sexual assault, and violence (Redfern and Fibiger 2019). These kinds of narratives of European Paleolithic life largely fail to take into account or are in conflict with available data. While it is likely that there were large group hunting efforts conducted by later paleo-peoples (Stiner and Barkai 2009), scavenging

[2] Popular media is here defined as "any cultural product that has a mass audience" (Zeisler 2008: 1).

presumably provided much of the big game meat for our earliest hominid ancestors (Brantingham 1998; Stiner 2002). Furthermore, there would have been an equal if not heavier dietary reliance on plants (Zihlman 1989; Owen 2005; El Zaatari and Hublin 2014; Power et al. 2015). Regarding violence, there is no way to prove the existence of a rape culture in the archaeological record nor is there enough evidence to deduce that interpersonal violence was a widespread phenomenon (see Churchill et al. 2009; Sala et. al, 2015; Lee 2018; and Kranioti, Grigorescu, and Harvati 2019 for the few examples of interpersonal violence).

By repeating the same narratives, these popular media origin stories reinforce a connection between nature and culture that dominates much of western imagination (McCaughey 2008; Zuk 2013). In this view, certain aspects of social behavior are explained in terms of "human nature," thus blending and obscuring biological evolutionary processes. These views continue to do insidious work, giving a naturalized "excuse" for modern-day rape, for patriarchal control over women's bodies, and for violence and war. In a gruesome and disturbing example, McCaughey (2008: 2) cites a series of group sexual assaults that occurred in 2000 in New York City's Central Park in which one attacker was videotaped saying, "Welcome back to the caveman times" to his sobbing victim. It is generally understood that more concerted efforts need to be made to change these misinformed popular narratives in accordance with current evolutionary data (e.g., Gifford-Gonzalez 1993; Solometo and Moss 2013; Redfern and Fibiger 2019). However, it is relatively unclear on how to implement these changes. My thesis will contribute to the understanding of what narratives about our species' evolution are being circulated in public discourse, why these narratives persist, and how science educators can begin to change the conversation and public understanding of human evolution.

1.1 Research Questions and Objectives

This thesis explores how to use popular media to mitigate popular misconceptions of human evolution. It examines the ways the general public gathers their information by exploring how the public's views of what behaviors are evolutionarily defined relate to popular media portrayals. Exploring the misconceptions of human evolution portrayed by popular media and circulated in popular discourse is not new (see McCaughey 2008; Zuk 2013). I approach this long-held issue with the goal of better understanding the nature of these misconceptions and seek to reveal the dominant tropes that are perpetuated by popular media.

Within this context, my research question is as follows: *How can science educators most effectively utilize edutainment*- which here is defined as "the convergence of education and entertainment" (Addis 2005:729)- *to educate the public on human evolution?* In order to answer this, I first needed to understand the following:

1. *What do people know about the Paleolithic and how do they believe they have come to hold certain views and knowledges about human life in the Paleolithic?*
2. *How has human evolution and Paleo-life been portrayed in popular media and how has this influenced public opinion?*
3. *What similarities do people see between the deep past and today and are they conceptualized as biologically or socially ingrained?*

The answers to these questions will inform me on where misinformation stems from and how gaps in people's knowledge affect their understanding of the world and their place in it.
By identifying persistent problematic themes and tropes of paleo-life and human evolution in popular discourses and media, science educators can begin rectifying these misconceptions in future edutainment work.

1.2 Thesis Outline

In the next chapters, I present data suggesting that popular media as edutainment may be an important tool for science educators in communicating themes of human evolution and paleo-life. In these chapters I work to reveal a range of people's understandings of these topics through survey and interview data, alongside a media analysis. Chapter 2 details why this study is necessary by exploring the ways in which anthropological and public discourse has framed race[3], gender, and violence in an evolutionary context. The chapter explores the religious and conservative pushback to the theory of evolution; the insufficient education schools generally provide on the theory; and evolutionary scientists' lack of effective public communication. The chapter finally elucidates how popular media can be a powerful tool for public communication and education, specifically by explaining its role in cultural models, enculturation, and socialization. Chapter 3 reviews the methods for my discourse analysis, which takes a mixed methods approach using surveys and interviews, alongside a close reading of popular media sources. Chapter 4 provides a detailed analysis of my mixed methods engagement of everyday discourses about evolution and the Paleolithic, achieved through conducting surveys and semi-structured interviews with particular cohorts in the community of Delmar, New York. My analysis reveals the ways in which people conceptualize race, gender and violence in paleo-life and human evolution, as well as how those conceptions inform their personal behavior or their stance on society today. Chapter 5 discusses the reflexive media analysis that was motivated and

[3] In accordance with the American Association of Physical Anthropologists (2019), the term "race" is used in this thesis to denote the social reality of human phenotypic variation as a means of "structuring society and experiencing the world," and is *not* to be interpreted as a biological reality.

contextualized by the implementation of a mixed methods study, allowing me to triangulate my findings and produce deeper insights into people's attitudes on human evolution and paleo-life than any singular method could have. This chapter focuses on an analysis of how popular media messages relate to participants' stances on race, gender, and violence. Finally, Chapter 6 summarizes the significance of my results. I then provide suggestions for science educators on best practices for addressing harmful misinformation *using* popular media, as well as critically identifying problematic and troubling discourses that are rooted in certain persistent stereotypes and patriarchal assumptions. I end by reflecting on the limitations of my study, and suggest directions for future research.

Chapter 2: "That's Interesting, Because We're Not Taught That:"[4] Contextualizing the Need for Evolutionary Edutainment

Occurring over large time-scales, human evolution is near impossible to witness in human time frames. Any biological changes at the population level happen incrementally and thus go unnoticed, as we can neither see nor experience more than a few generations of people (Zuk 2013: 17). As such, the concept of human biological evolution is often misconstrued in the public imagination. This chapter will explain why educating the public on recent findings in human evolution is so critically important and how popular media may be a remarkably effective educational tool for this purpose. I then discuss the importance of understanding human evolution in the context of race, gender, and violence, followed by my review of how misunderstandings of human evolution have come to be. Finally, I will explore the concepts of cultural models, enculturation, and socialization to further my argument of the importance of popular media as an educational tool.

2.1 Why Human Evolution Matters

Properly understanding current evolutionary findings is important for the contemporary social climate since the basic tenets of evolution have been problematically applied to human societies through Social Darwinism (Cohen 2007; Masci 2019). My concern here is that there is a strain of scientific discourse that was rooted in biased personal political, economic, and social positions, thus creating a dialectical relationship with the contemporary social world in which the questions researchers asked and answered reified ideas held in the contemporary world (Haraway 1988; see also Bowler 1989). These discourses are still evident in the legacy of Social

[4] Quote from interview participant Amy.

Darwinism. In this instance, views put forth by research that naturalizes social stratification (e.g., Lee and DeVore 1968; Chatters 2014; Harari 2014; see also discussions in Bowler 1989; Armelagos and Goodman 1998; d'Alpoim Guedes et al. 2013; and Fowles 2018) now circulate within popular discourse, despite ample research contradicting these notions of justified inequality (e.g., Conkey and Spector 1984; Armelagos and Goodman 1998; Echo-Hawk and Zimmerman 2006).

Although not unique to the United States of America, the country has a long history of blatant racial and gendered discrimination, which often leads to violence (see Laughland 2020; BlackPast; "Violence Against Women in the United States…"; and "Women's Rights" for statistics and accounts) and at times is attributed to "human nature" via Social Darwinism (I will elaborate on this further below). For example, recall the repugnant rationale for the American racial violence of the early 1900s, which was deemed necessary "when the rules of nature were abrogated" (Alcott 2015: 93). These kinds of logics persist and are urgently in need of addressing. My thesis operates under the premise "that human lineages evolved in dynamic mosaic landscapes that selected for flexible rather than rigid adaptive responses" (Martin 2019:20) and while certain "rules" guiding human behavior may exist, they merely provide a general framework, and the phenotypic expressions vary according to external pressures in order to properly adapt (Martin 2019: 8; see also Gould 1996). Human evolution was so successful because of our species' ability to culturally adapt to its location's selective pressures. Thus, natural selection acts upon human behavior, *meaning that claims about specific, ubiquitous behavioral traits that supposedly constitute human nature are counteracted by the vast array of modern human variety* (Prinz 2012 as cited in Alcoff 2015; see also Tallis 2020). As such, human concepts of race, gender, and violence vary across cultures and over time rather than

represent human universals. In short, "there was no single Paleo Lifestyle" (Zuk 2013: 41). However, despite these clear understandings of human evolutionary processes, popular media portrays stereotypical behaviors as universal experiences in paleo-life, disregarding the variety of behaviors that enhanced reproductive success across the world in favor of these modes of the Western imaginary (see Chapter 5). The next three sections provide examples of how these issues are dealt with in anthropological literature and provide context for how and why I am framing my research question around the social implications of misunderstandings of human evolution.

2.1.1 Human Evolution and Race: Logics of White Human Exceptionalism

As early as the 4th century BC, the concept of race was being constructed and reified in a model known as the Great Chain of Being. In this view, all living beings – including different "races" of human beings - were linked together, with each species' position relative to God (Armelagos and Goodman 1998: 360). Caucasians held the highest moral and social status in this chain (Alcott 2015: 99-100). This idea persisted well into the 1700s when Linneaus systematized the classification of all natural beings, including races, in what he believed was a scientific study of social and biological characteristics, thus "len[ding] scientific weight to popular and politically useful ideas about human differences" by acknowledging the existence of "feral and monstrous races" (Armelagos and Goodman 1998: 360).

In the latter half of the 1700s, scholars accepted race as a biological difference and explored whether or not race was of polygenic or monogenic origin (Armelagos and Goodman 1998:360). Polygenists believed there were multiple origins of races via divine intent, which in turn supported the idea that races are different species, consequently justifying the practice of

slavery (Armelagos and Goodman 1998: 360-361). Monogenists, on the other hand, believed all races derived from the single (Caucasian) origin of Adam and Eve and that they became differentiated through degeneration (Armelagos and Goodman 1998: 360-361). Blumenbach, a monogenist, measured "[s]kin color, facial form, and head shape," concluding that as the original race expanded across the globe, it was exposed to varying cultural and environmental factors that led to a degeneration of the race and eventually the formation of new races with different cultural practices (Armelagos and Goodman 1998: 361). Like his predecessors, he used his findings to rank his five newfound racial categories: Black, Brown, White, Yellow, and Red (Armelagos and Goodman 1998:361).

Following a monogenist approach in which White people are viewed as more evolved, modern White supremacists rely on gene differences to justify racial discrimination. In one compelling examples (of many), the White nationalist social media account "Enter the Milk Zone" discriminates against people based on their ability to digest lactose (Harmon 2018). Using a map taken from a scientific journal article, the social media administrators trace the evolutionary history of lactose tolerance (Harmon 2018). Their article explains how cattle herders arrived in Europe 5,000 years ago, and how a random genetic mutation on the gene for childhood lactose tolerance caused the enzyme that produces lactase to continue to be produced in adulthood. This mutation resulted in longer lifespans and increased reproductive fitness, culminating in the ubiquity of the gene in the population (Harmon 2018). White supremacists use this genetic difference to separate themselves from those with African ancestry, accompanying their post on lactose tolerance with hate speech: "If you can't drink milk…you have to go back" (Harmon 2018). A more recent study has found that a similar evolutionary track exists among cattle breeders in East Africa (Harmon 2018), thus undermining the White supremacist view that

lactose tolerance is unique to people of their skin color and exemplifying how data is selectively mobilized to support White human exceptionalism while ignoring data on the gamut of lactose tolerance globally.

The perceived racial marker of lactose tolerance shows that race as a biologically designed entity is being reified in the public sphere, despite the fact that race is a scientifically unsupported mode of classification and that what we see as racial differences is actually an intersection of clines representing environmental adaptations (Echo-Hawk and Zimmerman 2006:471). A study published in early 2018 (Brace et al. 2018) suggests that the first Britons had dark to black skin, as shown through DNA analysis. This finding is contrary to popular belief of who the first Britons were as well as to the original facial reconstruction of the 10,000-year-old fossil known as Cheddar Man, who was originally shown as White. The scientists working on this case argued that Cheddar Man proves that race as a concept was not the same in the past as it is now "and that skin colour was not always a proxy for geographic origin in the way it is often seen to be today" (Devlin 2018).

This claim became controversial and the lay audience accused the scientists of furthering their own political agendas. On the *Daily Mail*'s article covering the discovery, there are reader comments expressing distrust in the findings: "And this is exactly why we are losing faith in science, as they just can't help themselves overreach and imagine"; "The PC brigade are trying to rewrite British history now"; and "The program was udder [sic] twaddle, much of the 'Evidence' no more than guesses and wishful PC thinking presented as facts" (Collins 2018). These sentiments are echoed in numerous online forums, all citing the Cheddar Man findings as a hoax (see Adl-Tabatabi 2018) or propaganda for the "white-hating lefties" (Admin 2018; Parse the Noise 2018). In one White supremacist blog post entitled "Is the claim that Cheddar Man was

black just another stage in the propaganda war on whiteness?" the unidentified author argues the study's illegitimacy by claiming that the scientists used one human skeleton to make the claim that Britons used to be Black and that this particular Briton cannot be representative of his entire group. However, Brace et. al (2018) conducted a genomic study comparing six Mesolithic individuals, one of which was Cheddar Man. After examining the allele sharing between these individuals, they found that Cheddar Man belonged to the same population. Previous DNA studies on these Mesolithic individuals from Spain, Luxembourg, and Hungary identified that they, like Cheddar Man, also would have had dark skin, as they lacked the genes associated with reduced skin-pigmentation (Brace et al. 2018; Cheddar Man FAQ). Indeed, a study conducted in 2007 found that the gene for light skin did not evolve until 12,000-6,000 years ago (Gibbons 2007: 364). While the blogger may not have academic credibility, his opinions reveal and reinforce deeply problematic ideas that have currency with lay audiences (see Chapters 4 and 5 for related discussion). These examples support my assertion that the current information circulated in mainstream media about scientific discoveries to a lay audience is not particularly effective, and in spite of the hopes of researchers, few accurate popular media accounts meaningfully circulate in the public sphere in ways that have the power to reframe these problematic discourses.

Although concepts of groups and peoples may have circulated within societies in the deep past (i.e., the Paleolithic) and there is evidence for a variety of ethnolinguistic populations (Vanhaeren and d'Errico 2006), there is no evidence that Paleo-peoples conceptualized groups as different based on visible phenotypes (Alcoff 2015: 119). While ancient Egypt, Greece, and Rome showed awareness of phenotypic differences (Hirschman 2004: 389), the explicit concept of race as a categorical term for humans' phenotypes only emerged in the late 17th century as a

White supremacist ideology to rationalize slavery, European colonialism, and genocide (Hirschman 2004: 396). Despite the concept's relative nascence, it has been naturalized in portrayals of early hominin life, particularly in reconstructions of anatomically modern human (AMH) and Neanderthal interactions. Historically, the standard archaeological thinking on AMH and Neanderthal interaction centered on the one-way transmission of "'more advanced' or 'superior' technologies…*from* Cro-Magnons *to* Neandertals" (e.g., Hublin et al. 1996), assuming that AMH "were the superior race who had nothing to learn from [Neanderthals] who adapted to life over thousands of years in Europe and are generally understood to be one of the most successful varieties of *Homo*" (Sterling 2015: 107; see also Wragg Sykes 2020). Despite a lack of adequate archaeological evidence to support the idea of Neanderthals as technologically inferior (Villa and Roebroeks 2014), the public sphere focused on tropes of Neanderthals as hunchbacked, hairy, "unintelligent cave thugs" (Wragg Sykes 2020) who wielded hastily made clubs. Although public views on Neanderthals have oscillated over time between being the "same" as us and "other" than us, the dichotomy continues to exist unmodified despite paleoanthropological advancements (Drell 2000: 15) in which Neanderthals are determined to have had similar capabilities as AMH (Shipman 2008; Villa and Roebrooks 2014; Chang and Nowell 2020). For example, President Biden criticized states who began relaxing coronavirus restrictions in March 2021 by saying "'The last thing we need is Neanderthal thinking'" (Rummler 2021), as though Neanderthals were inherently less cognitively developed than AMH, which subsequently led to their extinction. While White supremacists embrace Neanderthal DNA for its absence in African populations (Harmon 2018; Chang and Nowell 2020), popular media more often portrays Neanderthals as "others" in situations that invoke colonialist attitudes of "the

triumphant whites… displacing 'inferior' races around the globe" (Drell 2000: 12; see also Martin 2019: 130 and Chapter 5).

Colonialist attitudes projected onto Neanderthals frequently occur in discussions of Neanderthal extinction. The most common explanation for Neanderthal extinction is competition, both violent and Darwinian, in the sense that AMH out-competed Neanderthals for resources (Sterling 2015: 107). Both forms of competition frame Neanderthals as an inferior race based on their limited biology or behavior, which could not sustain the pressure of a changing environment or co-habitants (Villa and Roebrooks 2014; Dogandžić and McPherron 2013 and Kuhn and Stiner 2006 as cited in Sterling 2015: 107). With mounting evidence for Neanderthal absorption into AMH societies (Glausiuz 2020) and a lack of clear evidence for competition-based extinction theories (Stewart 2004; Shipman 2008; Villa and Roebroeks 2014), Sterling posits "Neandertal individuals or groups willingly combined with Cro-Magnon individuals or groups" (Sterling 2015: 109). While this argument resembles most absorption theory arguments, Sterling accords Neanderthals agency (Sterling 2015: 109), rather than presenting them as a species or race existing at the mercy of the superior AMH. Neanderthals and AMH had a "significant overlap of 2,600-5,400 years," providing "ample time for the transmission of cultural and symbolic behaviours, as well as possible genetic exchanges, between the two groups" (Higham et al. 2014: abstract). Indeed, Neanderthals likely could have gone extinct due to a number of absorption related hypotheses, including low Neanderthal population density, possible male sterility for hybrid children, and a decrease in geographic distribution after which Neanderthals experienced genetic swamping and assimilation by the incoming AMH population (Villa and Roebrooks 2014: 7). This model is contrary to previous views of White paleo-peoples practicing manifest destiny. In manifest destiny type views, it was the fate of human kind to

expand and conquer new lands and peoples, an implicit part of the logic behind empires and colonialism that has long gripped Euro-American society.

Paleolithic racial dynamics are also being played out in popular media. A few examples show diversity, in which Black social groups come to the aid of White social groups (see, for example, *10,000BC, Quest for Fire*, and discussions in Chapter 5), though the majority abide by Gifford-Gonzalez's (1993) observations in her survey of artistic Paleolithic tropes. Specifically, Gifford-Gonzalez noted that artists tended to depict "white people with European features" (1993:30).

As seen through the Cheddar Man case, it is clear that paleo-peoples in the public imagination have a vastly different physical appearance than current scientific data shows. Furthermore, the physical differences between Neanderthals and AMH are popularly viewed as having influenced the relationship between the two hominin groups, making it an appropriate proxy for a discussion of "othering" in the deep past. However, research shows that there may have been an array of interactions between AMH and Neanderthals rather than the solely conflict-based images most often portrayed in popular media and discussions of Neanderthal extinction. In essence, the modern public discourse of race reflects outdated models rather than current scientific understandings and mirrors other modern logics of "othering" under what I interpret as tenets of White American exceptionalism (Alcoff 2015; see Lloyd 2014 for discussion of American Exceptionalism).

2.1.2 Human Evolution and Gender: "The women are not doing anything"[5]

[5] Quote from interview participant Pam.

After conducting an analysis of eighty-eight artists' representations of *Homo sapiens* in publicly accessible forums, Gifford-Gonzalez (1993) found several disconcerting trends. To summarize, she found that men and their activities are privileged by artists over those of women, children, and elders and that men are portrayed as the innovators with women as the caretakers. Collectively, the Upper Paleolithic representations invoke contemporary Western perspectives of "woman's-place-is-in-the-home." Gifford-Gonzalez notes the resemblance between imaginings about the Paleolithic and the graphic traditions of Fine Art, concluding that artists rely on their own background rather than suggestions from scientists (Gifford-Gonzalez 1993: 34), thus resulting in the production of images that conform to current cultural expectations rather than scientific data (Gifford-Gonzalez 1993: 26).

Similarly, Solometo and Moss (2013: 123) examined 204 pictorial reconstructions in *National Geographic*, concluding that women and their "work are significantly underrepresented and undervalued…" Specifically, 66.4% of illustrated people were adult men, with 45.3% of images containing men only. In contrast, adult women comprised 21% of the gendered illustrations and women-only illustrations only amounted to 7.5%. Men are primarily represented in open landscapes whereas women appear in scenes of the home or camp. These images portray a clear division of labor, which "communicates, naturalizes, and universalizes the 'traditional' gender ideology of American society" (Solometo and Moss 2013: 132). Notably, parenting is primarily conducted by women, with 2.5% of all men shown interacting with children compared with nearly a third of the women represented interacting with children. Moreover, "adequate mothering is deemed incompatible with work outside the home" (Solometo and Moss 2013: 135), further reinforcing the idea that women's place is in the home to provide proper childcare. Solometo and Moss' (2013) study further reflects Gifford-Gonzalez's (1993) conclusions in its

assessment of depicted mobility among men and women: *National Geographic* "always" portrays hominin men as actively engaged in a task, whereas women are typically depicted as stationary (Solometo and Moss 2013:136). Although *National Geographic* boasts their reliance on expert consultation to ensure accuracy, Solometo and Moss' (2013: 123) study makes clear that "A vigorous archaeology of gender has had little impact on the magazine's imagined past…"

Conkey and Spector (1984) credit Washburn and Lancaster (1968) as the scholars who crystallized this popular model of early hominid's highly gendered social system, known as "Man the Hunter", through the volume published after the 1966 "Man the Hunter" conference, in which the participating scholars aimed to document hunter-gatherer lifestyles before such cultures disappeared (Sterling 2014: 153). Since humans had subsisted by means of hunting and gathering for 95 per cent of human history (Lee 2018: 518), there was an underlying assumption that the behaviors exhibited by these societies were "natural," and thus could reflect something that is "natural about all people" (Sterling 2014: 152; see also Sterling 2011). Conkey and Spector (1984: 7) note the resemblance between the gender systems of the Man-the-Hunter model and contemporary gender stereotypes, lamenting at the messages being portrayed to other scholars, students, and lay people, specifically that the gender arrangements of the deep past are an inevitable and immutable aspect of social life. Lacking a theoretical framework for conceptualizing and researching gender and social roles, scholars who were "almost exclusively… white, western, middle-class men socialized in cultures that systematically discriminate on the basis of gender, race, and class" (Spector 1991: 388) drew upon their contemporary experiences, thereby "substantiat[ing] a set of culture-specific beliefs about the meaning of masculine and feminine, about the capabilities of men and women, about their power relations, and about their appropriate roles in society" (Conkey and Spector 1984: 1) that they

projected onto past peoples. Indeed, the participants of this symposium were primarily men, which is reflected in the lack of attention paid to "humans who are not men" or gathering, a typically female-associated task (Sterling 2014: 153). Had there been a more inclusive range of researchers, a wider range of research questions may have been posed (Harding 1987 and Longino 1990 as cited in Sterling 2014: 153-154) and resulted in higher quality data (Campbell et al. 2013). The Man-the-Hunter model was deeply rooted in anthropological thought well into the 1970s and "the contributions, activities, perceptions, and perspectives of females [were being] trivialized, stereotyped, or simply ignored" (Conkey and Spector 1984: 12-13). As this model was developed at a time when "political feminism was very visible" (Sterling 2014: 154), there was immediate backlash and gender became a more pronounced topic of discussion within anthropology, though hunter-gatherer studies and archaeology were slow to incorporate rigorous analyses of gender (Sterling 2014). However, scholarly work since the late 1980s has shown an increase in concern over the theorization of gendered pasts (e.g., Conkey and Gero 1997; Wylie 2007; Robb and Harris 2017), ranging in calls for evolutionary psychology and feminist theory to unite under the context of extended synthesis (Heywood 2013) to foregoing "gender" as an analytical category in favor of "sexe" (Fuglestvedt 2014). Unfortunately, works produced under the rigors of a gender-based theoretical framework have little impact on the depiction of gendered pasts (Solometo and Moss 2013).

Conkey and Spector (1984: 28) accused archaeologists of perpetuating gender stereotypes by functioning as a means of "'empirical' substantiation or justification for contemporary gender ideology" (Conkey and Spector 1984: 2). Because "they literally construct much of the knowledge that lay persons have of the prehistoric past" (Gifford-Gonzalez 1993: 24), they provide ammunition for baseless gendered arguments such as "boys will be boys" and the idea

that a woman's natural place is at home with her children. Indeed, the messages circulated in the public sphere regarding women's evolutionary journey are sparse in comparison, whereas "all guys are culturally encouraged to see themselves as cavemen" (McCaughey 2008: 61), particularly in ways that "reduce men's moral agency" (McCaughey 2008: 15) by explaining disreputable behavior such as rape, promiscuity, and aggression. These behaviors are excused and perhaps even lauded by assuming that strict gendered ways of behaving are rooted in "survival needs of the past" (McCaughey 2008: 73).

Specifically in regards to male reproductive fitness, this stereotype turned explanatory model suggests men dominated women to ensure their reproductive fitness by entering into "sexual contracts" with multiple women. In this view, women would bear children for men who provided support via protection and food –specifically meat - because women were too limited by their reproductive function to survive on their own (Martin 2019; see also McCaughey 2008, Heywood 2013, and Grossie et al. 2014 for discussions of evolutionary psychology's impact by arguing such "dangerous ideas"). Indeed, this model suggests male dominance over females constituted a human universal (Sussman 1999: 458). From this standpoint, men were credited with the defining evolutionary achievements such as tool making, whereas women were merely "reproductive vessels" who participated in simple domestic tasks. This view culminates in the "regulatory fiction" (Butler 1989 as cited in Haraway 1991b) of motherhood as natural and fatherhood as cultural (Haraway 1991b: 135). In short, popular evolutionary discourse serves as a means by which one understands themselves (read: men [McCaughey 2008: 7]) rather than a means by which one challenges that self-understanding (McCaughey 2008: 5).

Current research suggests females in matricentric units selected males who were sociable, cooperative and acted as protections against male aggression, producing children who were cared

for via alloparenting and practiced feeding strategies reliant on the female members (Martin 2019: 55-58). Corroborated by primate evidence, females avoid mating with violent, dominant males (Sussman 1999: 462). Ethnographic evidence suggests varied roles for hunter-gatherer women, including gathering, sometimes long distances from home that requires the construction of temporary camps (Owen 2004), as well as the ability to switch between roles, such as to becoming a hunter, based on "preference, context, and individual circumstance" (Kuhn and Stiner 2006: 954). Archaeological evidence proposes that instead of being invisible, women actually held positions of "power, prestige, and value" signaled by intricate textiles likely made by women (Soffer, Adovasio, and Hyland 2000). Evolutionary studies primarily rely on three modes of data: hominid fossils and artifacts, ethnographic studies of modern hunter-gatherers, and modern apes (Zuk 2013: 32), all of which here disprove the universal "Man-the-Hunter" myth. In sum, "Man-the-Hunter" is not supported by currently available data.

Regardless, these common tropes are continually depicted in popular media, which leads the public to believe in histories of meek women providing little for society other than children. While men are clearly privileged as characters worthy of focus, women are depicted as distractions to the man's quest, objects to be owned, or peripheral to the storyline (see *10,000 BC*, *Quest for Fire*, as well as Chapter 5 for further discussion*)*. Movies and books frequently reference women being traded for, raped, and bearing children (see *The Clan of the Cave Bear)* with infrequent references to women using tools, providing food, or having leading roles (see *10,000 BC, Alpha, Quest for Fire* as well as Chapter 5 for further discussion*)*. To reiterate, these popular representations of gender roles as static, unchanging, and persistent across time and space are adverse.

