**A Comparative Study of State Choices for Institutional Forms of State Pre-Kindergarten**

by

Jan C. Hume

A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
December 11, 2021

Keywords: education policy, public administration, early care and education, state policy, public policy, state pre-kindergarten



Approved by

John C. Morris, Chair, Professor of Political Science, Auburn University
John Brooks, Assistant Professor of Political Science, Auburn University at Montgomery
Sean Durham, Associate Professor of Curriculum and Teaching, Auburn University
Bridgett A. King, MPA Director and Associate Professor of Political Science, Auburn University
Greg S. Weaver, Sociology Graduate Program Director and Associate Professor of Sociology, Anthropology and Social Work, Auburn University

## Abstract

The issue of early care and education is squarely on the policy agenda at the federal, state, and local levels of government. Research and long-term evaluations of early childhood programs have shown that high quality early learning programs can close achievement gaps at school entry and have long lasting positive effects on children's growth and development, ultimately leading to better societal outcomes. As a result, states are increasingly investing in preschool through a variety of institutional forms. This dissertation will examine the variation among those state policy choices and possible predictors for such choices. Utilizing the literature to define three frames for early care and education, those three frames of education, social service and workforce development then become the building blocks for seven typologies of institutional form of state pre-kindergarten programs. This research uses the NIEER survey data from 2003 – 2018 to quantify the characteristics associated with the three frames and then develop the typologies of institutional form for state pre-kindergarten that become the dependent variables of the study. The independent variables are state characteristics within the categories of education, socioeconomics, and politics. Each of the seven typologies and the state characteristics are analyzed through logistic regression to offer insight into the state characteristics that may predict the state choice of institutional form. The goals of the study are to develop an understanding of the variation in state choice for institutional form of state pre-kindergarten as an important early care and education policy and to identify potential predictors for the choices made by the states.

**Acknowledgements**

This dissertation is the result of a leap of faith that I did not make alone. The person who has constantly encouraged me is the most incredibly patient, kind, and loving person I have ever known. To my wonderful husband and best friend, David, I thank you for leading our family and me through this journey. Thanks to you, we have survived and thrived! Our three children Vince, Libby, and James have also made this possible through their constant encouragement. I am so proud of the adults they are and could not have made it through this process without their patience, understanding, and sense of humor. I wish my parents could be here for this celebration. They always believed in me and instilled in me a love for education. I hope I made them proud!

The idea for this work came from a series of conversations with Dr. Steve Barnett and Karin Garver at the National Institute for Early Education Research (NIEER). The time they invested in speaking with me and helping me get to the research question was the spark that gave me so much enthusiasm for this topic. The leadership and staff at NIEER have provided invaluable support in making sure I had all the data needed to complete this project. To Steve and Ellen, your leadership and guidance throughout my state pre-k career has made more of a difference than you will ever know. And Karin, my CEELO fellow and friend, thank you for your constant encouragement.

I am also very thankful for the Department of Political Science at Auburn University. They have been a constant encourager through courses, comps, and the dissertation process. I would not have survived without them, especially Dr. Kelly Krawczyk and Dr. Paul Harris who have made me feel like family. Lindsey and Shaniqua have been my go-to fellow students and encouragers and have helped more than they realize.

I am so thankful for my wonderful friends who continued to reach out when I disappeared to my office for days at a time. The Red Oak family dinners and socials got me outside on days when I did not think I wanted to go anywhere. My girl's group, led by the wonderful Christy, kept me connected and supported through this process. And Sandy Horn has been my ongoing encourager and disciplinarian when needed. Her daily messages have kept me on track and moving forward when I wanted to quit. Over the past year, my work family at the ADECE has continued to cheer me on, and I thank them for their enthusiasm and support.

There is no doubt that I have the best committee! Dr. John Brooks and Dr. Sean Durham have asked the most interesting questions and have each given such unique views of this topic. Dr. Bridgett King has been so patient as I sat in her office going over the statistics and has provided all sorts of encouragement and advice. Dr. John Morris is the absolute best chair and mentor. There are not enough words to thank him for always making time for me and dealing with my crazy thoughts and questions. He has kept me on track and has really been the driving force behind this dissertation. Who could have imagined 30 years ago when we first met that he would go off and become a rock star academic, come back to Auburn, and guide me through this process? I cannot thank you enough, John, for always being there and challenging me to get this done. I am honored and thankful that you said yes to being my chair and that you have gone above and beyond to support me and this process.

As they say, the best dissertation is a done dissertation. I, my friends, and my family are certainly glad this one is finally done!

## Table of Contents

## List of Tables

## List of Figures

## List of Abbreviations

| | |
|---|---|
| ACF | Administration for Children and Families |
| CCDF | Child Care and Development Fund |
| ECE | Early Childhood Education |
| ECCE | Early Childhood Care and Education |
| HHS | U.S. Department of Health and Human Services |
| LEA | Local Education Agency |
| NIEER | National Institute for Early Education Research |
| PDG | Preschool Development Grant |
| RTT | Race to the Top |
| TANF | Temporary Assistance to Needy Families |

## Chapter 1: The Context of Early Childhood Policy

Over the past several decades, the issue of early care and education has landed squarely on the policy agenda. With more households having all parents in the workforce, demand for child care is higher than at any time during history (U.S. Department of Labor, 2019). Additionally, the field of neuroscience has provided substantial evidence that most brain growth occurs in the first five years of a child's life. The brain architecture that occurs during these early years builds the foundation for cognitive, social emotional and executive functions throughout the remainder of children's lives (Barnett et al. 2003; Gormley 2011; Kagan and Cohen 1997; Olson 2016; Shonkoff and Levitt 2010). This significant period of brain development impacts long term success in school and in the workforce and is thus an important frontier in public policy. Brain research has been translated into public policy by scholars and economists, including Nobel laureate James Heckman, who have written extensively about the substantial return on investment of programs that target children in their youngest years (see e.g Heckman, 2011, p. 7). This research and the recognition that a child's earliest years provide a vital foundation for his or her future have also led to calls for higher quality early learning programs. The policy problem is embedded in the fact that early care and education is a complex set of programs with different funding streams and different goals.

All levels of government, as well as multiple cross sector collaborations, are engaged in providing early childhood education (ECE) services, and each has a unique target audience and purpose. Early childhood policy is administered primarily at the state level and lends itself to a study of state choices. This dissertation first develops a taxonomy of frames for such programs to first understand the different orientations and policy goals of the varying early childhood

programs. Second, the dissertation explores the question of which state characteristics may lead to choices about goals, treatment, and governance of early care and education. The literature offers three basic frames for the typologies to be developed on which this dissertation is built: education, social services, and workforce development. Each frame is characterized by characteristics of its institutional form including the target population, rules for access, and program goals. The research questions to be considered are identifying contributing factors in states choices of the frame of the preschool program(s) in each state.

**Public Policy and Administration Implications**

An issue of interest in public policy and public administration is how the states achieve a common policy goal when states can, and do, administer the programs designed to accomplish the policy goal differently. Early childhood education and development provides policy scholars with a policy example that is attempting to address multiple goals. Through federal grants such as the Race to the Top and the Preschool Development Grant, the federal government has encouraged states to be laboratories of democracy (Tarr, 2001). However, each state has made choices about the administration and goals of ECE, and as a result, early care and education continues to be a disjointed group of programs funded through multiple federal, state, and local sources (McCabe & Sipple, 2011, p. e3). While the broader field of ECE, which includes both child development and early childhood education, has established cognitive, social-emotional, health, and family support goals for the programs, each state makes choices about how to administer programs and which goals will be prioritized.

The topic of governance of early childhood programs is a recurring theme in the ECE literature. With the persistent label of ECE as a patchwork, a non-system, and siloed and with the growth of ECE on the policy agenda, governance has been viewed as the necessary solution (see

e.g. Hustedt & Barnett, 2011). These questions of governance are related to rules, authority, management, decision making, and structure (Goffin, Martella, & Coffman, 2011; Kalifeh, Lora, & Grass, 2011; Regenstein & Lipper, 2013). The governance issue in ECE is often tied to systems building and questions of who will manage the system of early care and education. However, this dissertation argues that institutional form provides a different vantage point from which to examine ECE in the states, particularly the program of state preschool. While governance may be a consideration in the broad term of institutional form, it is not the primary nor the only criterion for examining the policy. Institutional form defined as the "rules and penalties that condition access to resources and structure the treatment citizens receive in government programs" provides the broader lens through which to exam the variation and similarities of ECE policies and programs (Soss, Schram, Vartanian, & O'Brien, 2001, p. 379).

Categorizing and understanding the variation in ECE and their relationships to policy provides a key link between policy and administration. Preschool or early care and education is not a single system of service provision. Therefore a study that categorizes ECE policy using the tool of institutional form (Soss et al., 2001) makes a valuable contribution to the public policy field by identifying and connecting policy levers to the achievement of policy goals (Pianta, Barnett, Burchinal, & Thornburg, 2009, p. 78). This dissertation takes a two-step approach by first creating a categorization of early care and education programs that will be used to develop a taxonomy of state programs. Secondly, this study identifies correlations between state characteristics and the framing choices for ECE in each state. While understanding the variation in ECE policy and administration among the states is a gap in the public policy and administration literature, an additional benefit to this study is that ECE is a growing policy area that has significant potential for closing achievement gaps among children of poverty with their

peers from more affluent homes. The fragmentation and variation among the states, however, is a barrier to making programmatic and administrative changes which might impact such substantial outcomes. States continue to develop and implement ECE policy with little guidance and history of administration from which to draw. Early care and education as a policy area provide fertile ground for examining issues of state choice. The complex and fragmented governance and financing of early care and education provide a wealth of information for this and future policy work.

This dissertation will establish three distinct frames for ECE policy. The categorization of the variety of ECE programs into three frames provides a new perspective for examination of public policy as well as contributes to the understanding of the multiple purposes of ECE and how those purposes might be administered. The three frames of education, social service, and workforce development have been addressed through separate literature but have not been explicitly scored and named together in any one work. The definition of the frames in general terms as well as the assignment of characteristics to each frame establishes the dependent variable in this dissertation and thus provides much broader implications for the future of ECE as a policy area. States and other entities that choose to implement ECE programs will have a foundation for decision making related to goals and delivery. Policy scholars will have a theory-based taxonomy of programs, studied through the broader lens of institutional form, through which to study variation and similarities among states. The concept of institutional form encompasses a broad range of characteristics that help segment the complexities of the policy into identifiable and measurable components. The diversity of where each state chooses to place the various ECE programs, as well as the variety of shared characteristics with ECE programs other than state preschool, can otherwise be a barrier to effective study of the policy. Breaking

this policy into individual components to rebuild frameworks will assist in understanding the variety of state choices.

Early care and education policy is an underrepresented area of research within the field of public policy and public administration. The recency of its arrival on the policy agenda and the rapid growth of early care and education as a priority contribute to its lack of study. While the ECE field continues to conduct research on the efficacy of programming and practices which lead to positive long-term outcomes, ECE has not been studied broadly within the policy arena. The implications for state choice research as well as federalism, cross-sector collaboration, public finance, and evidence-based policy are also substantial and provide an opportunity for examination of the application of policy studies utilizing the lens of early care and education policy.

