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The Limits of Morality: Exploring the Diffusion of Eugenics Policies across US States

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Nearly a century ago at the height of the Progressive Era, the idea of eugenics spread across the world, raising two rudimentary questions: how did eugenics gained such widespread global acceptance and why did so many US states adopt this policy? Policy diffusion, a theoretical framework that explains how multiple jurisdictions adopt the same policy may provide insight into this. Therefore, this study examines the adoption and diffusion of eugenics policies across US states. Using data from 1900-1940, this study hypothesizes that eugenics policies diffused via policy learning in addition to multiple other internal determinants. This study finds evidence for policy learning; however, this effect is largely contingent on a state's urban population and its political culture. While eugenics is rarely applied today, this policy can provide insight in to why certain policies and those that target specific subgroups are still enacted and are readily accepted by others. Furthermore, it can help decipher whether the dynamics of learning are different for these types of policies.

Introduction

Due to the significant increase in American poverty and crime from the Industrial Revolution, a multitude of scholars and policy entrepreneurs proposed solutions, one of which was eugenics. Eugenics was the science and belief that individuals could "improve" humankind by only allowing certain people to reproduce. At the height of eugenics' popularity,

involuntary sterilization policies were adopted by a majority of states, resulting in the involuntary sterilization of thousands of men and women (Vermont 1999).

Many academics have theorized why eugenics was so widespread and accepted by all types of individuals, but there has yet to be a study that seeks to identify the reasons it diffused so quickly across the U.S. Some have argued that Progressive-Era economics caused the diffusion of eugenic legislation (Leonard 2003), while others believe it was driven largely by public health concerns (Pernick 1996) or superintendents in the medical field (Hanson and King 2013). However, these theories have not been empirically tested nor do they offer an explanation as to why some states adopted these policies and not others.

In this paper, the diffusion of these sterilization policies across the U.S. states is examined. Specifically, this article tests whether this policy spread through policy learning. This study aims to enhance policy diffusion by determining whether states learn from one another in regard to policies that target specific subgroups. While policy (or social) learning has a long research tradition (Berry and Baybeck 2005; Butz, Fix, and Mitchell 2015; Glick and Hays 1991; Mooney 2001; Shipan and Volden 2008), most studies examine "easy policies," or those with perceived benefits for an adopting state. Much less is known regarding more difficult policies with unknown externalities or policies targeting subgroups, and this study aims to address this gap. While state sanctioned, involuntary sterilization no longer occurs within the jurisdiction of the United States, other forms of eugenics do, such as the creation of "designer babies," sterilization of children by parents, and voluntary terminations of pregnancies, which would result in babies with inferior genetic material. These examples show that the quest for human betterment is still occurring even in the field of genetic engineering (Gebelhoff 2016). As recently as 2002, Governor John Kitzhaber of Oregon apologized for sterilizations that occurred between 1917 and 1983. Additionally, Mark Warner of Virginia apologized the same year and multiple other governors followed suit (Stern 2015). Eugenics represents a unique policy to examine that may also provide an explanation for other types of policies that aim to repress individual rights, such as anti-LGBT laws, anti-Sharia laws, and certain immigration policies, among others. In the next section, we discuss the history of eugenics policies.

Background of Eugenics Policies

The first proposed eugenic sterilization legislation occurred in Michigan in 1897, which called for the castration of criminals. While this legislation did not pass, a 1913 law was enacted that allowed for the involuntary sterilization of residents "wholly or in part by public expense" of Michigan mental institutions (Ghent 1973). This law was later overturned in *Haynes v. Lapeer Circuit Judge*, (1918) and was replaced with the 1923 law that was amended several times and withstood judicial scrutiny. *An Act for the Prevention of Idiocy* was also passed by the Pennsylvania legislature in 1905, though it was then vetoed by the governor.[1]

As noted in 1905, Pennsylvania's legislature was the first in the United States to pass a eugenics law though it was later vetoed by the Governor Samuel Pennypacker (Kersten n.d.). This event though did not happen in a vacuum though in Pennsylvania considering the fact that eugenics had support in the state dating back about one hundred years. This was evidenced by the fact that the state mental institution for "defective" children at Elwyn near Philadelphia was led by its controversial superintendent Issac N. Kerlin who was a proponent of eugenic solutions. Elwyn was seen as an example for the national eugenics movement by how people with mental disabilities should be treated. Also in the 1800s in Pennsylvania, Henry Boies of Scranton wrote a study which claimed to connect crime and mental deficiency. People such as Kerlin and Boies tended to be supported by the political elites which in turn led to an environment that led to the passage of the eugenics bill (Jenkins 1984).

Despite these early attempts in places such as Pennsylvania, the first official eugenic law was passed in 1907 in Indiana (Ghent 1973). This law tried to reduce the "transmission of crime, idiocy, and imbecility" through eugenic sterilization. Though it was invalidated on 14th Amendment grounds by the Indiana Supreme Court, the legislature passed a subsequent eugenic law, addressing the 14th Amendment issues, which remained in effect until 1974.

California was a leader in reproductive eugenics policies. Senator Price introduced a eugenics bill in February of 1909 that was signed by Governor

[1] Governor Pennypacker's veto stated "To permit such an operation would be to inflict cruelty upon a helpless class in the community which the state has undertaken to protect" (Vetoes 1905, 27).

James Gillett on April 26, 1909, creating the first eugenics law in California[2] (Popenoe 1934). New York also paved the way for reproductive eugenics, establishing the ERO in 1910 and enacting its first Eugenic law in 1912. However, Alabama was the first state in the South to successfully pass Eugenic legislation (Vermont 1999). Enacted in 1919, the law allowed for the director of a state institution to sterilize any resident (Vermont 1999).

Even after repeated constitutional challenges, many state legislatures passed Eugenic policies if previous attempts were unsuccessful. Alabama, Colorado, Florida, Georgia, Hawaii, Illinois, Indiana, Kentucky, and Pennsylvania, for example, all had multiple eugenic bills proposed (Vermont 1999). Delaware, Maine, and Michigan also passed legislation and then expanded the legislation to include other groups of individuals or to address 14th Amendment concerns (Vermont 1999). Georgia was the last state to pass a Eugenic law in 1937 (Vermont 1999).

