Policy and Parenting:

An Ethnographic Study of Public Education and Religious Life

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I. Introduction

i. Overview of Topic

Creationism is a belief holding that "matter, the various forms of life, and the world were created by God out of nothing and usually in the way described in Genesis."[1] Young-Earth creationism and old-Earth creationism are two variants of this belief. Young-Earth creationism, otherwise known as Biblical creationism, maintains that the story of God's creation of the earth, as outlined in the book of Genesis, is a literal historical account. Old-Earth creationism, while still holding to the belief that God directly created all living things, does not maintain that the timeline given by Genesis is historically accurate, or that all creation-events occured within a six day period. Both of these views accept the concept of microevolution, believing that small changes can occur within species over time. Neither form of creationism, however, accepts macroevolution, or the idea that a simpler species can evolve to form complex species.[2]

The first known use of the term "creationism" was in 1880, and the doctrine it defines emerged as a response to Darwin's *The Origin of the Species,* the first systematized treatise on evolutionary theory, which was published in 1859.[3] [4] Within the two decades following *The Origin of the Species*' release, most scientists came to agree with it's evolution of life theories, as did many religious bodies. For example, the Catholic church's official stance, given by Pope Pius XII in the 1950 encyclical Humani generis, is that there is no inherent conflict between the

[1] Merriam Webster. (n.d.).
[2] Encyclopedia Britannica. (n.d.).
[3] Merriam Webster. (n.d.).
[4] Encyclopedia Britannica. (n.d.).

theory of evolution and the doctrine of Catholicism. Specifically, the encyclical states that the "Teaching Authority of the Church does not forbid that, in conformity with the present state of human sciences and sacred theology, research and discussions, on the part of men experienced in both fields, take place with regard to the doctrine of evolution, in as far as it inquires into the origin of the human body as coming from pre-existent and living matter - for the Catholic faith obliges us to hold that souls are immediately created by God."[5] This statement implies a distinction between the body and the soul of man, holding that as long as the creation of man's soul is ascribed to God directly, then it is doctrinally acceptable for members of this faith to believe that the body of man, guided by the hand of God, could have evolved from a 'lower' species that was created by God at an earlier point in time.

The most common proponents of Creationism are conservative, Protestant Christians, particularly those affiliated with the fundamentalist movement (anti-evolution movements, as well as fundamentalist movements, have been particularly strong in the US as compared to other similarly developed nations) .[6] [7] [8] A 2014 study shows Creationism to be a religious view held, at least nominally, by 34% of the US population, despite broad trends of religious adherence waning.[9] [10] This percentage remains unchanged from that found in a similar 2009 study.[11] There is, however, overwhelming scientific consensus on the topic: 98% of scientists associated with the American Association for the Advancement of Science (AAAS), the world's largest

[5] Libreria Editrice Vaticana. (1950).
[6] Encyclopedia Britannica. (n.d.).
[7] Creationist and Fundamentalist Apologetics. (2008).
[8] Evans, E. M. (2000).
[9] Pew Research Center. (2015). (1).
[10] Pew Research Center. (2015). (2).
[11] Pew Research Center. (2013).

multidisciplinary scientific society, support evolutionary theory.[12] [13] In a 2006 statement on the teaching of evolution, the AAAS Board of Directors affirmed that "there is no significant controversy within the scientific community about the validity of the theory of evolution. The current controversy surrounding the teaching of evolution is not a scientific one."[14] Accordingly, increasing amounts of legislation have emerged over the last several decades which mandate the teaching of evolution in public schools and prohibit the teaching of Creationism and its derivatives, such as Intelligent Design.

This raises several questions, both theoretical and practical. How is education viewed by the body responsible for creating policies to regulate the school system? How is science viewed? How are contradictory values, which come into conflict in the public school system, prioritized and weighed against each other by the state? How are they prioritized and responded to by parents? Finally, how could the percentage of the population holding a belief such as this, which is in opposition to both the scientific consensus and the content of public education, be not only so significant in number but also remain unchanged over a five year period?

ii. Personal interest and positionality

Having been raised in a conservative, Protestant Christian home where one of my parents was deeply convinced of the Bible's historical accuracy, I was well acquainted with creationist ideas throughout my childhood. If not explicitly fundamentalist, there was certainly evidence for strong tendencies towards Biblical literalism on behalf of the older relatives who taught me how

[12] Masci, D. (2017).
[13] JSTOR. (n.d.).
[14] AAAS. (2006).

to view the world around me. My exposure to evolution was much lower than it was to creationism; it never arose as a subject of conversation, the only exception being, perhaps, when it was brought up as a point of contrast to Sunday School lessons on Genesis' creation account. It was not until a high school science class that I learned, finally and for the first time, that evolution was not the untenable fringe belief I had assumed it to be.

My own late exposure to this material resulted in a curiosity about policy and curriculum. While I did spend two years in a private Christian school during a transitional period for my family, the majority of my education took place within the public school system. Seeing statistics on the frequency of anti-evolution beliefs piqued my curiosity: how were these topics being handled in school; were there specific policies on what was to be taught regarding such information? If so, how were these policies enforced, and what level of discretion did districts have in tailoring their own curriculum? If these topics were taught in all public schools, how did parents holding opposite views regard that teaching? Did they employ any strategies (consciously or unconsciously) to divert or diffuse their children's understanding of this specific topic, or of science more broadly?