**ECE as Workforce Development**

Early care and education, as a policy issue, is seen as a workforce development issue in three distinct ways: a support for working families, a need to professionalize and compensate the early care and education workforce, and growth of the future workforce. Two of the perspectives are addressed in Chapter 2 of this dissertation through the creation of the frames that comprise the dependent variable. The third perspective is related neither to the dependent nor independent variables but is vital to understanding what has influenced the placement of ECE on the policy agenda.

"Achievement gap" is the term used to describe the difference between children who are ready for school success and those who are not. The presence of such gaps at school entry is shown to lead to longer term negative outcomes such as lack of ability to read on grade-level by

the end of third grade, later school failure, and eventually school dropout and the societal and economic issues that result from lack of education. Research has shown that achievement gaps between socioeconomic and racial groups exists prior to a child's kindergarten entry (W. S. Barnett & Frede, 2010; Pianta, Steven Barnett, Burchinal, & Thornburg, 2009). These achievement gaps continue to grow and result in increasingly more severe gaps by third grade which is a time that children move from learning to read to reading to learn. Children not reading on grade level by the end of third grade are at least four times more likely to drop out of school without receiving a high school diploma and even more likely to drop out as their poverty level increases (Hernandez, 2012, p. 4).

The premise of Head Start, the first national preschool program, is that all children, including children from low-income families and children of color, should be provided an even playing field at school entry. Head Start is designed to reduce those achievement gaps through a combination of preschool programs as well as supports for improving health and family outcomes of children. However, Head Start only reaches a portion of the population in poverty. Historically, children who have had the greatest achievement gaps are those in poverty and those of color. As time has progressed, however, middle class children have also shown to display the negative outcomes such as not being ready for school, failing in school, and eventually dropping out of the education system (W. S. Barnett, 2011, p. 34). As such, business groups like the Business Roundtable and the U.S. Chamber of Commerce have placed high quality early learning on their advocacy agendas to ensure an effective and educated future workforce. Research helps advocates connect the dots from early childhood to third grade achievement and from third grade achievement to high school graduation or lack thereof. Thus, business groups have joined the advocacy community for increased investment in early care and education as it

prepares the workforce of the future (Bushouse, 2009a; Watson, 2011). Students who drop out of high school are certainly not eligible for college and otherwise not prepared for the workforce needed to sustain the economy.

## Early Care and Education Programs

The three primary early care and education programs to be considered through this dissertation are child care, Head Start, and state preschool. Both child care and Head Start programs have a long history in the United States while state preschool is a relatively recent program developed in response to the aforementioned brain research as well as to a substantial push for its presence on the state and national policy agendas (Bushouse, 2009b).

### *History of Child Care*

Child care is not fully a public good nor fully privately provided. Child care services are provided in the private market by providers that have as their business custodial care for children. The federal government provides subsidies to child care providers for the care of children whose families are considered low income. The federal funds are awarded to states in the form of a block grant, the Child Care and Development Fund (CCDF), and are then utilized for the purposes of subsidizing the cost of child care as a support for working parents. Child care as provided for in CCDF is the provision of custodial care to keep children safe while mothers work (Lowenstein, 2011, p. 95). These block grants are provided to state agencies who are then responsible for distribution. Each state chooses the structure and form for administration of CCDF, but the purpose of the funds is to provide, at minimum, custodial care of children.

Throughout the nation's history, the issue of who will care for children has revolved around economic and social issues including poverty which required women of a lower class to

work outside of the home. Charities began to form in the late 1700's which were designed to help women of poverty forced to work due to economic and social conditions. The charities formed day nurseries which were designed to provide custodial care for the children of poverty while the mothers worked in low paying jobs. At the same time, nursery schools were created to provide a more educational and social environment for the middle and upper class children to learn and socialize (Michel, 1999). Even from the birth of the U.S. as a country, questions were being asked about whether early childhood programs were custodial care or education. However, there was not a significant public funding stream to support early care and education until the era of the Great Depression. In 1933, the federal government provided funding for day nurseries designed to care for children while mothers worked (Cohen, 1996, p. 28). Following the Depression federal funding for day nurseries grew with crises, such as World War II, and shrank as crises ended. In 1940, the Lanham Act was passed as a workforce development tool and provided federal funding in the form of grants and loans to help parents work in areas most affected by the war (Cohen, 1996, p. 29). This first foray into the government's support of working mothers was met with some resistance from the values that mothers should be home with their children. However, the need for working mothers during wartime outweighed more traditional values regarding the role of women and their children. These wartime child care programs were primarily housed in public schools and were mostly closed in 1946 following the end of the federal funding. It was not until 1974 that the federal government again provided funding for child care, this time through Title XX of the Social Security Act (Michel, 1999, p. 251) and in 1976 through the Aid to Day Care Centers Act (Cohen, 1996, p. 32). The support was intended to subsidize child care for low-income families and to enable parents to work and become self-sufficient. Funds to support those in poverty and to encourage entry into the

workforce were the only significant federal funding to support child care. As a component of these programs, states were required to provide a match and were eligible for federal funds of up to three dollars for every one dollar provided by the state. This combination of funds provided slots for children in centers which held contracts with the state, effectively limiting parental choice only to programs which received the funds (Cohen, 1996; Michel, 1999). Parents were thus often forced to choose between quality and affordability.

During the Reagan years, Title XX was transformed into a block grant to the states in response to the perception that the federal government was an out-of-control bureaucracy, particularly in the case of welfare (Cohen, 1996). In addition to the change in administration, the funds were cut by nearly twenty percent and the requirements that tied the funds to programs meeting regulatory standards were eliminated (Cohen, 1996, p. 32). The combination of the devolution of child care to the states and the different state matching efforts has led to problems in being able to effectively measure the total amount of public funds dedicated to child care.

Through the 1980's, child care and welfare reform were woven together by requiring that those who received child care subsidy to be actively engaged in working or job training. With the passage of the Family Support Act (FSA) in 1988, the federal government tied child care directly to entering and remaining in the workforce. Additionally, the FSA tied child care rates to the local market rates by not allowing publicly funded payments to "exceed the local market rate charged for child care" (Cohen, 1996, p. 34). This led to inequity among the states in the ability to fund child care. States such as Alabama and Louisiana received the minimum rates while states such as Ohio, Virginia and Wisconsin received higher rates than ever before (Cohen, 1996, p. 34).

In 1996, Congress approved the Child Care and Development Fund (CCDF) which combined multiple federal streams and state funds. CCDF still provides the largest funding source for child care in the United States and is administered as a block grant to the states. Regulations require that states spend at least 70 percent of federal and matching funds on the provision of child care services (Greenberg, Lombardi, & Schumacher, 2000, p. 3). States have a great deal of discretion in the administration of the funds and each state receives an amount of federal funding directly related to the state's individual contribution or match. States can use a variety of funds such as state pre-kindergarten, private funds, and certain types of state funds to match federal dollars (U.S. Department of Health and Human Services, n.d.). The complicated funding and administration systems are designed to provide families the necessary supports to work which in turn should reduce the number of families at risk of needing Temporary Assistance for Needy Families (TANF). The variety in administration of child care mirrors the variety of administration in all other early childhood care and education programs: fragmented and siloed without a shared vision or goals. The differences in the levels of funding are also substantial. With the growing emphasis and policy agenda on the importance of early brain development, advocates are raising awareness about the need for child care to focus on more than custodial care but also to be of high quality and encouraging and supporting healthy development of all children. This recognition adds to the goals of a system that was originally designed for custodial care.

### *History of Head Start*

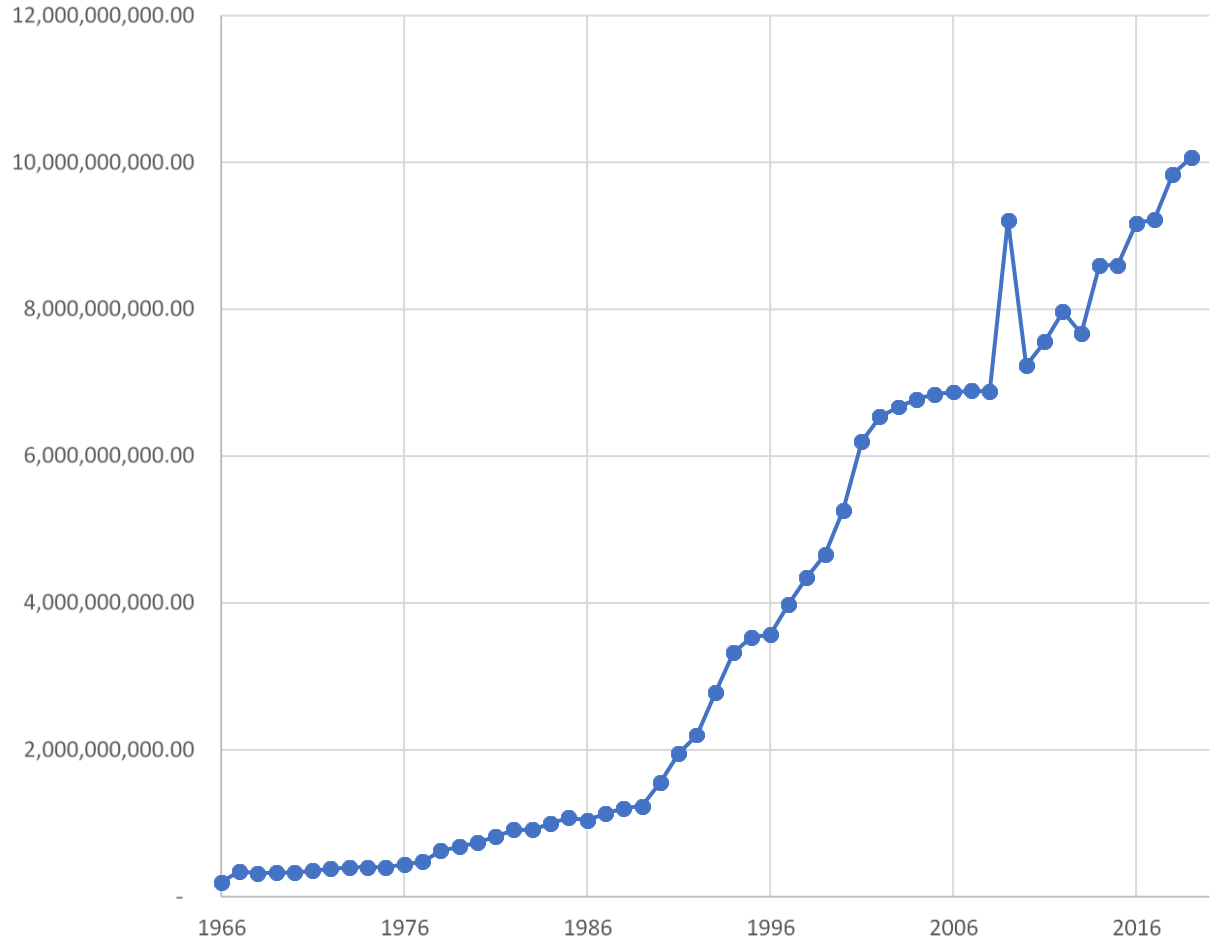
Head Start, the most notable early childhood federal program, was developed out of the War on Poverty in the 1960's. Head Start, administered through the Administration for Children and Families within the U.S. Department of Health and Human Services, provides funds directly

from the federal government to community organizations, often community action agencies, to fund the programs targeted primarily to low-income children and families.