The institutional arrangement of U.S. governmental structures allowed for the above referenced legislation to be reviewed by a state or federal court. Surprisingly, when state and federal courts held a specific eugenics policy to be unconstitutional, the Courts were concerned that the narrow language of the statutes did not allow them to be applied uniformly to all states. Harry Laughlin (1922) drafted and published a eugenic sterilization model law with the intent to prevent degenerative stock from procreating in the United States. This model law was adopted in whole or in parts by many states[3] (Vermont 1999). However, many states had already adopted eugenics laws, and the extent of this model legislation being a vehicle for diffusion is uncertain.

"Eugenics is the science which deals with all influences that improve the inborn qualities of a race" (Galton 1904, 1). The Indiana Child Creed, published by the Indiana State Board of Health, stated that "every child has the inalienable right to be born free from disease, free from deformity and with pure blood in its veins and arteries" (Bradburn et al. n.d.; Stern 2002, 90)[4]. Eugenics is divided into two separate sub-areas: negative and positive eugenics. Negative eugenics are those policies that result in the sterilization

[2] On March 16, 1909 the Senate approved the bill (with 21 ayes and 1 nay) and on March 22, 1909, the House of Representatives approved the bill (with 41 ayes and zero recorded nays) (Popenoe 1934).

[3] All states that passed eugenics legislation have repealed the legislation, and many states have offered formal apologies.

[4] The Indiana Child Creed is still recognized by Indiana (Bradburn n.d.).

of individuals based upon genetic characteristics, the idea that those with genetic material that is "animalistic and inferior" should not procreate and, in the extreme, those individuals who possess genetically inferior material should be euthanized as close to conception or birth as possible. Similarly, positive eugenics are those policies that result in creation of individuals with superior genetic material such as embryonic selection for specific positive traits (Kirby 2007) or selective breeding techniques (Davenport 1911)[5]. Even before laws concerning eugenic sterilization, there were a number of institutions that engaged in this practice. For example, Dr. Harry Sharp at the Indiana State Reformatory performed eugenic sterilizations in 1899 on male residents as well as all residents of Michigan institutions (O'Hara and Sanks 1956; Popenoe 1934; Van Wagenen 2009; Vermont 1999).

In 1865, Gregor Mendel determined the genetic material of an offspring is dependent upon the genetic material of its parents. In 1868, Charles Darwin "taught the whole world the marvelous efficiency of artificial selection" that allowed for hearty, healthy, strong plants to be selected for germination and breeding to thereby eliminate weak, unhealthy plants (Ward 1913). With social issues such as crime and poverty, Mendel's scientific explanation of genetics and heredity along with Darwin's scientific explanation of artificial selection provided a catalyst for an early 20th century American movement toward a "superior human race" through artificial selection of who was legally permitted to reproduce and marry (Vermont 1999). Darwin's cousin, Francis Galton (1904), is credited with extending the theories of genetics and artificial selection to human reproduction in order to "raise the average quality of our nation" (3). Galton used the terms "viriculture", "stirpiculture", and finally "eugenics"—Latin meaning "of good birth"—to promote the theory that humans can select who should procreate in order to produce quality citizens (Galton 1904; Leonard 2003; Ward 1913).

Eugenics was pervasive throughout American culture, both pre- and post-WWII. In 1934, 150 million citizens were living in American jurisdictions with Eugenic laws (Popenoe 1934). The propaganda of eugenics spread through all forms of media: radio, motion pictures, and print. A college textbook, *Applied Eugenics* was published in 1920, which provided college students with a thorough history of eugenics and the policies associated with it (Popenoe and Johnson 1920). The *Annals of Eugenics* (1925-

[5] Initial policy entrepreneurs championed positive eugenic policies, but it was negative eugenic policies that were codified by state legislatures (Epstein 2002).

1954), later renamed *Annals of Human Genetics* (Allen 2011), is an academic research journal, which contained research-based articles concerning reproductive eugenics at the journal's inception. Newspapers, such as the *Los Angeles Times* and the *Herald,* promoted eugenics alongside journals such as *Eugenical News* and *Eugenics*, which focused entirely on the subject (Black 2003; Burke and Castaneda 2007).[6]

Books, including Aldous Huxley's *Brave New World* (1932), Dr. Eduardo Urzaiz's *Eugenia: A Fictional Sketch of Future Habits* (1919), Charlotte Perkins Gilman's *Herland* (1915), and E.E. "Doc" Smith's *Lensman* series (1934) [as well as films such as *The Misers Conversion* (1914) and *Darwin was Right* (1924)], all championed a genetically superior race and thereby caused the idea to further permeate American culture. A commercially distributed motion picture, *The Black Stork* (1916) (re-released with new title *Are You Fit to Marry?* (1927), promoted euthanasia eugenics (Pernick and Paul 1996; Smith 1998). *The Island of Lost Souls* (1933), also involving eugenic concepts, was a screenplay adaptation of the book of the same name by H.G. Wells. Kirby (2007) argues that the science fiction media (both picture and print) of the early 1900s reflected the scientific community's promotion of eugenics and that this portrayal of eugenics has remained largely unchanged since the release of the movies and books mentioned above.[7] [8]

Eugenics propaganda found its way into daily life as the government, medical, clerical, and scientific professionals used church gatherings, fairs,

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[6] There were many eugenic societies, such as the American Eugenic Society in 1926 (renamed in 1972 as the Society for the Study of Social Biology), the Race Betterment Foundation (1906), the Eugenics Research Association (1913), the Eugenics Records Office (1911), and the Eugenics Education Society (1907), to name a few, that were formed with the mission to promote eugenics throughout the United States. Many states and local communities also had branches of the aforementioned societies to promote eugenics at the local level (Black 2003).

[7] There were also many prominent figures within the United States that supported American Eugenic policies. Philanthropic support by the Carnegie Institution and the Rockefeller Foundation provided financial backing for Eugenic policies (Black 2003). Most notably, Dr. John Harvey Kellogg wholeheartedly believed in Eugenics policy and dedicated his professional career to Eugenics policy implementation (Vermont 1999). Dr. Kellogg also invested a substantial portion of his profits from his commercial endeavors in the promotion of Eugenic policies in the United States, and in 1906 Dr. Kellogg established the Race Betterment Foundation in Battle Creek, Michigan (Selden 2005). Dr. Kellogg (1921) stated, "[W]e must cultivate clean blood. Society must establish laws and sanctions which will check the operation of heredity in the multiplication of the unfit" (391).