With regards to my fieldwork, I did not discuss my own personal religious orientation or lack thereof with any of my interlocutors. They did not know whether or not I shared any of their beliefs, and none of them inquired directly as to what my religious leanings were. There was likely an assumption that I shared at least some aspects of their Christian faith, as growing up in a similar breed of strongly religious community, I was equipped to speak with them using shared language, implicitly positioning myself as, at the very least, someone who was familiar enough with religious life as to ask questions pertaining to some of its nuances and speak as a member of

their ingroup. This assumption on behalf of some of my interlocutors was made apparent in their use of personal collective pronouns, specifically their use of "we" when talking about people of the Christian faith, or their use of phrases such as "you know…" when beginning an explanation of why something registered as contrary to their values or Christian ideology. This was done with little apparent thought on their part; it was never put in the form of a question, and I was not expected to affirm or deny this grouping. In the latter situation, I was sure to always ask follow up questions regarding anything they may have assumed I knew, rather than relying on my own assumptions to fill in these initial gaps in information.

iii. Comparison of PA's religious demographics and the national average

As the responsibility for developing educational policy rests primarily on the state rather than the federal level, policies can vary significantly between different locations. This paper focuses on educational policy in Pennsylvania, and the ethnographic portion was conducted in Lancaster County, PA, warranting an examination of the region's religious demographic.

A 2017 study showed that in the US, 89% of adults say they believe in God or some other higher power. This is a slight decline from the percentage found by a similar 2007 study, where 92% of adults claimed this belief.[15] Despite this, only 77% of adults were religiously affiliated in 2017; this is down from 83% in 2007. Of the 89% professing belief in a higher power, the majority (66%) believe in the God described in the Bible.[16]

79% of adults in Pennsylvania are affiliated with a religion; 73% identify as Christian and 6% identify with a faith other than Christianity. The remaining 21% are unaffiliated religious

[15] Pew Research Center. (2018).
[16] Pew Research Center. (2018).

"nones." Falling under this category are atheists, who comprise 3% of Pennsylvanian adults, agnostics (4%), those responding "don't know" (1%), and those responding "nothing in particular" (14%). 36% of respondents saying "nothing in particular" also indicated that religion was important to them.[17] Of the 73% identifying as Christians, 33% are of the Catholic tradition, 32% are of the mainline Protestant tradition, 26% are of the evangelical Protestant tradition, and 7% are from the Historically Black Protestant tradition.

Pennsylvania's population as a whole, then, has slightly higher levels of religious affiliation than the US average, though affiliation with Christianity, while still claimed by the vast majority of residents, is slightly below the nation's average.

II. History

Public education has been a contentious subject since its inception, with debate surrounding the contents of the material taught, the values conveyed by selected material, and which parties should have a voice in the selection of this material. Central to the question of which parties should be instrumental in the selection of material has been the work of interest groups, including the Christian Right (a party best understood as a freely evolving collection of interest groups united broadly by belief in the Christian faith and conservatism, rather than any singular, particular, or cohesive group).[18]

[17] Pew Research Center. (2015). (3).
[18] Lugg, C. (2001).

The history of legal debates over such course material has a notable beginning in the case of *The State of Tennessee v. John Thomas Scopes*, which was heard in 1925. Informally referred to as the Scopes Monkey Trial, the case attracted the attention of the nation and became emblematic of tensions between Biblical literalism and scientific findings. Preceding this case was the passing of the Butler Act by the state of Tennessee, a law which explicitly prohibited the teaching of evolution in its schools, making it illegal to "teach any theory that denies the story of the Divine Creation of man as taught in the Bible, and to teach instead that man has descended from a lower order of animals."[19]

John Scopes, the defendant, agreed to work with the American Civil Liberties Union (ACLU) in an effort to draw attention to this law. The goal of the ACLU was to have the case brought before the Supreme Court, where it would be reviewed and possibly ruled unconstitutional.[20] This idea was expressed in the defense's opening statement: "the broad purpose of the defense will be to prove that the Bible is a work of religious aspiration and rules of conduct which must be kept in the field of theology… there is no more justification for imposing the conflicting views of the Bible on courses of biology than there would be for imposing the views of biologists on courses of comparative religion."[21]

Tennessee was represented by William Jennings Bryan, a Christian, populist politician, and three-time Democratic nominee for president who viewed Darwinism as a force of evil, a "menace" responsible for staining the moral fabric of Christian America.[22] [23] The prosecution's strategy was to focus the case solely on whether or not Scopes violated the law by teaching

[19] National Center for Science Education. (n.d.).
[20] ACLU. (n.d.)
[21] Hanover College, (n.d.).
[22] Linder, D. (n.d.).
[23] Bryan, W. J. (1922).

evolution, stating "that statute interprets itself, and says that whenever a man teaches that man descended from a lower order of animals as contradistinguished from the record of the creation of man as given by the word of God, that he is guilty. Does the proof show that he did that, that is the only issue."[24] When the trial came to its end, Darrow requested that the jury return a guilty verdict so that the law could be challenged in a higher court. The jury complied, ruling that Scopes was in violation of the Butler Act. A year later, however, the verdict was reversed by the Supreme Court of the State of Tennessee on a technicality and dismissed, not reversed on constitutional grounds as the defense had hoped.[25]

The constitutionality of anti-evolution laws was next challenged over forty years later in the 1968 case of *Epperson v. Arkansas*. Arkansas had passed an anti-evolution law modelled on Tennessee's Butler Act, which declared it was unlawful to teach in a state school "the theory or doctrine that mankind ascended or descended from a lower order of animals," or "to adopt or use in any such institution a textbook that teaches this theory."[26] Susan Epperson was a 10th grade biology teacher in Little Rock, where the school district had approved a new textbook including material on Darwin's theory of evolution. Refusing to teach the material would have made her subject to dismissal, while agreeing to teach could have put her in legal jeopardy. She personally supported the teaching, and with support from the ACLU and the National Educational Association, filed a declaratory and injunctive relief to challenge the statute.[27] Upon hearing the case, the Supreme Court decided in favor of Epperson.[28] In a unanimous decision, the Court ruled that Arkansas' anti-evolution statute violated the Establishment Clause of the 1st

[24] Hanover College, (n.d.).
[25] Linder, D. (2010).
[26] Epperson v. Arkansas, 393 U.S. 97. (1968).
[27] Cornell Law School (n.d.).
[28] Religion in the Public Schools. (2018).

amendment, stating in the summary judgment that "the First Amendment mandates governmental neutrality between religion and religion, and between religion and nonreligion," and that "the Arkansas law is not a manifestation of religious neutrality."[29] [30] This landmark case established the unconstitutional nature of anti-evolutionist teaching in public schools, a precedent that would be repeatedly reaffirmed.