The Head Start program is one of the few remaining programs established as part of the Economic Opportunity Act of 1964 (Cohen, 1996; Kalifeh et al., 2011). Head Start appropriations have, in terms of actual dollars, increased over time as indicated in Figure 2. What initially started as a summer program for a small number of children has grown to serve nearly 900,000 children and their families in 2018 (U.S. Department of Health and Human Services, 2019).

**Figure 1.1**

*Head Start Appropriations 1966-2019*




Note: FY2009 funding includes ARRA funds.

Source: https://www.acf.hhs.gov/

Head Start was born out of a belief that providing a comprehensive education program that focused on child learning and development would help break the cycle of poverty. The program targeted not only the child but also the family who was expected to be engaged

throughout the learning process. Head Start programs were initially located in local education agencies (LEA's) and in the newly created infrastructure of Community Action Agencies which were designed to serve as "clearinghouses to administer and coordinate social service, education, job training, and legal service programs" to those in poverty (Flanagan, 2001, p. 585).

The history of Head Start, much as the history of federal funding for child care, has not been without some disagreement about its orientation, purpose, or values. The program, formed under President Johnson, was originally housed within the executive branch's Office of Economic Opportunity. Five years later, President Nixon moved the program to the Office of Child Development within the Department for Health, Education and Welfare. In 1978, this large federal agency was dissolved and separated into the Department of Education and the Department of Health and Human Services. There was some debate about whether Head Start should be a part of education or human services. Once again, the debate focused on the intent of the program. Head Start became a part of the Department of Health and Human Services where it remains.

While federal funding for child care for low income families is provided from HHS through the states, Head Start funding bypasses the states and grants funds directly to local entities including community organizations, school systems, foundations and private entities (Kalifeh et al., 2011, p. 49). This bypassing of the states is significant in the consideration of institutional forms. There is not a governing body at the state level which monitors Head Start quality nor its administration. Head Start programs are governed by federal regulations and monitored by the regional offices of the Administration for Children and Families. With the variation in administration, the state preschool program may or may not be integrated with Head

Start. The relationship between state preschool programs and Head Start varies substantially among the states.

### *State Preschool*

The most recent development in the field of early care and education is the establishment and growth of state funded preschool, sometimes called state pre-kindergarten or state pre-k, focused on preparing children for school. This program has significant variation among the states in terms of its purposes, target populations, funding mechanisms, and institutional home. Currently, forty- four states and the District of Columbia administer sixty different state funded preschool programs, each choosing their own eligibility requirements and funding mechanisms (A. Friedman-Krauss et al., 2019).

The growth of funding has elevated the issue of early care and education to one with serious fiscal implications. State funding for pre-k has increased from just under $2.5 billion, dollars not adjusted for inflation, in 37 states during 2001-2002 (W. S. Barnett et al., 2003, p. 38) to $8.75 billion in 44 states and the District of Columbia during the 2018-2019 school year (Friedman-Krauss et al., 2020, p. 10). This increase in resources dedicated to state preschool is an indicator of its importance on the policy agenda as well as the need for increased coordination for the purposes of accountability and effectiveness. Each state chooses the administrative home, the institutional arrangements, the funding sources and the rules and regulations for its own program. Many states have chosen to house the preschool program in their department of education which is, in most cases, a separate agency from the one that administers child care. Some states have chosen to administer multiple programs, each with a different administrative home as well as a different funding source. Other states choose to establish separate agencies dedicated solely to early care and education. The variation in the institutional forms of state

preschool provide the basis for this dissertation. The specific characteristics and their base in the literature are discussed fully in the dependent variable description presented in Chapters 2 and 3.

## Chapter 2: Construction of the Variables from the Academic Literature

Public policy around the issue of child care and early education is "inconsistent, fragmented, with troubling consequences" (Stoney & Greenberg, 1996, p. 84). However, early care and education as a policy issue is growing on the policy agenda at the federal and state levels. This dissertation takes a two - stage approach to studying the issue within the public administration and public policy context. Using the broad definition of institutional form from the political science literature, this dissertation constructs a typology of early care and education choices for institutional form based on characteristics of education, workforce development, and welfare programs. These three frames then become the dependent variables of the research. Secondly, this dissertation seeks to explain why states make the choices that they make about the frames within the individual states.

As debates continue about the federal role in education policy and as states take on more diverse policies, it is important to understand both the variation and similarities in policy choices. Similar to welfare policy, no longer does the federal government dictate institutional form for early care and education policy (Lieberman & Shaw, 2006; Soss et al., 2001). State choices impact policy, politics, and service provision as well as constituencies that benefit from such policies. Developing a classification of institutional forms for early care and education can provide some rhythm to the discord among the states. The academic literature has historically classified early childhood policy as either custodial or educational in its goals and structure (Grubb, 1987; Karch, 2013; Michel, 1999). This dissertation, however, provides a more specific typology based on the institutional form based on Grubb's 1987 report that offers the third classification of workfare as a need for early care and education policy. This dissertation extends the workfare argument made by Grubbs (1987) to a workforce development frame that includes

both custodial arrangements for children as well as the opportunity to develop the education and wages of the early care and education workforce as well as the potential workforce of the parents of children engaged in the state program.

The characteristics of institutional form used in this research specify three overarching goals for early care and education: workforce development that facilitates working families, social services that are designed to uplift families and thus communities, and education that is focused on improving the cognitive and academic outcomes. These three frames are created within this dissertation by examining characteristics of their institutional forms and then become the dependent variables of the research. Providing common vocabulary and classifications can help us understand both the variation and the similarities.

This dissertation seeks to answer the research questions about determinants for state framing of early childhood education and development as exhibited by the characteristics of the state funded preschool program(s) in each state. Which state characteristics are associated with choice of education, social service, or workforce development frames? Do states choose multiple frames? How does the interaction of state funded preschool with other funding streams impact the definition of the program and its policy goals?

This chapter organizes the theory and literature according to its association with the dependent and/ or independent variables. Such organization allows for a thorough but focused examination of the literature. Broadly, the literature that is used in support of the overall model falls into the policy, administration, and education fields. In order to build the three frames, literature related to institutional form as well as literature related to social service, workforce development, and education policies are used.

## Institutional Form

Institutional form is broadly defined as the rules, norms, cultures, practices, and structures that comprise institutions that seek to address needs of society (Casto & Sipple, 2011; Lieberman & Shaw, 2006; Soss et al., 2001; Weisbrod, 1998). The elements of institutional form and the combination thereof come together for a specific purpose or function. Ideally, the institutional form would derive from explicit choices made by government about the purpose of a particular program. However, early care and education as a policy or set of policies has been shown throughout the literature to have varying policy goals (Adams & Rohacek, 2002; Greenberg et al., 2000; Karch, 2013; Michel, 1999; Stoney & Greenberg, 1996). As a result, understanding the institutional form and its typology will provide an additional understanding of why a particular early childhood care and education (ECCE) program is or is not meeting its targets. While this is an interesting by-product of this study, it is not the primary research question. Instead, the research questions are around those factors that contribute to states making the choices they do about institutional form.

This study of institutional form is important to the fields of public policy, politics, and administration in that assumably, state choices regarding institutional form are related to the purpose of the policy. However the purpose of early childhood is shown to be somewhat of a puzzle (Michel, 1999). The choices for purpose of early care and education span multiple policy areas, primarily workforce development, education, and social service. These frames for ECCE may or may not be the outright choices of the states. However, understanding the association between state choices for institutional form and state characteristics may provide some insight into the future policy directions for ECCE at the federal, state, and local levels. Certain states may have social service goals for ECCE, but the elements of their institutional form more closely

relate to education. In still other states, the expressed purpose of ECCE could be education, but the form reflects social service characteristics. This study provides a classification of institutional forms for ECCE policies, specifically state preschool and provides a practical tool to help guide states as they consider purpose and choice. This study contributes to the academic literature by first offering a measured classification of the three prominent frames for early care and education policy: education, workforce development, and social service or welfare. Secondly, the study builds a bridge between the early education literature and the policy literature by applying the institutional form framework to the emerging issue of ECCE. Thirdly, this study applies the state comparative literature to the study of early care and education policy choices which are underrepresented in the state policy literature. Finally, this study lays the groundwork for future research in linking policy choices for institutional form to effectiveness of programs, specifically those in the ECCE realm.

By providing a classification of institutional forms based on each one's characteristics, this dissertation extends the research about institutional form. In addition to the literature which defines those conditions and constraints, this dissertation will apply characteristics associated with three typologies: social service or welfare, education, and workforce development.

**State Preschool**

State preschool, also known as state pre-kindergarten or state pre-k, is the program through which state framing will be evaluated. The institutional form for state preschool will be measured through a series of characteristics which are associated with each frame of social service, education, and workforce development.

A state preschool or state pre-kindergarten program is defined as one which is funded and controlled by the state, focuses on a three and/or four-year-old child's early education, provides learning in a group setting at least two days per week, and is not focused on children with disabilities (W. S. Barnett et al., 2003, p. 11; A. H. Friedman-Krauss et al., 2020, p. 40). Throughout its many years of State Preschool Yearbooks, the National Institute for Early Education Research (NIEER) has established a consistent definition for state pre-kindergarten. In additional to identifying the general characteristics which define state preschool, the yearbooks also provide insight into what preschool is not. While state pre-kindergarten or preschool can indeed be coordinated with state child care funds, the child care program and the state preschool program are not the same program. Additionally, state preschool is not the same program as Head Start, even if the state supplements Head Start programs, unless such supplement substantially increases access or additional services. Finally, programs that focus on parent education or establish a work requirement for parents are not considered state preschool (A. Friedman-Krauss et al., 2020, p. 40). This definition of state preschool establishes the parameters for the programs to be considered in this study yet still allows for enough variation to allow for the classification of programs according to characteristics closely resembling social service, education, and/or workforce development programs.

**Preschool Politics and the States**

The variation in institutional forms among the states serves as the dependent variable of this dissertation's models. This variation and the evidence of fragmentation are results of a long history of political struggles between the interests and the intent of ECCE (Karch, 2013). At one point in time, there was an opportunity for a unified approach to early childhood policy. However, a critical juncture in 1971 caused the effort for unification to derail and for advocates

to choose a different path for early care and education (Karch, 2013). Those who sought to expand the government's intervention in the early care and education field were forced to shop for other venues that included the states (Karch, 2013). President Nixon's veto of the Comprehensive Child Development Act in 1971 led to a more permanent fracturing of the early care and education community, particularly those special interests already entrenched and recipients of federal funding. This one event is still viewed as the turning point and critical juncture in the field of ECCE policy; the opportunity to have one federal system which comprehensively addressed the needs of children and working families was lost when Nixon vetoed the bill (Karch, 2013; Michel, 1999). This transition from a focus on federal level policy and framing to a decentralized state policy arena led directly to the variation among the states and the lack of systems and continuity in ECCE policy and administration. Each state has implemented the different components of ECCE policy differently. When federal child care funds were provided to states as a block grant, each state made choices about implementation and use of the funds. As states began to address the educational needs of young children, each state chose different forms for state funded preschool as well as how state preschool was to combine with other funding sources such as child care block grant, Head Start grants, and federal and state education funds.