2.1.3 Human Evolution and Violence: "It was kill or get killed"[6]

Survival of the fittest is perhaps one of the most enduring misrepresentations of Darwin's theory of evolution and the basis of all of the misconceptions about race, gender, and violence here represented. However, its effect is most prominent in explanations for humans' penchant for violence. Specifically, survival of the fittest is conceived as "actors struggling to overcome obstacles and achieve goals" (Ferrari and Chi 1998: 1250), which gives agency to humans rather than to evolutionary forces (i.e., natural selection). Following outdated anthropological notions of human progression (Bowler 1989: 236), evolution is today often popularly framed as linear progress (Nisbet 1980: 4-5; Bowler 1989: 11; Zuk 2013: 20; Martin 2019: 11) in which humans came to dominate the world. Violence is attributed a leading role in outcompeting our coexisting hominin ancestors and furthering our species' progress. Thus, c (Clancy 2017) with violence viewed as "part of the larger story of being, and processes of becoming, human" (Kissel and Kim 2018: 143).

According to the "Man-the-Hunter" model and related hunting hypothesis, the protection of the family unit and hunting "required a continued selection for male organisms who easily learned and enjoyed regulated fighting, torturing, and killing" (Hamburg and Washburn 1968 as cited in Haraway 1991a:35). As previously noted, men's ability to hunt was historically viewed as the driving factor in human evolution, thus leading to the perception of violence as equally important. In this view, without the propensity for violence and killing, humans would be unsuccessful hunters (Sussman 1999: 161). This produces an image of man the (violent) apex predator:

> [australopithecines were] carnivorous creatures that seized living quarries by violence, battered them to death, tore apart their broken bodies, dismembered them limb from limb,

[6] Quote from survey respondent.

> slaking their ravenous thirst with the hot blood of victims and greedily devouring livid writhing flesh. (Dart 1953: 209 as cited in Sussman 1999: 455).

Robert Ardrey, a playwright, popularized this violent origin story in a number of books between 1961 and 1976, particularly focusing on the idea that war and the instinct for territory produced modern man (Sussman 1999:457). Similarly, in 1975, E.O. Wilson, "the foremost proponent of sociobiology" (Ruse 2020), proposed a series of human universals, including territoriality and aggressive dominance hierarchies (Sussman 1999: 458).

Issues of territoriality supposedly culminate in violent interpersonal encounters. Support for this in-built human tendency draws from primatology, particularly the study of chimpanzees, because both chimpanzees and humans exhibit violence and we share a common ancestor (Sussman 1999: 461). Kelly (2005) argues that the mere existence of the throwing spear, the likelihood of ambush hunting as early as 500,000 years ago, and the evidence of chimpanzee intergroup violence suggests violent encounters based on territoriality and competition early on in our evolutionary journey under the assumption that differing hunting parties often came in contact with one another.

In spite of these dominant tropes, there is in fact a marked lack of primate data for interpersonal violence (Sussman 1999). Data on violence among primates tends to draw on these narrow studies of chimpanzee behavior rather than exploring the behavioral patterns of our equally close primate relative bonobos, who solve their problems with sex (Zuk 2013: 40). Indeed, when we look further at the evidence, we find that the earliest known archaeological data for settlement attacks dates to only 12,000-14,000 years ago at a Nubian cemetery in the Sudan (Kelly 2005) and "more than 390 of the 400 [Paleolithic] sites across the Old World (97.5%) are completely lacking in such signs" of violence (Haas and Piscitelli 2013: 181 as cited in Lee 2018: 520). Furthermore, our early hominid ancestors likely gathered plant foods and scavenged

meat long before they began hunting (Pobiner 2016b), more often serving as prey rather than predator (Viegas 2010). Robert Sussman attributes the theory of Man-the-Predator to the "'Judeo-Christian ideology of man being inherently evil, aggressive, and a natural killer'" (Viegas 2010; see also Pickering 2012 for a discussion on how the work of paleoanthropologist Raymond Dart established this line of thinking). Scholars argue that interpersonal violence is a context-specific strategy to adapt to certain situations and environments (Redfern and Fibiger 2019: 61). Indeed, recent analysis has shown it is evolutionarily detrimental to be as consistently selfish and ruthless as popular notions of survival of the fittest propose (e.g., Lee 2018). Cooperative relationships among social groups that extended beyond immediate kin are argued to have been the crux of ancestral human's reproductive success (Martin 2019: 7). Specifically, if organisms work together to lessen the pressures of selective forces, such as by sharing food and tools, more organisms survive and pass on their genes, thus allowing for increased opportunities of gene mutation and thus evolution (Clancy 2017).

However, popular media continues to depict "aggression, particularly male aggression, as being both deeply-rooted *and* evolutionarily advantageous" (Kissel and Kim 2018: 144). For example, an article on *The Great Courses Daily*, the online counterpart to an educational video series of the same name, ponders the pointlessness of human aggression, typically based on "minor disputes," baselessly concluding that "Clearly, the tendency for aggression is built into the human psyche" (Findley 2019). In a later article on *The Great Courses Daily*, Leary (2020), a social psychologist, explains that violently overreacting is an evolutionarily beneficial trait because "Animals that immediately kill intruders in their territory, avoid all risks and threats before any harm is done," thus providing a higher chance for survival; "Nonagressive individuals simply would not have survived at the same rate" (Leary 2019). Findley (2019) points out that

these behaviors are not helpful in today's society, but claims that they persist because evolution has all but stopped for our species: "We have essentially the same brain that our prehistoric ancestors had during the Stone Age. We are literally living in the modern world with a Stone Age brain." This argument is based on the hypothetical benefit of aggression and biologists' claim that our brains have not changed over the past 10,000 years; however, human evolution has been occurring for millions of years and as previously discussed there is a wealth of contradictory data. Bioarchaeologists Redfern and Fibiger (2019: 64) acknowledge how "popular media has contributed directly to the ways in which violence is reported and understood outside of our discipline." Movies, television, and books show that violence is immutable and evolutionarily beneficial in scores of battle scenes and sexual aggression that lead to reproductive success, a topic explored in Chapters 4 and 5.

2.2 Fighting and Appropriating Human Evolution in America: "Poor people are poor because… they're not fit"[7]

Evolution permeates political, religious, and social discourses and debates. The divide between religious creation stories and Darwinian evolution became a public issue in America towards the end of the 19th century, when Christian authors and speakers described "Darwinism as a threat to biblical truth and public morality" (Masci 2019). Over a century later, nearly three quarters of American adults continue to hold creationist views or the view that evolution occurred under the guidance of a supernatural being (Chang and Nowell 2016: 230).

On April 30, 2019, WZXV The Word, a radio station "broadcasting the life changing Gospel of Jesus Christ 24 hours a day…" in Rochester, Syracuse, and Buffalo, New York

[7] Quote from interview participant Ron.

(WZXV Home Page) aired a program in which a Creation scientist discussed current land formations and how they could have been created very quickly by the Great Flood, rather than slowly over time as geological data attests to. The speaker provided alternative explanations for the geological evidence and refrained from utilizing religious concepts to support his argument. This radio broadcast highlights the prevalence of Creation Science and anti-evolutionary stances that are publicly communicated.

Presidential campaigns act as a political arena for this debate. In 2008, three Republican candidates at the G.O.P. debate raised their hands when asked if they did not believe in evolution: Senator Sam Brownback of Kansas; Mike Huckabee of Arkansas; and Tom Tancredo of Colorado (Seelye 2007). When asked about their views, Huckabee "said that he did not object to the teaching of evolution as a theory in public schools" and did not expect the teaching of creationism to enter into public schools. By referring to "evolution as a theory," Huckabee turned the definition of theory into a hunch or guess, which is a misunderstanding and a colloquial use of the term, whose scientific use defines it as an established explanation.

Brownback was asked whether or not his "view was out of the mainstream, [and] and he said, 'Not in America'" (Seelye 2007). Nor were they out of line with President Bush's perspective, who expressed his anti-evolution stance in 2000 (Seelye 2007) and in 2005 suggested that intelligent design should be taught alongside evolution (Cohen 2007). The executive director of the National Center for Science Education at the time, Eugenie Scott, commented to *The New York Times* that nine Republican state parties had taken anti-evolutionist positions and that by supporting creationism over evolution the presidential candidates were catering to their far-right supporters (Seelye 2007).

Many, though certainly not all, religious groups (see "Religious Groups' Views on Evolution" by the Pew Research Center for further discussion) and conservatives agree that Darwinian evolution undermines religious faith and can lead to an amoral worldview resulting in abhorrent practices, such as abortion and embryonic stem cell research. However, many conservatives have come to embrace Darwinian evolution (Cohen 2007). Such conservatives have found that evolution can be applied to current social patterns, and that natural selection in particular supports many conservative ideals, such as traditional gender roles, government checks and balances, and free-market capitalism (Cohen 2007; see also Bowler 1989: 282). Furthermore, many conservatives have argued that they have many of the same views as Darwinists regarding human beings: "they are imperfect; they have organized in male-dominated hierarchies; they have a natural instinct for accumulation and power; and their moral thought has evolved over time" (Cohen 2007). To this end, evolution was mobilized in arguments in favor of restricting immigration and instating sterilization laws to stop mentally disabled people from having children (Masci 2019). This view of natural selection justifies their behavior in that "[t]he institutions that successfully evolved to deal with this natural order were conservative ones, founded in sentiment, tradition and judgment…" (Cohen 2007). This is a clear example of the misappropriation of evolution and the perpetuation of Social Darwinist views.

2.3 Popular Media as a Solution

People generally gather their information regarding human evolution from school, public lectures, museums, and popular media (see Chapter 4). However, the information circulated remains disputed and relatively unregulated. Within the last 15 years, more than a dozen US states witnessed public controversies in courts, school boards, and legislatures over school

curricula containing evolution (Funk et al. 2019). In 2017, the South Dakota Senate passed legislation allowing public schools to discuss both the strengths and weaknesses of scientific information (Masci 2019), essentially sanctioning the dismantling of the theory of evolution in the classroom to make way for alternative beliefs. Similarly, the Arizona State Board of Education attempted "to dilute references to evolution in the state's science standards" (Masci 2019).

Furthermore, local and state school boards mandated the teaching of "scientific alternatives" to evolution, namely "intelligent design," despite the fact that courts have ruled that intelligent design is religiously – not scientifically – based and thus cannot be taught in public schools (Masci 2019). The Louisiana Science Education Act allows classrooms to "critique" evolution with supplemental materials regarding creationism, and attempts to repeal the act failed three years in a row (Kopplin 2013). In Texas, Arkansas and Indiana, textbooks touting Creationism are distributed to about 17,000 students in publicly funded (about $82 million per year) Responsive Education Solutions charter schools, who argue they are promoting critical thinking by "teaching 'all sides' of 'competing theories'" (Morrison 2014). These textbooks claim that evolution cannot be tested and have workbooks with the opening line "'In the beginning, God created the Heavens and the Earth'" (Kopplin 2014). In 2021, Alabama continues to include disclaimers on their textbooks labelling evolution as a theory rather than a fact (Pobiner 2021). These are only some of the instances in which states around the country have contributed to misinformation surrounding human evolution (see Pobiner 2016a for a review on how much evolution is taught in American schools).

Recently, time devoted to teaching evolution has increased in the American school system as creationism has decreased, with the presentation of creationism by secondary school

biology teachers falling from 32% in 2007 to 18% in 2019 and time spent on evolution increasing by almost 90% (Plutzer, Branch and Reid 2020 as cited in Reid 2020), however, the content remains problematic. In particular, current evolution curricula focus on a "gene-centric model of evolutionary change," disregarding the interdisciplinary nature of evolutionary studies in which scientists seek to "understand the complex interactions of genes, behavior, cognition and culture found within human evolution" (Eirdosh and Hanisch 2020). "[G]iven the role of scholarship in the acculturation process" (Spector 1991: 394), the exclusion and distortion of certain evolutionary data may contribute to popular notions that much of our behavior is biologically ingrained rather than socially learned or varied expressions of adaptation mechanisms, though I argue it is emphasized by the repetitive portrayal of such behaviors in media containing themes of human evolution or paleo-life.

In the past, scientists often wrote "the first complete expression of [their] views" in books for the public, which in turn were "seriously read and reviewed" (Landau 1991:5) and as we saw with Dart's earlier remark on australopithecine violence, these descriptions tantalized the imagination with their gripping prose. Now, even with the advent of open access sites, in many cases academic articles are hidden behind paywalls (Erdman 2019), making the search for and access to scholarly works difficult. Furthermore, the "lifeless descriptions" (Spector 1991: 393), "jargon, name dropping, and complicated prose" make it difficult to engage a lay audience (Bernard 1998: 742-743), partially due to the lack of education on effective public communication and a focus on writing for academia (Fagan 2010; Mickel 2012). Indeed, there is little incentive for engaging in public spaces as an academic (Cool Anthropology 2021). There is a fear of communicating with the press (Cool Anthropology 2021) and it is often suggested to refrain from speaking to reporters because they are bound to get it wrong in the writing process

(Bernard 1998: 751). When the report is wrong, scientists often claim they cannot control what reporters do with their scientific ideas (Armelagos and Goodman 1998: 364; McCaughey 2008: 11). However, Moser (2001: 263) argues that it is the responsibility of the scholar to understand how our findings are represented "because the forms and media used to communicate our work have a significant impact on the ideas we have about the past…"

Nowell and Chang's (2016) journal article entitled "How To Make Stone Soup: Is The 'Paleo Diet' A Missed Opportunity for Anthropologists?" shows the vast disconnect between anthropologists and the public. During the height of the Paleo Diet trend, practitioners looked to anthropologists to better inform their dietary habits. Instead of accepting the opportunity to (a) bridge the gap between academia and lay people, (b) correct misconceptions, and (c) make evolutionary studies relevant, anthropologists either ignored the public discourse or replied in condescending manners. This showed Paleo Diet practitioners that anthropologists believed they were uninformed, foolish, and not worth their time.

In this light, the two primary academic resources from which the public can learn about scientific findings - the limited time in the educational system and direct communication from scientists- tend to be sparse and incorrectly or incompletely discussed. Popular media, a resource ubiquitously accessed by people of various ages across the world, offers an alternative and effective approach to communicating scientific ideas. My research will show that popular media already works to solidify misconceptions of human evolution for the public audience. Human evolution is a rather abstract idea if we cannot witness it firsthand, but viewing it on a screen or reading it in a book makes it more concrete. Indeed, the study of archaeological representation posits "that non-academic forms of presentation are not merely by-products of academic research, but rather that they have their own distinctive ways of participating in the process of

making meaning" (Moser 2001: 262). Should the stories we tell change, I argue that popular media could be an effective tool to challenge the legacy of 19th century thinking and provide new understandings and expectations of themes of human life in the Paleolithic and human evolution based on the theoretical concepts of cultural models, socialization and enculturation.

2.3.1 Cultural Models

An integral theory to discourse analysis (see Chapter 3 for methodology) is cultural models. Cultural models constitute "'storylines…' or (informal) 'theories' shared by people belonging to specific social or cultural groups" (Gee and Green 1998:123). These "storylines" consist of a series of related images and ideas that inform members of a group on how to act or interpret situations (Gee and Green 1998: 123). These models differ for each person based on their personal experience and possess the capability to modify, expand, and revise based on new experiences that add particular images to the "storyline" (Gee and Green 1998: 123-124). Developed both consciously and unconsciously, these cultural models rely on interactions with other group members as well as exposure to media, such as books, television and radio, the ubiquity of which produces shared "scenes" across individuals' cultural models (Gee and Green 1998:125). However, the use of these cultural models often occurs unconsciously in an effort to appropriately act within a particular social group, resulting in the appropriation of bits and pieces of the cultural model, thus continually constructing and reconstructing the "storyline" (Gee and Green 1998: 125).

In this context, cultural models of race, gender, and violence clearly draw on popular media to form a widespread common-sense understanding. As my research will show, popular media featuring themes of human evolution and paleo-life often have clear messages on these

three topics. As such, I argue that people's cultural models often include a "scene" of evolution or paleo-life that unconsciously inform people's conceptions of race, gender, and violence, and provides reinforcement of a rational for people's behavior.

2.3.2 Popular Media as Enculturation and Socialization

Enculturation describes the process by which "individuals learn to pattern their thinking and feeling in culturally appropriate ways" (West 2006), primarily through verbal language (Fernandes 2006). Socialization refers to the observational learning of how "to pattern behavior and adapt to society's norms, rules, and strictures for playing specific social roles" (West 2006). Popular media reflects the everyday social and lived experience (Morrell 2002: 73), subsequently producing a blueprint for how one is required to act in society. As such, I argue that both enculturation and socialization occur to individuals as they engage with popular media, which communicate particular and consistent ideas via verbal and nonverbal language as well as repetitive imagery and depictions of people in certain roles and behaviors. Indeed, popular media "is absolutely crucial to how people understand and live in the world" (Zeisler 2008: 3). Again, as with cultural models in discourse, these processes of enculturation and socialization infuse popular notions of human evolution and Paleolithic life with tropes of violence, gender inequality, and racializing ideologies.

2.4 Popular Media as Edutainment

Contrary to the belief that popular media is seen as a trivial and insignificant aspect of everyday life (Giroux and Simon 1988: 11), Gifford-Gonzalez's (1993) survey of artistic representations shows popular media as a powerful resource. More thoroughly covered in my

past research (Hendrick 2016), fictional books, such as novels, have been a positive source of public engagement and a reframing of typical social scenarios. Novels have the ability to condense copious amounts of research into one vivid snapshot of past lifeways, making it an easier method of knowledge consumption for a lay audience in terms of language, engagement, and time commitment. Although there is no way to know for certain what the everyday may have looked like for paleo-peoples, fiction provides a space for creating varied possibilities and centering on characters whom academia and popular reiterations have historically ignored.

For example, Elizabeth Marshall Thomas' (1987) *Reindeer Moon* follows the story of a teenage girl and her young sister. Jean Auel's *Earth Children* series also follows the life cycle of a young girl named Ayla and depicts her as an intelligent woman capable of contributing vital skills and knowledge to the betterment of her clan. As previously discussed, women are typically omitted from Paleolithic imaginings, making these excellent examples of women as actors worthy of study. These new gendered reconstructions are especially exciting when considering how widespread they became through these novels.

Aside from popular media's communicative benefits, research has shown that it has the potential for educational benefits as well. In particular, popular media offers a higher entertainment value than typical educational materials, thus engaging an otherwise uninterested population (Hoover 2006: 467-468). Furthermore, Ernest Morrell (2002) says that "[p]opular culture can help students deconstruct dominant narratives and contend with oppressive practices in hopes of achieving a more egalitarian and inclusive society" (72). As popular media directly highlights these types of discourses in relation to human evolution and paleo-life, this argument becomes especially salient.

2.5 Conclusion

In this chapter, I have explained the issues surrounding current evolutionary discourse and education. In particular, not all schools teach human evolution and neither schools nor popular media highlight the interdisciplinary nature of the field nor the varied possibilities of paleo-life (Eirdosh and Hanisch 2020). As such, people attach biological underpinnings to social actions and constructs, such as race, gender, and violence, subsequently providing biologically based excuses for poor behavior (e.g., Berman 2020; Oliver 2020; Orsinellia 2020; Unhappy-Restaurant 2020; Wyatt 2020). This exhibits itself in some of the discourses of Social Darwinism, specifically survival of the fittest, which pervade America. I then demonstrated the potential of popular media to better inform the public on topics of human evolution and paleo-life by exploring the theoretical concepts of cultural models, enculturation and socialization, followed by an analysis of popular media as edutainment. The following chapter will describe my methodological approach to better understanding how people obtain information, consume media, and popularly perceive paleo-life and human evolution.

Chapter 3: Research Methodology

In order to answer the research question of *How can science educators most effectively use edutainment to educate the public about human evolution?* I took an ethnographic approach, particularly via multimodal discourse analysis, to discourses relating to archaeological data and knowledge. Through surveys, semi-structured interviews, and a reflexive analysis of popular media, I examine the social implications of popular discourses of Paleolithic life, in the context of epistemological debates around evolution, Paleolithic human origins, and the development of cultural constructs like "race" and "gender." In addition to race and gender, I examine portrayals of violence. My approach was iterative from my initial analysis of popular media, which identified that these key themes are pervasive. I configured my interview and survey questions to elaborate on how these discourses figure into everyday understandings of evolution in the lives of an east coast American community. Through the lenses of race, gender, and violence I distinguish in the following two chapters between what portrayals have a basis in data and what is a product of popular imagination. This is determined by what the archaeological record suggests versus what popular media portrays. This critical evaluation helps me understand my core research problem by identifying where these gaps in knowledge stem from and how they affect the everyday experiences and logics of my participants.

Following Schensul and LeCompte's (2013: 272) suggestion of administering my survey in places where people regularly gather for other purposes, I worked with particular cohorts of my hometown community of Bethlehem, New York, to collect my ethnographic data: public school teenagers at Bethlehem Central High School (BCHS), congregation members of the Delmar Reformed Church (DRC), and youth group members associated with the DRC. In addition to the convenience sample provided by these three cohorts, I conducted snowball

sampling, in which previous survey respondents alerted additional community members of my study (Fink 2009: 56). Respondents provided valuable qualitative data about how these popular depictions of Paleolithic life are viewed and understood, and the range of knowledge and practice relating to how fundamental anthropological and archaeological concepts are made sense of in this community. The knowledge, understanding, and experiences of people in this community were useful for reflecting on the larger theoretical questions about how archaeological knowledge and expertise can be, or could better be, translated into powerful and influential public discourses. I interviewed these community members not as a statistically significant representation of the population at large, but as a community of knowledge holders who have experiences that we can learn from.

3.1 Study Sample and Recruitment

Bethlehem is a suburb outside of Albany, New York with over 35,000 residents, including more than 4,500 students from kindergarten through grade 12. There is only one high school in the town. The school district has been ranked first among the Albany area school districts five times out of the last seven years by the *Albany Business Review,* #81 among New York State high schools, and is among the Best High Schools in the nation as ranked by U.S. News and World Report. According to my stepfather, a congregation member of the DRC, the DRC's congregation consists of members from all walks of life, with a combination of both progressive and conservative views, held together by respect and kindness for each other's views and the common belief in the gospel and Jesus. RPMs, the youth group held at the DRC, consists of students in grades 9-12 who identify as Reformed, Presbyterian, or Methodist. This background was ideal for the conversations I aimed for, because although controversial to a few,

the topic of paleo-life was meant to be discussed politely and in-depth with no offence towards personal beliefs nor assumptions that they held "expert" knowledge on the subject. Had I selected a community of employees at the Natural History Museum or a teaching college who were more invested in being cognizant of paleo-life and human evolution, my data would likely have been very different. In this way, though I am not claiming to have a "representative" sample, I do think that my conversations reflect "everyday" or "typical" discourses of people neither highly engaged with nor particularly disinterested in evolution.

Multiple personal connections made it possible to conduct my research with these cohorts. Firstly, Bethlehem, New York is my hometown; as such, I benefited from being a trusted community member and an alumna of BCHS. Secondly, my stepfather is a guidance counselor at BCHS, adding to my credibility as a trusted community member as he could vouch for me. Thirdly, my parents are congregation members at the DRC. Because I had met the DRC's pastor at holiday events in the past and she has her own relationship with my parents, she viewed me as credible. Finally, I briefly attended RPMs when I was in high school and the organizer of the youth group revealed to me during my visit that she had vaguely remembered my name. Although some connections are through my parents, I made it explicit that they were to refrain from coercing anyone to participate; they did not attend the worship services the day I visited the DRC nor did my stepfather discuss my project with the superintendent prior to our meeting. This type of relational approach is typical of ethnographic work of this kind and better responses are gathered when the researcher and participant share characteristics (Bernard 1998: 379), such as hometown, school connections and links through kin.

After the superintendent declined my initial suggestion to survey biology students at BCHS, I scheduled a meeting with her at the high school to discuss an alternate survey

distribution plan. The superintendent felt that my study was not "relevant" to biology classes as I was conducting a survey about evolution discourses rather than evolution itself. We agreed the better fit was to distribute the surveys to various social science courses. As such, she and the social sciences coordinator worked to inform social science teachers of my survey and those who had interest and time to circulate it in class did so. The survey was circulated in 13 classes of primarily 11th and 12th graders: 4 sections of US History and Government, 2 sections of Participation in Government, 2 sections of 11-3 US History and Government (a course for struggling students), 3 sections of Advanced Placement (AP) Psychology, and 2 sections of Law and Life. After my visit to Bethlehem in November, I received numerous emails from Bethlehem community members asking to take my survey, particularly from faculty members of BCHS. These community members comprised my snowball study sample.

I attended two worship services at the DRC. In the beginning of each service, the pastor invited me to the front to read my recruitment script, in which I invited congregation members to join me in the narthex if they wanted to participate in my study with no repercussions if they decided not to. The organizer of RPMs invited me to attend one of their meetings, at which time I gave my recruitment speech and passed out the survey to about 20 interested students.

I offered my survey to community members ages 13 and older to understand how a wide variety of community members use popular media to receive information and how human evolution is perceived. Being age 13 or over was the only eligibility criterion, as my goal was to survey as many willing people as possible. Of the 109 Bethlehem community members surveyed for this study, more than half (56%) are aged under 18, while approximately 7% are in the 18-24 age group, 2% aged 25-34, 5% aged 35-44, 6% aged 45-54, 14% aged 55-64, and 11% over the age of 65 (see Table 3.1). Most survey respondents under the age of 18 range between 16 to 18

years old (11th-12th grade), due largely to the types of community groups I was able to partner with. As such, approximately 60% of survey respondents are still attending high school, with approximately 2% citing high school as their highest level of education, while 11% completed an undergraduate degree, 23% completed a graduate degree, and 2% completed a PhD program (see Table 3.2). In terms of gender, approximately 55% of survey respondents self-identified as female, with 44% self-identifying as male, 1% self-identifying as other, and 6 respondents did not self-identify (see Table 3.3). Unfortunately, I am unable to calculate the response rate, as I am unsure how many potential respondents at BCHS or congregation members at DRC there were.

Table 3.1 Age Ranges of Survey Respondents

Q. 27 What is your age?	**Number (n=104)**	**Percentage of total**
Under 18	58	56
18-24	7	7
25-34	2	2
35-44	5	5
45-54	6	6
55-64	15	14
65+	11	11

Table 3.2 Education Levels of Survey Respondents

Q. 29 What is the highest level of education you have completed?	**Number (n=102)**	**Percentage of Total**
Attending high school	61	60
High School	2	2
Undergraduate	11	11
Graduate	23	23
PhD	2	2

Table 3.3 Gender Distributions of Survey Respondents

Q. 28 What is your gender?	**Number of Respondents (n=103)**	**Percentage of Total**
Female	57	55
Male	45	44
Other	1	1

The final question of the survey invited those who were willing to have a more detailed conversation of 30-60 minutes about the issues at hand to self-identify with their contact information. Six people agreed to participate in a semi-structured interview, which I conducted between November and December 2019. Hereafter, I will be referring to these participants by their pseudonyms to protect their identities. Four of my participants were over the age of 55 (Ron, Nancy, Alice, and Pam) one was between the ages of 35 and 45 (Nina), and one was still in high school (Amy).

To contribute to the community and thank the various community members who helped make this research possible, I am sending a summary report of my findings to BCHS, the DRC, and the organizer of RPMs.

3.2 Ethics

In November 2019, after receiving ethics approval from the University of Victoria Human Research Ethics Board (HREB), I circulated a cross-sectional survey to high school students and adults in Bethlehem, New York, after which I conducted six interviews with self-identified survey respondents. I was not present for the surveys conducted at BCHS, however I provided the school's superintendent and social sciences coordinator with the survey, a recruitment script, and the parent letter of information in an email so they could distribute the necessary information to the interested teachers. I made it clear that students should not feel

obligated to take the survey and that not taking it would have no bearing on their course grades or status. For those recruited through snowball sampling, I sent an email that included a link to the survey and attached the letter of information for implied consent.