While the *Epperson v Arkansas* decision affirmed that the teaching of evolution deserved its place in public schools, it offered no comment on whether the teaching of creationism was in accordance with the constitution. This being the case, proponents of creationism began to push for a dual approach, encouraging curriculums that would present "evolution-science" alongside "creation-science" as two alternate, scientifically based explanations of the origins of life. They argued on principles of fairness that it was only right for both views to be given balanced treatment in public school curriculums.[31] Based on this idea, Louisiana passed the Balanced Treatment for Creation-Science and Evolution in Public School Instruction Act in 1981, mandating teachers spend an equal amount of time teaching evolution and creationism and "provide whatever information and instruction in both creation and evolution models [they determine] is necessary and appropriate to provide insight into both theories."[32] *Edwards v Aguillard,* a case resulting from this act, came to the United States Supreme Court in 1987. In this case, the court ruled that the act violated the Establishment Clause for having no clear secular purpose.[33]

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[29] Oyez (n.d.).
[30] Epperson v. Arkansas, 393 U.S. 97. (1968).
[31] Religion in the Public Schools. (2018).
[32] Schimmelpfennig, R. (1978).
[33] Scaeffer, S. (1988).

Derivatives of the evolution/ creationism controversy have entered courtrooms as recently as 2005, in the case of *Kitzmiller v. Dover*. Prior to this case, the board of the Dover Area School District in Pennsylvania developed a policy requiring all science teachers to read a disclaimer before presenting material on evolution. The disclaimer stated that "Intelligent Design is an alternative explanation of the origins of life that differs from evolution," and the policy required teachers to inform students that the school could provide a reference book on Intelligent Design theory if any student expressed interest. The policy was challenged in court, and aligning with precedent, was declared unconstitutional.[34]

III. Current Policy

i. Standards

As discussed, educational policy has mandated the teaching of evolution in public schools for decades, and has required it be presented as the only existing scientific theory. Accordingly, policy has long prohibited the teaching of Creationism and related origin of life theories, such as Intelligent Design (ID). In congruence with these policies, Pennsylvania's Core Standards detail the elements of science education expected to be covered by curriculum of each grade level. In the Standard Area of Biological Sciences (3.1), evolutionary theory forms the organizing category 3.1.C. This teaching begins in pre-kindergarten (pre-K), and continues throughout elementary school. It is described as intending to teach the following:

[34] Kitzmiller v. Dover Area School District, 400 F. Supp. 2d 707 (M.D. Pa. 2005)

> "Biology of organisms and cells concerns living things, their appearance, different types of life, the scope of their similarities and differences, where they live and how they live. Living things are made of the same components as all other matter, involve the same kinds of transformations of energy and move using the same basic kinds of forces as described in chemistry and physics standards. Through the study of the diversity of life, students learn how life has evolved. This great variety of life forms continues to change even today as genetic instructions within cells are passed from generation to generation, yet the amazing integrity of most species remain."[35]

There are three main content strands, or sections, under the organizing category of evolution: natural selection, adaptation, and unifying themes. The standards for the natural selection strand begin in the third grade, when students are expected to understand the role of adaptation and seasonal behaviors in a species' survival and fitness. In fourth grade, students should be able to recognize certain characteristics that enhance a species fitness and how environmental changes can lead to extinction. In fifth grade, standards state that students are expected to understand that organisms respond to stimuli to meet their needs, and in sixth grade, students should be able to differentiate between instinctive and learned behaviors. After progressing through 6th grade, students are expected to understand macro-evolution as a result of speciation through natural selection.[36]

Included in all organizing categories is a "Science as Inquiry" component, which is described as follows:

[35] Standards Aligned System. (2018).
[36] Standards Aligned System. (2018).

> "Science as Inquiry: Understanding of science content is enhanced when concepts are grounded in inquiry experiences. The use of scientific inquiry will help ensure that students develop a deep understanding of science content, processes, knowledge and understanding of scientific ideas, and the work of scientists; therefore, inquiry is embedded as a strand throughout all content areas. Teaching science as inquiry provides teachers with the opportunity to help all students in grades K-12 develop abilities necessary to understand and do scientific inquiry. These are very similar across grade bands and evolve in complexity as the grade level increases."[37]

The learning outcomes for the Science as Inquiry component of these standards are categorized by grade ranges, rather than individual years. The first range contains only pre-kindergarten, the second includes all grades kindergarten through fourth, and the third contains grades five through seven.

According to these outcomes, a pre-kindergarten student should be able to participate in simple investigations in order to answer questions and test predictions. They should also be able to ask questions about objects, events, and organisms around them, as well to gather data using their five senses and simple instruments. By the end of fourth grade, students should be able to use data to construct explanations, understand that scientists develop explanations based on evidence and compare these explanations with the current body of scientific knowledge, and distinguish between scientific fact and opinion. By the end of seventh grade, students should be able to identify questions that can be answered through scientific investigations, evaluate the appropriateness of such questions, and develop descriptions, explanations, and models using

[37] Standards Aligned System. (2018).

evidence. They should understand that these "emphasize evidence, have logically consistent arguments, and are based on scientific principles, models, and theories." Additionally, they should be able to "analyze alternative explanations and understandings that science advances through legitimate skepticism."[38] [39]

ii. Curriculum

The standards detailed above are not a curriculum; they provide the learning outcomes students are expected to have at all points throughout their education, but do not require the material to be delivered in any particular way. Instead, districts can choose to use whatever curriculum material they decide will best meet the needs of their students, so long as the standards are met (as evaluated by student results on the assessments discussed below). There is, however, a curriculum that is recommend for the majority of core subjects, including science.