State preschool programs can be classified as targeted or universal. These two types of programs have different goals and different constraints that are directly related to their institutional form (Weisbrod, 1998) Targeted programs have the constraint that they serve those perceived as highest need based on income or other risk factors associate with lower school performance. Head Start is the federal program that targets children from the lowest income families and was initiated as part of the War on Poverty in the 1960's. States implementing

preschool programs have often followed suit and initially targeted their programs to children of low-income families. However, even targeted programs still do not reach the majority of low-income children (W. S. Barnett, 2015). States such as Oklahoma, Georgia, and Florida were among the first to provide universal pre-kindergarten to children regardless of income or other achievement risk factors (Smith, 2020). Universal pre-kindergarten has fewer constraints and is thought to be a vehicle that provides access and benefits to all children, and even more so to the highest need children. Universal preschool offers at least two substantial advantages over targeted programs; first, it removes the stigma of entitlement or means-tested programs, and second, universal programs are shown to have a stronger, more long-lasting positive impact on those children with the highest needs (W. S. Barnett, 2015; Van Huizen & Plantenga, 2018). Without federal guidance or incentives, states have been left to make policy choices about whether they want to provide universal or targeted pre-kindergarten programs. The primary stated objective of many state pre-kindergarten programs is to close achievement gaps between groups of children (Lipsey, Farran, & Durkin, 2018; Valentino, 2018). The question about whether states utilize the institutional form consistent with targeted or universal is thus a central policy question to be answered by each state.

Just as questions about whether to provide universal or targeted programming, states must also make choices about requirements and standards of quality. Choosing higher quality often involves choosing to fund programs at a higher level per child. NIEER, the national leader on such quality research, has defined the minimum quality elements which offer the best chance for programs to achieve the objectives of closing achievement gaps and having lasting positive impacts on children's cognitive and non-cognitive learning. The ten elements of quality identified by NIEER are around teacher education and qualifications, curriculum and teacher

support, developmental and health screenings and referrals for children, and class size (A. Friedman-Krauss et al., 2020). The quality standards are based on research that shows which elements lead to better outcomes for children (S. W. Barnett, 2016; Van Huizen & Plantenga, 2018).

How states govern preschool is also a consideration in the institutional form. A majority of states house the state preschool program within the state education agency also responsible for governance and administration of K-12 education. However, the administrative home is only a piece of the governance puzzle. In most states, the funding for pre-kindergarten is separate from the K-12 funding formula and is thus subject to separate governing legislation and guidelines. The variation among the states, while a positive for this study, is indicative of its fragmentation. Such a patchwork leads to a substantial variation among the states in all components of institutional form including who has access to state pre-kindergarten services and what those services are (Karch, 2013, p. 7). The fragmentation that began in the early 1970's with Nixon's veto has substantially increased over the past fifty years.

**The Three Typologies as Dependent Variables**

The creation of the three typologies based on the institutional form characteristics provides the dependent variable for this dissertation. By creating the three forms, this dissertation contributes a more granular understanding of the characteristics and forms of early childhood education in the states. State pre-kindergarten does not have one institutional form nor one set of established goals and constraints. Each state makes specific choices related to the institutional form through both legislative and administrative decisions that include administrative home, services provided, funding streams, and eligibility regulations. These choices are not always related to the desired outcomes, and there is very little guidance for states around specific policy

choices regarding institutional form and how those choices relate to the goals of the programs. This dissertation establishes a method of classification of state preschool programs into one of three categories and uses those classifications as the dependent variables: social service or welfare, education, and workforce development.

Social services or welfare has been a driver at different points in history for federally funded ECCE programs such as child care and Head Start. While states also provide matching funds for the Child Care and Development Fund (CCDF), the overall purpose and use are established at the federal level. Unlike CCDF and Head Start, states fund and develop the rules for state preschool without federal oversight or official guidance, and the variation among the states provides insight into how early care and education are valued as well as the accepted purposes for such programs.

State preschool and early care and education in general have multiple characteristics that do not fit neatly into one of the frames provided. Not including those characteristics in this study does not diminish their importance or significance. However, the characteristics chosen are ones that are based in the research, and which are dominant in one of the frames indicated. Multiple studies have provided descriptive research on the multiple characteristics of early care and education, specifically universal preschool. To provide a taxonomy and to understand state choices, this work focuses on those 15 characteristics in Table 2.1 that literature has shown to be associated with each frame.

**Table 2.1**

*State Preschool Policy Frames*

| | Social Service | Education | Workforce Development |
|---|---|---|---|
| Income as a condition of eligibility | ✓ | | |
| Child health services required | ✓ | | |
| Screenings (health and/or developmental required) | ✓ | | |
| Referral to social services required | ✓ | | |
| Delivery system includes Head Start | ✓ | | |
| Education and job training for parents | | | ✓ |
| TANF funds support program | | | ✓ |
| CCDF funds support program | | | ✓ |
| Work day is length of daily programming | | | ✓ |
| Delivery system includes private child care | | | ✓ |
| Lead teachers must have bachelor's degree | | ✓ | |
| Transition to Kindergarten activities required | | ✓ | |
| School day is length of daily programming | | ✓ | |
| Program is funded at least in part through state school funding formula | | ✓ | |
| Delivery system includes public schools | | ✓ | |

### *Social Service Frame*

In terms of early childhood, social services have some distinguishing characteristics that are aligned with Head Start characteristics. Among the unique characteristics of the social service frame are that services are targeted to low income children and/or their families and are intended to incentivize and facilitate change at the community level (Kalifeh et al., 2011; Nichols & Jurvansuu, 2008). "The key outcomes in human services are not only the health and well-being of children and their families, but also the building of community capacity and social capital" (Nichols & Jurvansuu, 2008, p. 121). Head Start programs fit the social service frame.

They are designed to impact the poverty community by improving health, education, and family outcomes for children and families. Head Start "is a program aimed at improving the comprehensive school readiness of low-income American children through an array of education, health and social services" (Gilliam & Ripple, 2004, p. 17) In order to create the taxonomy of policy frames for state preschool perspectives, Head Start is used as the benchmark program for the social service frame. In determining which state program fits into a specific frame, the NIEER annual survey data are used. This survey asks every state to respond to a series of questions about the governance, policies, eligibility, and other characteristics of each state's preschool program. To develop each frame, the states' answers to a selected number of questions is grouped and scored according to the frame of social service, education, or workforce development.

The first characteristic that identifies the state pre-k program as a social service program is whether eligibility for participation is based on family or household income. The targeted nature of the program to individuals who are considered high risk for needing public assistance will provide insight into the policy frame for state preschool. If the state program's eligibility for participation is based on income, that program receives a point on the social service scale.

Because social service programs are also characterized by providing health and comprehensive services (Nichols & Jurvansuu, 2008), a state's affirmative responses to the survey questions about health and developmental screenings, referrals for social services, and the requirement for provision of health services for children are also included as points in the social services scale. The presence of all three characteristics indicates a strong social service orientation while the presence of only one might indicate that the state has chosen to limit resources on social services to focus on another purpose of the program. Head Start is often more

expensive due to the federal requirement for comprehensive and family services. States who are focused on school readiness may not invest the dollars into health and family services which are the hallmark of Head Start.

Finally, an affirmative answer that Head Start funds support the state preschool program will be an indicator of the orientation toward social service than toward education or workforce development. The use of Head Start funds requires that the state preschool program using such funds will comply with Head Start guidelines and practices which are social service in nature.

### *Education Frame*

The education framing of early care and education is not without its own controversies. There is a divide in the field of education about whether pre-kindergarten is the new kindergarten which has become the new first grade. Those on the early childhood education and child development side of the argument provide research that preschool practices should be different than elementary education practices (McCabe & Sipple, 2011). The disconnect and need for transition between early childhood and elementary education has been well documented (K. A. Kauerz, 2010). Children sitting at desks and completing worksheets has no impact on long term future school success; instead, high quality early childhood learning is relational and relies heavily on the teacher-child interaction (Pianta, Hamre, & Nguyen, 2020). However, the practices in K-12 are ingrained and long standing. Additionally, the stakes are becoming higher, particularly in states that have adopted testing at the third-grade level and that requires students be retained in grade until they are able to read at the appropriate level as defined by the state. If the state preschool program is framed as education, there are many questions about whether it is framed as early childhood or elementary education. However, for the purposes of this study, we will define education as the focus on “improved educational outcomes for students” (Nichols &

Jurvansuu, 2008, p. 121). In a comparison of Head Start and state funded preschool, Gormley states that state pre-k is "more clearly focused on early learning" as the vehicle to "prepare young children for school" (Gormley, Phillips, Adelstein, & Shaw, 2010, p. 397).

The responses to questions regarding the length of the instructional day, the yearly calendar and alignment with K-12 practices are used as indicators of the program falling within the education frame. One indicator is that the program follows the school year or even school day as opposed to the calendar year or school year. Alignment of early learning standards to K-12 standards as well as requiring transition to kindergarten activities are also indicators of the education framing of the early childhood policy. If eligibility is based solely on age rather than on income or risk factors, this also parallels K-12 policies. Funding of the programs through the K-12 funding formula or foundation program is another indicator of an education orientation of the program.

### *Workforce Development Frame*

The workforce development frame is one in which early childhood services are provided in order to support child caregivers such as parents in the workforce (Cohen, 1996; Kalifeh et al., 2011). The child care subsidy program was initially created and comes from a long history of providing supports for mothers to work (Adams & Rohacek, 2002). Workforce development's primary focus is to help individuals being socioeconomically upwardly mobile through improving individuals' abilities and skills in order to grow professionally and become qualified for better paying jobs (Adams & Heller, 2015). Workforce development as a policy fits squarely into Peterson's (1995) definition of developmental type policy that is designed specifically for economic growth (Hwang & Gray, 1991). By growing skills, abilities and earning potential of the human capital of a state, workforce development efforts are closely

linked to economic development and growth (Jones & Kelly, 2007). State preschool programs that are framed as workforce development have two primary objectives in achieving the goal of developing the workforce. First, they enable parents to work a full day, full calendar year job by providing care and education for the children of the members of the workforce. Secondly, the workforce development frame is one that encourages growth of the early childhood workforce itself. The multiple purposes of the workforce development frame provide specific indicators that are found within the NIEER survey as well.