[8] The Eugenic Records Office (ERO) was established with grant money from a New York railroad tycoon's heir in 1910 (Lawrence 2012; Vermont 1999) and was later funded by the Carnegie Foundation (Lawrence 2012). The ERO had two missions: to collect data concerning families and to train field workers in data collection (Lawrence 2012).

"beautiful baby" contests, and "fit family" contests, among other activities, to distribute information about eugenics as well as to collect data on families (Stern 2002). Professionals who were spreading the eugenic policies used terms which were known to average citizens, conveying eugenic policies through agriculture and biological stories, including the concept of breeding strong, healthy bulls with strong cows to result in strong offspring rather than breeding weak and diseased bulls with weak cows to create corresponding weak offspring (Stern 2002).[9]

Despite the cultural focus on the advancement of eugenics, the constitutionality of eugenics was challenged in several states based upon violation of the 14th and 8th Amendments (Van Wagenen 2009). However, many courts still upheld the laws. A Virginia law entitled, "An Act to provide for the sexual sterilization of inmates of State institutions in certain cases," for example, was upheld when the U.S. Supreme Court declared that "three generations of imbeciles is enough" (*Buck v. Bell* 1927, 207), and that involuntary sterilization of "imbeciles" did not violate the 14th Amendment because "it is better for all the world if, instead of waiting to execute degenerate offspring for crime or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind" through sterilization (*Buck v. Bell* 1927, 207). The opinion by Justice

[9] Eugenic was performed on individuals who met specific criteria. Classifications of degenerate characteristics of those individuals and families who were targeted in Eugenic sterilization were as diverse as the families themselves. In 1912, the Committee of the Eugenic Section of the American Breeders' Association (established in 1903) published a report that outlined the purposes of the Committee, one of which was to "build up an index of the American population, recording families traits, and their geographical distribution, with special references to super-normal and sub-normal traits" (Van Wagenen 2009). It was those individuals who possessed inferior genetic material who were targeted by Eugenics policy throughout the United States. There were many studies performed, including the "Family Studies of the Rural Poor" in Vermont, the "National Committee on Mental Hygiene Survey of Vermont School Children, 1927", the "Key Family Study (1928-29)", the "Women at the Rutland Reformatory: 'Miss Ross' Girls' (1929)" work, the "Brandon Waiting List (1929)", the "Migration Study (1930-31)", and the "Ethnic Study of Burlington (1932-1936)" (Vermont n.d.). Girls who were classified as "bad girls" who were "oversexed", "sexually wayward", and had "abnormally large labia" were included in the index of Americans targeted (Van Wagenen 2009). Additionally, individuals (both men and women) who possessed qualities such as wanderlust, alcoholism, low mentality, sexual offense, and thievish instinct were seen as degenerative, and individuals who had ancestry other than European were subject to Eugenic sterilizations; specifically, Native American women were targeted with Eugenic sterilization in large numbers (as many as one in four Native American women were sterilized by the American government prior to 1980 through government sanctioned sterilization programs) (Torpy 2000; U.S. National Library of Medicine n.d.; Vanwagenen 2009). Lombardo and Dorr (2006) argue that the infamous Tuskegee experiments (1932-1972) which resulted in the sterilization of many African American men, headed by the Public Health Services, had its roots in eugenics.

Holmes[10] solidified the national sentiment that reproductive eugenics was an acceptable solution to social issues of crime and poverty (Landman 1928). After this case, eight states (Arizona, Georgia, Idaho, New Hampshire, North Carolina, Oklahoma, Vermont, and West Virginia) passed eugenic sterilization laws.

Some eugenic laws, however, were invalidated by state court due to substantive or procedural 14th Amendment issues (specifically those eugenic laws whose motives were eugenic in nature) or to violations of the cruel and unusual punishment clause of the 8th Amendment (for sterilization laws that targeted criminals in particular) (*Davis* 1914; Laughlin 1922; *Mickel* 1918). And yet, the cases that were most successfully challenged were those that challenged the process of the sterilization (notice, the right to confront witnesses, etc.) (Ghent 1973).[11] Despite the legal challenges of eugenics, however, an explosion of state policy adoption occurred for almost 40 years. In the next section, we discuss sterilization policy adoption across the U.S. states followed by a discussion of the possible reasons this occurred.

Theory and the Diffusion of Eugenics Laws

Policy diffusion, or how policies spread among jurisdictions, has been examined extensively with the field of public policy (Gray 1973; Rogers 2010; Walker 1969). Diffusion generally posits that certain theories such as policy learning (Berry and Baybeck 2005; Berry et al. 2007; Mooney 2001; Valente 1995) explain multiple adoptions of the same policy across states.

A plethora of policies have been examined, ranging from economic policies (Berry and Berry 1990; Shipan and Volden 2008) morality policies (Butz, Fix, and Mitchell 2015; Mooney and Lee 2000), or policies that have federalism implications (Butz, Fix, and Mitchell 2015). Morality policies are distinctive from other policies and generate conflict about fundamental moral values (Mooney and Shuldt 2008). Eugenics most closely identifies with morality policy. However, unlike other morality policies, this policy targets specific subgroups, which has not been previously examined.

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[10] Dudziak (1986) and Leonard (2003) argue that Justice Holmes was a judicial activist who used his position to contribute to the eugenics movement.

[11] In *Skinner* (1942), the Supreme Court held that an Oklahoma Eugenic sterilization law was unconstitutional as the law did not apply equally to individuals found guilty of similar offenses. In *Osbor*n (1918), a New York court held that the Eugenic law violated the 14th Amendment because the law did not apply to persons who resided outside state institutions (Laughlin 1922).