The life science portion of the recommended curriculum[40] contains material organized into several categories. First, all information is organized by the grade level the material should be introduced in. There are also multiple 'big ideas,' which carry through all years of elementary instruction. For each big idea there are several "essential questions," and for each of these, there are one or more concepts and competencies that students are expected to learn. The concepts are specific focal points of a lesson, and the competencies detail specific skills that students are expected to be able to demonstrate following the teaching of the lesson concept. This curriculum

[38] Standards Aligned System. (2018).
[39] The learning outcomes listed here are the most directly relevant to elementary schoolers developing an understanding of evolutionary theory and of why anti-evolutionism is not a view accepted or endorsed by scientists.
[40] All curriculum references refer to the Standards Aligned System recommended curriculum for grades one through five (Pennsylvania Department of Education Standards Aligned System, 2019).

is explicitly linked to the standards it is designed to teach, which allows for a clear understanding of which portions of material are meant to correspond with the teaching of evolutionary theory (standards in the 3.1.C. range).

There are five Big Ideas for the life sciences portion of the curriculum, one of which states that "biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth." This statement clearly and explicitly identifies evolution as a key, foundational idea in the sciences, and the fact that students should be presented with material relating back to this idea throughout all elementary school years lends itself well towards students understanding this as both an uncontested and central piece of science.

With a particular focus on concepts and competencies (the parts of the curriculum most directly involving students in the classroom, through the specific idea they are taught and their expected learning outcomes), the most relevant portions of curriculum for teaching ideas relating to evolution are as follows. In grade one, students should be able to recognize shared characteristics among both plants and animals, and should be able to observe patterns of behavior among parents and offspring that contribute to the fitness of the offspring. Interestingly, while the first grade curriculum does include the biological evolution Big Idea and an associated Essential Question ("How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?"), there are no specific concepts or competencies associated with it.

In the second grade, there is an increased focus on the role of the environment in an organism's chance of survival and reproductive capabilities. The biological evolution Big Idea is

accompanied by two concepts and two associated competencies: the first set introduces students to the idea that living things can only survive in areas where their needs are met, and asks them to explain why this is the case. The second concept/ competency pair introduces biodiversity, and asks students to compare living things from different habitats. In the third grade, the biological evolution Big Idea gains much greater prominence, with seven concepts and ten associated competencies. This includes a significant focus on the use of the fossil record to identify organisms and gather information about their environments as well as a continued focus on the influence of habitat on organisms (for example, one main concept is "populations live in a variety of habitats and changes in those habitats impacts the organisms living there," and "sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing"). The most interesting shift in the curriculum is the last concept introduced: "Humans, like all other organisms, obtain living and nonliving resources from their environments." The associated competency asks students to use evidence to demonstrate how this is true. This, while prima facie a simple statement asserting little more than the idea that humans use environmental resources, introduces a far greater concept: the similarity between humans and other organisms. This paves the way for future discussions of a largely shared evolutionary history.

In grade four, the curriculum associated with the biological evolution Big Idea (and indeed, for life sciences as a whole) drops off significantly. There is one Essential Question for this Big Idea ("How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?"), but there are no concepts or competencies associated with it. The curriculum for grade five, similarly, has a new Essential Question ("How

can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?"), but no associated concepts or competencies. This question is an important one that builds off the previous material, but the lack of concepts and competencies means there is little guidance regarding focuses or classroom implementation that could be used to present this question and equip students to answer it.

iii. Assessments

There are two main assessments in Pennsylvania public schools, the PSSA and the Keystone exams. The PSSA for science is administered in grades four and eight, while the Keystone exams are administered after the completion of specific subjects (Algebra I, Biology, and Literature). The expectation is that these courses will be taken in either late middle school or early high school; thus, the 4th grade PSSA is the only standardized test administered during the elementary school years. There are four sections in the science PSSA: the Nature of Science, Biological Sciences, Physical Sciences, and Earth and Space Science. Material most closely relating to concepts of evolutionary theory is found in the Biological Sciences section, though there is only a scant amount of eligible content that this section may test. There are three assessment anchors under this category; the first addresses the structure and function of organisms, the second focuses on continuity of life, and the third on ecological behavior and systems.[41] The second category, Continuity of Life, is the most closely related to ideas of heredity, natural selection, and adaptation and change, though none of the testable content relates directly to evolutionary theory. There are two main content sections in this category, each with

[41] Pennsylvania Department of Education. (2007).

very limited eligible content. The first section expects students to be able to "identify and explain how adaptations help organisms to survive," though the content that may be tested to verify this skill includes only asking students to "identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest)," and "explain how specific adaptations can help a living organism survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water)." The second section expects students to understand that "characteristics are inherited and, thus, offspring closely resemble their parents," though the 'eligible content' that may be used to test this skill, similarly, only asks students to "identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring." [42] While these skills and the content represented by them are important and provide the basis for broader conceptual understandings, they do not directly address or require an understanding of basic evolutionary theory.

iv. Exemption policies

PA Educational Code General Policy § 4.4(d)(3) provides that parents have "the right to have their children excused from specific instruction that conflicts with their religious beliefs, upon receipt by the school entity of a written request from the parent or guardians." [43] While accountable to these standards, individual school districts have autonomy in the allowances they provide for parents to tailor their children's' exposure to various teachings.[44] Many districts have established opt-out or religious exemption policies, including Hempfield and Donegal, two of the

[42] Pennsylvania Department of Education. (2007).
[43] Commonwealth of Pennsylvania. (2018).
[44] Tyrone Area School District. (2018).

districts in which I will be conducting my research.[45] [46] Transcripts from certain districts' board proceedings indicate that evolution is one of the topics for which exemptions are requested. Exemption policies provide a way for the school districts to address parental resistance to the teaching of mandated material, while still remaining in compliance with state educational standards.