To identify those state preschool programs that fit more in the workforce development camp, questions that illustrate requirements for full year or extended day programs rather than school year and school day are among the most obvious. Specifically, the response to the survey questions which ask if after school care is a requirement and if the programs are required to provide services for a full calendar year or an extended day will be used as indicators. Additionally, a workforce development type program would most likely respond in the affirmative to the question which asks if education or job training services are provided for parents. The survey contains distinguishing characteristics about the type of services required for each state program, some of which fit in the social services frame and some of which fit in the workforce development frame. Those questions that support growing or developing the workforce, whether it be the ECCE workforce or the parents of students in the program, will be used to measure the characteristics of this frame.

The Child Care Development Fund (CCDF) was created with the intended purpose of providing subsidizing child care so that parents can work. The Aid to Families with Dependent Children (AFDC) cash assistance program was replaced by the Temporary Assistance to Needy Families (TANF) block grant program as a result of the 1996 Personal Responsibility and Work

Opportunity Reconciliation Act (PRWORA), and work requirements were placed as a condition of benefits. Responding yes to the questions regarding the use of TANF and CCDF funds to support the preschool program are indicators of the program's fit within the workforce development frame.

Finally, the workforce development component that encourages parents to improve their skills through providing education and job training services for parents. State preschool programs that have characteristics that facilitate working parents, growing skills for the parents of children in the program, and using TANF and/ or CCDF are considered workforce development type programs.

**Independent Variables**

Peterson provides three classifications of municipal policies that have been extended to state policies and that are useful in the classification of types of policies and internal and external determinants of such state policies (Hwang & Gray, 1991; Peterson, 1995). Peterson's classifications of redistributive, allocational, and developmental types of social service policy provide structure within which to examine determinants of state policy and selected institutional form of such policy. Hwang and Gray (1991) utilize Peterson's classifications in looking at determinants and posit that political factors will mostly be relevant for the social service frame that is redistributive in nature. The education and workforce development typologies are more aligned with Peterson's developmental type policy, however the conservative perception of the public provision of child care services is often perceived as an over-reach by government (Karch, 2013; Michel, 1999) . Education can be a combination of the allocational and developmental, but Hwang and Gray (1991) found that it was more closely aligned with developmental. These

categories are important in that they provide some broad guidance in constructing hypotheses about determinants of state choices.

Hwang and Gray (1991) examine two broadly used determinants of choice: socioeconomic characteristics of the state and political characteristics of the state. Additionally, in the tradition of V.O. Key, Soss et al (2001) and Lieberman and Shaw (2006), also use state needs as a determining factor in state choice. Following the logic of Nice and Karch, "policy adoption is more likely when the policy responds to conditions within a state" (Karch, 2010, p. 224; see also Nice, 1994). Needs can be classified as certain socioeconomic characteristics or in other relevant needs. For the purposes of this dissertation, certain education factors will be considered as an indicator of state need.

This study moves beyond whether a state adopts the policy of funding and implementing state preschool and moves to the examination of the characteristics of such preschool as well as typing the institutional form of the program based on those characteristics. The institutional form is classified in the three categories of social service, education, and workforce development; the explanatory variables chosen are ones that are related to the adoption of specific characteristics of the institutional form of the state preschool program(s) in each state. To conduct the analysis, each state preschool program will be classified according to the characteristics as summarized in the dependent variable section and will then be related to other policies which share characteristics of the categories of institutional form developed in this dissertation.

### *Education Characteristics of the States*

Education factors are relevant state characteristics to help in understanding the policy choices of the states when those choices are related to education, workforce development or

social services. Both Curran and Barnett have utilized K-12 expenditures as a predictor of state commitment to education (W. S. Barnett et al., 2003; Curran, 2015). To take the analysis one step further in looking at commitment, education expenditures per student for kindergarten through 12th grade will be used as a measure of commitment to education (Jackson, 2020). States that show increased commitment to K-12 as measured through per pupil education spending are expected to be more likely to adopt education characteristics. The National Assessment of Educational Progress (NAEP) scores at fourth grade which are low are also an indicator of education need in the tradition of Soss, et al. (2001) and will be an indicator of the institutional form framed as education.

An additional education related state characteristic of interest will be based on the growth or decline of the school age population. According to Dr. Steven Barnett at NIEER, states that have adopted preschool programs, particularly in the education frame, may have had a declining school age population in grades kindergarten through 12th grade, opening an opportunity to add another grade (pre-k) without changing the funding formula (Bushouse, 2009; Fernandez & Rogerson, 2001; Phone conversation with Barnett, February 2020).

An education characteristic with economic implications for states is the high school completion and drop-out rates. Students who drop out of high school are less likely to earn a professional living wage and more likely to have social as well as economic costs in terms of crime, welfare, and low productivity (Acosta & Martin, 2013). It is thus assumed that states with a higher percentage of the population that have less than high school attainment will be more likely to choose social service and workforce development characteristics for the state preschool's institutional form.

***Socioeconomic Characteristics of the States***

Socioeconomic characteristics of states including racial make-up and other characteristics of the population and the state economy provide insight into state choices. A variety of demographic variables will be considered as possible correlates to the adoption of certain frames for state funded preschool. Relevant state demographic variables include the percent of the population that is non-white. According to research about the provision of non-cash based social service programs, such programs are not as widely provided and supported in states with higher populations of those who would receive the service (T. L. Gais, 2009). Specifically, research has demonstrated that states with larger non-white populations are less inclined to adopt social services oriented policies (Federico, 2004; Fellowes & Rowe, 2004; Karch, 2010; Soss et al., 2001). Thus, the percent of the population that is non-white will be used as a predictor related to the adoption of a state preschool program which is targeted to lower income children and fits within the social service frame. Additionally, a higher percentage of unwed or single mothers is expected to be associated with a lower likelihood of adopting social service characteristics (Fellowes & Rowe, 2004; Soss et al., 2001).

State economies have been shown to have a substantial impact on the adoption of policies, so it follows that the characteristics of such policy would also be impacted by state economic indicators (T. L. Gais, 2009). The overall fiscal health of the state has been shown to have a direct impact on the adoption of policy, particularly those policies which go over and above federal requirements as does state preschool (F. S. Berry & Berry, 1990; Curran, 2015). A commonly used economic indicator in state comparative studies is per capita income as a proxy for state wealth and will be used in this analysis as well (T. L. Gais, 2009; Lieberman & Shaw, 2006). The theory is that states with greater wealth are more likely to invest in developmental type policies (Fellowes & Rowe, 2004; Peterson, 1995). Gais (2009) separates social service

programs into three categories of cash assistance, medical payments, and social service programs. This research provides a more specified explanation that states with higher wealth may not invest as highly in cash assistance programs but instead are more likely to invest in social services (T. L. Gais, 2009).

The Gini Index of Income Inequality will also be used as a determinant about the type of institutional form chosen for state pre-kindergarten. As income inequality decreases, states are more likely to invest in social service or welfare programs (Fellowes & Rowe, 2004; Ringquist, Hill, Leighley, & Hinton-Anderson, 1997).

As an indicator of state fiscal health, the unemployment rate will also be used. As unemployment rates decrease, it is expected that the likelihood of states selecting social service characteristics for the state pre-kindergarten program will increase (T. Gais, Dadayan, & Bae, 2009; T. L. Gais, 2009).

***Political Characteristics of the States***

Political variables are also well researched and are predictors in multiple types of policy including welfare policy typologies as well as the adoption of state preschool. Specifically, the liberal or conservative nature of the state government provides insight into the adoption and framing of policy. The presence of a republican governor and/ or republican legislature has been used extensively in state comparative literature (Lieberman & Shaw, 2006). Market driven policies are more closely associated with Republican leaning states while investment in education seems to be more closely aligned with Democratic leaning states (Tandberg, 2010, p. 746). As such, it is expected that more conservative and more Republican states will be less likely to choose the social service frame for state preschool. It is more likely that liberal states

and those with a higher turnout of low-income voters will choose the social service frame for their state preschool programs (Erikson, Wright, & McIver, 2007; Fellowes & Rowe, 2004; Peterson, 1995; Soss et al., 2001).

Political variables related to the citizenry are also important characteristics to consider in understanding the framing of specific policies. Citizen ideology offers an understanding of the liberal or conservative nature of the citizenry (W. D. Berry, Ringquist, Fording, & Hanson, 1998; Erikson et al., 2007; Fellowes & Rowe, 2004). States with more conservative citizen ideologies are less likely to increase expenditures on social service programs and thus less likely to frame pre-kindergarten as a social service program.

**Organization of Independent Variables**

For the purposes of developing hypotheses and organizing the large number of variables to clarify future findings, the predictor variables are sub-categorized beyond the education, socioeconomic, and political groupings. The individual predictors in the education and socioeconomic groups are also assigned to a sub-category of need and capacity indicators as shown in Figure 2.1 below. The political variables use conservatism as the reference category.

**Figure 2.1**

*Sub-Categories of Predictor Variables*

| Category of Predictors | Sub Category of Predictors | Predictor Variables |
|---|---|---|
| Education | Capacity | Higher per student state spending K-12 |
| | | Declining school age population |
| | Need | Lower NAEP scale scores |
| | | Percent of population < than high school |
| Socio Economic | Capacity | Higher per capita income |
| | | Size of population |
| | | Lower unemployment rate |
| | Need | Percent of pop non-white |
| | | Unwed mothers |
| | | Lower Income Inequality (Gini) |
| Political | Conservative | Republican Governor |
| | | Republican Legislature |
| | | Trifecta Republican |
| | | Conservative citizen ideology |
| | | Conservative government ideology |

## Hypotheses

The hypotheses offered in this dissertation are designed to identify the relationship between state choice of institutional form for state preschool and state characteristics. The predictor variables are organized into three categories and subsequent subcategories as described in Figure 2.1 above.

The hypotheses are built around the dependent variable in terms of its frame of education, social service, and/or workforce development. The predictor variables have also been further classified into capacity and need in both the education and socioeconomic groups of characteristics. Table 2.2 below summarizes both the groups of predictors as well as the expected direction of the hypotheses.

**Table 2.2**

*Summary of Hypotheses*

| Category of Predictors | | Family of Typology | | |
|---|---|---|---|---|
| | | Education (ED) | Social Service (SS) | Workforce Development (WD) |
| Education | Capacity | + | + | — |
| | Need | + | — | — |
| | Capacity + Need | + | — | + |
| Socio Economic | Capacity | + | + | + |
| | Need | — | — | + |
| | Capacity + Need | + | — | + |
| Political | Conservative | + | — | — |

In general, it is expected that those states with higher education need as measured through the predictors within the education category will choose a typology within the Education frame for state pre-kindergarten. It is also expected that the states with more fiscal capacity as defined in the socioeconomic category of predictors will choose an institutional form for state preschool

that includes education. And finally, it is expected that states that are more conservative are more likely to invest in state preschool programs that fall into one of the four education typologies. The following hypotheses are offered based on the literature and evidence related to state choices of institutional form for state pre-kindergarten programs.

H1: States with more capacity in K-12 education are more likely to choose a typology in the Education frame.

H1a: States with higher spending per student for K-12 education are more likely to choose a typology within the Education frame.

H1b: States with declining school age population in K-12 education are more likely to choose a typology within the Education frame.