Scholars note that there are several mechanisms that help explain the diffusion of policies among jurisdictions. The first mechanism, emulation, simply means that jurisdictions copy the policies of other jurisdictions without considering the implications of that policy (Shipan and Volden 2008). Put differently, states look to certain states (rather than all states) and emulate their policy. The second mechanism, initially highlighted by Berry and Berry's foundational state lottery adoption research, involves external pressures stemming from economic competition (Berry and Berry 1990). When a jurisdiction believes that neighboring policy adoptions will have negative economic spillover effects, the government will likely take action to minimize economic damage. For instance, policy scholars have noted that welfare and environmental policy might incite a `race to the bottom' as states respond to neighboring state adoptions limiting welfare access or weakening environmental protection for spillover fears of negative economic repercussion (Volden 2004). In addition to factors internal to the state, it is also possible that external factors might influence certain policies. The economic effects of neighboring or regional adoptions are referenced throughout the diffusion literature and presumably exert strong influence on many adoption decisions, but policy effects are situational (Berry and Berry 2018) and we have little reason to believe that external economic competition will substantially motivate eugenics policy adoption. Unlike with welfare, environmental, or tax policy, it is not clear that potent economic spillover exists with regard to eugenics laws.

In this study we hypothesize that eugenics spread among states through policy learning. Specifically, as a state's proportion of eugenics adopting neighboring states increase, so is the state's propensity for adoption. This occurs because adopting neighbor states can transfer policy information to non-adopting states, either through the media, eugenics societies, or among legislatures. As the proportion of neighbors adopting increases, this aforesaid are likely to occur in increasing volume, making adoption more likely.

Policy learning theory is based on social learning theory, or the idea that people can learn by observing the behavior of others, and thus learn new behaviors, attitudes, or values. According to Bandura and Waters (1977) learning is acquired through observing others. One facet of this theory is that individuals do not have to engage in verbal communication exchange, they can observe by examining others (Rogers 2010). In the context of state politics, it is uncertain whether policymakers have exchanged information, so this theory can provide a mechanism for transfer among states.

More specifically than social learning, policy learning occurs when government actors, such as states, look to other states when acquiring policy-relevant information. More specifically, states look to other states for solutions to problems or specific policies that might work for the respective state (Mooney 2001). Policy learning relies on a regional diffusion dimension (Berry and Berry 1990; Butz, Fix, and Mitchell 2015; Mooney 2001), or more specifically, states learn from their neighbor's adoptions, which thereby increases the likelihood of the policy getting adopted in the respective state (Berry and Berry 1990). Policy learning theory requires a presupposition that there is an empirical link among policy-makers within these states. In the age of technological innovations and rapid transportation, it is unsurprising that these links are established. Prior to widespread telecommunications and the Internet, information dissemination among states took much longer. However, there were eugenics societies that likely transmitted this information among states, particularly those in close proximity (as opposed to distant states) due to the length required for travel. Additionally, eugenics was widely reported in the media; therefore, states likely had knowledge of other states activities, and were capability of learning from them.

How Eugenics Policies Spread

Despite theories that explain how policies spread among states, scholars are also interested in examining the speed and shape of policy diffusion. Most diffusion models break adoptees into five categories: innovators, early adopters, the early and late majorities, and the laggards. Innovators are the first, taking the leap of faith to adopt a new idea with little evidence of potential success. These are small in number and are often the individuals who stand to gain the most from new techniques or have the least to lose in the event of failure. Next are the early adopters, who usually meet many of the same criteria of innovators but only need the benefit of seeing a few successful cases of implementation to initiate their own. The bulk of diffusion comes in the next two categories: the early and late majority. Together these comprise the largest portion of adoptees by far and represent the whole taking advantage of an innovation, as well as the recognition of the innovation as becoming the norm. Lastly, the laggards, around the same size as innovators and early adopters combined, represent those who are the final holdouts. Laggards tend to be those states who would face significant costs in adapting to a new innovation or would lose a substantial market share if it became the norm. Laggards are often characterized as resistant to change and are known for seeking ways to block further adoption or otherwise subvert the new innovation (Shipan and Volden 2008). Many

innovation models also account for the market share of the innovation, which steadily increases throughout the adoption process. In political science terms, market share can often directly translate into public opinion (Walker 1969).

Methodology

Most recent studies rely on event history analysis to model diffusion (Berry and Berry 1990; Butz, Fix, and Mitchell 2015; Grossback, Nicholson-Crotty, and Peterson 2004; Hays and Glick 1997; Mitchell and Petray 2016; Mooney 2001). This is due to the nature of current policy diffusion research, where scholars examine the factors that increase a state's risk of adopting a particular policy over time. In this case, we are looking at both external diffusion factors and factors within a state that make the adoption of these policies more likely.

Dependent Variable

For this study, we rely on data gathered from the years 1900-1940, which represents the life of eugenics policy in the US. The dependent variable is labelled as (0) each year that a state did not have a sterilization law enacted until the year it did, in which case it was coded as (1). Because this is an event history analysis, each state is dropped from the sample the year after it enacted a eugenics law. For this analysis, the Cox Model is the most appropriate due to the baseline hazard rate. Table 1 illustrates the adoption of sterilization law by each state as well as when it was repealed. It also shows the number of individuals sterilized as a result of the policy. Figure 1 shows the cumulative adoption of the policy, although diffusion curves typically rely on more than cumulative adoptions. Figure 2 shows the Mahajan and Peterson (1985) cumulative adoption equation, where: $\frac{d\,N(t)}{dt}$, and where N(t) is the cumulative number of adopters in a given year. In the next section, we empirically model the diffusion of these policies among the U.S. states.

Independent Variables

We also rely on multiple independent variables. Given the time period of this analysis, data are more difficult to obtain, so we were unable to include all known measures that capture diffusion and were often unable to obtain yearly measures.