I personally conducted the surveys at the DRC and RPMs meeting. Included with the survey packets that I handed out was the letter of information for implied consent, which described the purpose and use of the data being collected. At this time, participants were able to ask questions clarifying ethics and survey content. For example, two congregation members were upset at my decision to conduct my study at a church. However, once I explained that I was only interested in their media use and what they have been exposed to regarding human evolution/the Paleolithic, not their religious beliefs or their belief in evolution, they no longer objected to the study. One of the two congregation members continued on to complete the survey. In both instances, I emphasized there was no obligation to complete my survey and there would be no repercussions for not doing so. Completed paper surveys remain in a locked desk drawer in my home office until the successful completion of my thesis at which time they will be disposed of via the Department of Anthropology's confidential shredding service.

Interview data required more thorough consent and confidentiality. I sent a consent form to my participants via email to be signed and collected at our time of meeting, though before I started the recording of our session I clarified whether they had any questions or concerns relating to the consent form and requested verbal consent to record the conversation. To protect the identities of my participants, pseudonyms are used in this thesis and on any analysis materials such as transcripts and field notes. I am retaining transcripts and field notes, though the recordings were deleted from the recorder and the consent forms will be shredded.

3.3 Data Collection and Analysis

A mixed methods approach in which I used multiple kinds of both qualitative and quantitative data allowed me to triangulate my findings and thus see the data in a comprehensive context (Schensul and LeCompte 2013; Flick 2018). Specifically, the use of mixed methods and triangulation of the various elements of my approach "extended the range of insights and knowledge produced" more than any one of the three methods utilized alone could produce. The survey elucidated the knowledge, attitudes, and behaviors of my participants (Fink 2009:92). The semi-structured interviews provided rich descriptions and expanded upon "the range of variation in knowledge, attitudes, beliefs, [and] behaviors" (Schensul and LeCompte 2013:241) that were alluded to in the survey questions, which by nature elicit limited response depth. The semi-structured format also allowed me to question underlying assumptions held by my participants while providing additional context to ideas held by them. The reflexive media analysis drew further meaning from media examples provided by my survey respondents. Here, reflexive refers to what Nazaruk (2011: 80) calls "the constant questioning that the modern metanarratives (texts, films…) have put themselves under…" and highlights the view that language is in a dialectical relationship with social activity (Gee and Green 1998: 127), resulting in a "continuously produced and revised" culture (Bernard 1998:412). In particular, I view these media examples as reflections and constructors of popular evolutionary and paleo-life discourse and a means by which this cultural knowledge is "achieved and enacted" (Bernard 1998: 414). By practicing an ethnographically guided multimodal discourse analysis, I am able to examine how discourse shapes cultural knowledge (Bernard 1998: 411) in regard to "what is available to be learned and what is, in fact, learned" (Gee and Green 1998:126). This is accomplished by identifying "what members of a social group need to know, produce, predict, interpret, and evaluate in a given

setting or social group to participate appropriately" (Heath 1982 as cited in Gee and Green 1998:126).

3.3.1 Survey Construction and Collection

The survey questions span a wide range of topics covering popular media consumption and exposure to ideas of human evolution and life in the Paleolithic. I was particularly interested in understanding what types of media people value, where people have been exposed to concepts of human evolution and life in the Paleolithic, what people know about human life in the deep past, and how people conceptualize human evolution (i.e., is it more biological or social)? I began with questions based on personal experience, namely respondents' media consumption, followed by knowledge questions about the Paleolithic, and ended with categorical demographic questions based on Fink's (2009: 37) summation that questions on the most familiar topics should be first, proceeded by least familiar topics; however, easy to answer and sensitive questions should be the conclusion. The full survey can be found in Appendix A.

The survey consists mainly of multiple-choice questions, as they have been proven to be the most efficient and reliable type (Fink 2009:15-16) due to respondents' ability to more easily recognize relevant items when presented with them in the questions as opposed to open-ended questions in which fewer items are recalled by memory (Bernard 1998: 366). For this reason, open-ended questions were used to gauge participants' initial beliefs and knowledge on the topic; in particular, the inability to recall all knowledge by memory in an open-ended question made it possible to determine what kinds of tropes or beliefs about paleo-life are most salient. I also utilized rating scales to gauge participant attitudes and matrix scales to make multiple-choice questions more efficient.

Fifty-four survey responses were collected online through SurveyMonkey, using the University of Victoria's premium enterprise account. In particular, the online format was used for surveys conducted at BCHS and this allowed me to conduct snowball sampling. Using SurveyMonkey's "offline mode," I provided printed copies of the survey at the DRC and RPMs meeting, from which I received 55 completed surveys. I then inputted all of the printed survey data into the online version of my survey to ease the analysis process. Although I estimated that the survey would take no longer than 20 minutes to complete, many people took longer, as they seemed to be deeply concentrating on providing detailed answers to the questions. Both in-person and online survey takers were able to go back and change their answers to previous questions before submission.

3.3.2 Semi-Structured Interview Data Collection

I stratified my survey by first asking all survey participants the same set of baseline questions and then asking interview participants for more detailed responses to the same and related questions. These interviews were conducted in person at locations of the participants' choosing. Specifically, I met with Ron and Alice at the Delmar Reformed Church, Pam and Nina at the coffee shop next door, Amy at the local library, and Nancy invited me to her home. All interviews were recorded on a tape recorder and later transcribed by myself using InqScribe. I also took handwritten notes during our conversations.

Most interviews lasted an hour, however my conversation with Ron lasted two hours. As these were semi-structured interviews, I had a set of questions I asked each participant, creating probing or challenging questions in the moment based on participants' responses. The flow of questions mirrored the survey in that I began with a discussion of the participants' preferred media and where they last came into contact with themes of human evolution, followed by

questions on media portrayals of paleo-life and human evolution and their personal perceptions of the deep past, and ending with their thoughts on what traits have remained in humans from the deep past to today. I included a series of photo prompts (see Appendix B) pulled from movies set in the Paleolithic and a Google image search using the search term "human life in the Paleolithic." These photo prompts were used to elicit what messages participants gathered from popular media. This more personal mode of data collection worked to draw out more in-depth qualitative data than could have been provided in a survey.

3.3.3 Ethnographic Data Analysis

For analyzing open-ended survey questions and interview transcriptions, I relied on thematic coding in which I identified and organized broad thematic domains in my participants' discourse (Williams and Moser 2019). I created these thematic domains by reviewing responses for consistencies in certain word use, concepts, phrases, and characters across the study population (Fink 2009: 89). This helped determine how prominent my themes of study (gender, violence, race) were in the popular imagination of my research participants (i.e., both survey respondents and interview participants). I was also interested in illuminating any unexpected themes and connections between themes, so I free-coded the interview and long-answer survey data according to priorities and themes drawn out by participants. From these, a few of the key codes included "survival," "quality of life," and "subsistence."

3.3.4 Reflexive Media Analysis

To unpack and identify the broader discourse regarding paleo-life and human evolution, I conducted a reflexive media analysis of various popular media. In particular, based on survey

participant responses regarding frequently experienced popular media, I focused on movies, television shows, books, and online articles. I chose five examples of each (except for books; see chapter 5 for discussion) based on survey participants' responses regarding media that contains themes of human evolution and Paleo-life (see Appendix C for full list of survey participant suggestions). The media examples analyzed in this thesis can be found in Table 3.4, including their respective media format and the time period of the setting in order to ground the reader when I discuss thematic trends in certain media formats or depictions of the past or future.

Table 3.4 Popular Media Analyzed in Chapter 5

Title	**Number of Survey Responses**	**Media Format**	**Time Period for Non-News Representations**
The Flintstones	77	Television	Paleolithic
Star Trek	54	Television	Future
The 100	25	Television	Future
2001: A Space Odyssey	24	Film	Combination
Ice Age	12	Film	Paleolithic
The Handmaid's Tale	12	Television	Future
CNN	11	Online News Article	N/A
The Croods	10	Film	Paleolithic
10,000 BC	10	Film	Paleolithic
Year One	9	Film	Combination
The Clan of the Cave Bear	8	Book	Paleolithic
New York Times	6	Online News Article	N/A
The Jetsons	5	Television	Future
MSNBC	4	Online News Article	N/A
Sapiens	3	Book	Combination
Fox	3	Online News Article	N/A
The Washington Post	3	Online News Article	N/A

In analyzing visual culture, and arguably print culture as well, it is necessary to identify themes and the patterns and connections between these themes (Weakland 2003: 55). I first traced the messages being portrayed about gender, violence, and race by examining in-text discourse, interactions between characters, and descriptions of characters' appearance and actions, which together created patterned themes. Because "information on the 'native' view" of the media is equally important to discerning its meaning (Weakland 2003: 57), I then compared these messages to research participant responses on their understanding of popular media featuring paleo-life and human evolution, their personal views of paleo-life and human evolution, as well as themes and discourses emergent in relevant scholarly research. This analysis process illuminated how popular media may have influenced popular misconceptions (Weakland 2003: 47) of human evolution, as well as the potential of communication between academia and media producers.

3.4 Conclusion

In this chapter, I have described my purpose for using a multimodal discourse analysis and reflexive media analysis for this study. In particular, triangulating my data was necessary to understand the connection between three different sources of knowledge: archaeological data, popular media, and lay people. Interviews provided valuable qualitative data otherwise unavailable from my survey, which suffered from question construction issues (see Chapter 6 for limitations). The reflexive media analysis further corroborated participant experiences. In this light, this mixed methods study was an effective undertaking of determining how best to educate the public on human evolution and paleo-life. In the next chapter, I analyze the popular discourse

surrounding human evolution and paleo-life as illuminated by the results of my survey and interviews.

Chapter 4 : "You hunted, ate, fucked until you died at age 23"[8]: Ethnographic Results and Analysis

This particular chapter explores how my research participants' understanding of the deep past shapes and is shaped by social behavior today by analyzing the ethnographic data that I collected through cross-sectional surveys and semi-structured interviews. In answering *How can science educators effectively utilize edutainment to educate the public on human evolution?* I created survey and interview questions to address the following sub-questions:

1. Where do people get their information on evolution (and science more broadly)?
2. What do people know about human life in the Paleolithic?
3. Where do people see connections between our deep past and today/the future?

The answers participants shared demonstrate how human life in the Paleolithic and human evolution is perceived; where they identify having gathered this knowledge and scientific knowledge more generally; and whether or not they see these facets of life to be biological and/or cultural in nature. Perceiving certain behaviors as biological and/or cultural will consequently inform my research participants' understanding of their own social behavior today. Participant responses also serve to identify problems with current popular media representations of human life in the Paleolithic. I focused on research participant perceptions of paleo-race, gender, and violence, as my preliminary media analysis showed these to be common themes and research participants tended to have similar impressions of these topics.

The survey questions discussed in this chapter focus primarily on what participants gather about human life in the deep past from popular media and what they personally believe life had been like. While I briefly present results related to media consumption, they are addressed more

[8] Quote from survey respondent.

fully in Chapter 5. Additionally, my matrix questions on what types of behavior are and/or continue to be biologically or socially based will not be discussed in depth (see chapter 6 for limitations).

I begin this chapter by relaying part of my data on research participant popular media consumption. Next, I explore each of my themes of analysis – race, gender, and violence – as conceptualized by my research participants. These analyses discuss the personal views of my research participants, what they have come to understand about human life and the Paleolithic from popular media, and what archaeological evidence exists to either support or contradict research participant claims. In essence, these sections on race, gender, and violence examine the everyday understanding of these social constructs and behaviors to better understand how people's perceptions of the deep past and human evolution affect their view of the world and their place in it today. Specifically, I conclude that research participants' common-sense understanding of the themes of gender, violence, and race as they relate to human evolution and life in the Paleolithic include the following: men were the most prominent figures in the Paleolithic with women's roles nearly invisible; beyond the biological role of mother, any other task a woman takes on is an attempt to "have it all"; violence is humans' most successful survival instinct and presents itself in resource competition and territoriality, though is only enacted by men; paleo-peoples were primarily White; and humans are biologically designed to have strong group affiliation and have antagonistic feelings toward "others."

4.1 Valued Sources for Information on Human Evolution and Science

This section answers my first sub-question: *Where do people get their information on evolution (and science more broadly)?* I discuss where people gather their information from and how they feel about the quality and engagement of their information source.

The first question I asked all of my interview participants was what form of popular media they were most interested in, though they all responded with popular media from which they gather information. For example, Alice, a kindly older woman, views popular media as "more information gathering than just amusement," making particular note of her use of Netflix to watch educational and historical fiction shows to address what she considered "is a gap in [her] knowledge base about something that [she] might be interested in." All interview participants said they engage in some form of visual media (i.e., films or television). Nearly all interview participants discussed news source consumption, ranging from television, print, and online mediums.

The majority of interview participants discussed a preference for accessing information through phone-based platforms, especially social media such as Instagram and Facebook. Relatedly, social media was the second most accessed popular media category for gathering information among survey respondents, at 21% of survey respondents (see Appendix C). Nina, a middle-aged mother, explained this preference for phone-based media: "'Cause it's right there… you can just get so much information quickly." Indeed, videos on an Instagram feed can be up to 60 seconds, however the average person will only watch 3-10 seconds of the video (Villa 2019), aligning well with Microsoft's survey of Canadian media consumption in which it was found that the average Canadian's attention span averaged eight seconds (Egan 2016). This speaks to the depth and impact of these platforms and formats and the quality of knowledge that happens in 8 seconds; it is an impression at best, or a single accessible message or idea. Whereas both Amy, a

high school student, and Nina used social media to gather information, Nina admitted she does not believe much of what is on there, while Amy praised the short yet informative videos on often unexpected topics.

Indeed, when asked where my interview participants were deriving the answers to my knowledge questions from, the response tended to be popular media based. In regard to Paleolithic peoples' appearance and language, Amy admitted that

> The imagery, how they looked and sounded is more of the media, like movies and TV shows and stuff, but I try to ignore it 'cause I know that's not necessarily like super accurate, but…

Even though she says it is not "super accurate" and that she wants to ignore media portrayals, when asked what Paleo-peoples might have been wearing she told me it "…depends on the movie, honestly." She continues on to reconcile the repetitive imagery of scantily clad Paleolithic peoples with the reality of living in an environment with varied weather patterns and needing layers; she finds herself caught between common sense and the images to which she is being exposed. Pam, a historical novelist, said she obtained information from television in addition to books written by Bryan Sykes, a renowned geneticist, and programs on NPR. Alice tried accessing her memory of pictures and history books from when she took World History in school, though she also cited *Planet of the Apes* as an especially impactful film that she considered during her responses.

If interested in learning more about or fact-checking something they read on Facebook, most survey participants (74%) said they would do a simple Google search on the topic; 39% of respondents said they would seek out the scientific source of scholarly articles; 22% of respondents said they would find a book on the topic; and 14% of respondents admitted to not typically fact-checking or looking more deeply into the things they read on Facebook (see Table

4.1). I had no opportunity to observe people's fact-checking in practice, but a recent study shows that while people say they fact-check, they typically scroll past information they are skeptical of because of any number of reasons: political burnout, not in the mood/uninterested, it would take too long, it is hard to investigate on a cell phone, or a false sense of security in the sources on their Facebook or Twitter feeds (Geeng, Yee, and Roesner 2020).

Table 4.1 Survey Respondent Fact-checking Methods

Q. 25 Imagine you just read an article on Facebook about a new scientific discovery related to human evolution and you want to know more and/or fact check. What do you do?	**Number (n=99)**	**Percentage of Total**
I don't typically fact-check/look deeper into the things I read	14	14
Google Search	75	76
Find a book on the topic	22	22
Look for scholarly articles on the topic	39	39

Similarly, during my interviews I asked participants how they can tell if their popular media is accurate, if they would fact-check their popular media, and how they would fact-check. In line with Geeng, Yee, and Roesner's (2020) findings, many of my participants relied on source reputation, ranging from claims of not exposing oneself to unreliable sources in the first place to "assum[ing] if it was something that came from… a more scientific basis that it would be true" (Nina). At the same time, participants were seen to rely on personal experience and logics when assessing popular media, as exemplified by the following quotes from Nancy, a self-assured woman over 65, and Nina, respectively:

> [I] see if it rings any bell with the experiences I've had at the New York State Museum or the Museum of Natural History in New York, you know, to see if the facts line up to the best of my memory.
>
> [I know it's coming from a scientific basis based on] whether or not I think it's plausible and…if I remember it from school or things like that.

Many of my interview participants claimed to cross-compare sources when fact-checking, with some relying most heavily on news sources while others privilege books as their primary research tool, aligning with Erdman's (2019: 5) claim that books are often viewed as one of the most credible sources due to their extensive review processes. However, a study by Graham and Metaxas (2003) revealed that when college students in particular fact-check, they tend to take the first source they read at face value without verifying the information from another source. With multiple research studies citing a lack of fact-checking in the public sphere and evidence of participant reliance on past encounters, it seems participant experiences of fact-checking coalesce around Alice's claim that nothing she "hear[s] or see[s] or even read[s] is 100%, unless [she's] experienced" it herself.

Question 13 of the survey is meant to track where, aside from popular media, participants have come into contact with themes of human evolution (see Appendix C). Seventy-two survey respondents across all age ranges out of 99 who responded have encountered topics relating to human evolution at a museum. Fifty-seven respondents cited learning about human evolution at school, both high school and college, in a number of courses, including environmental science, biology, global history, and psychology, with only four of the 57 respondents specifying they learned about it in college. The third most common response was public lectures at 13 respondents.

To understand the ways in which people are coming into contact with themes of human evolution and the prevalence of such experiences, I asked each of my interview participants to

tell me about the last time they came into contact with themes of human evolution or the Paleolithic. At the time, Nancy and her husband were preparing for their National Geographic sponsored trip to the Galapagos, the reading material for which "you [could] hardly read a paragraph without reading about Darwin and evolution." While learning further about the theory was not the main motivator of the trip, she did consider it an "exceedingly interesting aspect." Amy had discussed evolution in class just a week prior to our conversation; in particular, her class discussed the effect Darwinism has had on different societies and peoples' understanding of how they should be living their lives. Similarly, while Ron, a lawyer, admitted that he finds the Paleolithic interesting and will read articles in *The New York Times* or in *National Geographic* if he sees that they've "discover[ed] previously undiscovered caves with human remains from 25,000 years ago," he particularly pays attention because of the social and political implications our understandings of human evolution have, specifically in Social Darwinist terms. Outside of school, Amy had recently seen "an Instagram TV video about the Paleolithic era and it was talking about…roles of the different genders." Amy understood from this particular video that in terms of gender it was "a pretty equal society." Nina last came into contact with themes of human evolution at the New York State Museum, where in between chasing her young son from exhibit to exhibit she saw a snowy scene of animal skin clad hunter-gatherers fighting a wooly mammoth, as well as their makeshift huts and every day activities such as child care and planting (what exactly is being planted is not mentioned). Interestingly, Alice noted Bible study as her last contact with themes of human evolution, because they dig into the harder questions of whether or not there really was only an Adam and Eve and if the Bible should be taken literally. Pam encountered these themes through the recent reading of Brian Sykes' work, who writes popular science books on tracing human origins and human movement through genetics.

Genetics became important to Pam through having her DNA ancestry done. She was excited to share the results with me; having traced her ancestors through genetics and historical records, she brought an entire bag filled with the print outs of her results and the literature she has been reading on the topic. Though not engaged with evolution per se, these experiences relate to evolutionary themes.

Based on these narrative and survey results, it is clear that human evolution is a prevalent topic, with many people actively involved in these sorts of discussions in a variety of places, ranging from the expected school lectures and museum visits, to vacations, reading material, and spirituality. Even more important is that it is clear these discussions of human evolution are having an effect on people's understandings of themselves, as seen through Ron and Amy's acknowledgment of the impact the theory of evolution has had on society, as well as Alice's question of spiritual truth and Pam's quest for understanding her place in the world through genetics.

4.2 Everyday Epistemologies of Gender

Historically, paleoanthropologists viewed the advent of organized hunting by males as the behavior that prompted *Homo sapiens'* cognitive revolution, including the use of complex tools and language (Martin 2019: 136), thus ascribing the achievement of all that "makes us human" to men, with little regard for women's roles in humans' evolutionary development beyond bearing children. My research participants' beliefs on gender roles in the deep past largely parallel this outdated paleoanthropological theory. The first everyday epistemology held by my participants regarding gender reflects the historical scholarly assumption of Man-the-Hunter and the subsequent invisibility of women's subsistence roles in the Paleolithic. The

second finding on gender is that beyond the biological role of mother, any other task a woman takes on is, in the words of interview participant Alice, considered to be an attempt to "have it all".

4.2.1 Man-the-Hunter and Woman-the…?

In reference to messages portrayed in popular media about human evolution and Paleo-life, most survey respondents answered question 14 with themes of food acquisition, with 40 of the 93 responses containing at least one food related code. In particular, popular media is seen to emphasize hunting, with 25 people expressing this as the main mode of food acquisition for paleo-peoples as shown in popular media. Indeed, most of the survey responses about meat signify its absolute necessity for survival: "they had to hunt to survive." The gendered hunting responses exclusively identified men as the hunters. Four of the 53 references to food are coded to gathering, only one of which was gendered ("women gathered berries"); 12 people referenced hunting-gathering; and 10 referenced a nomadic lifestyle. Additional representations included farming, spending all of their time in food-based activities, and food scarcity. Current archaeological data suggests that while there certainly may have been times of starvation, on the whole our Paleolithic ancestors would have had an abundance of food available to them (Rodriguez-Gomez et. al. 2013; Martin 2019: 117) and one of the clearest things the data shows is that these past peoples did indeed hunt *and* gather for their sustenance up until 10,000 years ago; agriculture has existed for a mere fraction of the time that hunting and gathering was the main mode of food acquisition. These varied and inconsistent participant responses demonstrate the lack of reliable knowledge that is being communicated.

Interview responses on messages gathered from popular media mirrored the survey responses. To understand what messages my interview participants were pulling from popular media about human life in the Paleolithic, I showed them a selection of images (see Appendix B) from films and a Google search on human life in the Paleolithic. The first thing most participants recognized regarded food-related activities. For example, Pam told me, "The first thing that jumps out is that they're hunter gatherers and Brian Sykes made a very interesting point: he said that they were also fishermen." Pam filled in the gaps of the visual representations with what she had learned from other media, making references consistent with her personal experiences. The first thing Amy said when I showed her the pictures was the single word "hunting," specifying that the movie images were "very hunting focused." Throughout her responses to this portion of the interview, she continued referring to people of the Paleolithic as hunters, showing how the repetitive portrayal of someone in a certain position can create an identity; because these people hunt in many scenes, they are hunters rather than a generic "people." Most survey participants (66%) believed that subsistence strategies with an emphasis on hunting large game were portrayed accurately in popular media (Appendix C).

The subsequent invisibility of women in popular media representations of Paleo-life was reflected in my interview participants' responses to the photo prompts. Amy's comment captures the common recognition among interview participants of how prominent men are in depictions of paleo-life compared to women:

> Lots of guys. Lots and lots of guys… I don't know a whole lot, but some of these images seem maybe more inaccurate than what I thought it was… I thought it was small groups, like in this image it looks pretty big but in this image it looks super small, like I thought there was supposed to be 10, 15 hunters maybe per group. And there's definitely less females than I thought there were. Like I thought that it was [a] pretty 50/50 society or close to it.

In this internal debate, Amy was attempting to reconcile what she was looking at with what she had learned in school (these "textbook images are throwing me back to 9th grade."). You can note a creeping sense of doubt coming into her language with the repetition of "I thought," as though what she originally thought is inaccurate.

Women were also viewed as absent from the so-called gendered division of labor. Pam commented:

> It looks like there is a division of labor, that the men are doing that and the women are not doing anything.

Survey responses were equally as inconclusive about women's roles as depicted in media about the Paleolithic. In particular, out of 7 responses coded as gender, 6 included men and 2 included women (one response discussed both genders), however only one of the female-coded responses actually provided women with a tangible task while 3 labeled men as hunters and 2 labeled society as male-dominated. This shows that survey participants see an unequal division of labor among paleo-men and women in popular media and that men's roles are more prominent.

When asked to list the first five Paleolithic-related words or phrases that came to mind, most respondents discussed quality of life and subsistence. In terms of subsistence, hunting was the most frequent code, with the words "hunting" and "hunter" used 23 times and the word meat used 3 times. This importance placed on animal foods is in stark contrast to plant foods; the words "gathering" and "foraging" were used 9 times and the phrase "hunter-gatherer" was used 10 times. These themes were reflected in my survey participants' longer imaginings of human life in the Paleolithic in response to question 22. Out of 73 survey responses reflecting more deeply on personal depictions of paleo-life, 45 related to diet. Of these, animals were the most widely imagined source of food, with a form of the action word "hunting" used 22 times and the label of "hunter" used 5 times. In contrast, words related to "gather" were used 6 times, and the

phrase "hunter-gatherer" was used 5 times. Alice explained to me why she viewed meat as the most important food source:

> I would see them as primarily meat eaters because of the protein that they would need to survive, the fatty build-up that they would need, though I never thought of them as being overweight because of all the activity that they needed just to survive. I don't think any of them were vegetarians… but in Africa unless you lived on the coast you were dealing with meat of some kind.

In this response, Alice assigns a biological drive for protein and fats to the act of hunting.

Ron, Nina and Pam all imagined a hunter-gatherer lifestyle. Drawing on personal experience and knowledge of rural or Native American culture, Pam told me

> …there were seasons. I grew up in the Adirondacks and people were very much still into the hunting-gathering thing so there were seasons when they would go hunting and whatever they got they would get together and keep for the rest of the seasons…if you have a really good year with apples, you know the apples would last for a while, I'm sure they figured out how to dry fruits, how to dry vegetables…

Notable in this response is Pam's vision of a hunter-gatherer culture that prepared for the future. Few research participants felt the same; instead, an overwhelming majority viewed food procurement as the most time-consuming activity in a Paleolithic person's life, leaving little if any time for relaxation and bonding, as demonstrated in Amy's following response on what downtime in the Paleolithic may have looked like:

> …probably honing in on their skills for hunting, like maybe practicing doing art, expanding their culture in that way 'cause they're maybe figuring out plans on what they could do next or where they were going to go next or… when their next hunt was going to be. Maybe working on new tools… I think they were more focused upon survival than downtime 'cause I think…there would be more of a…recorded culture, more painting, more figurines, more things that were left behind by them.

This reveals the same kind of biases that led to such a strong idea of gendered division of labor in the deep past: that the lack of evidence means it did not exist. In this particular instance, because we find so many stone tools, animal bones and paintings of animals, people are quick to assume a cultural focus on hunting (Sterling 2011: 190) because there are no organic tools or

paintings of human activity to suggest otherwise. Such arguments disregard the fact that much has degraded in these tens of thousands of years and that there is still much to be discovered. Absence of material goods does not necessarily prove anything. Ideas of food scarcity also persist in research participants' personal imaginings. Nina told me they likely ate "whatever they could get" such as fruits, vegetables and "probably any sorts of animals that they could find and then they probably used every part of" it. Similarly, of the 45 diet related survey responses in which respondents were asked to provide their own interpretation of Paleo-life, 6 were coded as "food scarcity."

Eleven of the 45 expanded sustenance-related survey responses involved gender. In particular, of the 27 responses using "hunting" or "hunter," 9 were associated with a gender. Specifically, all 9 responses were associated with men and supported the model of Man-the-Hunter (see Lee and Devore 1968 for a full account of this theory). Indeed, 54% of participants believed that the Man-the-Hunter trope was correctly portrayed in popular media (see Appendix C) and it was further argued by my interview participants to be biological in nature. Nancy told me "…the men probably went after the larger animals because they're stronger, faster…" Before finishing my question on who did the hunting, Alice blurted out "the men," further explaining that

> …why men went out and hunted was just the physical body of a man would have more strength to haul big animals, drag them…But I think that the husbands [hunted] just because of the muscle structure of men…

Nancy and Alice's responses demonstrate gender polarization - the assumption that the fundamental differences between males and females result "in the ubiquitous organization of social life'" (Ben 1993: 80 as cited in Solometo and Moss 2013: 125) - and is further legitimized by the idea of biological essentialism, which treats gender polarization as an inevitable

consequence of the fundamental differences between males and females (Ben 1993: 2 as cited in Solometo and Moss 2013: 125).