H2: States with higher levels of education need are likely to choose a typology within the Education frame.

H2a: States with lower fourth grade NAEP scores are likely to choose a typology within the Education frame.

H2b: States with a higher percentage of the adult population with less than high school achievement are more likely to choose the Education-Workforce Development (EDWD) frame.

H2c: States with a higher percentage of the adult population with less than high school achievement are less likely to choose a Social Service frame.

H3: States with higher levels of both education capacity and education need are more likely to choose a typology with three or more characteristics in both Education and Workforce Development frames.

H4: States with greater fiscal capacity are more likely to choose at least three characteristics from all three frames.

H5: States with greater socioeconomic need are more likely to choose a Workforce Development frame.

> H5a: States with a higher percentage of the population that is non-white are less likely to choose the Social Service frame.

H6: States with higher fiscal capacity and higher socioeconomic need are more likely to choose at least three characteristics each from the Education and Workforce Development frames.

H7: States that are more conservative are more likely to choose the Education frame over either the Social Service or Workforce Development frames.

Chapter 3 provides the measurement and operationalization of each of the variables that comprises the three frames and the seven specific typologies as shown above in Figure 2.2. Additionally, the measurement and operationalization of the predictor variables are described in detail in Chapter 3.

## Chapter 3: Operationalization and Measurement of the Typologies and Variables

The policy of state preschool or state pre-kindergarten provides an example of a policy that has appeared in the federal government's space since the 1960's and the beginning of the war on poverty. Through an evolution of federalism, early childhood care and education, as a policy, moved to the state and local arena in the form of state preschool or state pre-kindergarten. The issue is in the process of a great deal of newly focused federal attention through a series of grants aimed at building state systems of early care and education. Additionally, President Biden's proposed policy agenda has paid special attention to the issues around early care and education and how they impact future school success as well as how early childhood care and education (ECCE) impacts the ability of the workforce to be present in the workplace. The issue of early childhood care and education, specifically state preschool, provides a lens through which to study both federalism as well as state variation in a policy with a shared general vision as well as diversity and lack of clarity in the purpose and goals. This study attempts to understand state choices so that practitioners in states as well as policy researchers may understand the relationship of policy choice to policy outcomes.

This dissertation first constructs the three typologies or frames for state preschool institutional form from the annual state survey administered by the National Institute for Early Education Research (NIEER) at Rutgers University. NIEER collects data from each of the states that administers state preschool programs, and this survey is the basis for the annually published *State of Preschool Yearbook.* The yearbook provides data regarding the administration, policies, enrollment, and context for each state's program. While there are many data points collected across the survey from 2004 through the most recent survey, this dissertation utilizes 15 of the

data points as characteristics of institutional form to define the framing of the state preschool program. The 15 items selected are ones that are both consistently reported across the years and that are found in the literature used to define and construct each typology.

The first yearbook was published in 2003 and provided data about the 2001-2002 school year. Due to differences in data between 2003 and the remaining yearbooks, the 2004 survey data will be the first year used for this research. Initially, 24 characteristics, eight for each typology, were identified as possible descriptors for each of the frames. After in depth review of the survey content over time, 15 data points, five for each frame that are comparable across the years, have been consistently collected each year, and have theoretical basis in the literature to define the three typologies. Each state program is given a score of 0-5 on each of the frames according to the number of characteristics present from that frame in the preschool program. This chapter outlines the specific characteristics and operationalization of the concepts that create the three frames. It is anticipated that state programs will have characteristics in multiple frames, and the modeling and methodology will take that into account.

**NIEER Survey, Research, and Yearbook**

The National Institute for Early Education Research was formed at Rutgers University as a result of a substantial grant and longer term funding commitment by the Pew Charitable Trusts as a part of its campaign for state pre-kindergarten (Bushouse, 2009b). Pew saw the need for an independent research arm as a function of the campaign to grow state efforts and capacity to fund preschool. NIEER was formed to study state pre-k efforts across the nation and was formerly the Center for Early Education Research (CEER) focused on New Jersey's preschool efforts (Bushouse, 2009b). Dr. W. Steven Barnett was the CEER director and NIEER's first director. Dr. Barnett was already an established economist who had published extensive research on the

economic returns of investing in high quality early learning. Dr. Barnett, in partnership with leading researchers in the field and Pew Charitable Trusts, established NIEER as the most recognizable university-based research center focused on early childhood research. NIEER and Pew funded multiple state studies and evaluations of established state pre-k programs (Bushouse, 2009b).

In 2003, NIEER conducted its first survey of state preschool programs to establish baseline data upon which to build as state pre-kindergarten programs began to grow. The 2003 survey examined the access, quality, and administration of 45 state preschool programs in 40 states. The survey is administered through an instrument sent out by NIEER, answered by state preschool staff and administrators, and returned to NIEER for review. The most recent surveys have been administered through a computer assisted interview (CAI) process of each of the administrators of state preschool programs in the 50 states, the District of Columbia, and U.S. territories (A. Friedman-Krauss et al., 2021). Once the survey results are submitted, NIEER staff conduct follow-up interviews with state administrators to collect clarifying and additional information (W. S. Barnett et al., 2003).

Each year since 2003, NIEER has continued the process of collecting data and publishing that data in the annual *State of Preschool Yearbook* that provides information about the access, quality, growth, and specific policies related to state preschool programs. The yearbook is the only national report that provides detailed information about access, administration, and funding of state preschool programs in the U.S. ("Bill and Melinda Gates Foundation Washington State," 2021). The 2020 survey regarding the 2018-19 school year asked states to respond to 292 questions regarding the programs and followed up with each state's program administration to verify and clarify reported information.

The yearbook is organized consistently across the years. Following the Executive Summary of the yearbook, the National Overview section provides an overall picture of the state of pre-k based on the assembly of state responses to the survey. The overview identifies highlights and themes that arise in terms of the enrollment or access, quality or standards, and resources dedicated to the program. The yearbook often highlights current events that impact state preschool such as the most recently released edition highlighting the impact of COVID-19 on early learning. Following the overview and any special topics, the yearbook provides a definition of state preschool and a guide to each of the state information pages. Each state program is described in a two-page summary of the access, spending, and quality standards highlights of each state's program. The Appendix of each yearbook contains the detailed information about each program and provides specific information about access, enrollment, quality, standards, teacher qualifications and supports, and resources dedicated to the program. While the state summaries provide general information, the appendices are the actual responses from the states to the survey. The following sections describe the data to be used in the framing of the typologies.

**Education Typology**

The five characteristics from the NIEER survey that define the education typology are ones that most closely mirror policies of the public education system or indicate a close relationship with public education. As shown in Table 3.1, the five characteristics are taken directly from questions in the NIEER survey of the states.

**Table 3.1**

*Education Typology Characteristics*

| Variable Identifier | Characteristic |
|---|---|
| E1 | State policy requires that lead teachers in state preschool programs have at least a bachelor's degree |
| E2 | State policy requires that state preschool programs provide transition to kindergarten activities |
| E3 | State preschool programs meet daily for a length comparable to a school day (6 hours) |
| E4 | State preschool is funded through the state's K-12 school funding formula |
| E5 | State preschool is delivered, at least in part, in public schools |

The five characteristics outlined in Table 3.1, while not the only characteristics in the NIEER survey that indicate the alignment with the K-12 education system, are selected based on their consistency in collection across the years and their consistency in definition throughout the survey's history.

The first characteristic defining the education frame is the requirement that teachers in ECE classrooms have a bachelor's degree. Teachers with a bachelor's degree are almost exclusively relegated to traditional K-12 school settings. Early care and education settings have a history of not requiring any sort of education or professional requirements for teachers for children. This lack of required education and experience for ECE workers has led to a call for professionalizing the field of early care and education through both education and compensation. Additional characteristics of the education frame are the requirement for activities related to the transition to kindergarten, the requirement that the program meets for the number of hours comparable to a school day, the program is funded through the state's school funding formula, and the program is delivered in public schools.

Early care and education classrooms nationally are often staffed with people with few qualifications other than a high school diploma and a minimum age set by state policy. The early childhood workforce is often only paid a minimum wage and is infrequently compensated at the same level as a professional teacher as in the kindergarten through 12$^{th}$ grade continuum. To operationalize the education frame, one of the characteristics measured in the NIEER survey is whether the state requires that the lead teacher in the pre-kindergarten program have a bachelor's degree. The requirement that the lead teacher has a bachelor's degree is a measurement of the similarity between the pre-kindergarten class characteristics and the K-12 education system where more than 95% of kindergarten teachers are required to have a bachelor's degree (Pianta, Steven Barnett, et al., 2009). The NIEER survey questionnaire asks specifically if the state requires a bachelor's degree for lead teachers. This particular question was present and consistently asked on the survey each year from 2004 – 2019.

The second characteristic that defines the education frame is the state requirement that preschool programs provide transition to kindergarten activities as part of the preschool year. The transition to kindergarten activities characteristic indicates a focus on kindergarten readiness and alignment with kindergarten, the first year of the K-12 education continuum (S. Barnett & Carolan, 2013). The survey asks if there is a policy requiring that state preschool programs provide kindergarten transition activities. The purpose of transition to kindergarten activities is to support the entrance into kindergarten for children and families; if done well, transition to kindergarten activities are an effective tool for school success at school entry (K. Kauerz & Schaper, 2021).

The third characteristic selected from the NIEER survey to create the education frame is the length of the school day. Early childhood programs are loosely categorized as partial day,

school day, and work day in the length of the services provided. Those programs that answered that they provide services for a minimum number of hours comparable to a school day (+/- 6 hours) were coded as having this characteristic. The length of the preschool day is not dictated by policy in some states, but in those where it is required to be comparable to a school day, that state's program was given a "1" for the presence of this characteristic.

Funding for state preschool programs comes from a variety of sources. In some states, there is a dedicated budget line item specifically for the program. In other states, the program is funded through a variety of federal and state sources. State preschool programs that are funded through the school funding formula in the state are assigned this education characteristic. This funding mechanism indicates a close alignment with the kindergarten through 12$^{th}$ grade continuum and is thus scored as such.

The final characteristic used for identifying the education frame is whether the program is delivered, at least in part, in public schools. State preschools often have what is referred to as diverse delivery systems. States often utilize existing resources such as private child care, community organizations providing child care, and Head Start centers in addition to public schools. A few states such as Oklahoma deliver preschool exclusively through the public school system. The variation in delivery provides an opportunity to distinguish the frame for preschool; if a state program delivers any of its services through the public schools, that preschool program was scored accordingly.

**Social Service Typology**

The social service typology of state preschool also utilizes five characteristics and is scored on a 0-5 scale. The five characteristics are those that are consistent with the literature as

well as found consistently present and defined in the NIEER survey from 2004- 2019. The characteristics are developed from the literature that defines social service programs as one in which the focus is on "the health and well-being of children and their families, but also the building of community capacity and social capital" (Nichols & Jurvansuu, 2008, p. 121). As shown in Table 3.2 below, the characteristics of the social service typology are those that are consistent with the definition of social service according to the literature.