IV. Fieldwork

i. Introduction to fieldwork

My interlocutors for the ethnographic portion of this research are all evangelical Protestant Christians who believe in creationism, and all are from Lancaster County, Pennsylvania, an area of rural farmland with strong conservative influences. The individuals interviewed are primarily conservative Republicans, though some take their places further left along the political spectrum (while discussion of political leanings often emerged organically in the context of our conversations, I did not directly ask any of my participants about their political affiliations). I interviewed a total of seven families, which I contacted through snowball sampling. Interviews took place in a variety of locations, ranging from families' homes, to churches, to neighborhood spaces such as cafes. All locations were suggested by the participants, as I wanted our first meetings to be in locations they felt comfortable and willing to talk freely. As to the family makeup, most of my participants were middle-class heterosexual couples, the

[45] Hempfield School District. (2017).
[46] Donegal School District. (2017).

only exception being one single parent. When interviewing families with two parents I sometimes spoke with both parents together, and sometimes I only met with one; in such instances, I spoke with mothers and fathers about equally. Children were generally not present, though during some of the interviews that occurred within a family's home the children would come to get the attention of their parents. In no such instance did they stay for long, so parent's comments were not colored by what their children might overhear. As I was focusing on an elementary school age range, children's grades ranged from entering the 2nd grade to entering the 6th (all interviews took place during the summer, when children were between grades).

Interviews ranged in duration from thirty minutes to just under under three hours, with an average length of approximately one hour and fifteen minutes. Further communication took place over email, through which I discussed follow up questions with my participants. Additionally, some sent supplemental examples of instances that related to the conversation we had or that reminded them of questions I had asked. These examples were either things they thought of after the interview had ended, or things that had occurred at a later date that they felt to be relevant.

I have used the term 'evangelical' to describe my interlocutors, as I believe it to be the designation most representative of their religious affiliations as they have been expressed in interviews. Additionally, most of my participants self-identify as evangelical Protestants. Some were not sure what label they would attach to further identify their beliefs, but did believe in the hallmarks of evangelicalism: an emphasis on a personal conversion experience through belief in Jesus being risen from the dead (i.e. being "born again" in what is often described as an experiential encounter with the Holy Spirit, one of three members of the triune Godhead), an

emphasis on the Biblical scriptures, particularly the four Gospels, as the foundations of faith, and an emphasis on evangelism, or of telling others about their faith and sharing their testimony. This testimony, often not referred to as such in an informal setting (informal references I heard more frequently included "personal story with [God/ religion]," or "story of [their] experience with [coming to faith/ growing in faith]," is a story of their religious experience, often highlighting what they considered to be defining moments in the development of their relationship with religion or the divine. The last of these qualifiers emerged as a particularly component of how families viewed and discussed their position, and their children's placement within the public school system.

The word 'evangelical' can, however, carry with it certain negative connotations, and the group it identifies is often assigned stereotypes (or even caricatured) in ways I believe to be unhelpful for this paper. While these connotations are not expressed by people within the group as reflective of their own feelings on evangelicals, they were mentioned by my participants multiple times as something they felt to be placed upon them by other people who were not of their faith. Additionally, my participants provided at least slightly different, and sometimes contradictory, explanations as to what the term 'evangelical' meant to them. For example, one father, a mild-mannered man in his early forties, allowed that he "suppose[d] [he] could best be described as an evangelical," based on his beliefs, but was hesitant to connect himself with the term primarily because he felt the designation came with undesirable, unwarranted overtones. He hesitantly described this stereotype as one representing evangelicals as "Bible-thumping, bigoted, or... fiercely conservative. I think that's what people would sometimes assume," and continued to say, referring to himself and his family, that "we're not so… loud, or… brash as I

think you might otherwise imagine, based on how that word seems to be often used." When used as survey terms, Protestant respondents are asked to self-identify as either evangelical or mainline, and there is very little by way of a clear definitional separation between these two groups.[47] However, as outlined previously, there are statistically significant differences in the beliefs of those who identify as evangelical and those who identify as mainline Protestant, thus rendering the distinction useful, despite its flaws.

ii. Values and moral goods

While the opinions and stances of the families included in sample cannot be extrapolated to that of Christians more broadly, or even to middle-class evangelical Protestants, they are representative of a portion of this group. Their stories and their views, while differing in certain ways, align in largely cohesive approaches towards weighing values and designating rights and wrongs. This does not mean that the things they value or the things which they designate as either 'right' or 'wrong' are the same, though there are many similar threads between these families. Rather, they express similar processes in how they determine right and wrong, and how they weigh conflicting values against each other when such a conflict is brought to the surface. Interviewees also spoke about the application of these values in similar ways, and described similar patterns of response when their values were incongruous with something either they, or their children, were exposed to.

The first notable finding is that the language with which my participants spoke about morality seemed to reveal their possession of two different sets of values, or moral codes. While

[47] Stipe, C. (1985).

they are all moral realists, believing in a set of universal goods that is based in Biblical notions of right and wrong, what they regard as a moral life looks different for Christians than it does for non-Christians. One of these codes is comprised of values they consider to be more broadly applicable, which they believe everyone should adhere to and expect everyone to understand. This, a set of what I am referring to as 'core values,' includes goods such as respect, kindness, honesty, and, most notably, acting in good faith. They see these values as based on Christian ideas, as these concepts of goodness come from God, but they do not The second code, which I am calling 'key values,' is focused on themselves and their families as well as, to an extent, other Christians. The set of key values is different from the set of core values in kind as well as in degree, as they hold themselves (as Christians) to a higher standard than that which they expect those who do not share their faith to follow, but they also use an explicitly Christian framework to evaluate right and wrong that they do not expect non-Christians to have.

A conversation with Kristin, a mother of three elementary schoolers, exemplifies the belief that these core values are founded on Biblical principles, though one does not need to be Christian in order to know to follow them and see their importance. She shows me a poster listing specific principles, or rules for good behavior, in a rhyming, easy to read, child-friendly format that she had received from her children's school. She explains that the school has decided to use these principles across all grades, in order to keep behavioral expectations a steady, consistent part of the children's lives, and that parents were encouraged to use the same phrases at home in order to help their children internalize these principles. "At first I didn't realize it," she said, "but as I read over the information the school sent home describing what each [principle] meant, I saw that they were all very similar to what we talk about from the Bible--

without saying anything at all about religion, of course; you can just kind of tell, you know? . . .So a lot of these things we were using already, just in different words." She continued to explain how they were used by teachers in the classroom, and said, "and it's not like I think they developed this off Christianity, or that they're Christian, even. But there are just so many similarities, you know? There are all these common themes, and then when you do read the Bible it becomes so clear, like, 'oh, now I get it!'" In this case, Kristin's hypothetical "'now I get it'" represented a person's understanding of a value becoming deeper as they see where the value comes from and why the value is important (this would be the Biblical text describing it, and often a story exemplifying how this value is rooted in an aspect of God's character).