Although it is clear that men are seen to have been valued more highly in the deep past by how often men are mentioned in survey responses as opposed to women, survey responses make this value explicit. In particular, expanded survey responses to what paleo-life may have looked like exhibit an overarching view of a patriarchal society, with responses such as "The men had a lot of the power and the women didn't get much of it"; "males dominated"; "Patriarchal society dominated by men"; "subsistence living, characterized by male dominance, female subservience…"; and "A society dominated by strong men (hunters). Women in need of protection-gatherers." 49% of survey respondents viewed Paleolithic male dominance portrayed by popular media as accurate (see Appendix C).

Women's roles in subsistence activities are only mentioned 3 times in the 75 survey responses on personal views of paleo-life and relate to the Woman-the-Gatherer idea (i.e., "Women would typically stay home and collect fruits/berries and nuts while the men would go out and hunt for food"). Interview responses gave a bit more credence to women's roles in food procurement:

> "If I remember correctly, it was pretty 50/50. But in reality, it was kind of more skewed towards females 'cause they were like hunter-gatherers so like if the males couldn't hunt or…the males couldn't catch something for that little bit 'cause there were still migratory patterns of the animals, so…if the hunter group failed on that the women would have to… step up a bit more and produce or find more food for the group overall, so it is 50/50 but like, more like 60/40 sometimes, you know?" (Amy)

> "…while the majority of hunters may have been men I bet a lot of the gatherers were women and they were providing for sustenance just as much as the men." (Ron)

However, these views still confidently rely on fixed gender roles despite the lack of evidence in the archaeological record. A few interview participants posited that women may have actually

hunted. Nancy told me that "…women might kill rabbits and mice, squirrels and maybe they ate insects, right?" Pam was the only participant – in the survey or interviews - who envisioned a division of roles based on skill as opposed to gender:

> …if you're good with a bow and arrow they'd be stupid to keep them at home, you know, it would be a detriment to their survival and they may be better and quieter at tracking even if they didn't have the physical strength, they may just have some better way of finding the game.

Although Nina wanted to believe in gender equality, she still struggled to reconcile what she "knows" – or has seen and learned - with her logic:

> …it's always portrayed that the men hunt and the women gather, but I don't…know if I believe that… I feel like the women hunted too…Maybe if it was really hard to get things- I don't know, I feel like the women hunted as well, but I mean from what I know the men hunted and the women gathered… I don't think the women just sat around waiting for them to bring them meat… I feel like the whole, the women staying home and things came from when life was a lot better and easier and it didn't necessitate women to- I mean, now we work and stuff, but… I don't feel like that's how it started… I feel like everybody had to be involved, but I don't know if that's true… if they were…sharing all of the work together, then I think they would've had a lot of respect for the women… But now I'm picturing movies where I feel like cavemen didn't respect women.

Gender was only mentioned four times by survey respondents out of 99 total responses to survey respondents' first thoughts on paleo-life, however the invisibility of women's roles, especially in regards to subsistence, are incredibly clear in the following survey response excerpts, in that "men do all the work" and exert "dominance" over the "women [who are] subjugated" and merely "stay in [the] cave and gather water."

The everyday epistemology of paleo-women as invisible reflects the very research critiqued in Conkey and Spector's "Archaeology and the Study of Gender" (1984). The authors drew attention to the fact that historically, the dominant theory on gender roles had been linked to activities held at different levels of importance; in particular, hunting was seen as the pivotal moment in human evolution that spurred on bipedal locomotion to free the hands for making and

using tools, following animals, and carrying meat, and it also led to humans' communication and intelligence since hunting requires forethought and planning (Zihlman 1982). Hunting was assumed to have been conducted by men, who were defined as strong, aggressive, and active (Conkey and Spector 1984). Because stone tools preserve better than organic materials, archaeologists were finding tools they associated primarily with hunting, thus excluding any tools that were presumably female-linked (i.e., non-hunting). As women were viewed as invisible in the archaeological record, they were portrayed as less important and presented as weak, passive, and dependent under the dominant males: "Thus female roles and activities are not only distinct from but less visible than those of their male associates…" (Conkey and Spector 1984:6). What was made clear about females in this theory was that women's "biological characteristics associated with pregnancy, lactation, and childbirth" restricted their activities and the actual act of caring for a child immobilized them (Conkey and Spector 1984:8). The restrictions of motherhood define the second everyday epistemology held by my research participants: beyond motherhood, any task a woman takes on is an attempt to "have it all."

4.2.2 Life After Children?

Biological essentialism legitimizes strict social organization based on sex due to the biological characteristics of each sex. However, the biological differences between the sexes are viewed to limit only female's roles and positions in society. This interpretation of strict social organization in the deep past was originally based on the assumption of the existence of an exclusive sexual division of labor with no explicit framework or methodology to conceptualize and research gender and social roles in the past (Conkey and Spector 1984). Strict gender roles in the deep past have been argued against in the scholarly literature over the past four decades (e.g,,

Conkey and Spector 1984; Wurst 2003; Owen 2004; Arthur 2010; Skogstrand 2011), yet we still see these kinds of ideas being held by my research participants. Whereas the previous section showed the privileging of men's roles in the deep past, this section explains the everyday epistemology of Women-as-Caretakers in Paleolithic life.

Fifteen out of 75 survey respondents included women in their extended visions of paleo-life, with 12 responses associating women with specific tasks. At 9 coded responses, Woman-the-Caretaker was the most commonly assigned role among survey respondents, including words and phrases such as "mother," "The women would watch the young and stay at the caves," and "women would stay home with the children". Indeed, among both survey and interview participants, motherhood was the most frequently assigned role for women in the Paleolithic and was seen to shape the division of labor. This reflects historical academic discourse about women's roles in the Paleolithic. According to Zihlman (1982: 5), the Man-the-Hunter model presents women as sedentary and passive, and that females had to be "immobile" in order to ensure the survival of their offspring. Despite the extensive "evidence on female primates and women in nomadic groups, whose babies do not die because their mothers are mobile" (Zihlman 1982: 5; see also Lee 2018: 523 for discussion on alloparenting), this outdated argument is still being circulated. These are the same kinds of sentiments Gifford-Gonzalez (1993) found in her artistic survey. Although only 35% of survey respondents believed that the depiction of women staying at the base camp with children was portrayed correctly, this is the precise image that was elaborated on in my interviews and extended survey responses to visions of paleo-life. Six survey respondents stated in similar terms that in order to care for the children, "the men went out and hunted animals… [while] the women would watch the young and stay at the caves." Again, men are able to go out in the world while women have to stay in place.

The old trope of women's "biological limitations" was made particularly clear when I asked Amy how we might *know* that men were the hunters. She told me:

> Mmm I don't know, but that's what I remember being told… so for females like clearly they're the ones that get pregnant and are the mothers so… it's hard to be pretty… agile when you're pregnant, so they would maybe have to stay at- I don't want to stay at home, that sounds so bad- stay like, more towards the base camp and do something that involves less chasing around and also less risking your life as well. Also to take care of the children, not saying that the men couldn't take care of the children, but I think- I'm pretty sure that was more like the roles of the women tended to take care of the children…the men did spend some time with their children…after hunting or in the down times…

For physical evidence of gender roles she suggested looking at the artifacts buried with gendered individuals or at cave art, but could not tell me specifically what piece of physical evidence tells us about these roles, only that this is the logic she was taught. Amy was shocked to learn that ethnographic studies have revealed that women are capable of traveling long distances and continuing their subsistence practices while pregnant and as soon as a few days after giving birth (Owen 2004: 203), telling me "wow, that's interesting, because we're not taught that." Presented without any specific evidence at school, Amy had to use her own logic to respond to my question. Similarly, Amy relied on historical knowledge to explain why she thought paleo-peoples would organize themselves into monogamous nuclear families: "I'm looking more at like, modern history as kind of, like, a fall back 'cause like, why have we been monogamous… all these years if there wasn't…a backbone to it, you know?"

However, artifacts with gendered individuals tend to be problematically interpreted. For example, in the Indian Knoll culture, atlatl components are commonly found in female burials and grinding pestles with males (Conkey and Spector 1984: 11). While these artifacts are each found in both male and female contexts, the historical interpretation of the use/significance depends entirely on the sex of the individual they were buried with (i.e., grinding pestles with women signify food processing but when they are found with men they suggest that the man

must have made it) (Conkey and Spector 1984:11). Another example is the Red Lady of Paviland, whom was assumed to be a female due to the elaborate grave goods of beads and other ornaments, though it is now known that the Red Lady is actually a man ("The 'Red Lady' of Paviland"). Amy's stance on monogamy also goes against available research (e.g., Martin 2019). Instead, she looks at modern history to determine that the only logical family structure is one in which there is one person to have and care for babies and one person to provide food for the babies. However, this goes against modern societies that practice polygamy or other potential group arrangements in which someone watches over another's child. This perception of caregiving practices is further iterated by Nina, who explains, "when [the kids] got to be… a little bit older maybe the kids all hung out and took care of each other." The survey and interview data, as illustrated by Amy and Nina's quotes reveal how modern social practices of caregiving roles influenced ideas of caregiving practices in the Paleolithic.

The projection of modern ideas of motherhood, childrearing and biology onto Paleolithic practices is best exemplified by Alice, who concluded that motherhood was/is women's primary role based on a comparison between paleo-life and life in the present:

> Maybe what they did as far as food gathering might've been closer to home where the children were so they could do both, which is very interesting because that sort of [is] what women in our society are trying to have it all, and have a job… it's changing, but it's not really, really different than it was back in that age…

Primarily, to "have it all" as a woman means that one must first fulfill their biological duty as mother; any additional role a woman takes on means going beyond the womanly means of motherhood and infringing on men's life-preserving tasks – such as food acquisition – and thus means they have their foot in both gendered social spheres. Research participants generally view this as problematic. Ron, acknowledging that such gendered ways of behaving have changed

even in his lifetime, as evidenced by his wife's educational journey, expressed concern over this concept of women beginning to "have it all" in the modern era:

> …there are population changes occurring as the result of many women pursuing careers and either never getting married or getting married and not having kids or getting married and having kids but only having one or two kids and then fairly late in their reproductive lives… Society changes as a result, in ways that we don't fully recognize… but if the men… aren't the breadwinners and women haven't decided to accept the role of breadwinner, who is? And how do you support a family if neither is the breadwinner?

Ron explicitly stated that he does not mean women should be banned from working, but rather is cognizant of the fact that such a change in behavior is having a large-scale impact on our society. Ron's answer illustrates the fact that women's lives are still being defined by their procreation practices and the societal changes are viewed as a result of women's desire to "have it all" rather than the systemic issues that have led women to make the decision not to have children. Furthermore, this places the reproductive onus on women despite the fact that procreation is a two-person job.

Survey results show that 65% of survey respondents believed social pressures will cause women to share the role of breadwinner with men. This means that 65% of participants believed that there was indeed a higher workload placed on men in the deep past. The recognition of differential roles is in contrast to the only 38% of survey respondents who believed the strict gendered roles and ways of behaving were correctly portrayed in media about the Paleolithic. This, in conjunction with the consistency of men's roles versus inconsistency and even lack of recognition for women's roles suggests a confidence in what men's roles may have been and an ignorance or disinterest in women's roles. Alternatively, it suggests a heightened interest in the "primal behaviors" of man that have had to be "tamed" versus the female actions that have remained consistent over the years and thus taken for granted, as seen in discussions of women trying to "have it all." Regardless of the specific implications, these are discourses that rely on

the problematic assumption of a strict gendered division of labor in the Paleolithic that was once scholarly dogma, though at the time of its inception there was no explicit framework or methodology to conceptualize and research gender and social roles in the deep past (Conkey and Spector 1984).

4.3 Everyday Epistemologies of Violence

Much like popular discussions of gender, the everyday epistemology of violence as demonstrated by my survey and interview participants falls in line with outdated scholarly claims. The general belief of my research participants reflects Sussman's (1999: 457) critique of past scholars' assumptions, namely that "It is war and the instinct for territory that has led to the great accomplishments of Western man" (Sussman 1999), though this is universalized to all humankind. Indeed, it was viewed by past scholars that man's lauded capacity for hunting was only made possible by humans' propensity for violence (Sussman 1999), thus characterizing humans as an apex predator. As evidenced by research participants' emphasis on hunting in the Paleolithic, research participants strongly believe in the human role of predator, thus encouraging views of the human capacity for extreme violence. Research participants viewed violence as humans' most successful, long-lasting survival instinct and as presenting itself in the form of intergroup conflict and resource competition/territoriality. A glaring contradiction to this popular and historically scientific claim is that what is meant to be a universal human characteristic is exclusively being discussed as a male preoccupation. This can be seen in the ways research participants talk about and rationalize violent scenarios in the past and present.

Violence is underrepresented in my survey respondents' account of media about the Paleolithic. Words related to violent behavior occurred 8 times, of which "weapons" appeared

twice, the verb "to fight" appeared 3 times, and "battles" and "violent" appeared once each. Similarly, when responding to the images of common depictions of paleo-life, Alice noted that "it appears that there are weapons, that people felt threatened and felt [they] needed to protect themselves and their families." Only one survey respondent noted non-violence: "small competition among the people in their communities." Only 33% of survey respondents believed frequent interpersonal violence was depicted correctly in popular media and 25% of respondents believed violent competition between groups was portrayed accurately (see Appendix C). Despite the fact that violence is underrepresented in survey respondent accounts of media about the Paleolithic, research participants had much to say on the topic when prompted to explain everyday paleo-life in their own words.

When asked for the first five things survey respondents thought of when they see the word "Paleolithic," the topic of violence often appeared in response to the fear of potential threats. This view became most evident in the many comments on past peoples' quality of life. In particular, paleo-peoples' quality of life was primarily viewed as poor, with descriptions such as: "dangerous," "short lifespan," "unforgiving," "grim," "harsh," "unbearable," "fear," and "struggle". Violence contributes to this picture of a dark and dangerous time for our ancestors. Respondents saw Paleolithic peoples as violent in the following ways: "angry," "fighting for food," "war," "competition," "intergroup conflict," "hostile," and much more. These responses stem from a perception of violence as occurring between groups rather than within groups.

While talking about what interpersonal violence in the Paleolithic may have looked like, Pam acknowledged that

> …if you got rid of too many people you're really impacting the group… [unless] they were a total drag on the group. I mean, I don't know if they would actually get rid of people who were crippled or not helpful or causing dissention…

In this view, the logic holds that less able-bodied people in an already small-sized group would mean less people to collect food, to watch children, to create tools, thus resulting in more stress on having all of one's survival needs met. Survival through community bonds was a common theme among interview participants, as evidenced by Alice's quote:

> …in any age community is important. And group identification because I think that's how groups survive and… I think that for their survival they had to work as a team.

This quote is particularly important due to the implication for interpersonal bonds remaining within a group rather than extending to outsiders of the community.

My research participants viewed intergroup violence as spurred on by competition of resources and territory. According to Amy,

> …back then seeing another group was like seeing a whole other species, if you will, so I feel like if they were going to attack you that would just be your response to attack or fight back. Or if you see an invader or an outside person trying to take a resource or something away from you, you would attack because you need to protect yourself or your group.

This quote operates under the assumption that "others" are inherently likely to attack and designates violence solely as a defense mechanism while minimizing the fact that one group has to first be antagonistic. Furthermore, Amy's quote demonstrates my participants' tendency to project behaviors onto Paleolithic peoples in an attempt to make sense of how past peoples would have adapted to these kinds of scenarios; however, it builds a narrative contrary to the archaeological record. Specifically, we have evidence of trade among different communities (e.g. Kowalik et al. 2020) and of paleo-communities likely practicing exogamy (Sikora et al. 2017), suggesting cooperation among different social groups. Pam drew on her knowledge of Native American history - whom participants frequently conflated with people of the deep past - to conceptualize intergroup relations in the Paleolithic:

> Well I think when they were settled in one place and found a great cave and plenty of game they were definitely going to defend it, they weren't going to welcome anyone in and if it was some situation where the Native Americans… put up a temporary wood shelter and it sort of got fished out they'd move on to the next place like "yeah, help yourself, we already got all the fish out there that we want…" So I think it would depend on the resources. We're always fighting over resources and I don't think that's changed much.

Pam concluded that people who settle down somewhere and reap the benefits of the resources available automatically envision themselves as owning a specific territory. Amy, considering what she had learned from school, held the same assumptions about territory: "if they were competing for the same area, for the same resources, there would definitely be some fighting or some intertribal war." When I asked Nancy if there were any human behaviors that have remained the same between the Paleolithic and now, she laughed at the seemingly obvious fact being taken for granted:

> Dogs have hierarchies. Some, you know, travel in packs… there are certain characteristics that mammals have that I think we share… even the birds are territorial for heaven's sake. People are territorial, so I mean there… are a lot of things that are in common in the animal kingdom.

Similarly, Ron told me that violence is

> …not just the result of poor thinking or bad choices, it's also while we are humans, humans are also animals. And animals have the instinct both to get along and to fight and if you spent any time watching dogs you'd know that.

These quotes do not capture the effect that our social world has had on our evolution. Instead, these quotes reflect Robert Ardrey's (1966 as cited in Bowler 1989: 327-328) argument that humans are not exempt from the "'territorial imperative'" that informs most animal behavior, "because territory is the key to food supply and successful mating." In this instance, humans' place in the animal kingdom is invoked to explain the problematic behaviors of violence and territoriality in an attempt to universalize it, however the promiscuity of female dogs in heat was never used to explain human family structures nor the role of a lioness as the primary hunter

used to explain the gendered division of labor. In short, humans' place in the animal kingdom was used pointedly.

My data analysis revealed survival of the fittest was perceived as the driving factor for most, if not all, actions in the deep past. Sixty-four percent of survey participants thought that Paleolithic peoples being constantly in survival mode was accurately portrayed in popular media (see Appendix C). This lifestyle of survival is still seen as a driving factor in some of today's social practices, especially those involving violence, both physical and institutional. Pam demonstrated this popular belief when she told me, "I think [today's] not so different. I think it's all about survival…"

Social Darwinism, much to my surprise, turned out to be a persistent and popular idea. Ron transposes Social Darwinism as a "natural" characteristic of contemporary behavior and incorporates this notion into Christian logics of God favoring the fittest as the most deserving:

> …all of life and all of economics is a struggle for survival of the fittest and therefore the people who are successful must be the fittest and they must deserve to be successful and that ties in in certain ways to the religious belief that…some people are chosen by God and some are not and if you're chosen by God and favored by God you will be prosperous.

Ron's explanation of Social Darwinism exhibits its role as a justification for social classes, which he relates to a similar religious mentality. Both mentalities are explained as a naturalization of social stratification.

Indeed, many of my research participants naturalized survival instincts and survival of the fittest fueled violence. Naturalization of survival of the fittest fueled violence primarily occurred among research participants by comparing the past to the present. For instance, Nina spoke of humans' inherent survival instinct and stated that because of these instincts "…we're still in survival mode, but it's very different now than back then" in that we no longer have the

fear of wild beasts, but we do still heavily value our family's survival. Alice told me that, "…the violence, the survival, wanting to have power, those basic human characteristics I think are the same." Alice invoked qualities of modern global power dynamics in this quote. Similarly, Ron's response to what survival of the fittest meant to him demonstrates the ferocity of survival of the fittest fueled violence as viewed in modern warfare:

> You ever hear the U.S. Marine's take on the 23rd psalm? "Lo, though I walk through the valley of death, I will fear no evil, for I am the meanest expletive deleted in the valley.

To prove the inescapable reality of intergroup violence among humans, Ron told me of 11 wars his ancestors have been in since before the Revolutionary war in 1775, cited his own potential to get drafted for war, and detailed in great length three instances of family members caught in traumatic combat. Ron continually told me that humans' penchant for violence is not innate because there are safer actions we could take to solve problems, however the way he described and recounted the many instances of violence that have occurred to him and his loved ones can be best summed up in the following quote of his: "…what I'm saying is that the wild beast inside, there's still some of that there." We especially see this "beast" in Ron's personal account of having violently acted out towards a bully:

> At the same time, in my experience, violence is *not* just the result of being misguided or making bad choices, it's the gut reaction you sometimes have to situations you're dumped into the middle of for circumstances beyond your control and there are inbuilt human instincts toward violence, as I found out myself… I got into a certain number of fights when I was a kid… life as a boy can be somewhat different than life as a girl.

Not only is Ron basing his assumption on only his experiences, but suddenly an "inbuilt human instinct" becomes gendered.

For Amy, in the event that two groups came upon each other during the Paleolithic, she imagined they would be cordial if one group was primarily women, but if both groups consisted of both males and females there would be violence if competing for the same territory or

resources; thus, it is males who instigate the violence. Alice believed that when "husbands" left their mates to hunt "that women probably had also some kind of weapons where they were to defend themselves. I don't think at that age that women were defenseless." This particular view does not reinforce the "damsel in distress" metaphor so often applied to Paleolithic women (e.g.., a survey respondent said "Women in need of protection"), however violence in this instance only occurs for women as a defense mechanism against a danger that comes to them. This is in contrast to issues of territoriality and resource competition in which my participants envisioned men bringing the fight to the enemy.

4.5 Everyday Epistemologies of Race

Survey data on perceived geographic locations of paleo-peoples, AMH and Neanderthal interactions, as well as interview data in which participants were urged to think through how human diversity has evolved suggests that my participants' popular view of race in the Paleolithic is deeply informed by popular media. Specifically, the popular view of paleo-race consists of White AMH battling it out with Neanderthals, the competing "race" of the time. Furthermore, Neanderthals may be seen to represent the first act of "Othering" among humans and support feelings of (White) American exceptionalism, as viewed through AMH/Neanderthal interactions and further supported through participant conceptions of future human biological evolution.

4.4.1 New Land, New Look

Following visual anthropological theory (Weakland 2003), I included in the interview photo prompt an image of an ethnically mixed group from *10,000 BC* to spark discussions of

race among interview participants (see Figure 4.1). The image from *10,000 BC* constitutes an irregularity in the phenotypic representations of media set in the Paleolithic. As such, the image challenged participants' expectations and assumptions of human variation in the deep past. In particular, participants expected these past peoples to be homogenously White. As Nina pointed at the image, she said with a nervous laugh:

> These people look more modern… 'cause they… look different from each other. I think they used to all- now, this could be totally not true- but to me they kind of all looked very similar, where this looks- there's diversity in there.

Pointing to another photo of a more phenotypically uniform group Nina told me:

> …this is what I've always seen so this is what I think of, but you're right, then how did we get diversity. So then maybe there were all sorts- there were different groups. I mean, that's the only way to explain it I think. But like, I've never seen different groups, so maybe this is more right, although- yeah, I don't know.

Here, Nina revealed something of the internal struggle between her logic and the popular media she has seen in the past. Despite the fact that Nina recognized there would have to be diversity in the past to get diversity today, she could not reconcile that with what she has been visually exposed to. Pam, too, had trouble reconciling the photo from *10,000 BC* with her concepts about the deep past*:*

> First of all, this one has a lot of mixed races and I don't know how that would come about… but who knows what they looked like. There have been some reconstructions, but I don't think I've…seen any reconstructions since Lucy and Australopithecus, you know, and that's going back to my college days, so who knows how accurate, how much more research has been done…

Even though Pam acknowledged that there has been more research done regarding physical appearance of Paleolithic peoples, she still reverted back to what she remembered from college decades prior when she questioned the accuracy of the movie's depiction of human variation. This discussion of race is a particularly good example of how visual media has a lasting effect on one's mind and how it reinforces social norms and expectations, holding more credence over

even logic and knowledge. This reflects western cultures' ocularcentric tendency, in the sense that vision is the most highly valued sense and thus largely affects what people consider to be true (Mannik and McGarry 2017: 123).

Figure 4.1 Image from *10,000 BC* used in interview prompt (Ali 2008)

I asked survey and interview participants where in the world they imagined Paleolithic peoples living, as I expected people to have stereotypical images of what people may look like depending on geographic location. Amy listed Africa, Europe, North America, the Steppes, and India as places where Paleolithic peoples likely lived, stating that

> …I know that there were people located in different areas on the globe, but like even still I didn't think there was a huge drastic difference in skin color or in physical features. Like, yes, certain areas had different adaptations, but… I don't think they were all mixed together in one place.

In this quote, Amy was torn between not believing that people looked different from each other while at the same time acknowledging that peoples' physical appearance is an adaptation to the environment. The implication of Amy's final comment on not being "all mixed together" is that people left Africa, widely dispersed to their various geographic locations, and then stayed in that

location for tens of thousands of years with no further travel or intermingling. I find this particularly interesting, as she and many survey participants labeled Paleolithic peoples as nomadic and one may imagine more travel and opportunity for intermingling within a nomadic lifestyle that requires travel as opposed to a sedentary lifestyle. Again, this exemplifies a disjuncture between logic and the normative narrative of paleo-race in which people are typically depicted as White (Gifford-Gonzalez 1993). Indeed, many interview participants were unable to reconcile the knowledge that skin color relates to environmental adaptation and the belief that everyone looked similar that long ago.

Rooted in her reading of the work of Brian Sykes, Pam had a more well-informed and unique response to my question of what people might have looked like, stating, like many interview participants, that such physical adaptations would be a gradual process but that according to Sykes "they were dark people with blue eyes." Though confident in this statement, her knowledge of where they may have been located became less certain and precise as she tried to combine her personal experience and what she had learned:

> They say that they started in Africa or the Middle East and my maternal DNA, my mDNA, they said it started in Greece about 25,000 years ago, which is a lot more recent, but they said they… spread, so who knows where they were, you know, whether they went out into Asia…

By contrast, Ron's distrust of how science could contribute to a meaningful understanding of our deep past framed our conversation about the geographic location of people in the Paleolithic:

> To the extent that science has a good grasp of it, which it may or may not, they appear to have started out of Africa, spread to Europe and Asia, spread from Asia to North America and apparently from North America then south, although I don't really know that as factual. But [people moved] all over the world.

According to what Nancy recalled from "the *Times,"* it used to be thought that people came from Africa, but recent evidence has pointed to "way up north. Like Finland or Norway or some such

place… discoveries are continually being made…" Nina likewise shared that she imagines people primarily in northern territories:

> But then again, it might have been on all the continents, so it might've been… one large landmass, but I would say in the northern part of the world, I don't know what was in the southern part.

As Table 4.2 shows, most survey respondents envisioned Paleolithic life occurring primarily in Europe, with 10% less viewing Paleolithic life as occurring in Africa, despite the fact that it has frequently been labeled as the cradle of humanity. Solometo and Moss (2013: 127) found a relatively similar geographic bias in *National Geographic*, in which two thirds of the images depicted New World prehistory, followed by images in Europe (18 %) and Africa (11%). The European scenes were "dominated by images of Upper Paleolithic hunter-gatherers…" (Solometo and Moss 2013: 127). Sterling (2011: 185) explains this preponderance of Upper Paleolithic depictions by describing the view of "[t]he European setting [as] where and when our biological and/or cultural evolution reaches a point where we see 'ourselves,' in other words, where 'our evolution' is completed" (see also Martin 2019: 127-128). After Darwin's work on the origin of species was published, early intellectuals considered race to be synonymous with "geographically isolated populations" (Hirschman 2004: 393) and the term is still used "to describe members of a population who share some common physical features (e.g. skin color) and whose ancestors share a common geographical origin" (408). My research participants' acknowledgment of the adaptation of humans' skin color to change based on geographic location and the inability to reconcile with the imagining of phenotypically different humans coexisting in one place reflects the idea of geographic rootedness of race. Additionally, in survey participants' initial thoughts on paleo-life, 54 respondents commented on the cold and 67 respondents commented on the hardships paleo-peoples would face. As such, the repetition of

research participants imagining life occurring in the northern part of the world combined with the acceptance of survey respondents that it was a cold and brutal environment, creates an image of White Europeans being able to overcome any and all obstacles. It is these kinds of arguments that are used to claim White Euro-descended exceptionalism, as exemplified in White supremacist narratives of the Solutrean hypothesis (e.g., Voluspa/Astrid 2018; see also Bowler 1989: 303 and Sterling 2011: 185). While I cannot say for certain that these results mean most people believed Paleolithic peoples were of a light skin tone, I do conclude that there is a focus on European, presumably Upper Paleolithic life which educational and popular media resources alike often portray as White Europeans. The implication of this finding is that popular discourse surrounding paleo-race is grounded in the evolution of White Westerners while ubiquitously and superficially applying the model to the rest of the world's populations without a clear understanding of when or where human variety truly began.