**Table 3.2**

*Social Service Typology Characteristics*

| Variable Identifier | Characteristic |
|---|---|
| SS1 | Eligibility based on income |
| SS2 | State policy requires provision of health services to children |
| SS3 | State policy requires screenings of children for health and/or developmental issues |
| SS4 | State policy requires referrals for social services |
| SS5 | State preschool is delivered, at least in part, in Head Start programs |

The first characteristic is related to the eligibility to participate in the program. If a state program targets its program to those with low income by limiting access to a percent of the poverty scale, that program was given a point for the social service typology. State preschool programs have differing policies on income eligibility; some require participants to be at or below the federally defined poverty level while others allow participation from children whose family income is as much as 300% of the poverty level. If income eligibility was a criterion for entry to the program, no matter the percentage of poverty, the program was considered to have this characteristic of a social service program.

The second characteristic that defines the social service frame is if the preschool program is required to provide health services for children in the program. Social service programs are

characterized by their comprehensive nature. Head Start, the largest social service program for young children and their families, is required to provide services to ensure children are healthy as part of the development of young children and family. The NIEER survey has asked over the years about the required services provided to children by state preschool programs. States that require the provision of health services to children are given one point in the social service frame.

The third characteristic of the social service typology is whether a policy exists at the state level that requires screenings of children. Research shows that early identification of existing or potential health and developmental issues through screenings and subsequent referrals and treatment to address issues can increase a child's chances of being successful in school. The data related to screenings in the survey are most clearly presented over time. The survey asks about both screenings and referrals to services based on any issues found in the screenings. However, the data used for this research are simply the screenings. These screenings can fall into multiple categories such as dental, vision, general health, and developmental. If a state preschool program responded that it requires any sort of screening during the year of the survey, the program was coded as 1 or yes to the requirement. There is much variability in types and amounts of screenings, but any positive response to any type of screening resulted in that state program coded as yes.

Characteristic number four of the social service typology is the requirement that state pre-k programs refer children and families for social services. This question, while sounding similar to the referrals related to screenings, is operationally different than the screenings and referrals questions. The referral to social services is a choice in a list of comprehensive services in a separate question and section in the survey. The other comprehensive services listed include

health services for children, as described in the second characteristic above, health services for parents and parent involvement among other specifically listed services considered comprehensive. Those states that responded that the referral to social services is a state requirement received one point for the social service typology.

The fifth and final characteristic used for this research to classify institutional form as social service is whether the program is delivered at least in part through Head Start providers. As noted in Chapter 2, Head Start is the definition of a social service program in that it targets low-income children and families and is required at the federal level to provide comprehensive services to uplift children and families experiencing poverty. If the state preschool delivery system includes Head Start, that preschool program is given a point in the social service frame.

**Workforce Development Typology**

Workforce development has multiple meanings in the context of early childhood education. Developing the future workforce is often the meaning of workforce development in this context. According to much of the economics research, the young children of today are the workforce in 15-20 years, therefore it is important that investments are made in early learning and brain development so that they will be successful in school and later in life (Belfield, Nores, Barnett, & Schweinhart, 2006; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010).

The second meaning of workforce development in the context of early care and education is the need to grow, develop, and compensate the teachers and providers of early care and education services. Teachers and staff of ECE programs are among the least paid of all fields. The National Association for the Education of Young Children (NAEYC) has a specific and

large- scale effort targeted at raising awareness about the need to professionalize the ECE field through increasing competencies and compensation.

The third meaning of workforce development is one that supports working parents. This definition is the one that is used as the primary focus of the workforce development frame for this research. The workforce development typology is an economic perspective on the issue of early care and education. The characteristics, as shown in Table 3.3, of this typology are ones that enable parents to participate in the workforce.

**Table 3.3**

*Workforce Development Typology Characteristics*

| Variable Identifier | Characteristic |
|---|---|
| WD1 | State requires that program meets for a length comparable to a work day (+/- 10 hours per day) |
| WD2 | State policy requires provision of education and job training for parents |
| WD3 | State program is funded, at least in part, by Temporary Assistance for Needy Families (TANF) funds |
| WD4 | State program is funded, at least in part, by Child Care Development Fund (CCDF) |
| WD5 | State preschool is delivered, at least in part, in private child care programs |

State preschool programs range in length from half day to work day. The school day length, approximately six hours, is used as a characteristic of the education frame. The work day length allows parents to drop off children on the way to work and pick up the children after they complete their work day. The work day length is a combination of learning and custodial care and is consistent with child care service provision length.

The second characteristic is a state requirement that the preschool program provides education and job training services for parents of the children in the program. This requirement is

a direct workforce development activity to help improve the knowledge, skills, and abilities of the parents and thus develop the workforce. Child care that is workforce development focused has as one of its primary goals to help parents obtain and retain jobs that are well paying. To do so, child care that is framed as workforce development will provide the necessary job training and education to help parents enter into and remain in the workforce successfully. This approach is an example of the two-generation approach to helping children and families out of poverty (Adams & Heller, 2015).

The two funding sources that define the third and fourth characteristics, TANF and CCDF, are both federal sources that are related to working families. Temporary Assistance to Needy Families (TANF) requires that recipients are engaged in work related activities. The goal is to incentivize job seeking and work behavior and reduce the long term dependence on welfare (Soss et al., 2001). States are allowed to use TANF to fund workforce supports such as preschool and child care. The Child Care and Development Fund (CCDF) is specifically designed to subsidize the private child care market so that low-income families have access to affordable child care specifically for the purpose of allowing parents to work. The CCDF supports both child care access through state defined subsidy programs as well as child care quality that some states have chosen to use as a support and funding source for preschool.

The literature review in Chapter 2 defines the evolution of the current child care system and the original intent of the precursor nursery schools to support mothers in poverty who were forced to work during national crises. Child care is a system that is the original workforce support and is squarely within the workforce development typology. If the state preschool program is delivered, at least in part, in a private child care, the preschool is given a point for the workforce development frame.

**Scoring of the Typologies**

The dependent variable for this study is the state's typology choice for state preschool program. Each state preschool program will be given one point for each of the characteristics within each frame. While it is impossible for any one state program to have all 15 characteristics due to the mutual exclusiveness of some of the choices, it is expected that individual state preschool programs may fall into multiple frames. As a result, the specific typologies for the dependent variable are anticipated to be as follows:

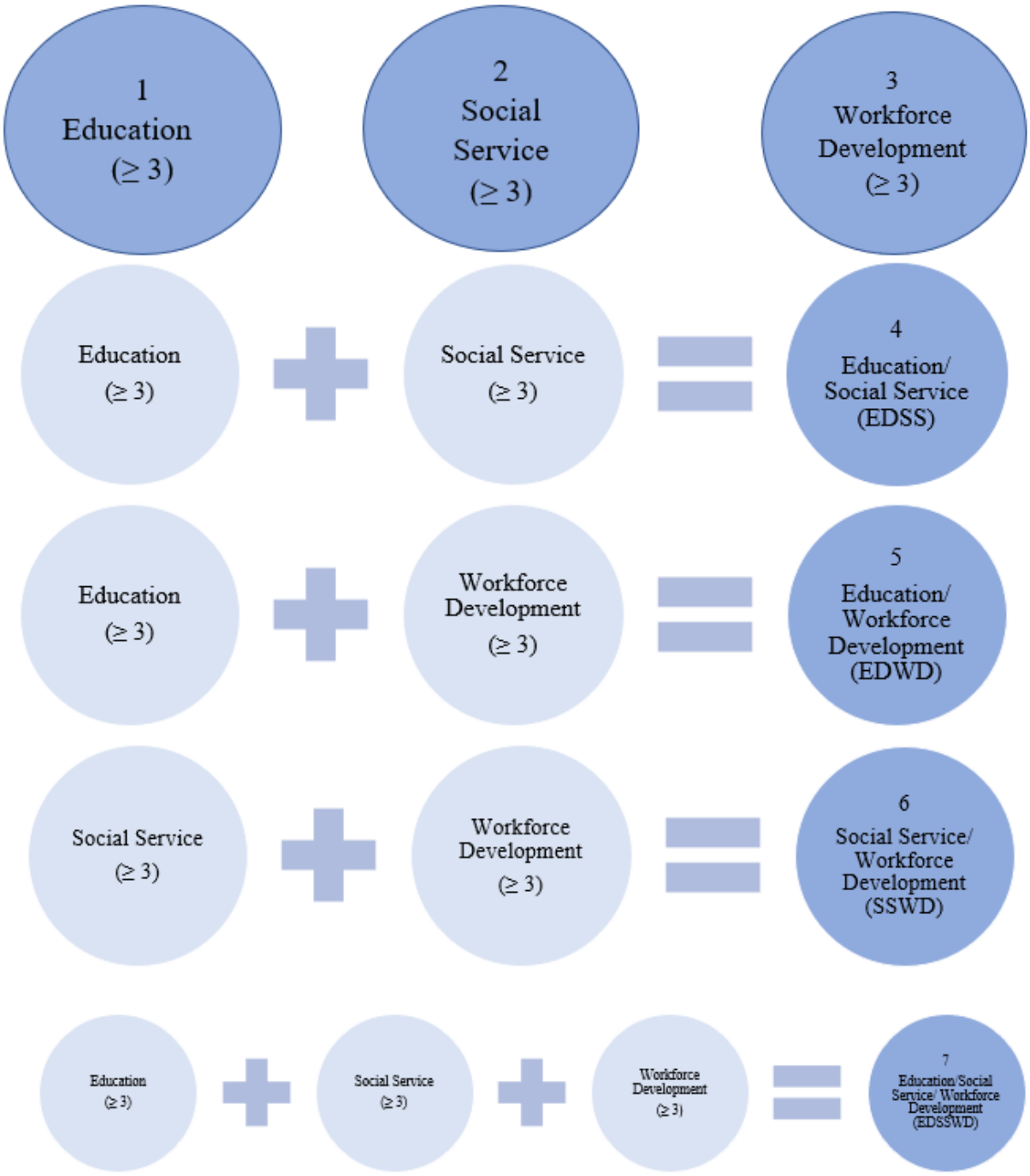
1. Education,
2. Social Service,
3. Workforce Development,
4. Education/ Social Service combined,
5. Education/ Workforce Development combined,
6. Social Service/ Workforce Development combined, or
7. Education/ Social Service/ Workforce Development combined.

The creation of the dependent variable is a multi-step process that first involves scoring each of the programs according to the three frames. Preschool programs that have three or more characteristics of a frame will be assigned that frame. Then each program's scoring will be assessed to determine in which of the above seven categories each program falls. The seven categories will then be used as the dependent variable in the model.

The dependent variable is organized into a total of seven typologies: the three previously mentioned of Education, Social Service, and Workforce Development as well as combinations of each of the individual typologies as shown in Figure 3.1 below.