Table 1: The Adoption of State Sterilization Laws

State	Start	End	Law	Sterilized	Male	Female
Alabama	1919	1935	Y	224	58%	42%
Alaska			N			
Arizona	1929	1956	Y	30	33%	67%
Arkansas			N			
California	1909	1963	Y	20,108		
Colorado			N			
Connecticut			N			
Delaware	1923	1963	Y	945	50%	50%
Florida			N			
Georgia	1937	1963	Y	3,284	45%	55%
Hawaii			N			
Idaho	1918	1963	Y	38	21%	79%
Illinois			N			
Indiana	1907	1974	Y	2424	48%	52%
Iowa	1911	1963	Y	1910		
Kansas	1913	1961	Y	3032		
Kentucky			N			
Louisiana	1918		Y	0		
Maine	1925	1963	Y	326	14%	86%
Maryland			N			
Massachusetts			N			
Michigan	1913	1963	Y	3786	26%	77%
Minnesota	1925	1979	Y	2350	22%	78%
Mississippi	1928		Y			
Missouri			N			
Montana	1923	1981	Y	256	28%	72%
Nebraska	1915					
Nevada	1911	1918	Y	0		
New Hampshire	1917	1963	Y	679	22%	78%
New Jersey	1911	1913	Y	0		
New Mexico			N			
New York	1912	1920	Y	42		
North Carolina	1919	2003	Y	8000	15%	85%
North Dakota	1913	1965	Y	1049	38%	62%
Ohio			N			
Oklahoma	1931	1955	Y	556	22%	78%
Oregon	1917	1983	Y	2648	35%	65%
Pennsylvania	1905		Y	270		
Rhode Island			N			
South Carolina	1935	1984	Y	277	8%	92%
South Dakota	1917	1974	Y	789		
Tennessee			N			
Texas			N			
Utah	1925	1960	Y	772	46%	54%
Vermont	1931	1957	Y	253		
Virginia	1924	1979	Y	7325	38%	62%
Washington	1909	1942	Y	649	23%	77%
West Virginia	1929	1956	Y	98	15%	83%
Wisconsin	1913	1963	Y	1823	21%	79%
Wyoming			N			

Figure 1: Cumulative Adoptions of Eugenics Laws

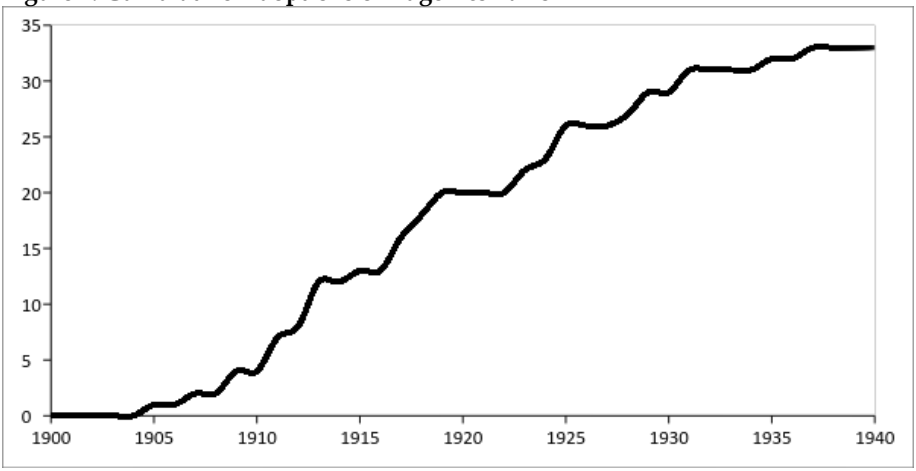
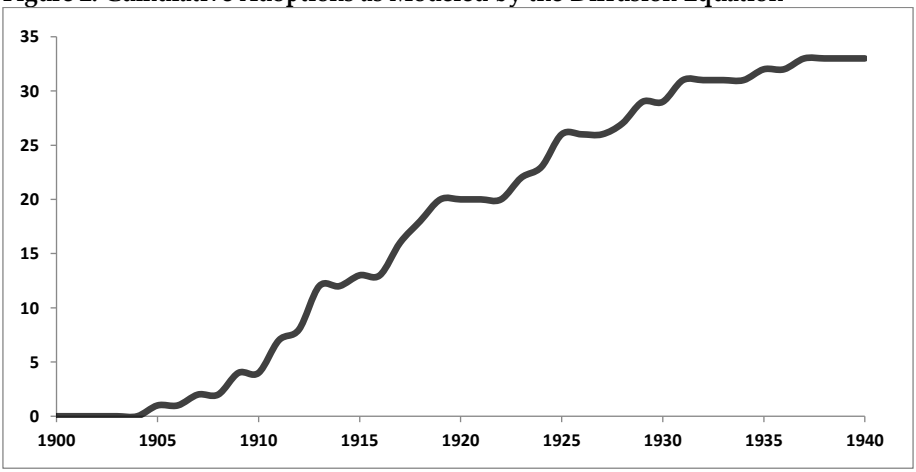


Figure 2: Cumulative Adoptions as Modeled by the Diffusion Equation



Policy diffusion has long been known to entail a regional dimension (Berry and Berry 1990; Butz, Fix, and Mitchell 2015; Mooney 2001). The assumption is that policymakers are more likely to learn from their neighboring states. To measure diffusion, we rely on the *proportion of a state's neighbors* that previously adopted a eugenics policy in the prior year. For example, if a state has 5 neighbors, and 1 adopted in 1910, it would be coded as (.2) beginning in 1910. Then, if an additional neighbor had adopted, this would be coded as (.4). Recent diffusion studies (Sylvester and Haider-Markel 2015) have relied on the proportion of neighbors' measure. We

expect that this variable will have a positive influence on the adoption of eugenics policies. That is, as the proportion of adopting neighbors increases, so does a state's likelihood of adopting a eugenics policy.

Morgan and Wilson (1990) indicate that political variables such as ideology can have an impact on policy outputs. More specifically, the political composition or ideology of a state's electorate is often associated with policy diffusion behavior as it pertains to internal adoption determinants (Berry and Berry 1990; Grossback, Nicholson-Crotty, and Peterson 2004; Mooney 2001). As research has found, legislatures push the policy agendas espoused by their constituencies (Karch 2007; Mayhew 1974). Government officials or states that are oriented towards a certain ideology (liberal or conservative) will adopt certain policies over others (Grossback, Nicholson-Crotty, and Peterson 2004). For eugenics, we expect that the more progressive states (or ideologically liberal) will be more likely to embrace eugenics, given that it was a Progressive based policy. However, ideology measures for that year are not available, so we rely on proxy measures from the David and Claggett (1998) dataset, which looks at historical electoral returns. At this time period, given the party platform transitions, we expect that both parties may likely exhibit an influence at differing time points. For example, prior to the New Deal, vote shares for the Democratic Party may decrease the likelihood of the adoption of eugenics policies, and after the New Deal, there is an increasing likelihood given the New Deal coalition. We rely on the *electoral returns* for the president in the most previous election for the Democratic Party. We also utilize the *vote returns for the Democratic governor* in the most previous election as well as the vote returns for *congressional elections for Democratic candidates*. We expect both of these to have an impact, but we are unsure of what direction given the temporal changes in the political landscape. Ideally, we would include ideology scores which encompass multiple measures (Berry et al. 2007), but for this, we rely on electoral returns.