Table 4.2 Locations Where Survey Respondents Believed Paleo-life to Occur

Q. 23 Where in the world do you imagine these kinds of scenes happening?	**Number of Participant Responses (n=96)**	**Percentage of total**
North America	60	63
South America	41	43
Europe	76	79
Asia	56	58
Africa	66	69
Australia	32	33
Antarctica	28	29

4.4.2 Paleolithic "Racial" Tensions and the Case for (White) Human Exceptionalism

Most often, discussions of Paleolithic racial tensions had nothing to do with variation among AMH. The only participant who conceptualized my question on what AMH intergroup relations looked like in terms of the modern-day concept of race was Pam, who told me that

groups at that time "sort of looked the same as each other. I don't know if someone who looked totally different would be able to just walk into the group… unless they had some skill or something…" In following with Sterling's (2015) framing of potential Paleolithic concepts of race, I used questions of interpersonal violence between AMH and Neanderthal groups as a way of eliciting how my participants may have imagined interactions between different races occurring. Amy had difficulty imagining how an AMH group may have reacted to a Neanderthal group because "there's nothing even from today's time to really base that off of…" However, many of my interview participants immediately latched onto the idea of people who look different from one another. Ron, drawing on examples from today, told me he wished he could say that AMH would respond to a chance encounter with Neanderthals

> …reasonably and with negotiated interaction and with some level of cooperation. My life experience tells me that's probably an over-optimistic view of things. There may well have been competition for resources, there may have been open warfare or they may just have avoided each other…it presupposes the notion that Neanderthals were somehow all inevitably blatantly…looking subhuman and all of the humans looked like a well-groomed modern man in a business suit and I think the actual differences in physical appearance may have been much more subtle at the time and the resemblances much closer than people might imagine. I'm sure there were some differences, though… Unfortunately, humankind has a long history of being unable to find ways of resolving differences other than violence as witnessed in the experience of my family here. But to say it was always warfare or that it was always physical violence I think would be a mistake, but to rule that out as part of the interaction would also be a mistake.

Here, Ron touched on many important facets of understanding intergroup relations between different hominin species. First, he explicitly stated that the differences in physical appearance would be enough to spark physical violence between the groups. Second, there is the reoccurring theme of the necessity of territorial and resource defense as opposed to cooperation, as discussed in the previous section. Finally, Ron comes to these conclusions based on his and his family's history as well as global history to inform his opinion. Mirroring Stump's (2013: 274) analysis of Collingwood's (1940, 1999 [1935], and 1946) critical interpretation of modes of historical

knowledge production, Ron exemplified how "statements that are incommensurate with the historian's conception of reality have to be treated merely as contextual information rather than as factual statements…" In this instance, Ron (who would be Collingwood's problematic historian) acknowledged that physical differences would be relatively minimal and that deducing whether or not Paleolithic war was widespread is not possible, yet he was still drawn to the idea of a violent past because his personal reality, which encompasses a long-held family involvement in war, supports that particular view.

Similarly, Nina struggled to reconcile what she personally believed about Neanderthal/AMH interactions with what she had experienced. Even after telling her that there was enough procreation among the two hominin groups to have Neanderthal DNA in our genes to this day, Nina still responded with the following imagining:

> So if there was more variation then I think they…maybe didn't meet them with aggression… But we have such a diversity in us that I think maybe they procreated and became just part of our DNA, but I don't know 'cause they were ruthless though, weren't they?...Neanderthals? Weren't they really…I mean, I guess we don't know. When I think of them I think of them as being very violent. I don't know why, but I do. So if they were very violent then we probably met with violence and then that was the end of that…

This particular imagining evokes the earlier discussion of violence, in which AMH are not primarily viewed as aggressive, but rather as defensive. It also assumes that AMH automatically have better war tactics and presumably better weapons, thereby allowing them to "wipe [the Neanderthals] out." This discounts the fact that Neanderthals were adapted enough to their environment and had existed longer than AMH have to date, in addition to the 1-4% of Neanderthal DNA in many people's genes today (Green et al. 2010), which indicates significant relations between the two hominin groups.

The following responses from Amy and Nancy, respectively, further exemplify how strong the racial tensions and "othering" would have been in the Paleolithic by contrasting what

would happen between two AMH groups versus an AMH and Neanderthal group were they to encounter one another by chance:

> I feel like the two [AMH] groups would… ignore each other and pass each other [if not encroaching on territory/resources]…
>
> [Among AMH] My image is that these people were so busy trying to keep warm and find food and make some clothing that they might've been- they didn't live very long as it was (laughs)…[As for AMH/Neanderthal interactions] I guess it would depend…if everybody had enough to eat and they weren't hunting and gathering on each other's-I assume they had territories…They could've just let each other alone, but if I suppose they were going after the same fishing grounds or something then there could be fights. Wars, whatever, right? If they were competing for the same food, shelter or something.

This compilation of interview responses alludes to popular explanations of Neanderthal extinction, primarily via competition and violence. However, the survey results tell another story. Nearly an equal amount of survey respondents believed AMH outcompeted Neanderthals for resources or that Neanderthals were absorbed into AMH society, with 41 versus 40 respectively (see Table 4.3). Only 21 of the 99 respondents believed AMH outcompeted Neanderthals using violence. This is surprising considering the confidence with which my interview participants told me of the violent and victorious encounters between AMH and Neanderthals. However, the argument for resource competition induced extinction is undermined by archaeological data, as studies have shown that the dietary overlap between AMH and Neanderthals would have been too minimal to produce extreme resource competition (Stewart 2004) and that there was likely trading of technology and ideas (Hublin et al. 1996), and thus close interaction between AMH and Neanderthals (see Herrera et al. 2009 for discussion of AMH/Neanderthal interactions). The majority of the survey and interview results suggest a vision of extreme "othering" of Neanderthals, based on physical, cognitive, and technological qualities. Some viewed these differences as leading to violent interactions and the defense of territory and resources as opposed to cooperation. The successful defense against these "others" thus created a sense of

superiority against these violent, animal-like hominin ancestors. In this view, our apparently all-White AMH ancestors paved the way for the life we lead today because of their cognitive, cultural and technological superiority, legitimizing feelings of human exceptionalism and the act of "othering."

Table 4.3 Why Survey Respondents Think Neanderthals Went Extinct

Q. 24 Neanderthals and anatomically modern humans coexisted, yet the Neanderthals went extinct. Why do you think this is?	**Number (n=99)**	**Percentage of total**
Neanderthals were absorbed into AMH social groups	40	40
AMH out-competed Neanderthals for food resources	41	41
AMH out-competed Neanderthals through violence	21	21
I don't know	32	32

Arguments for modern human exceptionalism become clearer in interview participants' discussions of future biological evolutionary change. Specifically, there is a common view that evolution is synonymous with progress. Nina explicitly told me "…evolving to me now would be the best genetics," meaning that evolving is constant progress toward perfection. In her brief discussion of eugenics, Amy acknowledged that "the natural selection going on is more human-made than natural:"

> …in the US you can literally go get your genes figured out and then your partner's genes figured out and then you can see if you have a kid, what they might be susceptible to… so you can choose whether or not… to have a kid or don't, so it's a power of choice too…

Nancy told me that "we're evolving resistance to certain viruses and bacterias [sic]," however this positive view of our biological evolution negates the reality of how those resistances come to be, particularly through vaccines. According to Amy, the option of perfected genes and health is only available to the wealthy in Social Darwinist terms: "…throughout the world, even in the US, it's scary but like diabetes even and insulin, like not everybody has access to insulin, so like that's slowly gonna impact the amount of people in our country that have diabetes." In this instance, the wealthy are driving human evolution as opposed to the poor "others" who will die from lack of access to proper healthcare and will be unable to pass on their genes. As such, human evolution (read: progress) is facilitated by our capability to distinguish ourselves from others and react violently to them not only through tangible physical violence, but through institutional violence such as housing crises, access to healthcare, poverty, incarceration, etc. which tend to have a basis in racism, a form of "othering" imagined here by my research participants to extend as far back as AMH/Neanderthal interactions.

4.5 Conclusion

The survey questions helped inform me of people's more general ideas on paleo-life and especially enlightened me on popular media use. The personal and focused conversations of my interviews were enlightening and invaluable to gaining a deeper understanding of what kinds of everyday epistemologies of human life in the Paleolithic and human evolution are being circulated among segments of the population today and how they are created. Data collected from surveys and interviews show that the most popular forms of popular media tended to be news-oriented and smartphone accessible, none of which consume much of one's time per article, video, etc. Additionally, catchy visual imagery is seen to leave a lasting impact rather

than just written word or spoken voice. When fact-checking their media, many participants said they first compare it to their personal experiences, then what they remember learning or knowing in the past. Part of the problem with this line of reasoning is that the high school education students are experiencing does not often embrace the most recent evolutionary data nor is it informed by modern anthropological theory and interpretation of the paleo-past. The legacies of 19th century racist, misogynistic, and dominating discourses are still very present in these experiences. Amy, referring back to her textbook images and class lectures, told me that she learned that humans were vicious and practiced the strictest of gender roles, yet we have little to no material evidence to say such. This is not necessarily the fault of the teacher, as Amy points out that "It's also the textbook too. They have a certain structure and guidelines you're supposed to follow."

The majority of popular media reflects modern social behavior (Weakland 2003) and as we saw with Alice and Amy part of the personal experience participants used as a rationalization tool relates to what media they have experienced. Most interview participants told me that they take non-news-oriented media such as television and film with, as Amy says, "a grain of salt," yet research participant responses to the long answer survey questions and interview questions demonstrated that it is in fact the popular images from more visually-based media sources that are at the forefront of how respondents think and talk about the deep past. Thus, the issues of media representation of human evolution is crucial and will be presented in the following chapter.

When pressed for the reasoning behind their answers, my interview participants were often critical of their own initial response, acknowledging they are actually *illogical*. This shows me that if presented with a different view of what life may have looked like in the deep past,

people may be able to better conceptualize the vast possibilities of what life may have looked like and what that means for their behavior today. This further reflects Stump's (2013:274) claims of how historical knowledge is produced, in particular that "the construction of a historical account requires information regarding the local conception of causation in order to understand the motives behind local decisions." In the case of paleo-life, however, there is little possibility for this emic point of view, as it is so long ago in the past that there is no one with firsthand knowledge on the topic. Furthermore, "what is considered plausible [in the past] results from culturally and contextually specific notions of cause and effect" (Stump 2013:273), in this case being modern-day realities. As such, these interpretations of human life in the Paleolithic become unquestioned reflections of modern life because they align with the kind of reality that lay people experience to be "true".

Participants recounted that they have encountered themes of human evolution at museums, school, and public lectures, but it is also clear that these topics are being addressed in the popular media they consume, as many of the examples and themes they shared were the same, despite their diverse educational and popular media backgrounds and experiences. To be specific, my survey and interview participants gather from popular media that human life in the Paleolithic consisted of a nomadic lifestyle in which the society was male-dominated with a highly gendered division of labor where the men hunted, and the actual role of women is near invisible, at most with an economic role of collecting berries. As such, meat was the most important source of food and the most frequently noticed theme throughout popular media. Paleo-peoples in these discourses lived in fear of the wild beasts around them and were required to protect themselves with spears from creatures as varied as dinosaurs and tigers. Finally,

according to my interview participants' shock at the photo from *10,000 BC* showing human diversity in the past, popular media largely depicts people in the Paleolithic as White.

My research participants' common view of human life in the Paleolithic is seen as a time of doom, gloom, and danger, in which humans had to brave the frigid cold and wild beasts of the North. Once a small, patriarchal group of 15-20 AMH found land that suited their needs, they would fight tooth and nail to defend their territory and resources, especially from those who looked different. Cooperation between groups to acquire more resources for all was/is an impossibility. The resource and territory fueled violence were naturalized by my interview participants by comparing humans' behaviors to that of other mammals. While violence is deemed by my interview participants to be a facet of human nature that we still experience today, it is highly gendered in the way it is depicted and spoken of. Those in the group that acquired resources tended to be men and the resource in question tended to be meat. Hunting was the most important occupation and men filled this role. Most people did not think about women in the Paleolithic, but those that did tended to identify women as mothers and homemakers. Any role beyond mother is seen as a social push to "have it all," and is generally discussed in terms of comparisons with the present. If the men were not out hunting, then they were home, and everyone was working on creating new tools or hunting plans. There was little to no joy or relaxation in one's short life, only procreation or food acquisition activities.

We can see numerous commonalities between the media portrayal and the public imagination of human life in the Paleolithic, especially between the importance placed on hunting in the day-to-day life of a Paleolithic person and the strict gender roles, vigorously articulating the age-old trope of Man-the-Hunter. Violence even shows commonalities in that survey results on media portrayals show violence as an act of protection against non-human

beings and in response to personal views violence is seen as *especially* occurring towards non-humans, mainly Neanderthals in the case of my interviews, and is chiefly spurred on by the need to protect one's resources and territory to ensure survival. Finally, interviews show that seeing non-White people in depictions of the Paleolithic are shocking, if not an indicator of inaccuracy in the piece of media. Although most interview participants claim they do not believe what they hear in popular media, the similarities between media accounts of Paleolithic life and peoples' personal opinions on what life was like are too great to support these participant claims. The following chapter will further detail what messages about human life in the Paleolithic are being portrayed through popular media and will include a cross comparison between popular media and popular perception.

When asked to look to the future, my participants generally viewed evolution in Social Darwinist terms. In particular, evolution is viewed as progress and whereas evolution in the deep past occurred because of biological changes, future evolution is viewed to be more driven by social action rather than biology. We see this in discussions of gender, in which women of the deep past were limited by the biological burden of pregnancy, but now women are having babies *and* working, and my participants predict the shift in gender roles to change even more. According to the survey, most participants believed we used to be in survival mode, but now because of biological changes, we no longer have the same survival instinct in our DNA; however, the responses given during the interview strongly suggest that participants believe that survival mode is a biologically caused condition that we are still experiencing and being driven by today. Survival mode today expresses itself in our wars, strong group identification and urge to protect our families. Future biological evolution is primarily identified as positive changes to our health and appearance (e.g., taller and fewer congenital disorders).

In short, biological underpinnings are attributed to the disreputable aspects of human behavior, such as violence and the tendency to "other" people. Gender roles are seen as having broken away from their biological underpinnings to an extent, however women are still viewed first and foremost as mothers and anything beyond that is not necessarily natural, though it is possible – with consequences - through social change. These views of what evolution means in the past and present are disconcerting because they are used to explain reprehensible behavior despite the fact that they are not based on recent evolutionary data and they support a "survival of the fittest" logic. The following chapter will highlight similar common tropes found in media examples featured in my survey results.

Chapter 5 : "Everything was based on survival of the fittest:"[9] An Analysis of Popular Media Representations of Human Evolution

"My name's Eep. And this is my family, The Croods. If you weren't clued in already by the animal skins and sloping foreheads, we're cavemen. Most days we spend in our cave… When we did go out we struggled to find food in a harsh and hostile world… We were the last ones around…The Croods made it because of my dad. He was strong and he followed the rules…"- Eep in *The Croods* (DeMicco and Sanders 2013)

Inspired by participant observations of popular media, I conducted a close viewing analysis of frequently experienced media to draw out evolutionary narratives and better understand the broader public framing of paleo-life and human evolution that is so influential on peoples' every day views. The popular media I chose to analyze were based on common suggestions among my survey respondents and a selection of popular media that I considered to contain themes of human evolution and that many survey respondents also experienced. The reflexive media analysis and ethnographic data demonstrate popular media's power in communicating ideas, especially fiction-based visual media, which dominate popular discourse in a way that "credible" sources such as books or news do not. The following analysis will examine race, gender, and violence presented in television, movies, books, and online news articles and the ways they intertwine with understandings of human evolution and paleo-life.

According to survey results, on a scale of 1 to 5, one being least important and five being most important, popular media averaged at 3.2 as a valued educational source. Though interview participants claimed to believe little of what they experienced in popular media, the following reflexive media analysis will show the similarities between popular perceptions of paleo-life and human evolution and media portrayals of these same topics. This is no surprise considering "*what people say they do and what they actually do are often different"* (Rathje 2008: 38;

[9] Quote from survey respondent.

emphasis in original). A cross-comparison between participant responses and popular media messages is an effective and insightful method for illuminating the power of popular media, as surveys and interviews alone bear the inherent informant bias in which the knowledge of being tested and having to give satisfactory answers can greatly influence the responses they give (Webb, et. al 1966). Furthermore, interview participants said that to a high degree they relied on past personal experiences to perform on-the-spot fact-checking of popular media prompts, which included not only what they learned in school or museums, but other popular media that they have encountered. When the same messages are continually communicated across multiple platforms and mediums, it quickly becomes a form of common-sense knowledge, affecting how people have come to understand the past and present (Moser 2001). This can be especially problematic in depictions of the past because popular media acts as a modern cultural critique and relies on stereotypes, while paradoxically evoking a cultural "truth" or shared understanding that is the source of the implied meaning and significance. In this way, these popular media representations sustain the structures and ideas about the past even if they are meant as images and stories about the present.

The survey presented examples of films, television shows, books, and video games containing themes of human evolution and paleo-life and invited respondents to provide their own examples. Respondent examples feature life in the deep past as well as in the future, positioning human evolution as human cultural experience through time and revealing the direction in which participants think humans are heading.

Although I had planned to evaluate five examples of each medium, only two books were read by multiple people; of 33 survey respondent book suggestions, no two people wrote the same title (Appendix C). Similarly, 93 survey respondents of the 102 who answered question 5

had not read any of the four books I provided on the survey. This speaks to the hegemonic nature of visual media as opposed to the varied and uneven distribution of literature. Because no two people read the same book, I conclude that ideas on human evolution portrayed in literature do not reach as wide of an audience as visual media or create the same kind of hegemonic ideologies. Indeed, television is the most preferred form of popular media with 34% of survey respondents citing it as the most enjoyable form of popular media (Table 5.1) and 34% claiming to watch it daily (Table 5.2).

Table 5.1 Survey Respondent Popular Media Preferences

Q. 9 Rank your preferences for which popular media you enjoy most.	**1 (Most favorite)**	**2**	**3**	**4**	**5**	**6 (Least favorite)**	**Total**
Magazine Articles	2	8	10	22	37	29	108
Video games	13	4	17	9	14	50	107
Online Resources	6	7	20	38	25	11	107
Books	16	14	27	21	16	14	108
Movies	34	40	17	6	9	2	108
TV Shows	37	35	17	12	6	1	108

Table 5.2 Survey Respondents' Frequency of Popular Media Consumption

Q.10 How often do you do each of the following?	**Every day**	**Several Times a Week**	**About Once a Week**	**Several Times a Month**	**About Once a Month**	**Less Than Once a Month**	**Never**	**Total**
Movies	5	23	19	23	18	20	1	109
TV Shows	37	41	14	10	3	1	3	109
Books	18	17	12	10	14	20	14	105
Videogames	8	18	5	6	14	14	44	109
Online Articles	27	18	15	11	10	21	7	109

When broadly categorized into media types, the most popular media format for educational purposes was news sources, at 57 survey respondent responses (Appendix C). Four of my six interview participants also cited news as a favorite form of popular media, with two of them indicating that nearly the only media they consume is news. As such, I narrowed my search of online articles to online news articles, focusing on the top five news sources cited by survey respondents. On each news sources' website, I used the search term "human evolution" and analyzed the article that (a) exhibited the closest connection with the deep past and (b) was published closest to August 2020. While my participants may or may not have engaged with these particular news articles, I hoped to be able to more generally evaluate the ways in which stories of human evolution are framed and whether these discourses connect to the problematic narratives of paleo-race, gender, and violence.

The following sections will examine how race, gender, and violence are depicted in popular media containing themes of past and future human evolution. Comparing perceptions of the deep past and future, it is clear that participants view certain behavioral traits as cultural "survivals." This discussion will reveal the likeness between public understanding and popular media portrayal.

5.1 Gender: "male dominance, female subservience"[10]

"A woman had to be protected, provided for, and totally dominated, or the delicate balance of physical and spiritual forces would be disrupted and the continuing existence of the life of the Clan would be destroyed." – excerpt from *The Clan of the Cave Bear* (Auel 1980: 130)

I analyzed eight examples of media based in the Paleolithic, one of which is nonfiction. Aligning with participant interpretations of media based in the Paleolithic as male dominated, of

[10] Quote from survey respondent.

the fiction-based media, four feature male lead characters, two feature women lead characters, and one - *2001: A Space Odyssey* (Kubrick 1968) – features non-gendered apes. This emphasizes how popular media perpetuates tropes of the perceived value of men's Paleolithic lives over women's. As one of the most blatant expressions in popular media of strict gender roles, *Year One* (Ramis 2009) opens with a comical hunting scene of 10 men in unfitted furs with wooden stone-tipped spears, immediately signaling to the viewer what time period the film is set in. The film goes on to lampoon the male main characters for being unable to do this most important and manly task, made all the more embarrassing since this paleo-society only has two jobs: hunting (by men) or gathering (by women, children, and weak men). *Year One* and *10,000 BC* (Emmerich 2008) tie men's sexual fitness to their ability to hunt. In *Year One,* Maya will not copulate with Zed because of his inability to hunt, while in *10,000 BC* the lead character, D'Leh, single-handedly kills a mammoth during a large hunt, the reward for which is his ability to "claim" a female with whom to mate. Indeed, survey respondents cited the male-dominated practice of hunting as paleo-peoples' primary concern as conveyed by popular media. With an underlying belief that humans are inherently violent apex predators (see Chapter 4), the correlation between successful hunting and sexual selection in popular media communicates the idea that violent patriarchal tendencies were selected for and passed down to us modern humans in the 21st century.

I have characterized *Ice Age* (Wedge and Saldanha 2002) as a film with a male lead not only because the nonhuman actors are male, but because the only human female in the movie dies in the very beginning in an attempt to save her child, leaving a group of wild male animals to "reunite a one year old boy with his hunter father" ("Ice Age" 2002) and the rest of his male kin. The male human characters of all three of these films have the singular goal of saving

women, or in *Ice Age*'s case, a baby. Aside from a brief portrayal of the women and children gathering in the beginning of *Year One*, the women needing to be saved are valued primarily for their sex appeal and serve little other purpose. Indeed, this echoes survey respondents who were largely unable to define women's paleo-roles as communicated by popular media, with only one specific suggestion: "gathered berries." The relative uselessness of women beyond sex suggests that their primary role in nature is to copulate and bear children, as opposed to men who take on the gamut of subsistence activities.

Although Fred Flintstone of *The Flintstones* (Hanna and Barbera) lives in the Paleolithic, he lives a more modern lifestyle. Despite the fact that he is not out hunting to provide for his family, he is the sole provider of the home: Fred is the breadwinner of his nuclear family by going to work and consistently trying to succeed in get-rich-quick schemes while his wife stays home to cook and tend to their child.

In media based in the Paleolithic that casts female lead characters, men are still given the same roles and higher level of respect. Eep of *The Croods* (DeMicco and Sanders 2013) lives in a patriarchal nuclear family led by her father, Grug. Grug shoulders responsibility for his family's survival by organizing gathering expeditions and enforcing the rules of survival, especially by using fear tactics to emphasize the necessity of staying in the cave at night and not deviating from the norm: "Fear keeps us alive, Eep. Never not be afraid. No one said survival was fun" (DeMicco and Sanders 2013). Survey respondents' views when imagining human life in the Paleolithic echoed the same sentiments expressed by Grug: "scary," "unforgiving," "simplistic," and "scarce." Eep wants to rebel, but it is not until Guy, "a more evolved caveman" (Gracenote) whose name emphasizes his maleness, enters her life that she is able to have new experiences and adventures. Furthermore, this great adventure is a journey to a new land at a safe

distance from the natural disasters ravaging their home territory. Therefore, *The Croods* is just another example of a story in which (a) Guy saves the damsel in distress.

The Clan of the Cave Bear (Auel 1980) is rife with gendered messages (see Pollak 1991 for gender descriptions throughout *Earth's Children* series), boiling down to the Neanderthal's biologically stagnant gender roles in which women are docile, obedient members of patriarchal society who gather plant foods, cook, bear and care for children, and generally do whatever men ask of them. Men are tasked with leadership roles, hunting, and spiritual communication. Ayla, the AMH main character, disrupts this longstanding division of labor by being slow to react to male commands and learning to hunt, though this is explained by her identity as an "Other." Similarly, Ayla breaks the tradition of "remembering" Clan skills by learning medicinal knowledge from her adoptive mother, Iza, who holds the highest female position of power: medicine woman. This disruption of the norm leads to a violent rape that produces a male hybrid child, who is later prophesized to be the future of Neanderthals' existence:

> She was nearly unconscious when he threw her over on her face, feverishly ripped her wrap aside, and spread her legs. With one hard thrust, he penetrated her deeply. She screamed with pain. It added to his pleasure. He lunged again, drawing forth another painful cry, then again and again. (Auel 1980: 313)

Thus, while Ayla is the protagonist, it is the men's roles who are most often discussed in terms of reverence and it is the product of a man's violent sexual aggression that is the promising hope for an entire species' continued existence, not the will of the female protagonist, but the strong guiding hand of a man who forced her to perform the most basic of women's natural roles: bear children. *Year One* similarly discusses procreation in terms of rape:

> Zed: Listen, you want to impress Eema? Do the fertility dance with her at the feast tonight, then drag her back to your hut…
> Oh: What if she struggles?
> Zed: You know, give her a little tap on the head, women respond to that. (Ramis 2009)

These misogynist, violent, rape-enabling visions of the past are entrenched in popular media, projecting the ongoing tragic experiences of women today onto the deep past where such behaviors and social structures are archaeologically invisible. Such depictions risk promoting the unfounded idea that rape was a naturally selected behavior to continue the human race.

All six examples of gendered fiction set in the Paleolithic exhibit male-dominated societies. Even in examples with female lead characters, the protagonists may have the leniency to practice non-normative behaviors, such as the yearning for adventure or the skill to hunt, but they are unable to break free of neither male dominance nor their biological roles. While Eep does not bear children like Ayla does, she does fall in love with her male savior. Across the six examples, men are tasked with saving – or in Fred Flintstone's case providing for –women, children, and at times, the entire species. Thus, human survival is impossible without dominant male roles and expectations being fulfilled. In addition to saving lives already in danger, males are burdened with the gender-defined role of maintaining daily survival. This is not only visible in their leadership, but the four examples where men hunt, thus providing important sustenance for their people. Only two of the examples analyzed depict women as contributing to food acquisition through gathering plant foods. Although *The Croods* makes gathering a family affair, it only includes one adult and one teenaged male and is instead dominated by females ranging in age from infancy to geriatric, thus making the argument that without enough able-bodied men it is not possible to hunt.