There was no evidence of moral relativism on behalf of any of my participants, as they believe that God is the ultimate arbiter of right and wrong, and that these rights and wrongs are, like God himself, eternal and unchanging. In some cases these conceptions are tempered by contemporary moral frameworks, though my interlocutors did not discuss such changes in terms of modern society altering their perception of Biblical values or directly changing the way they interpreted various portions of Biblical text. Rather, they spoke in terms of having trends or specific incidents in contemporary culture merely spark their questioning of what was right. Changes, when they occured, emerged out of this process of questioning, a process that involved prayer, a search for relevant Biblical text (and its context), and discussion with others (both peers and those they respected as leaders in the faith). They describe this process of questioning as having led to their discovery of something new in the Bible or in their own religious understandings which made them reevaluate their prior ideology. In other words, they viewed

their changed morality as the result of a more developed understanding of scriptures, a deeper enlightenment as to what the word of God had meant all along.

One of my interlocutors, David, described this process as he reflected on his own changing views of homosexuality. “I had always thought of it as not being Biblical, you know,” he said, explaining his initial stance. “I guess I didn’t think much about it until this thing with my church.” At this point in the conversation he explained that the conference, or membership group, his church was affiliated with had recently split over whether individuals practicing homosexuality would be allowed to hold positions of religious leadership. “But now I’m not so sure,” he continued, and paused to decide how best to express his feelings. “I’m not sure what I think about it. I’ve been trying to see what the Bible actually says about it... It’s tough. But I don’t think we’re to judge, at least.”

David’s first comments, “I had always thought” and “I didn’t think much about it,” at first appear to be contradictory. Instead, however, they reveal the nature of the opinion that he initially held. Though at first he did not personally think much about the topic, he had still taken a stance on it. This default position was informed by the beliefs of those surrounding him, particularly, in this case, the religious organization he was a part of. His later comment, “now I’m not so sure,” indicates a progression in this stance. While he had not come to any definitely conclusions, he had entered into the process of questioning. He had adopted a belief based on what he assumed to be true, not having seriously considered this position, or its alternatives, on his own. Then, sparked by a contemporary debate happening within his church, he began to more closely investigate the issue for himself. His church ended up remaining with the more conservative side of the conference, holding to the doctrinal position that homosexuality was

contrary to the will of God and should therefore not be considered an acceptable lifestyle for church leaders. He did not express any strong feelings on this decision beyond saying that regardless of the institutional stance the church affirmed, he did not think that individuals should be judgmental.

Despite being moral realists, my interlocutors would still consider people who do not live according to the Christian ethical standards they themselves ascribe to as 'good,' though, in an interesting distinction, they would hesitate to call such people 'moral.' It in such instances that one of the most important core values, acting in good faith, becomes especially relevant. This value is closely tied to the process through which a person comes to deem a certain behavior or act as moral, rather than being tied to the act itself. If a non-Christian person appears to be living in accordance with the set of core values, and is holding to what they personally believe to be right and wrong, they will be deemed 'good,' as they are living according to the only moral framework they could be expected to know. This will, however, be viewed as a less complete morality; the Christian is viewed as having a more developed moral system by virtue of knowing God, who is viewed as the source of all truth. These designations take on an especially important tenor in the lives of my participants, as adherence to a proper moral code is the main part of determining how aligned one's life is with the will of God. They view such an alignment with God's will as the gold standard for action, behavior, or belief.

These designations are important in practice, as well as in belief, as they alter the way my interlocutors treat those around them. This is true for direct interpersonal relations as well as their political leanings and beliefs about what the state should involve itself in. Additionally, the frameworks of core values and key values are important for understanding these parents'

responses to the teaching of evolution in the classroom, as it informs both their expectations of what is acceptable for their children to be exposed to and their response to something contrary to their beliefs being taught to their children in the public school setting.

iii. View of science and public education

For the majority of the families I interviewed, the parents were not surprised or even concerned by the idea that their children would be taught evolution in schools. I found this to be especially interesting, as this finding was not one that I had expected when beginning my research. The surprise came, of course, because my interlocutors were all Creationists; none were unsure of their opinion regarding the truth or falsity of evolution. Additionally, the educational system, as an institution that plays a large role in the habitus formation of the next generation, has long been an arena where views and values are contested.[48] The Christian Right in particular (which is closely tied to Protestant fundamentalist traditions) has been engaged in the politics of education since its inception. According to the work of Catherine Lugg (2001), this educational focus has been accompanied and supported by the belief that public schools were becoming increasingly hostile to Christianity (and fundamentalism in particular), and that this needed to be 'fixed' through a process of re-Christianization. [49] This process involved, primarily, a goal to transform secular, public schools into "subcultural allies for adherents through the return of state-sponsored religious practices." [50] Fifteen years have passed since this study with little

[48] Fairclough, N. (2003).
[49] Lugg, C. (2001).
[50] ibid.

ethnographic work on the topic in the interim, so Lugg's accounts were the most relevant pieces of scholarship to use in framing my initial hypotheses.

Among my interlocutors, however, there were no traces of this view. Instead, there emerged a different common theme around conceptions of the role and positioning of public education in relation to religion: they viewed the public education system as an inherently secular institution, and readily expressed beliefs that this was how the public school *should* be. Following from this, none of my interlocutors expressed any sentiments that public education could be expected to, or even should, teach Christian beliefs. This, however, does not mean they agreed with everything that was being taught, as this was not the case. Again, focusing specifically on evolution, none of the people I worked with for this project believed that this origin of life theory was true.