Religion is also often associated with policy adoption behavior (Berry and Berry 1990). As a result, we rely on the total number of *religious bodies present within a state each year*. These data were available from the Association of Religious Data archive, although unfortunately only available every ten years. We anticipate that religion may directly be linked to eugenics adoption, and those states that have higher religiosity will be less likely to embrace eugenics. This is because those progressive states will be more likely to embrace eugenics, and will typically have lower levels of religiosity. Additionally, it has been suggested that some religious groups such as

Catholics openly opposed eugenics (Hansen and King 2015). Thus, we expect that the states with the highest religious bodies present will be less likely to adopt eugenics.

Additionally, we use a political culture categorical variable, based specifically on Elazar's (1966) state classification system. In our first model, individualistic states are coded as (1), traditional states are coded as (2), and moralistic states are coded as (3). This variable does not vary by year. Presumably, states with different cultures would likely have different positions on policies such as eugenics. Specifically, we believe that moralistic states will be more likely to embrace religion, given that eugenics is largely a morality-based policy. However, given that culture is a categorical variable, we also include a dummy model, where moralistic is labelled as 1, and 0 if a state is traditional or individualistic.[12] We do not expect that individualistic or traditional cultures will have an impact.

Finally, we rely on the urban population of each state as reported by the US Census Bureau, which, like our religion variable, was only available on a ten-year basis. Urban population can represent many things, such as the professionalism of a state government, demographic characteristics, and the economic development level of a state. Shipan and Volden (2008) note that larger cities tend to have larger and more professional governments that are more likely to learn from others. We expect the same behavior from states. Theoretically, these will likely be linked to eugenics policies. Furthermore, population is typically included as a variable in diffusion studies (Berry and Berry 1990; Butz, Fix, and Mitchell 2015). Thus, we expect states with a higher urban population to be more likely to adopt a eugenics policy.

In our other models presented, we also capture whether or not a state was part of the *South*, coded as confederacy (1), or not (0). V.O Key (1949) and others examined the racial threat hypothesis, which states that, in the South, the dominant class may feel threatened by large numbers of African-Americans even though they are not the majority; therefore, the southern white elites would pass laws more hostile towards minority interests (Key 1949; Liu 2001). For eugenics, we feel that this effect may be similar. Specifically, the dominant class may feel threatened by the mentally deficient, and would thus be more likely to adopt a eugenics policy. Thus,

[12] We also ran different versions of this model, where each culture was included as a dummy, and where the model was ran with each culture separate. Since we hypothesize that moralistic culture exhibits an influence, we only report those results given the potential collinearity issues present with multiple dummy variables.

we expect Southern states to be more likely to embrace eugenics policies. We run one model separately from the political culture variable since theoretically they could overlap.

Some scholars have noted that the regional effect of diffusion may measure multiple mechanisms or multiple means of policy diffusion. It is therefore important to rely on multiple geographic indicators (Maggetti and Gilardi 2016). We test for a conditional learning effect in this analysis, which relies on the assumption that jurisdictions may be more (or less) responsive to neighboring jurisdictions' policies (Shipan and Volden 2008). Walker (1969) also posited that some states serve as leader states (Walker 1969), but that it should not be presupposed that one state looks to other states equally. Accordingly, we rely on an interaction variable of *urban population x proportion of neighbors*. Scholars have often relied on these models to model conditional diffusion (Shipan and Volden 2008). These typically rely on a combination of external determinants, such as our proportion of neighbors' variable, and an internal determinant, such as urban population. The corresponding assumption is that smaller or larger urban population states may exhibit different adoption behaviors, or a differing influence on the regional effect. Thus, smaller states may be more likely to be influenced as the proportion of their neighbors adopt sterilization laws, and larger states may be less influenced. Or more specifically, larger states may adopt these policies in response to surrounding states with smaller urban populations. For the case of eugenics, we feel that those larger states would be more likely to embrace eugenics due to a more professionalized government (Shipan and Volden 2008), which may have a greater propensity to produce policies.

We tested the assumptions of the proportional model using Grambsch and Therneaus's (1994) test using the Schoenfeld residual. We found that the religious unions and political culture violated our proportional hazards assumptions (ρ= -.23 p=.027; ρ= .264 p = .02 respectively). We ran additional models excluding these variables, ran them as time varying covariates, and also stratified the results and determined that they did not significantly bias our model. However, to help alleviate this problem and to deal with the potential for group-related errors, we also clustered the standard errors in our model by state.

Results

As stated in our Methodology section, Figures 1 and 2 illustrate the shape of the diffusion curve. Figure 1 shows the total number of cumulative

states having adopted eugenics policies, while Figure 2 presents the classical diffusion curve. The typical diffusion curve relies on an s-shape, but this curve shows gradual growth, which could be evidence that eugenics policies diffuse rather slowly. There are a few initial adopters with no definitive visualization of laggards, and the saturation point is located at the end of the 1930s. The likely reason is due to the lack of modern communication technologies, although additional explanations could lay with WWII, the stock market crash and the resulting Great Depression, the election of Franklin Roosevelt, or the death of major policy entrepreneurs that supported eugenics, such as Andrew Carnegie. Lastly, it could be due to the nature of the policy itself; due to the implications of this policy, both on individuals and the policymakers that adopted them, it may have made policymakers hesitant to adopt.

Table 2 shows the descriptive statistics for each variable used in this study. It lists the mean, standard deviation, and the minimum and maximum of each value. Our total sample size for our analysis is n=1280. Each state was included with the exception of Alaska and Hawaii, which did not become states until after the time frame utilized in our analysis.

Table 2: Descriptive Statistics

Variable	Mean	STD	Min	Max
Adopt (DV)	.0257	.158	0	1
Neighbors	.2079	.2548	0	1
Population (l)	12.74	1.481	8.722	15.96
Religious Groups (l)	13.30	1.146	9.806	15.390
Political Culture	1.935	.7655	1	3
South	.274	.446	0	1
Pop x Neigh	13.855	18.22	0	90.99
Democratic Gov	54.73	18.94	5.9	100
Democratic Congress	54.76	20.81	4.4	100
Democratic President	49.28	20.81	4.4	100

Table 3 shows the correlation matrix. According to Table 3, our three political variables are correlated with one another, raising the possibility of multicollinearity. Therefore, we run an additional model including only one of these variables. Table 4 shows the results of the event history model. Looking within Table 4, Model 1 is the primary model used in this study that examines social learning. Model 2 shows the results with our South variable as opposed to the political culture variable, and Model 3 shows the interaction model between logged urban population and the proportion of neighbors. Model 4 represents political culture modelled with the morality

dummy variable. Model 5 is where South and Culture as both included, and Model 6 is using only one political variable.