Reflecting on these dominant tropes in popular media, it is no surprise that my survey and interview participants designated food acquisition, particularly hunting, as one of the most prominent aspects of media set in the Paleolithic. Nor does it come as a surprise that the task is associated with males or that Paleolithic society in general is male-dominated. Male roles are

consistent in every example of fiction based in the Paleolithic, whereas women's roles range from typical gathering and child-bearing to being undefined or attempting to break free of tradition. This is a potential explanation for why survey participants were more confident in asserting the roles of men and why women were often left unmentioned: dominant public narratives leave people with few stories of paleo-life from which to base an opinion or understanding of the world, thus the roles of men are confidently lauded while those of women are silenced. That is to say, the consistent depiction of men in dominating and hunting roles has been described by my participants as an accurate and memorable aspect of media based in the Paleolithic and the Paleolithic generally because no matter the genre of the media it is the same, whereas depictions of women's roles lack consistency and at times even definition, thus leading media consumers to have a lack of understanding in the exact roles and behaviors of women. Over time, this lack of a clear role of women in the deep past risks turning into the belief that women lacked a real role in driving human evolution and that instead it was the lives of men that got us to the modern era.

Sapiens (Harari 2014) is a non-fiction work that reinforces the messages of fiction set in the Paleolithic and reflects ideas held in the publicly imagined past. Harari (2014) emphasizes the biological underpinnings of gender roles, stating "there is some universal biological reason why almost all cultures value manhood over womanhood" (172). He encourages women to feel grateful for being able to exercise modern rights they are biologically unworthy of:

> Throughout most of history, women were often seen as the property of family or community. Modern states, on the other hand, see women as individuals, enjoying economic and legal rights independently of their family and community. They may hold their own bank accounts, decide whom to marry, and even choose to divorce or live on their own. (2014: 403)

Men, on the other hand, are bound by their biological makeup: “Most males spend their lives toiling, worrying, competing and fighting, instead of enjoying peaceful bliss, because their DNA manipulates them for its own selfish aims” (Harari 2014:441). Even the arduous task of maintaining the species through procreation is only made possible because of its pleasure, not because it is an organism’s biological drive to reproduce: “If sex were not accompanied by such pleasure, few males would bother” (Harari 2014: 432). Harari’s cultural “survivals” work to alleviate men’s agency in a variety of behaviors, such as war and heightened sexuality, while reinforcing women’s role of mother. Although Harari (2014: 51) begins his book by arguing “Ever since the Cognitive Revolution, there hasn’t been a single natural way of life for Sapiens. There are only cultural choices, from among a bewildering palette of possibilities,” he frequently states otherwise: “no matter what their efforts and achievements, Sapiens are incapable of breaking free of their biologically determined limits” (Harari 2014: 445). In short, Harari has provided academic support for the idea that gendered behavior is biologically induced when it is convenient for excusing male behavior and puts women in their place.

The examples of media representing future human evolution similarly allow women to enter different sectors of public life. Most women described here are still being put in roles that characterize them as caretakers or are otherwise cast as mere love interests. No matter the task being given to women, there is always a man involved in the women’s “new” roles.

Dystopian fiction (i.e., *The Handmaid’s Tale* and *The 100*) features female lead characters, an unfamiliar role for women in media set in the Paleolithic, though parallel with survey respondents’ assumption of shifting gender roles in the future. These women take it upon themselves to mollify the oppressive and highly problematic societies that natural and technological catastrophes have produced. However, none of these female leads is given the

chance to lead the resistance on her own; men assist them all. *The Handmaid's Tale*[11] focuses on June, a "fruitful" woman amidst an overwhelmingly barren society. She, and other women like her, are forced to conform to traditional patriarchal values and roles in which there is a highly stratified society based on gender and women's reproductive capability:

> Sterile. That's a forbidden word. There's no such thing as a sterile man anymore. There's only women who are fruitful and women who are barren. (Barker 2017)

The denial of categorizing men as sterile puts the reproductive onus on women, further reinforcing the idea that childbearing is a woman's natural role, not a man's. While being forced to have sex with men in power to bear their children, June's only solace is in a male driver who falls in love with her. Even while under the oppression of men, June can only find comfort in them. Although women hold positions as varied as doctor, rocket scientist, and warrior in *The 100*[12], Clarke is unable to lead her peers without the help of her male counterpart, Bellamy, and similar to June seeks solace in a male love interest. Under the pretense of giving women the ability to lead and enact change, these pieces of media still abide by normative patriarchal power relationships, suggesting that while the social roles may change the biological prerogative of men as leaders will not.

Non-dystopian media – *The Jetsons, Star Trek,* and *2001: A Space Odyssey* – cast male main characters. *Star Trek* and *2001: A Space Odyssey* position men as intelligent, fearless leaders of great scientific missions. *The Jetsons* features America's typical 60s father figure working to provide for his family, while the women in George Jetson's life are portrayed as homemakers and caretakers, mirroring Hanna-Barbera's image of paleo-life as depicted in *The Flintstones.* These overwhelmingly popular cartoons work together to convey a continuation of

[11] I watched the first season of *The Handmaid's Tale* for this reflexive media analysis.
[12] I watched the first season of *The 100* for this reflexive media analysis.

material-social processes across time, reflecting popular conceptions of human evolution as a change in technology rather than behavior. *2001: A Space Odyssey* also attributes the title of caretaker to its women, as the few present are mothers or stewardesses. *Star Trek* [13] provides women with roles of prestige, such as members of The Bridge and as heads of departments. However, there is arguably only one main female character, Lieutenant Uhura, and her secretarial role continues to fall in line with traditional values. While *Star Trek* features much positive female representation, it is relatively subdued in its impact. Most of the female characters that have large speaking roles are guest appearances that often act as potential love interests of any member of the male crew, though especially Captain Kirk, who seems to have a history as an interstellar player. That being said, *Star Trek* was certainly ahead of its time in regard to more inclusive representation. In sum, popular media portrays gender roles of the future as changing only in appearance rather than substance. While there may be an increase in women's ability to enter different areas of the workforce, or even lead, there will always be a man there to guide her or pursue her for procreation purposes.

5.2 Violence: "…they're all trying to survive and they're all fighting in their hostile environment…"[14]

"War is inevitable, [ever] since cavemen smashed each other's faces in for control of the fire stick." – Aunt Elizabeth in *The Great* (Chessell 2020)

Ten out of the 17 analyzed popular media examples contained elements of violence, only one of which argued against the existence of widespread paleo-violence. MSNBC's Viegas (2010) presents in her online article an archaeologically-based past in which humans did not

[13] I watched the first season of *Star Trek* for this reflexive media analysis.
[14] Quote from survey respondent.

begin as predators, but rather as prey, emphasizing that "'Despite popular theories posed in research papers and popular literature, early man was not an aggressive killer… Our intelligence, cooperation and many other features we have as modern humans developed from our attempts to out-smart the predator'" (Viegas 2010). However, this piece is 10 years old and based on the continued reference to 19th and 20th century views of human evolution in participant responses and additional popular media, it is clear that this piece did not have significant resonance to change dominant discourses and has not been a sustained narrative since. Indeed, popular media overwhelmingly imagines the type of past expressed by Alice, who said humans have the "basic animal instinct of… attacking…"

Six of the eight analyzed examples of media set in the Paleolithic contained violence. Two of the three animated pieces of media did not (*The Flintstones* and *The Croods),* likely because they are targeted towards children. As a movie with an implied metanarrative of evolution, the violence depicted in *Ice Age* constitutes natural animal behavior. Although the violence in this film primarily occurs between animals rather than humans, humans are depicted as undergoing the same survival struggles as the animals, thus placing humans in the same animalistic category. This means that humans may be expected to embody the same violent behavior. For the five examples of popular media that contain human interpersonal violence, two frame it in terms of domestic violence with males as the aggressor and females as the victim (*The Clan of the Cave Bear, Year One*), three depict it as a mode of territorial protection/acquisition (*Sapiens, 2001: A Space Odyssey, 10,000 BC)*, and one depicts it as ordained by God (*Year One*). Only two of the examples depict large-scale violence that could be categorized as warfare (*10,000 BC* and *Sapiens*), whereas the rest are personal encounters. In all instances, except for *2001: A Space Odyssey,* in which gender is indefinable, the violence is enacted by men. Thus,

violence becomes an innate *male* characteristic, which survey and participant responses similarly signal is how violence is typically contextualized, even when initially argued to be a species-wide phenomenon.

Primarily, acts of violence are framed by popular media as successful modes of perpetuating survival. *The Clan of the Cave Bear* touts violent rape as the driving factor of the continued existence of Neanderthal genes. *Sapiens* recounts the unlikely story of our "violent, accomplished species" (Harari 2014), pointing to the killing of the "Other" as the mode by which humans have been able to conquer the world. Indeed, Harari posits "Building and maintaining an empire usually required the vicious slaughter of large populations and the brutal oppression of everyone who was left" (Harari 2014:216); violence was not only a tool to maintain a large social unit, but a *requirement*, and without violence our current way of life would not exist. In *2001: A Space Odyssey*, "a bunch of bedraggled primates are losing the battle of the survival of the fittest until…one of those apemen [sic] is inspired to pick up a bone and use it as a club to kill the animals that" (Overbye 2018) stole their watering hole. They subsequently celebrate the defeat by throwing the murder weapon towards space, where the audience is introduced to humans' future. This scene echoes paleoanthropologist Raymond Dart's notion that human nature originated "in the moment when our ancestors picked up a bone or sharp rock and realized it could be used to kill," as described by Milam (2018). This model for understanding our species is especially critical considering the film's long-standing reputation as "one of the most important movies of all time" (Overbye 2018) because it argues that we would not be here today without such violent acts. *10,000 BC* depicts violence as the most successful way to obtain labor, land, and women in order to provide for its people, turning this "sublimely dunderheaded excursion into human prehistory" into a "decent action movie" (Scott 2008). Finally, *Year One*

not only promotes knocking a woman unconscious in order to procreate, but in its Biblical scenes frames violence as a necessary sacrifice required by God to remain in his good graces; violence can be morally excused. Depicting violence as not only a ubiquitous experience, but necessary in order to survive and obtain resources, frames violent behavior as human nature and the means by which our species has been able to continue procreating and thus evolving.

Across survey and interview responses, paleo-violence was made visible by weapons, especially spears. This is notable, as spears contain one of the few Paleolithic artifacts that tend to remain intact over time: a stone point. The archaeological visibility reflects itself in media about Paleolithic life, just as the archaeological invisibility does with the lack of what are designated to be women's tools, like baskets and digging sticks, which are made of natural materials that gradually degrade. Thus, the participant focus on weaponry, a historically male-dominated niche, and my interview participants' tendency to refer to historical events when deducing what life in the deep past looks like, supports the perceived importance of men's roles in the Paleolithic (see Gero 1991, Torrence 2001 as cited in Sterling 2011 for Pleistocene weaponry associations). These participant responses regarding violence center on the need for protection and survival and thus act as a successful mode of survival as enacted by men.

Popular imagination likewise envisions violence as a defense mechanism, especially in the context of protecting territory and resources, as exemplified in the following survey responses: "there was competition between people for survival;" "they fight for their lives;" "they used traditional weapons to…protect the family." Yet this so-called innate *human* characteristic becomes gendered in the ways that participants described and imagined it. In the few instances in which women were spoken of in relation to violence, they were excused from it because the male enemies would pity them and take them in or women were left at home with

weapons in case they needed to defend themselves from intruders. Here we see similarities between participant conceptions of media set in the Paleolithic, participant personal views on paleo-life, and the messages portrayed in popular media as seen through this reflexive media analysis. My analysis shows that popular media portrays violence as a successful mode of survival in that it is an effective tool to get the resources you need (women, land, labor as seen in *2001: A Space Odyssey, 10,000 BC, Sapiens*), to protect the resources and territory one already has (*2001: A Space Odyssey)*, and to ensure the future (*2001: A Space Odyssey, Year One, The Clan of the Cave Bear, Sapiens)*. However, men are the only ones perpetrating these "natural" acts of violence.

Aside from the children's cartoon *The Jetsons*, all analyzed popular media set in the future perpetuates violence as a successful form of survival in which humans will continue to engage. *The 100* depicts future violence as ubiquitous, with all characters either being forced into or willingly turning to violence to ensure their survival. Despite the moral dilemma this causes, Bellamy continually assures his people that "who we are and who we need to be to survive are very different things" (Showalter 2014), thus minimizing the agency of the characters in these acts of aggression. The 100's culpability is further diminished by blaming their opponents and natural instincts respectively, thus framing violence as an innate aspect of humanity:

> Violence is the only thing they seem to understand. (Behring 2014)
>
> When I saw the Grounders in the trees it's like nothing I ever felt, you know. Pure animal instinct took over and pulled the trigger: Grounders dead. (Madha 2014)

Violence is also used as a means of gaining control and maintaining order as seen in *The Handmaid's Tale* and *Sapiens.* Characters of *The Handmaid's Tale* who oppose the new regime or break one of their values are met with severe violence. For instance, in episode one, the corpses of a priest, doctor and gay man are left strung up along the river wall to serve as

warnings for those of different religious, scientific, or sexual orientations. For speaking out on the first day of her Handmaid orientation, Janine's right eye is gouged out. By framing violence as means of progress and weeding out the immoral, "unfit" dissenters, the governmental regime of *The Handmaid's Tale* echoes the conservative Social Darwinist perspective that humans succeeded because of male-dominated hierarchies, the natural instinct for accumulation and power, and morality (Cohen 2007). In addition to extensive commentary on successful violence against Neanderthals, Harari (2014) often invokes aggressive rhetoric that signals how humans had to fight to become "rulers of the world." For example, he weaponizes language by stating, "…*Homo sapiens* conquered the world thanks above all to its unique language" (Harari 2014: 21).

More than one of *Star Trek's* extraterrestrial characters comments on humans' innate aggression. In episode 18 (McDougall 1967), General Trelane marvels at humans' capacity for violence: "Do you know that you're one of the few predator species that preys even on itself?" In the following episode, the Metrons stop the USS Enterprise's pursuit of an enemy ship to avoid violence, however it was deemed fruitless: "…we have analyzed you and learned that your violent tendencies are inherent…" (Pevney 1967). In the end, Captain Kirk "demonstrated the advanced trait of mercy" (Pevney 1967) by not killing his opponent. This scene demonstrates that only once we acknowledge violent aggression as a problem can we move to the next stage of human evolution. Although adhering to the standard narrative of inherent violence, this scene is unique. Not only does this scene acknowledge the problematic nature of aggression, while the rest of the analyzed popular media condones it as an important survival tool, but it depicts more "evolved" beings that pass judgment on "primitive" AMH, much like AMH today judge hominins of the deep past.

Popular views of the future continue to find a role for violence; violence is an inescapable part of being human, one we have endured and benefitted from since the beginning of time. Research participants cited protection, resource competition and territoriality as driving factors of violence. My interview participants further naturalized the act of violence by frequently comparing humans' natural instincts to those of other mammals in the wild, sometimes even laughing at my naïve questions of why they think that humans would automatically react violently. These types of responses suggest that violence is a natural means to acquire and maintain the resources necessary to survive. Indeed, the same messages have been expressed in the analyzed popular media by presenting it as a ubiquitous facet of past and future life.

5.3 Race: "To me they kind of all looked very similar"[15]

"Homo sapiens evolved to think of people as divided into 'us' and them.'" –Yuvah Noah Harari in *Sapiens* (2014)

Based on my interview participants' shock at seeing the ethnically varied war party depicted in *10,000 BC*, it is uncharacteristic to see non-White actors in depictions of human life in the Paleolithic and at times even seemed to suggest a lack of accuracy. Based on my own analysis, in the seven examples of fiction set in the Paleolithic, main and supporting characters were overwhelmingly White (with the exceptions of *2001: A Space Odyssey* and *10,000 BC),* despite geographic location. The paleo-characters were apes for the former film and thus cannot be racialized, whereas *10,000 BC* features an extensive Black army that comes to the aid of the White main character. Indeed, with casts such as this it is clear why the *10,000 BC* photo prompt shocked my interview participants. Furthermore, many survey respondents understood from

[15] Quote from interview participant Nina.

popular media that paleo-peoples lived in a "cold and snowy area." When asked for personal perceptions, more survey respondents envisioned humans to inhabit Europe than anywhere else in the Paleolithic. Based on some interview participants' confusion over whether the south experienced an Ice Age, I think it likely that media consumers imagine paleo-life occurring primarily in Europe. While I cannot say for certain that participants' perceptions of where paleo-peoples were located geographically demonstrates a vision of a White population in the popular imagination, I find it likely, considering the types of logic upon which my interview participants have been observed to rely. I, thus, argue that my participants' views overlap with popular media in envisioning a predominantly White paleo-population.

Race was most extensively discussed in terms of Neanderthal and AMH relations during my ethnographic research. When asked why Neanderthals went extinct, few survey participants agreed with the statement that AMH outcompeted Neanderthals through violence and instead near equally viewed the Neanderthal demise as a product of resource competition or being absorbed into AMH society (Table 4.6). This was in stark contrast to interview participants who overwhelmingly envisioned a violent interaction. Indeed, while interview participants viewed inter-group cooperation warily, they made it clear that cooperation between AMH groups was more likely than between AMH and Neanderthal groups. Encounters between the different hominins were generally contextualized in terms of competition and protection against Neanderthals.

Sapiens emphasizes a human need to "Other" those who can be distinguished from "Us." Harari (2014) and Auel's (1980) books most explicitly demonstrate this concept in the context of AMH versus Neanderthals. Invoking the classic "caveman" image, Auel describes Iza, a main Neanderthal character, as

> …just over four and a half feet tall, large boned, stocky, and bow-legged, but walked upright…Her arms, long in proportion to her body, were bowed like her legs. She had a large beaky nose, a prognathous jaw jutting out like a muzzle, and no chin. Her low forehead sloped back into a long, large head, resting on a short, thick neck…A soft down of short brown hair, tending to curl, covered her legs and shoulders and ran along the upper spine of her back. It thickened into a head of heavy, long, rather bushy hair…dark brown eyes were deep set below overhanging brow ridges… (Auel 1980: 11)

This is in direct contrast to Ayla, a quintessential Aryan child with "hair that…[was] nearly white, and as fine and soft as silk…" (Auel 1980: 5) "and [a] little stub of a nose" (25), whom the Clan calls an "Other." It is this animalistic Neanderthal image that comes to mind when Harari (2014: 19) discusses how "It is unsettling – and perhaps thrilling – to think that we Sapiens could at one time have sex with an animal from a different species, and produce children together." Harari uses Sapiens as a group identifier – the label for Us – and replaces Neanderthal with the word "animal," creating the ultimate Them as he separates Us from the animal kingdom (note that he does not say "have sex with *another* animal," which would rightfully place us in the same category as Neanderthals as we both belong to the genus *Homo*).

Indeed, Harari seems to privilege the competition between AMH and Neanderthals as the cause of their demise over the absorption theory, which is far too "unsettling." Throughout the book he continually references AMH and Neanderthal violence because it "was the first and most significant ethnic-cleansing campaign in history" (Harari 2014: 19) that presumably started *Homo sapiens sapiens* on their violent path of conquering the world. Participant responses paralleled these sentiments, most vividly exemplified in Alice's claim, which works to naturalize such a violent defense mechanism against an "other":

> …I believe [AMH] had more brain power to think things through and see them as a threat- a threat to their population, their security and I think it's still the reason what we have what we have today, because if we see other groups, whether it's true or not, but in our group, in our mind, we sense a fear, then that basic animal instinct of defending ourselves and attacking…

Indeed, this reflects the outdated idea that humans are violent "towards 'inferior' peoples (e.g., Neanderthals) because they threaten more civilized communities" (Ruddick 2009 as cited in Redfern and Fibiger 2019:62). The extermination of inferior peoples was viewed as a necessity to ensure human progress, and the disappearance of Neanderthals was viewed by early paleoanthropologists as an early example of White superiority and rationalized the slaughter of native peoples in America and Australia (Bowler 1989: 289). Because the Neanderthal demise is often argued by these books to have led to AMH "conquering" the world, the act of violent "othering," a behavior that can be seen in society today, risks being perceived as a once beneficial "cultural survival."

Auel (1980) and Harari (2014) show us a past in which there was a deep, innate fear and disgust for the opposing hominin, which Harari states in no uncertain terms was the cause of the Neanderthal demise. However, these two books and *The Croods* also portray scenarios in which AMH and Neanderthals interbreed – or at least the first step of falling in love in Eep's case. Despite this, the books still portray these intimate relations in a negative light, with Harari (2014) deeming it near inconceivable and certainly "unsettling" and Auel (1980) depicting it as an act of pure hatred. Even Grug dislikes Guy until the end of the film.

Beyond physical appearance, these examples emphasize behavioral differences, specifically the AMH capability to adapt. A main theme of *The Clan of the Cave Bear* revolves around Ayla's superior ability to adapt socially and technologically while the Clan's traditions hold them back. Similarly, Guy has the courage to try new things and has a superior handle on tool creation and use. Without Ayla or Guy, the Neanderthal lineage would not have persevered.

Much like in the discussion of gender, popular media represents "Othering" in various ways (e.g., via skin color or species) and at times in multiple forms of relationships (e.g., love

and violence). This array of representations aligns with the inability of my participants' survey responses to signal a singular cause of Neanderthal extinction. While there is indeed an undercurrent of disgust in these media portrayals of Neanderthal/AMH interactions, they also contain elements of intimacy. For the most part, popular media reflects the varying theories surrounding Neanderthal extinction, making my interview participants' vehemence at the potential for violent encounters between AMH and Neanderthals much more of an outlier. This could potentially be explained by their ages and the different narratives of human evolution and paleo-life that may have been expressed in the past, however that is outside the scope of this study. These pieces of media thus show an innate distrust and loathing for the "Other" while at the same time exhibiting the many ways this type of relationship presents itself, mirroring society today, with its myriad interracial couples, racialized tension, and ethnic cleansings.

Similar to discussions of Neanderthal and AMH relations, futuristic popular media depicts conflict between humans and other sentient beings. *2001: A Space Odyssey* depicts the murder of a sentient AI system as essential to survival (and perhaps transcendence) and *Star Trek* is often a meditation on the use of violence as the basic response to extraterrestrial encounters with "evolved" beings who eschew violence or use it as a test of how "primitive" other space-faring peoples are. Even *The Jetsons* displays an "Other" in the distaste for Martians ("I get to hold a sign [at the protest meeting]: 'Martians go home!" [Barbera and Hanna 1962]) and by characterizing one of the only Black characters as a criminal.

Remaining futuristic media "others" certain subcultures. *The Handmaid's Tale* works to extinguish the sinful modern lifestyle and those who engage in it through subjugation and violence. *The 100* revolves around Harari's concept of Us versus Them as those from space

attempt to steal territory on Earth from those who survived the nuclear war. Violence between the various "tribes" is often excused as a means of ensuring the survival of "my people."

Regarding modern concepts of race, the main characters of these futuristic media are all White. There are ethnically diverse supporting characters, but those with the largest speaking roles remain primarily White. Despite this, *Star Trek* warrants recognition for their diverse cast. Although non-human sentient beings are viewed warily, it presents an ethnically varied cast that holds positions of prestige aboard the USS Enterprise and in its third season featured the first interracial kiss on American television (Delmont 2018). Furthermore, Lieutenant Uhura became "the first black woman to have a continuing co-starring role on TV" (Delmont 2018). Although *Star Trek* did much to expand ethnic diversity in popular media, racial power dynamics are largely viewed as unchanging through the various examples here examined. Indeed, strong and exclusive group identification is overwhelmingly depicted as necessary to survival.

As evidenced, there is an undercurrent of distaste and even hatred for those that are deemed as "Others," and this often results in violent aggression. While not always an exact analogy for race, these media examples show that there will always be an element of hostility between those who differ from one another. This is a reflection of Alcoff's (2015: 123) belief that racism is a fluid concept with the ability to "morph into new versions." There is little ethnographic data on my participants' views of what race will look like in the future, however, the few biological changes mentioned tend to coalesce around differing physical appearances and health. Furthermore, there is an emphasis on how human evolution is more genetically modified nowadays (e.g., determining whether or not to abort a fetus if birth defects are predicted) and how that will potentially lead to less diversity, especially in terms of health and disabilities. Even

so, the option of genetic modification is only open to those who can afford it, which at this time largely coalesces with race.

5.4 Online News Articles

Aside from Viegas' (2010) piece, online news articles are not included in my analysis on gender, violence, and race because these particular sources post little on paleo-life or recent finds in human evolution; indeed, the search term often brought up more about debates surrounding belief in human evolution than any evolutionary findings. These online articles mobilize topics of human evolution to serve particular political and social agendas, whether to provide prestige or explanation for certain practices, hope for our future via the tenacious nature of our species, or to build scientific support for otherwise baseless racial claims. Rarely, though, is it to merely inform and educate the public. That is to say, the sources meant to provide some of the most accurate data as signaled by my survey and interview participants does not fulfill their duty; instead, these sources convey the same tropes that the public is already familiar with in which the significance of the scientific find is to explain some type of modern behavior. Such discourse impedes the efforts of those who read these sources for a "broader perspective on what people are thinking" or for becoming "a well-informed citizen."

For example, Megan Marples (2020) of CNN wrote a piece titled "Humans wore necklaces made from shells more than 120,000 years ago, a new study finds," where she emphasized the study's significance as humans' continued penchant to wear jewelry as a signal of "group identity of the person carrying it, their status in society, or they could reflect certain beliefs." Indeed, jewelry today serves these very functions as well: some wear crosses around their neck to display their faith while others wear diamonds to display their wealth. The reader is

not made aware of the significance this has for human evolution, in particular the vast array of technological opportunities the advent of string provides and the associated cognitive abilities. Instead, Marples focuses on the continuity between our *Homo sapiens* ancestors and our modern selves. Seph Rodney's (2020) "New York's Sidewalk Prophets are Heirs of the Artisans of France's Lascaux Caves" in *The New York Times* frames paleo-artists as having "wanted to convey to other humans a political reality crucial to their survival: They shared their environment with other beings that looked and behaved differently from them." Rodney argues that if these cave paintings can be considered worthy of protection, then so should the socio-political artistic works being painted across the boarded-up storefronts of New York City, which will be "the means by which future historians and researchers will come to understand this time…" From the perspective of survival of the fittest, *The Washington Post's* Ian Morse (2020) discusses the thousand-year "'arms race with pathogens'" humans have engaged in. Specifically, Morse invokes "Stone Age" pandemic experiences in the midst of a modern pandemic to display humans' capability to overcome environmental challenges, assuring his readership that our species will always persist. Finally, Carbone's (2019) misleadingly titled article "Ancient upright ape 'Danuvius' that had human legs discovered by scientists" frames this Germanic fossil find as a missing evolutionary link based on its ability to climb like an ape and walk on two feet like a human. Carbone posits, "This changes our view of early human evolution, which is that it all happened in Africa…" (Carbone 2019), thus associating a major development in human evolution with assumed "whiteness". However, the original scientific article does not confirm humans' relation to Danuvius, instead labeling him as "a model of the common ancestor of great apes and humans" (Böhme et al. 2019: 489).

While these articles shed light on popular discourses of human evolution, their impact is minimal; article topics that highlight finds contradictory to popular beliefs (e.g., Viegas 2010) were absent from participant responses and other articles merely touched on what the public is already familiar with in their own day-to-day experiences. Viegas (2010) demonstrates the difficulty of science communication when the context of and expectations for "evolution" and "Paleolithic" are so well established in public imaginations that genuine new insights are invisible next to stories that reinforce what we think we know or narratives that do particular social and political work.

5.5 Conclusion

To summarize, fiction set in both the Paleolithic and the future overwhelmingly impart messages of deep-rooted gender roles, violence, and "Othering." Paleo-life is used as a cover for ongoing problematic social constructions rooted not in the past, but in modern stereotypes. Harari's (2014) critically acclaimed account of human biological and cultural evolution through time confirms these claims. The online news articles I examined, which my participants noted as a trustworthy source, do little to educate their readership. Instead, news media mobilizes paleo-life and human evolution in an attempt to further their own ideological agendas. They reflect the common-sense view of evolution in which our modern actions can be traced to the deep past. The belief in deeply rooted gender roles and violence are prevalent in my survey and interview participants' responses. Considering the archaeological data says otherwise – or nothing – on these matters suggests that my participants were recalling popular media that they have encountered in the past to respond to my questions. Some participants cited school as a source through which they learned about human evolution, but as interview participant Nina pointed

out, "you kind of forget it." As such, I argue popular media is the most memorable and frequently accessed source through which people come into contact with themes of human evolution on a daily basis. The reflection of my participants' stances on these matters in the media suggests an adherence to popular media imaginings of 19th and 20th century archaeological visualizations rather than current human evolutionary theories, data or evidence.