Though the views expressed by these families were differing and nuanced, an analysis of the perspectives they discussed regarding science instruction in their children's schools revealed two distinct categories of thought in relation to this teaching which, in turn, affected the way parents discussed possible contradictions between teachings and family beliefs with their children. The first is the view that science, or certain aspects of scientific understanding, belong to the Other. This allows for an (unstated and implicit) freedom to choose to accept certain aspects of this body of knowledge that are found acceptable, and to reject other aspects and dismiss scientific 'experts' in favor of experts already accepted and esteemed by the Us, the in-group. The second view is the much-discussed conception of non-overlapping magisteria, coined by scientist Stephen Jay Gould. This view holds that science and religion are addressing fundamentally different questions through fundamentally different means, and that any

'knowledge' or discovery in one is divorced and disconnected from any understandings in the other. [51]

The first view is reflected in a conversation I had with Kristin. She mentioned evolution as a topic taught in schools that she and her husband did not agree with, but said that they did not mind her children being taught it, saying, "we want them to see all the different things that people believe… we want them to be informed of that, you know? Then they can choose what they think." In a partial contradiction that shows the competing values of her children's free choice and her desire that they agree what she and her husband believe to be true, she answered my question about how these topics are discussed at home by saying, "well, if my kids hear something at school that they think we (their parents) might not agree with and they're curious about, they'll talk to us. We're all pretty open that way; I'm really glad that they do-- that they feel they can talk about things. They know we're honest with them and that it's okay to disagree, you know? Like with this; Caleb (her eldest son) mentioned it. We don't force our opinions on them-- I mean, of course we try not to [laughs]. So yeah, all that to say it doesn't bother me. I just talked with my kids about why scientists believe in evolution and we believe creationism, and let them ask whatever questions they have." The last part of this statement demonstrates that Kristin is aware of scientific consensus. She does not express a belief that evolution is a contested theory, rather clearly stating her understanding that it is what 'scientists believe.' This shows that, while she did not make any attempts to discount the discipline of science or the merits of its study over the course of this conversation, she had little trouble identifying this as a part of science where she dismissed 'expert opinion' and chose not to believe.

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[51] Gould, S. (1997).

Similarly, two parents of three that I met with together, Patrick and Natalia, echoed this sentiment by saying they "know they (public schools) have to teach that (evolution), and that's fine. I mean of course-- it's a public school, of course they do. And we can talk with our kids about all of that and explain why we believe something different, if they want to know more about it. I'm not sure they've ever asked. I'm not sure if they've talked to you about that? [Natalia looks to Patrick, who shrugs] --it's not come up, at least." When asked how they might imagine themselves responding if their children did ask such a question, Patrick said, "well we do talk about these things, you know? I just don't think it's come up very directly in response to them hearing anything different, but we've taught them the Bible stories, they've learned from those… If they had questions we would revisit those, we would talk about how things they've heard line up with it and go from there." As with Kristin's comment, this statement shows that the theory of evolution is understood as the accepted scientific view, but that they choose to adhere to something different. Patrick's comment suggests that the basis for this adherence is the Bible, an authority held in higher regard than that of scientific consensus.

The expressions of the other belief, non-overlapping magisteria, were less common and more tenuous ones, as my interlocutors often found the ideas difficult to articulate. This, I hypothesize, lay in the idea that they believed science and religion answer different questions and could not be weighed against each other, yet they chose to accept the 'religious' explanation for the origin of life, without, it seemed, a clear reason for doing so. One of the more overt examples of this stance came from Kenneth, a father of two and pastor of a local church. He had mentioned evolution as one teaching he knew his children would hear in school that he did not agree with, but then said, "I know they have to teach it, and we (he and his wife) knew that when

we chose to send them there. We *want* them there, you know? We don't want them to be… insulated, from the outside world. We don't want them to be very sheltered, and then one day be surprised by all these other things they've never heard! . . . This way it gives us the chance to have a conversation about while they're young, and, well, we think that's more natural for them. . . We haven't had this yet, but when they start learning these things we'll (again referring to himself and his wife) talk with them about how there are certain answers the Bible gives to questions that science doesn't know how to answer-- or doesn't know yet, or can't answer. And that's what I think things like this (evolution) are, you know? It's not a … science question, really." The tone of the conversation made it so I did not feel I should press the topic by asking why this was a 'religion question' as opposed to a 'science question,' beyond his assertion that he did not believe it was a question science was able to answer. The distinction is clear in this statement, though, that there are certain questions that he believed fell under the domain of science, and others that he believed fell under the domain of religion.

Often, this view was evidenced in comments not directly related to evolution. For example, one small business owner and father of four (one of which was in elementary school), Evan, was made an offhand comment while I was speaking with him and his wife: "it's more than that (science), though, its something people *know.* They've experienced it." The context of this conversation was discussing a parallel that was drawn between a need for God in one's everyday life and the need for water, or hydration. Evan's wife, Emma, mentioned that she thought the metaphor was memorable because of the undeniable need for water; in her words, "it's a scientific fact, you can't survive for more than three-- is it three?-- a few days, without it." Evan's comment was in response to this, as he claimed what made the metaphor powerful was

that everyone has, at some point, experienced thirst or dehydration. In his view, the 'science' was something divorced from daily life, though it could be made relevant or 'real' to daily life through experience.

The exception to this hypothesis was when my interlocutors believed that the theory of evolution was controversial even within the scientific community. A comment made in one of my interviews by Melissa, a mother of two, was that "I guess evolution might be one of those things (things that her children have been exposed to in school that goes against something she believes)-- that wouldn't bother me though. I mean, I don't think they really spend much time on it anyway? And they have to teach something, and I know it's a theory a lot of people… believe, you know? So it makes sense… I don't even know if my kids have heard about it yet?. . . But anyway, it's the sort of thing I can talk with my kids about. If scientists themselves are still debating it, I mean, it's not like it's hard for me to tell them why we don't believe it." Despite the collective pronoun, elsewhere in Melissa's interview she discussed her desire for her children to be able to "understand the different sides" and "make their own choice," as did most other parents I spoke with. This earlier comment, though, makes clear that one of the reasons Melissa doesn't mind her children learning about evolution is because she believes it is taught only as a possible explanation, a 'theory' that has yet to be 'proved', as "scientists themselves are still debating it."