Table 3: Correlation Matrix

Variable	Neighb	Pop(l)	Rel(l)	Gov	Cong	Pres	Cult	South
Neighbors	.1							
Population(l)	.214	1						
Relig Grps(l)	-.065	.477	1					
Governor	-.113	.057	.235	1				
Congress	-.080.	.072	.265	.912	1			
President	-.048	.048	.254	.843	.884	1		
Culture	-.181	-.258	-.247	-.062	-.104	-.115	1	
South	-.210	.016	.310	.808	.844	.747	.052	1

Table 4: Cox Proportional Hazards Model

Variable	Model 1	Model 2	Model 3	Model 4 (culture dummy)	Model 5	Model 6
Neighbors	.028*	.076*	.623	.026*	.028*	.042*
	(2.03)	(.083)	(.936)	(.028)	(.025)	(.035)
Pop(1)	1.09	1.06	1.23	1.04	1.11	1.06
	(.181)	(.177)	(.217)	(.186)	(.162)	(.149)
Relig Grps (1)	1.08	.762	1.25	1.12	1.02	1.00
	(.452)	(.240)	(.568)	(.484)	(.267)	(.243)
Pol Culture	3.68*	-----	3.97*	-----	3.53*	3.44*
	(2.03)		(2.29)		(1.18	(1.11)
South	-----	3.65	-----	-----	1.48	-----
		(3.07)			(1.07)	
Moralistic	-----	-----	-----	11.52*	-----	-----
				(9.65)		
Pop x Neigh	-----	-----	.948*	-----	-----	-----
			(.021)			
Dem Gov	.997	.992	.997	.955	.996	-----
	(.022)	(.027)	(.021)	(.025)	(.023)	
Dem Cong	.969	.959	.964	.990	.964	-----
	(.027)	(.032)	(.025)	(.034)	(.025)	
Dem Pres	.998	.984	1.00	.995	.997	.966*
	(.020)	(.021)	(.012)	(.022)	(.021)	(.012)
N	1280	1280	1280	1280	1280	1280
LLV	-177.23	-185.78	-173.5	-176.4	-177.08	-179.25
LR x^2	32.05	19.59	42.1	38.9	44.23	39.9
Prob x^2	.00	.00	.00	.00	.00	.00

According to our results in Model 1, neighbors and political culture were significant. Figure 3 shows the relative hazard rate of the model. According to this graph, the hazard rate increases at a relatively constant rate until roughly the 60% point in the diffusion process, where there is a sharp

increase. This reveals a gradual increase in the risk of adoption over time, until it reached the halfway point that marked a large increase. Analyzing Table 4 specifically, we found that neighbor states decreased the risk of adoption by roughly 97%. Political culture increased the risk by almost three times, though, as a categorical variable, it offers an unintuitive assessment. Figure 4 shows the relative hazard rate at different points between categories 1, 2 and 3.

Figure 3: Hazard Rate Adoptions of Eugenics Laws

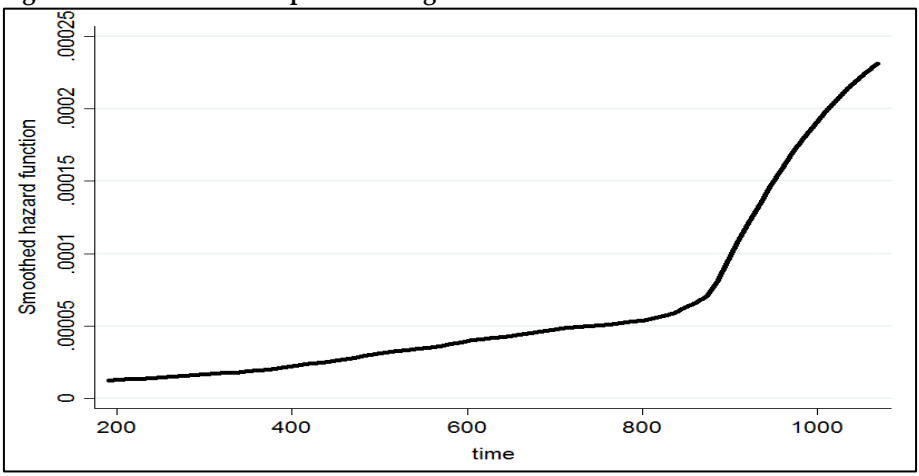
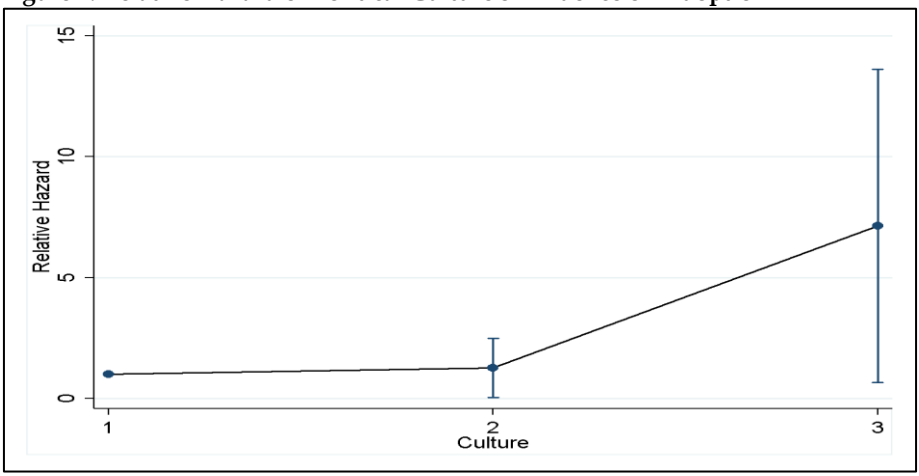