Unfortunately, my exploration into race was not as fruitful. Indeed, the media is predominantly dominated by characterizing a White paleo-past and future as well as a sense of "Othering" that extends beyond skin tone. However, my survey lacked enough specific questions to tease out a more detailed stance on race/"Othering" in human evolution. That being said, the ways my participants reflected other stereotypes perpetuated in media discourses suggests to me that problematic ideas of race and "othering" are similarly intertwined with how they see these issues in respect to human evolution and paleo-life.

In conclusion, there is a clear resemblance between popular belief and the messages being portrayed through popular media. These messages are portrayed in ways that my participants have recognized as relating to evolution and the repetition of such messages works to naturalize these behaviors. This then suggests that my participants' beliefs in what is an innate part of humanity is at least partially informed by popular media, which is largely inattentive to scientific discourse and is more attuned to the social and political messages that they think people want to hear. As such, evolutionary discourse in popular media could very well be cited as a factor in the poor excuses we see people using for their immoral behavior, aligning with what Khan Noonien Singh says in episode 23 of *Star Trek*: "…I am surprised how little improvement there has been in human evolution. Oh, there has been technical advancement, but how little man himself has changed" (Daniels 1968).

Chapter 6 : "I should read…Smithsonian magazines, I might get smarter"[16]: Discussion and Conclusion

This thesis has revealed the deeply ingrained and problematic misconceptions people have about human life in the Paleolithic and human evolution by examining people's perceptions of race, gender and violence. I have shown how people predominantly gather their scientific (mis)information from popular media and how various forms of media continue to reproduce incorrect human evolutionary narratives, by specifically looking at books, television, movies, and online news articles. These ever-present ideas have become unquestioned, familiar, common sense ways of thinking and being.

Specifically, popular media reflects outdated anthropological understandings of human evolution. This reinforces older cultural models, positioning gender roles as biologically determined, with men being the necessary breadwinners – as seen in "Man-the-Hunter" type discourses – with women attempting to "have it all" beyond fulfilling their vulnerable biological role of mother. Race is especially ingrained in popular imagination via visual popular media, as exhibited by participant shock at the idea of Black paleo-peoples. Paleo-race is viewed as predominantly White, with the evolution of other races unclear. In this view, White paleo-peoples successfully out-competed Neanderthals, the first "others," thus giving a seemingly compelling biological underpinning for the idea of White human exceptionalism and that othering is a characteristic of human nature. Viewed as humans' longest-standing survival instinct, though entirely discussed in terms of men, violence is depicted as expressing itself in an innate human quality of competition over territory and resources, which reinforces dominant

[16] Quote from interview participant Nina.

cultural models of capitalist societies, whose successes are predicated on colonial and imperial histories.

Popular media imaginings of future human evolution adhere to these same tropes. Violence is portrayed as omnipresent and necessary, often conducted under the guise of saving the human race. While women hold more leading roles, they still depend on men to maintain control. Similarly, while there are more ethnically diverse casts there is still a person or a group deemed as an "other" who is viewed negatively for their differences.

In sum, popular media and participants engage in parallel discourses that suggest a world of shared cultural narratives in which the social constructs of race and gender and the prevalence of violence are framed as outcomes of "survival of the fittest." I argue that by excusing these harmful behaviors by claiming they are cultural "survivals," my participants are, in fact, drawing on their cultural models that inform their appropriate behavior in American society. Specifically, White American Exceptionalism requires the belief in political and cultural descriptors that contradict one another (Pease 2009 as cited in Lloyd 2014), at once separating itself from the rest of the world while at the same time claiming to represent "what is truly human" (Alcoff 2015:100-101). An overarching expression of this contradiction rests in participants' and popular media's tendency to praise humans' ability to adapt, which is evident in increasingly complex tool use and cognitive abilities, while at the same time remaining slaves to our biological adherence to survival of the fittest. These biological preoccupations appear in discourses of race, gender, and violence, though they contain further contradictions. For example, gender roles are viewed as biologically assigned, yet against nature's wishes, women have entered the public sphere while men are hampered by their DNA, as seen through the male prerogative of violence. In the same vein, violence is deemed an innate human trait, yet is only enacted by men.

Discourses that designate disreputable behaviors as biological in nature work to remove one's own agency and guilt by justifying selfish tendencies as natural mechanisms of "survival of the fittest," in which it is everyone for themselves and systemic hierarchies are "natural."

In answering my knowledge questions on paleo- race, gender, and violence, interview participants often drew on personal experience, including popular media consumption, school, and other activities such as vacations or museum visits. Family and world history comprised a considerable amount of information sourcing as well, with a focus on Native Americans and American wars as a proxy for understanding the deep past. For understanding violence in particular, participants often cited other instances of animal aggression, such as dogs and birds. Survey results largely mirrored interview participant responses on scientific knowledge sourcing with a focus on popular media, such as books. Collectively, the data suggests that people's cultural models of paleo-race, gender, and violence are influenced ubiquitously by popular media, with additional references from personal experiences and historical references. These models constitute a biological understanding of people's place in the world today. Revealing the prevalence, use, and source of these misconceptions of paleo-life and human evolution highlights the cultural forces that problematically empower race, gender, and violence in these contexts. Unable to escape popular conceptions of race, gender, and violence, these discourses of paleo-life and human evolution are caught up in larger cultural conversations in spite of contradictory scientific evidence. In this way, popular media is a powerful and unwitting form of perpetuating these cultural norms passed down from previous centuries.

This thesis lends qualitative data to the conversation of misconceptions about the Paleolithic and popular media portrayals of the Paleolithic (e.g., McCaughey 2008; Zuk 2013). It provides firsthand accounts of *how* people gather their information and how it often goes

unquestioned. In particular, upon probing for *why* participants held certain beliefs about paleo-life, they often came to realize their popular imaginings defied logic or could not relay specific data to prove their popular imagining other than having "seen" or been "told" it. In short, my study provides support for the power of media and its extensive role in creating an imagined past and affecting people's perceptions of scientific data, in this case human evolution and paleo-life. Based on my conclusions, I provide creative and actionable suggestions for future communication about Paleolithic life and human evolution to mitigate the damage caused by misrepresentations (see section 6.2).

6.1 Why (Mis)Representations of the Paleolithic Matter

Although "the Ice Age… [is] so long ago that some people might think 'well who cares if you make [the popular media] truthful or not'" (Nina) the stories we tell about the deep past have a lasting effect on our perceptions of life today. The limited narratives about paleo-peoples' lives diminish how we see ourselves. Poor behaviors are conceived of as rooted in our DNA, contrary to *Homo sapiens'* adaptability that is often praised in popular media. These constructs and behaviors – such as race, gender, and violence - become immutable in the popular imagination, which is harmful for working towards a more equitable society.

Such constructs and behaviors are perceived as immutable due to their repetitive representation; a product of what Moser (2001) calls "longevity," they are seamlessly incorporated into people's understanding of the world. Although the stories they appear in can be fictitious, they are often praised for their scientific accuracy. For example, *2001: A Space Odyssey* is lauded as "a documentary of the future" that "encourages us to reflect again on where we're coming from and where we're going" (Overbye 2018), assuming that the depiction of the

killer ape was an equally accurate representation. Similarly, the Chicago Sun-Times authenticates the *Earth's Children* series and "convince[s] readers that Auel's world represented a *real* historic situation" in its review: "AUEL BRINGS ALIVE A WORLD THAT HAS BEEN IRRETRIEVABLY LOST TO US" (Drell 2000: 18). Both *2001: A Space Odyssey* and the *Earth's Children* series did indeed incorporate an extensive amount of research into their stories, however through their icons they continued to perpetuate "ideas about the past which themselves are nothing more than products of a specific tradition of Western thought" (Drell 2000: 18). These "cultural documents" "reflect cultural premises and patterns of thought and feeling" (Weakland 2003: 47), yet depictions of paleo-life reflecting Western social structures and thinking inform people's understanding of the deep past. Thus, the common sense and popular media discourses surrounding topics of human evolution and paleo-life feed off of what is happening in modern society. I argue that popular discourse surrounding human evolution and paleo-life reflect Social Darwinist views revolving around themes of survival of the fittest and White American exceptionalism, attitudes that are necessary to participate appropriately in American society, which has seen an explosion of overt discrimination and violence in recent years (e.g., police brutality against Black folks leading to months of peaceful protests made violent by local police forces and Trump-supporting militias).

We especially see the naturalization of White American exceptionalism in interview participants' discussions of race, in which the multiethnic photo prompt sparked mass confusion, as the majority of media portrayals only show White social groups braving it out in the north. This consequence is especially pertinent to visual media. Interview participants Amy and Nina both noted the importance of graphics in leaving a lasting impression, with Amy citing the colorful, fast-paced nature of film as the best way for her mind to engage with and remember

material. When I prompted interview participants to explain why they came to certain conclusions, such as what paleo-peoples looked like or dressed like, how they talked or organized themselves socially, they often became puzzled as they discovered that the logic would not add up to their initial response. At the same time, they had trouble accepting the logic because "this is what I've always seen."

Because the Paleolithic is often White-washed in popular media representations, my study's focus on race shifted to a study of the "other." Representations of the Paleolithic categorized the "other" as Neanderthals, whereas any number of groups could be categorized as an "other" in futuristic fiction based on physical capabilities or political affiliation. Especially in regard to the sci-fi media examples, I interpret this need to "other" as a fear of no longer being exceptional and a need to be the most successful, both of which are facets of American visions of survival of the fittest and coincide with White American Exceptionalism. Indeed, there is overwhelming uncertainty, fear, and hostility in the United States as the country faces a demographic shift, "as if the country will simply not survive it" (Alcoff 2015: 104).

Representations of paleo-gender have become equally ingrained in the public imagination. Indeed, Man-the-Hunter has become an icon of the public's imagining of the Paleolithic. Moser (2001: 271) defines icons as a set of motifs that compress as much information as possible to convey the "essence" of the subject. These icons work like stereotypes and because iconic or stereotypic images are difficult to replace, they persist "despite being disproved, updated, or replaced" (Moser 2001: 273). For paleo-gender, Man-the-Hunter as an icon relies on and perpetuates problematic ideas of androcentrism, gender polarization, and biological essentialism. Specifically, actions associated with males are perceived as natural (Nelson 2004 12-13 as cited in Solometo and Moss 2013: 125), as exemplified by my research

participants' belief that violence is a human universal despite only envisioning men participating in it. Gender polarization is the assumption that social life has been ubiquitously organized based on the fundamental differences between men and women (Ben 1993: 80 as cited in Solometo and Moss 2013: 125); my research participants adhered to gender polarization in their repeated comments on gendered division of labor. "Biological essentialism 'rationalizes and legitimizes [androcentrism and gender polarization] by treating them as the natural and inevitable consequences of the intrinsic biological natures of women and men'" (Ben 1993: 2 as cited in Solometo and Moss 2013: 125). Research participants perpetuated biological essentialism by legitimizing the gendered division of labor based on women's biological role as mother, leading to the inability to either leave the home or perform many other tasks. The logics of androcentrism, gender polarization, and biological essentialism rely on the assumption that gendered behavior is a ubiquitous experience, however, "[W]hile [gender] may exist everywhere, its manifestation is not universal" (Sterling 2014: 153). The belief that Western gendered ways of being are universal is just one facet of White American exceptionalism, in which America represents that which is "'truly' human" (Alcoff 2015: 101). This ignores the many different ways that people around the world have conceptualized gender through time; by attaching biological essentialist logic to gender, it becomes difficult to accept a change in the "natural" division of labor or those people who are viewed as "unnatural" (e.g., non-binary or transgender individuals).

Androcentrism, gender polarization, and biological essentialism also diminish the perceived capabilities, importance, and agency of women, who are so hampered by their biological role of mother that they cannot perform any other tasks in the premeditated gendered division of labor. Recall Harari's (2014: 432) stance on men's sex drive: "If sex were not

accompanied by such pleasure, few males would bother." This statement removes the agency and pleasure of procreation from women, while allowing men the agency to seek pleasure outside of their biologically designed roles, of which procreation is not one. This assumes that women's sole purpose in life is to reproduce to maintain the species and thus do not need an added incentive.

Commonly, paleo-peoples or scenes are included in a story to contrast with or explain the present or future characters (i.e., *10,000 BC, Year One, 2001: A Space Odyssey, The Flintstones, Sapiens,* Carbone [2019], Morse [2020], Rodney [2020], Marples [2020]). Fiction-based media often contains elements of fantasy or sci-fi (*The Clan of the Cave Bear, Year One, 2001: A Space Odyssey, Ice Age, The Croods, 10,000 BC)*. This tendency to show paleo-life only in comparison to more "evolved" lifeways perpetuates this idea that we do not know what life was like, that it is shrouded in fantastical mystery and can only be imagined through the lens of familiar historic lifestyles, much like my participants expressed. For example, when explaining how she came to her conclusions, Amy told me, "I'm looking more at modern history…" Despite the elements of fantasy and sci-fi, there are clear and consistent ideas about human nature and evolution being perpetuated. The repetition of these few ideas leads the viewer to believe those are accurate aspects of human evolution, as they are consistent across media formats.

These types of depictions and logics represent a failure to translate contemporary findings into the dominant popular narratives, which instead continue to reproduce limited stereotypes played up for a laugh or for assurance that our (read: American) culture is rooted in human nature. The Paleolithic is positioned in popular media as this unique moment in time that exists in and of itself, with modern lifeways seemingly sprouting out of nowhere, completely discounting any sort of transition period or any acknowledgment of the fact that modern

technology and knowledge had to be based off of and grow from something else. This is evident through the vast stylistic differences these media producers make between the technological, social, and "primal" behaviors exhibited by its characters. For example, characters of the deep past tend to lack intelligence and varied tool use and engage in more frequent and severe violence, whereas present and future peoples have more organized violence, varied tool use, and critical thinking abilities. The reliance on these more accessible and comfortable narratives reflects anthropologists' failure to comprehensively rewrite western stereotypes and visions of human evolution that are rooted in 19th century values. This is problematic because it positions white patriarchal society – like America - as the pinnacle of human evolution and success, leading to feelings of entitlement and disgust towards those living less privileged lives. Such cultural evolutionist stances have been critiqued time and again: evolution is not a steady progression toward perfection. Evolution is not purposeful, we do not "evolve to" do anything (Zuk 2013:23).

6.2 Suggestions for Science Educators: "I like when [my son's] shows…have history and it's accurate…so I would like that in adult films as well"[17]

Survey and interview participants alike expressed how my survey made them realize how little they knew. Further, it prompted them to ask many questions regarding human evolution and paleo-life, making clear the interest people have for the subject. People were often shocked at how current data on human evolution and paleo-life counter their popular beliefs and pressed for more information. In short, people are interested and their thirst for knowledge is far from being slaked. People often forget what was taught in school or it was so long ago that the information

[17] Quote from interview participant Nina.

is outdated. Even the information used in schools today seemed to be uninformed by current evolutionary literature. This leaves a wide gap in people's reliable knowledge sourcing on the topic.

Indeed, online news articles, the media type with which interview participants held in highest esteem for information gathering, had little to say on human evolution and paleo-life and those that did either had little staying power or only used these topics as a source of comparison to modern practices, thus sending particular social and political messages. Similarly, while books were highly regarded for their information gathering, no two participants suggested the same book twice. Although participants cited scholarly sources as a reliable form of information and scholarly articles as a fact-checking source, jargon can impede a layperson's understanding (Bernard 1998; Fagan 2010) and current data suggests few people really fact-check (Geeng et al. 2020). With scholarly presence in the public sphere primarily occurring in online news articles, the uneven narrative distribution of books, and the inaccessibility of scientific papers, it appears current efforts to communicate with the public explicitly on topics of human evolution and paleo-life are insufficient and ineffective.

In line with Moser's (2001: 280) argument that "visualizations of the past have become intimately linked with knowing or understanding the past," I have found that visual fiction, such as television and film, has the most staying power, with participants' visions of paleo-life reflecting that depicted in visual media. Likewise, many participants explicitly mentioned what they had seen in films or television when responding to my knowledge questions on paleo-life. Furthermore, visual media was ubiquitously enjoyed; television was the most popular (i.e., widely preferred and frequently accessed) form of popular media followed by films. Both contained examples viewed and mentioned by multiple participants, further exemplifying the

pervasive nature of visual media. As such, it is no wonder that the paleo-life imaginings of my participants resembled one another: their cultural models are informed by the same popular media. Moser (2001: 273) refers to the ease with which pictorial motifs created in early representations of human evolution can be implemented to communicate primitiveness, wildness, and a lack of civilization rather than having to create an entirely new visualization. Solometo and Moss (2013: 123) attribute the success of visual representations of the Paleolithic to the fact that they bring the *human*, rather than the archaeological remains, into focus: "they are populated with fully imagined people who participate in useful work, interact with one another, and display emotion, a stark contrast to the 'faceless blobs' (Tringham 1991: 94) as we consider" varied social organizations and evolutionary processes (see also Moser 2001: 276-277; see also Tringham 2015: 29). Indeed, the appeal to the *human* in representations of our species' evolution makes visual images "an extremely powerful means of explaining the past because they allow us to experience it" (Moser 2001: 280-281). The incorporation of archaeological data into fiction centering on *humans* "provide[s] a way to [communicate] accessibly and empathetically about… people… hopefully capturing some essences or images of how people under very different conditions than our own may have thought about and confronted certain fundamental changes" (Spector 1991: 404).

My first suggestion, then, is for science educators to shift the communicative focus away from articles and books. Instead, we need to tell new and varying fictitious visual narratives of paleo-life and human evolution in which characters are not white or women hold leading roles and wield spears in the midst of a hunt while foreign groups interact with one another peacefully, even as they differ in hominin species or skin color. The important part is that the stories we tell of our paleo-ancestors *vary*. These new stories are not necessarily more "correct," however they

will reflect the many ways life could have been organized at that time, rather than portraying one means of paleo-life as a universal experience. Similarly, the variety of narratives we tell about human life in the Paleolithic would reflect the speculative nonfiction nature of the science of archaeological interpretation, which Chip Colwell (2019) says "is inevitably a creative act." To achieve more engaging and impactful public communication, I suggest science educators begin a more concerted effort to educate the next generation of university students on science communication (see also Cool Anthropology 2021), focusing on visual media. As of 2014, archaeological visualizers were often "consigned to archaeology's sidelines [and] it [was] not uncommon to see their credibility, relevance and financial worth challenged, [and] their subject areas eliminated from university curricula…" (Perry 2014: 190). If we are to tell more varied visual stories, the discipline of archaeology needs to put an end to the deprecation of visual interpretations and a new generation of archaeological visualizers needs to be trained. Graduate curriculums in particular should place a higher value on public knowledge mobilization. While successful visually based science communication efforts exist (e.g., *Cosmos* and *NOVA*), there have not been enough on recent evolutionary finds to exert much discursive power.

The second suggestion is to influence the media industry immediately by partnering with the National Academy of Science's Science and Entertainment Exchange[18]. This organization connects scientists with media industry professionals to create scientifically accurate film and television (The Science and Entertainment Exchange). Media producers and viewers alike are in search of fresh stories with realism and legitimacy (The Science and Entertainment Exchange). While interview participants said they do not believe what popular media tells them, many

[18] To get involved with the National Academy of Science's Science and Entertainment Exchange, please visit their website: http://scienceandentertainmentexchange.org/

expressed a preference for accurate accounts of historic events and how it prompted further research. Amy commented, “there's something about it being so accurate that just kind of makes your jaw drop a little bit more.” Evolutionary data is primed to provide this kind of jaw dropping experience: current models are in stark contrast to popular imaginings and have the benefit of supporting data, culminating in the kinds of fresh, legitimate stories that The Science and Entertainment Exchange and media consumers are interested in.

Finally, I suggest that at the primary and secondary school level, evolution be taught as an interdisciplinary science, as discussed by Eirdosh and Hanisch (2020). As exemplified in this thesis, participants assign biological underpinnings to culturally defined actions and constructs. I argue this is due to teaching and presenting paleo-life and human evolution as unilinear and exclusively biologically motivated as opposed to the many varieties of social life that could have manifested in response to environmental changes. To begin this conversation, I suggest showing a “foil reel,” which contains problematic scenes and/or quotes from paleo-media, much like I have done in Chapter 5, in order to highlight the ubiquity of supposed paleo-experiences. The “foil reels” open up epistemological conversations, in which the interdisciplinary nature of evolutionary studies can emerge through discussions of how we might be able to come to conclusions about humans’ experiences in the deep past. This is a particularly good time to highlight the lack of (or contradictory) archaeological evidence on concepts of paleo-race, gender and violence. This also provides the opportunity to challenge students’ logics by explaining how these popularly defined cultural “survivals” may not have worked in every environment and may have actually impeded evolution. For example, counter to popular discourse in which the unfamiliar is not only scary, but to be fought against, Darwin actually hypothesized that living on the borders of a community and closer to what may be considered

foreign would force those people to innovate and find new adaptations, thus enhancing the chance for survival (Alcoff 2015: 120). Similarly, working together to share innovations would improve survival rates as opposed to living individualistically or constantly in competition with one another (Clancy 2017).

To prepare for class discussion, Marlene Zuk's (2013) *Paleofantasy* is a particularly good and accessible source to turn to for comparing evolutionary myth with evolutionary data (see Pobiner 2014 for review). If wanting to show more accurate popular media, *Alpha,* although continuing to privilege hunting and male paleo-lives, primarily adheres to available archaeological data. Though I was quite critical of *The Clan of the Cave Bear*, Auel's Earth Children series deserves recognition on behalf of the author and scholars alike for the immense amount of research that made skeletal, paleo-environmental and artifact data accessible and entertaining to a wide audience. In addition to text-based research, Auel (1990) consulted prominent scholars in the field, including Olga Soffer and Milford Wolpoff. This series supplies ample opportunity to discuss artistic license (i.e., gender roles and social organization) versus data-informed prose, as well as exemplifies the appeal and strength[19] of media producer and scholarly collaboration in the public sphere.

In short, school curricula and popular media continue to reproduce the same, incorrect narratives of human evolution and paleo-life. These narratives support the American Social Darwinist ideal of survival of the fittest by creating ubiquitous cultural models in which social hierarchies and violence are vestigial survival mechanisms. As popular media is the most

[19] Jean Auel's Earth's Children series is renowned among readers, with individual books having been number one bestsellers in 16 countries and over 45 million copies of the books selling worldwide. The series has also garnered respect among archaeologists, anthropologists, and paleontologists, earning her four honorary university degrees and the French Ministry of Culture's "Officer in the Order of Arts and Letters" medal (Auel 2010).

pervasive method of science communication, it is imperative that evolutionary science educators get involved in media production, particularly visual media, in order to correct these harmful narratives.

6.3 Limitations of this Study

This thesis provides concrete suggestions for reaching the widest audience possible on topics of human evolution and paleo-life. However, I have provided little guidance on how to reach specific audiences. I received survey results predominantly from high school students and interviewed participants primarily over the age of 55. As such, each set of data is skewed towards one age range.

The data collection tools also exhibited construction complications. This analysis largely omitted data gathered from the survey's matrix questions. Based on my observation of participant survey taking and participant feedback, the matrix questions caused confusion. Another concern is the phrasing of my questions; one survey respondent commented that she knew I threw in "foils" such as paleo-peoples being overly hairy, hunch-backed and only in Europe. This was made especially clear in the matrix questions in which my key themes (gender, violence, and race) were described in more detail than the "foils." In urging respondents to provide extended responses to what life looked like in the deep past according to popular media, I included guiding topics: how people interact, what people eat, and what people and the environment look like. This may explain why associated answers primarily referenced these topics rather than concepts such as violence or gender roles. My survey questions likely guided participant responses and indicated to the respondent which tropes I was particularly interested

in, thus resulting in responses aimed at giving me the "right" answer. This was a valuable lesson in understanding the complexities of qualitative survey design.

Furthermore, I refrained from explicitly referencing race in my survey, resulting in a lack of data on people's perceptions of the concept. Although I used Neanderthals and AMH interactions as a proxy for this conversation, due to the popular framing of Neanderthals as opposite of us (Wragg Sykes 2020), the survey would have benefited from more than one question on the topic. The current data on this cultural concept cannot be considered comprehensive.

6.4 Future Directions for Research

Future research requires a more diverse demographic. In particular, this study would benefit from having wider age representation, as having age-specific data may better explain how evolutionary information has been portrayed over the years, whether an increase in education and life experience affects peoples' perceptions of the deep past, and could assist science educators in choosing a medium best suited to their target audience. Furthermore, the study should be distributed to a more diverse demographic to include the voices of non-White community members, who may have different perceptions of race in the deep past. With these additions, more comprehensive data on popular perceptions of paleo-race can be collected. Similarly, a longer-term ethnographic study in which months of participation in different contexts within a community would more realistically inform the deeply held and widely circulated everyday discourses of evolution. Instead of just talking *about* their evolutionary discourses, participant observation would reveal those discourses at play. In addition to diversifying the demography, it would be interesting to diversify the media being analyzed to include museum exhibits, YouTube

videos, and podcasts, which participants cited as sources from which they have learned about human evolution or science more broadly.

There is also room to quantify the staying power of specific forms of popular media. Understanding whether visual, textual, immersive, or some combination thereof creates larger impacts on one's memory and understanding of scientific material may further inform science educators on the most impactful forms of science communication.

6.5 Conclusion

Race, gender, and violence have been problematically portrayed in representations of the Paleolithic and human evolution. Despite the development of ideas in evolutionary sciences, representations of these constructs and behaviors reflect 19th century values and outdated anthropological thought, which themselves inform modern Western ideals. This thesis has shown that media consumers internalize these media messages on the Paleolithic and human evolution and apply them to their understanding of the world and their place in it. It is imperative for science educators to work towards creating more varied stories of our paleo-ancestors and human evolution in order to combat the White American Exceptionalist sentiment that is currently rooted in popular discourse surrounding the Paleolithic and human evolution.

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Appendices

Appendix A: Survey

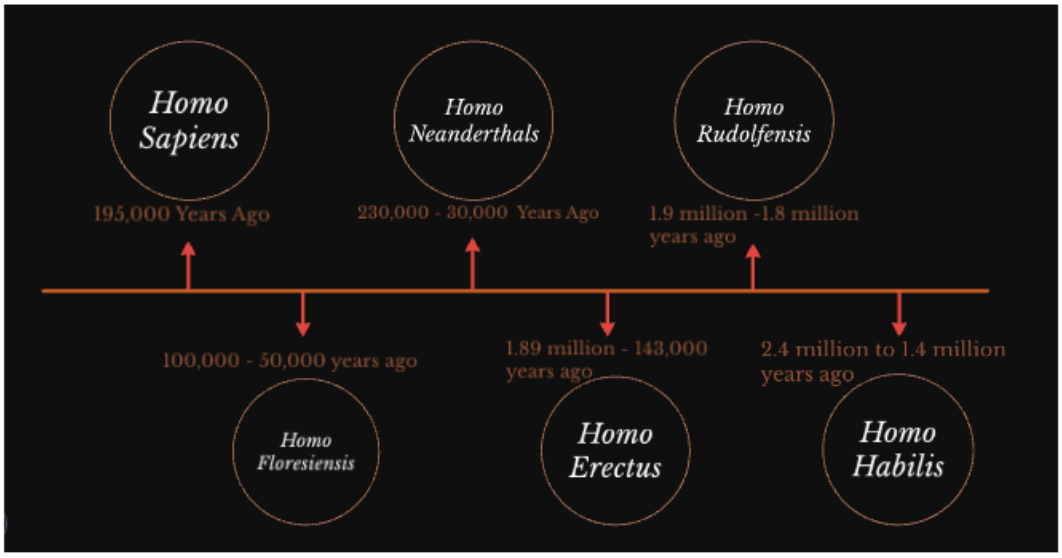
Welcome Back to Caveman Times

The following survey will ask you questions about popular media and human evolution.