One significant aspect of my interlocutors understanding of the secular basis of the educational system lay in the view that they, as Christians (particularly as evangelical Protestants) were members of a subgroup. None used language similar to the commonly-touted refrain that "America is a Christian nation," and thus should have policies reflecting "Christian

values," as was the stance more clearly evidenced in Lugg's work. By contrast, one of the parents I spoke with (Doug, a father of three elementary-aged boys) willingly stated, in a sentiment similar to those described by others, that "there are things that maybe we disagree with, I can think of one or two examples, but we send our kids to a public school so of course we expect them to hear those things-- if we wanted them to hear only Christian teaching we could have sent them somewhere else, to a private school. It seems… it would seem kind of ridiculous to think that that shouldn't be the case." Here, his statement reflects the idea that there are things he recognizes as being a part of his explicitly Christian beliefs, which he does not expect a public institution to reflect.

There is an interesting tension, though, in that while my conversations with my interlocutors clearly evidenced a belief that Christianity and their explicitly Christian beliefs (key values) were not part of society's dominant ethos, another view frequently referenced was that America was a nation founded on Christian values. This idea provided the basis for the expectation that others, regardless of whether or not they are Christian, should adhere to the values discussed above as 'core values.'

V. Policy Analysis

i. Review of strengths and weaknesses of current policy

The "Science as Inquiry" portion of Pennsylvania's science curriculum is especially strong, as it calls for an early, complete exposure to the scientific method. A clear understanding of the scientific method, and why this method is used, is essential for differentiating why certain theories are deemed scientifically plausible while others are not. Also, importantly, an understanding of these methods is key for a student being able to understand why science as it is practiced is not, simply, one of many possible ways to view the world, and why the findings that emerge through it can not be dismissed as mere opinion, as though weighed equally against beliefs unsupported by evidence. The recommended curriculum provides material that forms the basis for teaching evolutionary theory, though does not necessarily require that teachers following the curriculum deliver the content explicitly, should they choose not to contextualize their lessons by presenting the Big Idea for each concept.

Additionally, the concepts and competencies provide value in that they clearly and explicitly state the material that a lesson should deliver, and the learning outcomes that students are expected to achieve. One notable lack in the current curriculum regarding the teaching of evolution, then, is that there are no concepts or competencies for the biological evolution Big Idea in grades one, four, or five. Of these, grade four is especially notable, since a significant portion of the third grade curriculum focused on concepts building towards an understanding of evolution. This third grade material begins to introduce the similarities between humans and other organisms, but never explicitly introduces the concept of a shared evolutionary history.

While the PSSA assessment standards do not cover concepts relating to evolutionary theory, this is not something that could be expected without more complete integration of the idea into curriculums.

ii. Potential improvements

One significant change to the Pennsylvania's public education system was the implementation of the Common Core, which was created in 2009. The Common Core is a state-led effort, developed by the state school chiefs and governors that comprise Council of Chief State School Officers (CCSSO) and the National Governors Association Center for Best Practices (NGA Center) in collaboration with teachers, administrators, and other experts. [52] The goal of the Common Core is to create a more unified curriculum across states and provide a "clear and consistent framework" for educators.[53] It is not part of any federal initiative, and adoption of the Common Core is not mandatory. It's adoption has no implications for any specific source of national-level funding, though it does show that a state is making an effort to improve their policies, which is considered in the selection of grant recipients.[54] The Common Core has been voluntarily adopted by forty-one states, as well as the District of Columbia, four territories, and the Department of Defense Education.[55]

The stated need for these standards is that "for years, the academic progress of our nation's students has been stagnant, and we have lost ground to our international peers. . . One root cause has been an uneven patchwork of academic standards that vary from state to state and

[52] Common Core State Standards Initiative. (2018). (1).
[53] Common Core State Standards Initiative. (2018). (1).
[54] Common Core State Standards Initiative. (2018). (2).
[55] Common Core State Standards Initiative. (2018). (1).

do not agree on what students should know and be able to do at each grade level."[56] The focus of the Common Core, however, is exclusive to language arts and mathematics. The rationale for this system's development exposes the need for it in other subjects, including in science education, as the lack of consistent standards across states means there is little or no accountability for states that do not place a strong emphasis on science or aspects of science education, such as evolution. While a collaboratively developed set of science standards would be especially helpful in creating more consistent educational material across state lines, the same standards could certainly be implemented by individual states.

Focusing specifically on the standards in Pennsylvania, there are several changes that could be made in order to better enable children to understand the relevance and importance of evolutionary theory, and its place in the wider body of scientific knowledge. First, the natural selection strand could begin earlier in elementary school, as soon as any kind of science instruction is given. Following the current standards, this strand does not begin early enough, and when it does begin, there are far too few requirements as to what students are expected to know. Students are not expected to know the term "natural selection" until seventh grade, and then are only expected to understand it as "an underlying factor in a population's ability to adapt to change." It is in this year that students are exposed to the concept of macro evolution, a concept that would be best introduced far earlier. One example that highlights the importance of an early introduction to this topic is that, as discussed in the fieldwork portion of this paper, many families who believe evolution is a contested or controversial concept teach their children contrary positions before the children are even attending school. Again, introductions to a

[56] Common Core State Standards Initiative. (2018). (1).

creationist worldview are often not done with the explicit intention of teaching children a ‘true’ belief in order to preempt their exposure to evolution. Students from families who believe in allowing the children to understand all perspectives and make their own choice are still predisposed towards their parents belief, when it is what they are most familiar with and have been aware of for the longest time. This means that any contrary teaching beginning in schools is, at the outset, competing against long-established beliefs.

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