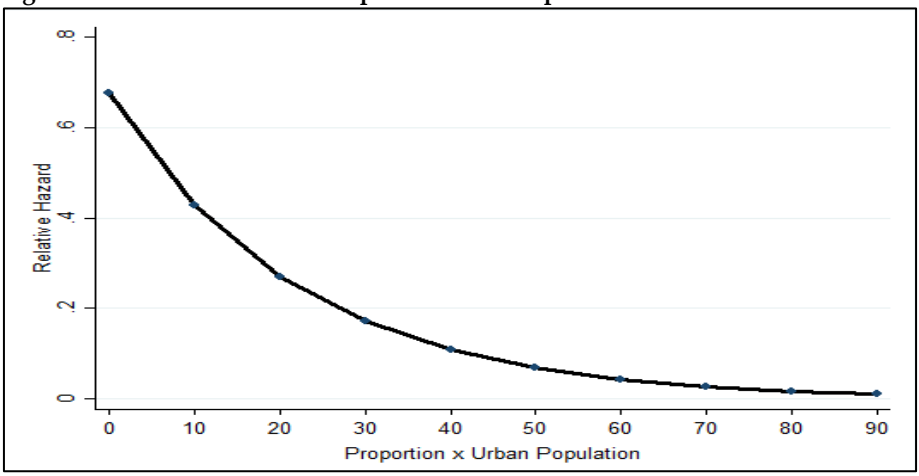
Figure 4: Relative Hazard of Political Culture's Influence on Adoption



According to this graph, we see the relative hazard is higher at category 2 and 3, or between traditional to moralistic cultures, where this policy is more likely to occur. It peaks as it moves to three, indicating that the risk of adoption is highest among moralistic states.

Turning to Model 2 in Table 4, only the neighbor (social learning) variable was significant. The proportion of neighbors decreased the likelihood of adoption by approximately 92%. This means that the learning effect was not positive as we expected. States are actually either delaying or are less likely to adopt if their neighbors have already done so, Our South variable was not significant in this model. For Model 3, political culture and our interaction model were significant.[13] Political culture was similar to Model 1, meaning that the moralistic culture was most likely to adopt sterilization laws. For our interaction model, the negative hazard rate indicates that states look to smaller (as opposed to larger) states differently. Figure 5 shows the graphed interaction, revealing that as culture and proportion increase, so does the predicted hazard rate. The x coordinate is the multiplicative interaction between urban population and the y is the relative hazard rate. Thus, when the proportion of neighbors and the urban population is highest, the risk for adoption is the greatest.

Figure 5: Interaction of Urban Population and Proportion



[13] It should also be noted that we produced an interaction model between culture with proportion and obtained a p–value of .06. Though this was not significant, we feel that some relationship exists, and that states within certain regions look to other states differently.

However, as the value decreases, there is less of a likelihood for adoption. Next, according to Model 4, our moralistic variable is significant with a relatively large effect on risk, maintaining confirmation of our hypothesis related to the Progressive "moral" states being more likely to adopt eugenics policies. For Model 5, including both the Culture and South, the results remain relatively the same. Finally, in Model 6, our political variable that shows the vote for the Democratic President is significant, meaning the inclusion of all three may cancel one another out. We also ran additional models and each of the political variables were significant when included on their own. Therefore, support for Democrats typically corresponds to a decreased risk of adopting a eugenics law.

Our research aimed to explore the diffusion of involuntary sterilization laws across U.S. states. We examined the speed and shape of the diffusion of these policies and found that the adoption pattern does not follow the standard s-shape curve, which we surmise is due to the technology (or lack thereof) available at the time period. However, we speculate that it could also be as a result of the above mentioned historical events occurring at this time period. The eugenics policy is likely very similar to the diffusion of state income taxes (Berry and Berry 1992), which took place at the start of the 20th century. However, this particular type of policy does not have an economic dimension, and perhaps a morality dimension, or a belief that the policy produced a societal good.

Additionally, we also tested for the idea of policy learning. That is, part of the reason why eugenics policies spread was due to policymakers learning from the eugenics policies of other states. To test social learning theory, we examined the regional effect of eugenics policies. The proportion of neighboring states previously adopting a eugenics policy exhibited an influence, which is a consistent finding in diffusion studies (Berry and Berry 1990; Mooney 2001; Shipan and Volden 2008) and particularly those that examine policy learning, albeit this effect in our study was negative. The negative neighbor effect is consistent with the Butz and colleagues (2015) study that examined the diffusion of Stand Your Ground Laws. It could be argued that if a state's neighbor adopted a policy, it caused states to be more hesitant to adopt before first evaluating the implications of neighboring states' adoptions, showing evidence of learning. We also suspect that the impact of the previous adoptions by neighboring states may vary by region.

Additionally, political culture has a strong dimension in this policy, particularly among moralistic cultures. This is unsurprising given that the

moralist tradition often associated with the Progressive Movement embraced science in general and eugenics specifically. We feel that political culture is an important construct that has largely been overlooked in explaining diffusion. We also found that urban population and the neighbor variable interaction model showed an influence, which means that smaller as opposed to larger states exhibited a different response to the adoption of their neighbor's policies. Finally, when ran separately, we found that support for the Democratic Party corresponds with a decreased likelihood of adopting a eugenics policy.

Despite these significant findings, this study had several shortcomings. First, we did not have large amounts of variables to explore. And further, a small number of variables we explored had only measures available every ten years, thereby lacking variation. Lastly, some of our measures such as political culture were constant due to the static nature of culture and the fact that yearly measures were never developed during the eugenics policy adoption time period. Despite these shortcomings, this study was a first step towards exploring hard policies that impact subgroups and often have negative consequences.

Future research should examine the international diffusion of this policy. Ultimately, this policy diffused across the ocean into Denmark, which was the first Nordic country to pass a sterilization law in 1929 (Dikötter 1998). Soon after, Norway and Sweden (passing 1934 and 1941 sterilization laws), followed by Germany all passed sterilization laws, which ultimately led to many other countries such as Canada, China, and nations located in South and Latin America to pass sterilization legislation (Broberg and Roll-Hansen 2005; Dikötter 1998; Stepan 1991). Additionally, future studies may want to examine other policies of this time period, including anti-immigration or prohibition policies to see if there are similarities or differences in the diffusion process.

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