Popular media can be defined as any source that has a mass audience.

Human evolution can be defined as human change over time, including the deep past (the very first humans or "Cave Men") and through to the future.

I will be asking questions about the Paleolithic. This time period spans from 3 million years ago up until 10,000 years ago, but I really want to know your thoughts on *Homo sapiens*' lives. As you can see in the timeline below, *Homo sapiens* have been in existence since 195,000 years ago. I want to know your thoughts on human life between 195,000 years ago and 10,000 years ago (before farming!). Most people are familiar with this time period because it was the Last Ice Age and the time of the "Cave Man". *Homo sapiens* are us, so imagine what life for the very first humans looked like!



1. Here are examples of films that include themes of human evolution. Please select all that you have watched.

Alpha

Quest for Fire

10,000 BC

Year One

Clan of the Cave Bear

2001: a Space Odyssey

IO

None of the Above

2. Other movies with themes of past or future human evolution that you have watched. This is defined by you and can be anything that you think relates to human evolution.

3. Here are examples of TV shows with themes of human evolution. Please select all that you have watched.

The Handmaid's Tale

Star Trek

10,000 BC

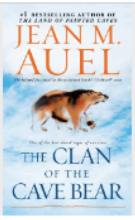
The Flintstones

The 100

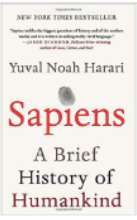
None of the Above

4. Other TV shows with themes of past and future human evolution that you have watched. This is defined by you and can be anything that you think relates to human evolution.

5. Here are examples of Books with themes of human evolution. Please select all that you have read.

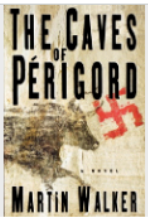


Clan of the Cave Bear



Sapiens

Reindeer Moon



The Caves of Perigord

None of the Above

6. Other books with themes of past and future human evolution that you have read. This is defined by you and can be anything that you think relates to human evolution.

7. Here are examples of videogames with themes of human evolution. Please select all that you have played.

Far Cry Primal

Dawn of Man

Echo: Secrets of the Lost Cavern

None of the Above

8. Other videogames with themes of past and future human evolution that you have played. This is defined by you and can be anything that you think relates to human evolution.

9. Rank your preferences for which popular media form you enjoy most, with 1 being your favorite and 6 being your least favorite.

- Movies
- TV Shows
- Books (novels, nonfiction, etc.)
- Videogames
- Online resources (articles, blogs, etc.)
- Magazine Articles

10. How often do you do each of the following?

	Every day	Several times a week	About once a week	Several times a month	About once a month	Less than once a month	Never
Watch movies	○	○	○	○	○	○	○
Watch TV shows	○	○	○	○	○	○	○
Read books	○	○	○	○	○	○	○
Play videogames	○	○	○	○	○	○	○
Read online articles (news, magazine, blog)	○	○	○	○	○	○	○

11. On a scale of 1 to 5, 1 being least important and 5 being most important, how important is popular media as an educational source for you? Please shade in the number of stars that corresponds with the level of importance.

★ ★ ★ ★ ★

12. What are some examples of popular media that you use to learn new things?

13. Are there other ways in which you have been exposed to themes of human evolution (i.e. posters, museums, school, public lectures, etc.)? If so, please list them here :

14. In up to three sentences, please share your interpretation of life in the Paleolithic as seen through these popular media examples. This can include how people interact, what people eat, what people and the environment look like, etc.

15. Based on the examples of popular media featuring human evolution, your own examples of media containing themes of human evolution, and your own background knowledge, which of the following aspects of Paleolithic life do you believe are accurately represented in popular media? Please check all that apply.

- [ ] Strict gender roles/ gendered ways of behaving
- [ ] Subsistence strategies (i.e. emphasis on hunting large animals)
- [ ] Frequent interpersonal violence
- [ ] Art
- [ ] Verbal language
- [ ] Male dominated social groups
- [ ] Women remaining at base camp with children
- [ ] Men were the hunters
- [ ] Paleolithic peoples were only in Europe
- [ ] Hunch-backed
- [ ] Very hairy
- [ ] Humans were constantly in survival mode (i.e. not much time for relaxing, needed to get the next meal or starve)
- [ ] Tool technology (i.e. stone tool making)

- [ ] In order to survive they had to compete violently with other social groups
- [ ] None of the above
- [ ] I don't know

Other (please specify)

16. Some of the traits of Paleolithic life may still be in practice today because of social continuity. Please check off all aspects of Paleolithic life that we are still experiencing today because of social continuity (i.e., what social activities have not changed over time?)

	Social continuity	I don't know	It changed over time	It was never this way
Strict gender roles/gendered ways of behaving	○	○	○	○
Subsistence strategies (heavy importance on meat-eating)	○	○	○	○
Tool Technology (stone-tool making)	○	○	○	○
Frequent interpersonal violence	○	○	○	○
Art	○	○	○	○
Verbal language	○	○	○	○
Male dominated social groups	○	○	○	○
Women remaining at home with the children	○	○	○	○
Men are the breadwinners	○	○	○	○
People are only in Europe	○	○	○	○
Hunch-backed	○	○	○	○
Very hairy	○	○	○	○
Humans are always in survival mode (little time for relaxing, need to survive)	○	○	○	○
In order to survive people have to compete violently with other people (such as through war)	○	○	○	○

17. Some of the traits of Paleolithic life may still be in practice today because of biological continuity. Please check off all aspects of Paleolithic life that we are still experiencing today because of biological continuity (i.e., what activities have not changed over time because they are part of our biology?)

	Biological continuity	I don't know	It changed over time	It was never this way
Strict gender roles/gendered ways of behaving	○	○	○	○
Subsistence strategies (heavy importance on meat-eating)	○	○	○	○
Tool Technology (stone-tool making)	○	○	○	○
Frequent interpersonal violence	○	○	○	○
Art	○	○	○	○
Verbal language	○	○	○	○
Male dominated social groups	○	○	○	○
Women remaining at home with the children	○	○	○	○
Men are the breadwinners	○	○	○	○
People are only in Europe	○	○	○	○

- ☐ Women remaining at home with children
- ☐ Men are the breadwinners
- ☐ Humans are mainly in Europe
- ☐ Hunch backed
- ☐ Very hairy
- ☐ Humans will constantly be in survival mode (i.e. not much time for relaxing, need to get the next meal or starve)
- ☐ In order to survive we will have to compete violently with other social groups (such as through war)
- ☐ None of the above
- ☐ I don't know

Other (please specify)

Hunch-backed	○	○	○	○
Very hairy	○	○	○	○
Humans are always in survival mode (little time for relaxing, need to survive)	○	○	○	○
In order to survive people have to compete violently with other people (such as through war)	○	○	○	○

18. After reflecting on how humans have or have not changed through time based on the above answer, what aspects do you expect to change in future human evolution? Please check all that apply.

- ☐ Strict gender roles/gendered ways of behaving
- ☐ Subsistence strategies (heavy importance of meat-eating)
- ☐ Frequent interpersonal violence
- ☐ Art
- ☐ Verbal language
- ☐ Tool technology
- ☐ Male dominated social groups
  - ☐ Women remaining at home with children
  - ☐ Men are the breadwinners
  - ☐ Humans are mainly in Europe
  - ☐ Hunch backed
  - ☐ Very hairy
  - ☐ Humans will constantly be in survival mode (i.e. not much time for relaxing, need to get the next meal or starve)
  - ☐ In order to survive we will have to compete violently with other social groups (such as through war)
  - ☐ None of the above
  - ☐ I don't know

Other (please specify)

19. Are the changes that you chose in the above question results of social change?

	Social change	I don't know	It did not change	It was never this way
Strict gender roles/gendered ways of behaving	○	○	○	○
Subsistence strategies (heavy importance on meat-eating)	○	○	○	○
Tool technology	○	○	○	○
Frequent interpersonal violence	○	○	○	○
Art	○	○	○	○
Verbal language	○	○	○	○
Male dominated social groups	○	○	○	○
Women remain at home with children	○	○	○	○
Men are the breadwinners	○	○	○	○
People are mainly in Europe	○	○	○	○
Hunch-backed	○	○	○	○
Very hairy	○	○	○	○
Humans are always in survival mode (little time for relaxing, need to survive)	○	○	○	○
In order to survive people have to compete violently with other social groups (such as through war)	○	○	○	○

20. Are the changes that you chose in the above question results of biological change?

	Biological change	I don't know	It did not change	It was never this way
Strict gender roles/gendered ways of behaving	○	○	○	○
Subsistence strategies (heavy importance on meat-eating)	○	○	○	○
Tool technology	○	○	○	○

Frequent interpersonal violence	○	○	○	○
Art	○	○	○	○
Verbal language	○	○	○	○
Male dominated social groups	○	○	○	○
Women remain at home with children	○	○	○	○
Men are the breadwinners	○	○	○	○
People are mainly in Europe	○	○	○	○
Hunch-backed	○	○	○	○
Very hairy	○	○	○	○
Humans are always in survival mode (little time for relaxing, need to survive)	○	○	○	○
In order to survive people have to compete violently with other social groups (such as through war)	○	○	○	○

21. What are the first five words/phrases that come to mind when you think about human life in the Paleolithic? The Paleolithic is most commonly known as the Last Ice Age.

1.
2.
3.
4.
5.

22. Using your own background knowledge, please provide a description of what life in the Paleolithic (Last Ice Age) may have looked like using 2-3 sentences.

23. Where in the world do you imagine these kinds of scenes happening? Please check all that apply.

- [ ] North America
- [ ] South America
- [ ] Europe
- [ ] Asia
- [ ] Africa
- [ ] Australia
- [ ] Antarctica

24. As we can see from the hominid timeline on the front page, Neandertals and anatomically modern humans (the first homo sapiens!) coexisted, yet the Neadertals went extinct. Why do you think this is? Check all that apply.

- [ ] Neandertals were absorbed into the anatomically modern human social groups (they began living and mating together until there were no pure-bred Neandertals).
- [ ] Anatomically modern humans out-competed Neandertals for food resources.
- [ ] Anatomically modern humans out-competed Neandertals through violence.
- [ ] I don't know.

Other (please specify)

25. Imagine you just read an article you found on Facebook about a new scientific discovery related to human evolution and you want to know more and/or fact check. What do you do? Check all that apply.

- [ ] I don't typically fact check/look deeper into the things I read (do not click any other responses)
- [ ] Google search
- [ ] Find a book on the topic
- [ ] Look for scholarly articles on the topic

Other (please specify)

26. What non-popular media sources do you value for scientific information (i.e. what resources do you use to get scientific information?). List up to 5 responses.

1.
2.
3.
4.
5.

27. What is your age?

- ○ Under 18
- ○ 18-24
- ○ 25-34
- ○ 35-44
- ○ 45-54
- ○ 55-64
- ○ 65+

28. What is your gender?

- ◯ Female
- ◯ Male
- ◯ Other (specify)

29. What is the highest level of education you have completed?

- ◯ PhD
- ◯ Graduate
- ◯ Undergraduate
- ◯ High School
- ◯ High School (in progress)
- ◯ Other (please specify)

30. If you are willing to have a longer (30-60 minute) conversation with me on these topics over tea, please provide your email and/or phone number and I will get in contact with you over the next 24 hours to schedule a place and time of your convenience. I will be expanding on the questions in this survey.

Please be assured that your name will **not** be associated with these survey results.

Name	
Email Address	
Phone Number	

By completing and submitting the questionnaire, YOUR FREE AND INFORMED CONSENT IS IMPLIED and indicates that you understand the conditions of participation in this study as outlined in the Letter of Information for Implied Consent and that you have had the opportunity to have your questions answered by the researchers.

Thank you for your participation!

Appendix B: Interview Photo Prompts

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Appendix C: Survey Responses

Long answer responses have been omitted to protect the privacy of the survey respondents.

Q1: Here are examples of films that include themes of human evolution. Please select all that you have watched.

Movie	Number	Percentage of Total
Alpha	6	6
Quest for Fire	4	4
10,000 BC	10	10
Year One	9	9
Clan of the Cave Bear	4	4
2001: A Space Odyssey	24	23
IO	3	3
None of the Above	68	65
Total Respondents	104	

Q2: Other movies with themes of past or future human evolution that you have watched.

Movie	Number of Respondents (total: 51)
Ice Age	12
The Croods	10
The Flintstones Movie	4
Night at the Museum	3
Encino Man	3
Planet of the Apes	1
X-Men	1
Cave Man with Ringo Starr	1
Aliens series	2
Exmachina	1
Blade Runner	2
Matrix	1
Children of Men	1
Scopes Trial	1
Early Man	1
Time Machine	1
Star Wars	2
Divergent	1
Good Dinosaur	1
Darkest Minds	1
The Day the Earth Stood Still	1
Interstellar	1
5th Wave	1

Noah	1
Heal documentary	1
Documentaries	1
Apollo 13	1
Don't watch movies	2
None	7

Q3: Here are examples of TV shows with themes of human evolution. Please select all that you have watched.

TV Show	Number	Percentage of Total
The Handmaid's Tale	12	11
Star Trek	54	50
10,000 BC	3	3
The Flintstones	77	71
The 100	25	23
None of the Above	16	15
Total Respondents	108	

Q4: Other TV shows with themes of past and future human evolution that you have watched.

Television Show	Number of Respondents (total: 37)
The Jetsons	5
Friends	3
NOVA	3
Battlestar Galactica	2
Dr. Who	2
Twilight Zone	1
PBS	1
National Geographic	1
Mr. Robot	1
Secrets of the Past	1
Ancient Aliens	1
Lab Rats	1
Walking Dead	1
This is Us	1
Gurren Lagann	1
Lost in Space	1

Q5: Here are examples of books with themes of human evolution. Please select all that you have read.

Book	Number	Percentage of Total
The Clan of the Cave Bear	8	8
Sapiens	3	3
Reindeer Moon	1	1

The Caves of Perigord	1	1
None of the above	93	98
Total respondents	102	

Q6: Other books with themes of past and future human evolution that you have read.

Book Title	Number of Respondents (total: 33)
The Little Prince	1
A Brief History of Everyone Who Ever Lived	1
Origin of Language	1
The Zuni Enigma	1
Who Discovered America	1
The Bible	1
The Handmaid's Tale	1
1984	1
The Rise and Fall of the Third Reich	1
Scopes Trial information	1
Thomas Hobbes	1
The Hunger Games	1
Ken Follet book	1
Hawaii	1
Fahrenheit 451	1
I Robot	1
Brian Sykes	1
The Maze	1
The Maze Runner	1
Red Queen	1
Darkest Minds	1
One and Only Ivan	1
Divergent	1
Ready Player One	1
Guns, Germs and Steel	1

Q7: Here are examples of video games with themes of human evolution. Please select all that you have played.

Video Game	Number	Percentage of Total
Far Cry Primal	20	19
Dawn of Man	1	1
Echo: Secrets of the Lost Cave	1	1
None of the above	84	81
Total respondents	104	

Q8: Other video games with themes of past and future human evolution that you have played.

Video Game	Number of Respondents (total: 27)
Portal	1
Wolfenstein	1
Borderlands 3	1
Halo	2
Ark: Survival Evolved	2
Call of Duty at War	1
Battlefield	1
Lisa the Painful	1
Detroit Become Human	1
Conan Exiles	1
Grand Theft Auto	1
None	15

Q9: Rank your preferences for which popular media form you enjoy most, with 1 being your favorite and 6 being your least favorite.

Media Format	1	2	3	4	5	6	Total
Magazine Articles	2	8	10	22	37	29	108
Video games	13	4	17	9	14	50	107
Online Resources	6	7	20	38	25	11	107
Books	16	14	27	21	16	14	108
Movies	34	40	17	6	9	2	108
TV Shows	37	35	17	12	6	1	108

Q10: How often do you do each of the following?

Media Format	Every day	Several Times a Week	About Once a Week	Several Times a Month	About Once a Month	Less Than Once a Month	Never	Total
Movies	5	23	19	23	18	20	1	109
TV Shows	37	41	14	10	3	1	3	109
Books	18	17	12	10	14	20	14	105
Videogames	8	18	5	6	14	14	44	109
Online Articles	27	18	15	11	10	21	7	109

Q11: On a scale of 1 to 5, 1 being least important and 5 being most important, how importance is popular media as an educational source for you?

	1	2	3	4	5	Total
Number of Respondents	**19**	**11**	**29**	**32**	**18**	**109**

Q12: What are some examples of popular media that you use to learn new things?

Categories are bolded. Some categories have an associated number of participants and this is because this is the exact phrasing that some participants used. Additional related individual responses are listed underneath their associated category. Individual responses that do not fall under a larger category are bolded to signify they stand alone.

Category	Number of Respondents (total: 104)
Social Media	5
Snapchat	11
Facebook	5
Instagram	18
Pinterest	1
TikTok	2
Twitter	8
News Sources	2
News apps	3
Newspapers	6
News channels	4
Online news	5
Consumer reports	1
The Week	1
Real Clear Politics	1
Slate	1
Politico	1
CNN	11
MSNBC	4
CBC	1
CBS	1
BBC	1
Washington Post	3
Fox	3
WST	1
The Guardian	1
NY Times	6
Internet	9
Buzzfeed	1
NASA	1
YouTube	18
Online articles	8
Quizlet	4
Kahoot	1
Google	8

Yahoo	1
Phone	2
vlogs	1
Blogs	4
School databases	1
wikipedia	2
Message boards	1
TV Shows	9
National Geographic	1
Discovery	2
Hisory Channel	1
Travel Channel	1
Ancestry Program	1
PBS	2
Netflix	1
Movies	9
Great Courses DVD	1
Documentaries	3
Musicals	1
Plays	1
Videogames	1
I don't care about popular media	1
Music	1
Podcasts	3
Magazines	7
Smithsonian	1
Atlantic	1
Archaeology	1
Learning tools	1
Journal articles	1
Radio	4
NPR	1
Books	11

Q13: Are there other ways in which you have been exposed to themes of human evolution (i.e., posters, museums, school, public lectures, etc.)?

Categories are bolded. Some categories have an associated number of participants and this is because this is the exact phrasing that some participants used. Additional related individual responses are listed underneath their associated category. Individual responses that do not fall under a larger category are bolded to signify they stand alone.

Category	**Number of Respondents (total: 99)**
Museums	65
Museum of Natural History	1
Boston Mseum	1

Indian Museum in Cobleskill	1
NYS Museum	1
Thatcher Nature Center	2
Five Rivers	1
School	41
Environmental Science	1
Biology	3
Global	3
Psychology	2
Field trips to museums	3
College	3
Anthro minor	1
Books	3
Encyclopedia	1
Newspapers	1
NY Times	1
National Geographic Magazine	2
People	
Parents	2
Friends	1
Known anthropologist	1
Archaeology	1
Articles	1
Historic Sites	1
Theater	1
Public lectures	13
Posters	5
Online	2
Spaceship Earth Ride at Disney World	1
Religion	
Bible studies	2
church	2
DNA results	1
Enneagram/personality tests	1
No	2
I don't know	1

Q15: Based on the examples of popular media featuring human evolution, your own examples of media containing themes of human evolution, and your own background knowledge, which of the following aspects of Paleolithic life do you believe are accurately represented in popular media?

Answer Choice	Number	Percentage of Total
Strict gender roles/gendered ways of behaving	41	38

Subsistence strategies (i.e. emphasis on large game hunting)	71	66
Frequent interpersonal violence	35	33
Art	53	50
Verbal language	24	22
Male dominated social groups	52	49
Women remaining at base camp with children	37	35
Men were the hunters	58	54
Paleolithic peoples were only in Europe	1	1
Hunch-backed	15	14
Very hairy	36	34
Humans were constantly in survival mode	68	64
Tool technology	69	64
In order to survive they had to compete violently with other social groups	27	25
None of the above	3	3
I don't know	10	9
Total Respondents	107	

Q16: Some of the traits of Paleolithic life may still be in practice today because of social continuity. Please check off all aspects of Paleolithic life that we are still experiencing today because of social continuity.

Trait	**Social continuity**	**I don't know**	**It changed over time**	**It was never this way**	**Total respondents**
Strict gender roles/ways of behaving	17	9	74	5	105
Subsistence strategies	22	8	74	2	106
Tool technology	17	14	74	1	105
Frequent interpersonal violence	29	32	41	3	105
Art	49	13	42	1	105
Verbal language	32	13	57	1	103

Male dominated groups	22	21	59	4	106
Women at home with children	15	13	77	1	106
Men are breadwinners	10	26	64	5	105
People only in Europe	0	18	39	46	103
Hunch-backed	2	35	45	22	104
Very hairy	5	31	60	7	103
Always in survival mode	17	13	72	4	106
To survive, people had to compete violently with other people	23	26	52	6	107

Q17: Some of the traits of Paleolithic life may still be in practice today because of biological continuity. Please check off all aspects of Paleolithic life that we are still experiencing today because of biological sontinuity.

Trait	**Biological Continuity**	**I don't know**	**It changed over time**	**It was never this way**	**Total**
Strict gender roles/ways of behaving	23	16	58	5	102
Subsistence strategies	26	22	50	3	101
Tool technology	17	22	57	4	100
Frequent interpersonal violence	30	28	38	5	101
Art	35	22	37	3	97
Verbal language	42	17	38	1	98
Male dominated groups	18	23	55	3	99
Women at home with children	16	19	65	1	101

Men are breadwinners	11	27	59	5	102
People only in Europe	1	28	33	39	101
Hunch-backed	5	36	44	17	102
Very hairy	10	29	52	9	100
Always in survival mode	19	17	62	3	101
To survive, people had to compete violently with other people	27	17	50	8	102

Q18: Reflecting on how humans have or have not changed through time based on the above answers, what aspects do you expect to change in future human evolution?

Trait	**Number**	**Percentage of Total**
Strict gender roles/ways of behaving	76	73
Subsistence strategies	53	51
Tool technology	39	38
Frequent interpersonal violence	60	58
Art	53	51
Verbal language	67	64
Male dominated groups	56	53
Women at home with children	50	48
Men are breadwinners	49	47
People only in Europe	25	24
Hunch-backed	22	21
Very hairy	28	27
Always in survival mode	36	35
To survive, people had to compete violently with other people	39	38
None of the above	1	1
I don't know	11	11
Total respondents	104	

Q19: Are the changes that you chose in the above question results of social change?

Trait	Social Change	I don't know	It did not change	It was never this way	Total
Strict gender roles/ways of behaving	91	10	1	1	103
Subsistence strategies	61	31	4	3	99
Tool technology	48	36	9	2	95
Frequent interpersonal violence	52	29	13	1	95
Art	68	20	9	1	98
Verbal language	70	17	7	2	96
Male dominated groups	71	20	4	4	99
Women at home with children	76	20	4	1	101
Men are breadwinners	65	25	3	7	100
People only in Europe	23	37	4	31	95
Hunch-backed	17	51	7	18	93
Very hairy	20	49	10	14	93
Always in survival mode	64	23	8	4	99
To survive, people had to compete violently with other people	58	22	14	4	98

Q20: Are the changes that you chose in the above question results of biological change?

Trait	Biological change	I don't know	It did not change	It was never this way	Total
Strict gender roles/ways of behaving	23	56	9	7	95

Subsistence strategies	41	38	9	8	96
Tool technology	20	52	15	6	93
Frequent interpersonal violence	26	43	15	5	89
Art	13	53	17	6	89
Verbal language	34	40	13	4	91
Male dominated groups	19	48	15	11	93
Women at home with children	19	51	14	8	92
Men are breadwinners	9	57	16	10	92
People only in Europe	12	49	9	21	91
Hunch-backed	36	37	6	14	93
Very hairy	41	35	5	12	93
Always in survival mode	42	35	11	5	93
To survive, people had to compete violently with other people	30	37	18	7	92

Q23: Where in the world do you imagine these kinds of scenes happening?

Answer Options	Number of Participant Responses	Percentage of total
North America	60	63
South America	41	43
Europe	76	79
Asia	56	58
Africa	66	69
Australia	32	33
Antarctica	28	29
Total Number of Respondents	96	

Q24: As we can see from the hominid timeline on the front page, Neanderthals and anatomically modern humans (the first homo sapiens!) coexisted, yet the Neanderthals went extinct. Why do you think this is?

Answer Options	Number	Percentage of total
Neanderthals were absorbed into AMH social groups	40	40
AMH out-competed Neanderthals for food resources	41	41
AMH out-competed Neanderthals through violence	21	21
I don't know	32	32
Total Respondents	99	

Q25: Imagine you just read an article you found on Facebook about a new scientific discovery related to human evolution and you want to know more and/or fact check. What do you do?

Answer options	Number	Percentage of Total
I don't typically fact-check/look deeper into the things I read	14	14
Google Search	75	76
Find a book on the topic	22	22
Look for scholarly articles on the topic	39	39
Total number of respondents	99	

Q26: What non-popular media sources do you value for scientific information (i.e., what resources do you use to get scientific information?) List up to 5 responses.

Categories are bolded. Some categories have an associated number of participants and this is because this is the exact phrasing that some participants used. Additional related individual responses are listed underneath their associated category. Individual responses that do not fall under a larger category are bolded to signify they stand alone.

Response	Number of Respondents
Books	19
Library	6
Reference books	1
encyclopedia	3
Collegiate materials	1
textbook	4
History textbook	1
Science textbook	3
Global textbook	1

Integrated learning packets	1
Magazines	4
Scientific America	1
Science Magazines	2
American History magazine	1
Archaeology magazine	1
Psychology Times	1
Smithsonian magazine	1
Wildlife magazine	1
Times magazine	1
National Geographic	9
News	1
CBC	1
BBC	1
Fox	1
CNN	7
Local newspaper	1
Newspaper	2
Washington Post	2
NY Times Science Section	2
NY Times	3
Daily Mail	2
ENews	1
Social media	1
Facebook	3
Twitter	1
Instagram	5
TikTok	1
DMV app	1
Tumblr	1
Snapchat	4
TV	4
Public TV	2
NOVA	1
Talk Shows	1
History Channel	2
Netflix	1
Movies	3
Great Courses DVDs	1
Radio	1
Public Radio	1
Internet	6
Wikipedia	9
Wikihow	1
History.com	1

Reddit	1
websites	3
Links from emails	1
NASA	1
Science webpages	2
Trivia crack	1
Yahoo	1
Bing	1
OK Google	1
Google Newsfeed	1
Google	11
Scholarly Sources	
Google Scholar	4
Databases	2
Science direct	1
Britannica	2
Gale	1
Nexus Lexus	1
JAMA	1
Trade journals	1
journals	3
Peer-reviewed journals	1
Scientific journals	2
Journal articles	2
Scientific articles	1
Scholarly articles	5
Research papers	1
Articles	8
Document	1
Museums	2
Lecture series	4
Quote	1
The World	1
Coustaeu	1
Person	2
Science teacher	**1**
Mrs. Seaburn	**1**
Mr. Young	**1**
Teacher	**2**
Scientist	**1**

Q27: What is your age?

Age range	Number	Percentage of total
Under 18	58	56
18-24	7	7

25-34	2	2
35-44	5	5
45-54	6	6
55-64	15	14
65+	11	11
	104	

Q28: What is your gender?

Gender Options	**Number of Respondents**	**Percentage of Total**
Female	57	55
Male	45	44
Other	1	1
	103	

Q29:What is the highest level of education you have completed?

Education Options	Number	Percentage of Total
Attending high school	61	60
High School	2	2
Undergraduate	11	11
Graduate	23	23
PhD	2	2
	102	