**Figure 3.1**

*Seven Typologies of Institutional Form*



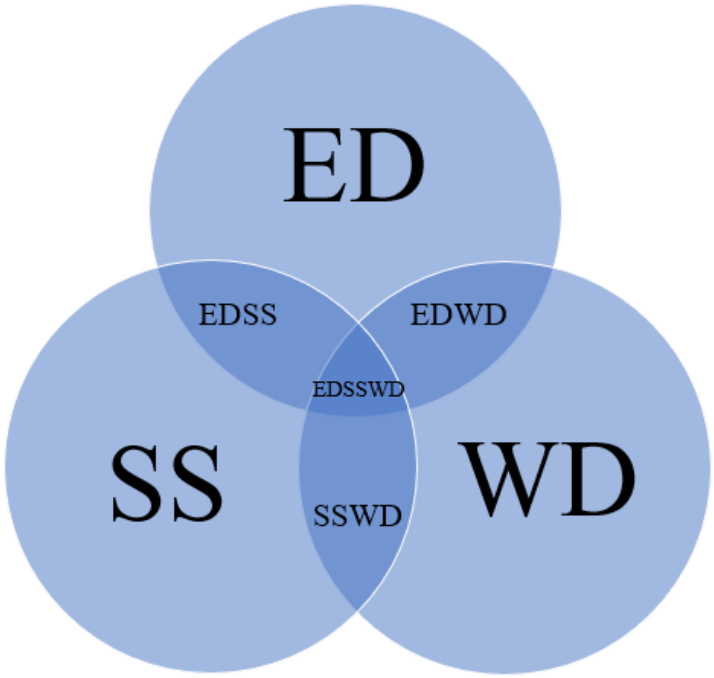

Characteristics of some states are predicted to be associated with more than one of the three frames. If a state is classified as having three or more characteristics in more than one

frame, the state is assigned that combined typology such as Education & Social Service (EDSS) which is a composite typology and considered one of the seven typologies as illustrated in Figure 3.1 above.

The seven typologies can be classified in three frames. For example, those typologies in which three or more education characteristics are demonstrated by the state's pre-kindergarten program are considered part of the education frame of typologies. Figure 3.2 below illustrates the three frames of Education (ED), Social Service (SS), and Workforce Development (WD).

**Figure 3.2**

*Typologies by Frame*



## Independent Variable Groups

The independent variables are categorized into three broad groups: education, political, and socioeconomic. Because state preschool is often considered a contributor to future academic success, the hypotheses are that certain state education characteristics indicate a stronger incentive for the state preschool program to fall into the education frame. The education category of explanatory variables includes those that indicate either an education need in the state or that reflect the state's investment in education.

### *State Education Need Indicators*

The first explanatory variable related to education need is the K-12 spending per pupil. The spending per pupil is available from the U.S. Census Bureau Annual Survey of School System Finances data tables as well as from the National Center for Education Statistics of the Institute of Education Sciences. The spending per pupil amount is adjusted for inflation and the actual dollars per student will be used as a continuous variable within the explanatory variable group.

The second explanatory variable that is an indicator of education need is a declining population of school age children in kindergarten through $12^{th}$ grade. These data are calculations based on the state school enrollment data available from the National Center for Education Statistics. This research will use simple math calculations to determine the difference, whether increase or decrease, in school age population each year. The difference from one year to the next will be the continuous number used for the data analysis.

The third data point in the education need category to be used as a potential explanatory variable is the state's percent of students who are proficient on the $4^{th}$ grade reading portion of

the National Assessment of Educational Progress (NAEP). Lower proficiency scores on NAEP reading are linked to higher need for early education as the NAEP scores are a national indicator of student success. While individual NAEP assessments are offered in math, science, writing, and history, reading is the specific skill most broadly associated with future student success throughout the K-12 years. Table 3.4 below describes the score frequency and the coordinating school and NIEER Yearbook years.

**Table 3.4**

*Variable Years*

| School Year | NIEER Yearbook Year | NAEP Year Scores Used |
|---|---|---|
| 2003 | 2004 | 2003 |
| 2004 | 2005 | 2003 |
| 2005 | 2006 | 2005 |
| 2006 | 2007 | 2005 |
| 2007 | 2008 | 2007 |
| 2008 | 2009 | 2007 |
| 2009 | 2010 | 2009 |
| 2010 | 2011 | 2009 |
| 2011 | 2012 | 2011 |
| 2012 | 2013 | 2011 |
| 2013 | 2014 | 2013 |
| 2014 | 2015 | 2013 |
| 2015 | 2016 | 2015 |
| 2016 | 2017 | 2015 |
| 2017 | 2018 | 2017 |
| 2018 | 2019 | 2017 |

The National Center for Education Statistics is the source for this statistic that is offered every two years, and the statistic will be used for a two-year period.

The final indicator used as part of education need is the high school dropout rate as provided by the American Community Survey (ACS) through the U.S. Census Bureau. The

measure for this variable is the percent of population age 25 and older that has less than a high school education attainment as measured through the ACS and made available through the Social Explorer data tables tool. This variable is a continuous variable measured as a percentage and is available for each of the years of this study from 2003 – 2018.

### *Political Variables*

The political influences at the state level will be measured broadly in terms of the government ideology, citizen ideology, and party of the government in the state. Both government ideology and citizen ideology are based on the work of Berry et al in 1998 and 2010 (W. D. Berry, Fording, Ringquist, Hanson, & Klarner, 2010; W. D. Berry et al., 1998). These measures of ideology are continuous variables that reflect partisanship on a continuum of liberalism to conservatism. On a scale of 0-100, the higher scores reflect a higher level of conservatism. While there are other measures of ideology at both the citizen and state government levels, the Berry et al measures have been well utilized in literature, particularly in the seminal Soss et al. (2001) work on correlating state characteristics to welfare reform among the states. The data are available through the 2016 year; for 2017-2018, the values of the final year available will be imputed for the most recent two years.

An additional measure of the political leaning of the state will include the party of the governor, the party of the legislature, and whether the state is a trifecta of the republican party. The trifecta is defined as both houses of the legislature as well as the governor are all three a majority republican. The reference category for the party of the governor and the party of the legislature will be the republican party. The party of the governor will be a dichotomous variable with zero as not republican and one as republican. The same is true for the legislature and the

republican trifecta. These data are gathered from the National Conference of State Legislatures and the National Governors Association.

### *Socioeconomic Indicators of Need*

A variety of socioeconomic variables will be utilized in this panel data including per capita income, size of population, unemployment rate, percent of population that is non-white, the percent of mothers who are unwed, and the Gini Index of income inequality. Each of these data are continuous variables obtained from the American Community Survey administered by the U.S. Census Bureau.

Per capita income will be in terms of dollars and will reflect 2019 inflation adjustments. The size of the population will be the actual number of individuals in the state's population. Unemployment, non-white population, and unwed mothers will be presented as percentages of the total population for each state. The Gini index or coefficient is a scale of 0-1 with 0 being perfect income equality and 1 being perfect inequality. The coefficient is expressed in continuous decimals along the scale. States with a higher coefficient will be those with greater income inequality among the population.

## Coding for Analysis

The unit of analysis is the program typology in a state year. To establish unique identifiers for each program within each state year, each case was assigned a code comprised of the year of the program, the state abbreviation, and number assigned to each program code. For example, the Alabama First Class Pre-K program in 2015 was Alabama's only state preschool program. The data for the program were presented in the 2016 NIEER yearbook. The code for the 2015 Alabama program presented in the 2016 yearbook is 2015AL1. The master list of state

codes can be found in Appendix 1. The codes were established so that future research can focus on the time series component, and for the purpose of this research, each state program in a state year is assigned a unique program identifier.

**Methodology**

The methodology to be used for this study is logistic regression analysis. The data were entered, coded, and cleaned using Microsoft Excel. The logistic regression analyses were performed using Stata-17. To best analyze the data, each of the dependent variables or typologies of the institutional form for state pre-kindergarten are coded as 0 and 1 and analyzed using logit. Each individual state program is assigned a typology for each state year based on the characteristics of the program in that year. Programs are only assigned to one typology; for example, if a program has three or more characteristics of the Education (ED) frame and three or more characteristics of the Social Service frame, that program is classified as Education-Social Service (EDSS) only and not as ED, SS, and EDSS. Each state program in each year is uniquely classified in only one typology.

This dataset is a compilation of state pre-kindergarten program data from each of the NIEER yearbooks from 2003-2018 and could be utilized as a panel dataset. However, for the purposes of this study to develop the typologies as well as to determine the relationship between state choices of institutional form and the characteristics of state pre-kindergarten programs, the data were used as a pooled cross section to maximize the number of cases. The population of the study is the individual programs within each state in each year, recognizing that some states only have one program while other states have as many as four programs. States without programs will be excluded from the study and introduced when and if the state develops a program in a

subsequent year. For example, Montana appears for only one year; the state had a pilot program that was not subsequently funded by the legislature.

## Chapter 4: Creating the Typologies and Analyzing State Choices

This dissertation first constructs the dependent variable that is the typology of the institutional form for state preschool programs. The dependent variable, on which future research will be built, is a construct of fifteen individual characteristics that fit into one of three categories, called frames for the purpose of this research. The frames and their combinations then comprise the seven individual typologies. While there are multiple other characteristics of state pre-kindergarten programs collected annually through the National Institute for Early Education Research (NIEER), the data used for this research are selected based on their consistency with literature as well as consistency over time in being collected in the survey. This survey is the only consistent data collection tool and publication describing state pre-kindergarten programs from 2002 through the present time. This chapter describes the results of the construction of the dependent variable as well as the analysis of the relation of the dependent variable to state characteristics. This multilayer process of analysis is described first through the results of the individual characteristics, then through the results of typologies as created by the combination of the individual characteristics. Finally, the analysis of the relationship between typologies and state characteristics is described. The common unit of analysis across programs, states, and characteristics is state year that is a construct of the specific state in which the program is located and the year in which the school year ended.

### Characteristics as Components of Construction of Dependent Variable

The dependent variable was constructed using the fifteen characteristics found over time in the survey of state preschool programs administered by NIEER. The NIEER survey collects a plethora of information about state pre-kindergarten programs, and fifteen of the data points were selected to be classified and used in the construction of the dependent variable for this research.

The program characteristics used are measured across the 16-year period of data from the NIEER surveys. Each characteristic is reported both by year in terms of the number of state pre-kindergarten programs that have such characteristics each year as well as across time in terms of state years. To ensure that the selected characteristics did not directly lead to a prediction of the presence of another, a correlation analysis of the characteristics was conducted. As shown in Table 4.1 below, one of the two highest correlating characteristics (0.62) are the requirement that children are provided with health services and the requirement for referral to social services. The other characteristic that is over the 50% correlated is the delivery in Head Start and private child care. This may be explained by the fact that there are three primary delivery systems for state pre-kindergarten: public schools, private child care and Head Start. Public school is the most prominent of the three which leaves a de facto correlation between Head Start and private child care. While correlations among the characteristics that are the building blocks for the typologies are not related to bias in the model, the purpose of the chosen characteristics was to choose ones which were not automatically associated with each other to build a more thorough and reflective model of each typology. It was surprising that correlations were not stronger, particularly among the use of TANF and CCDF funds as well as between income eligibility and Head Start programs. As shown later in the analysis and in Figure 4.1, income eligibility is one of the most frequently reported characteristics of state pre-kindergarten programs.

**Table 4.1**

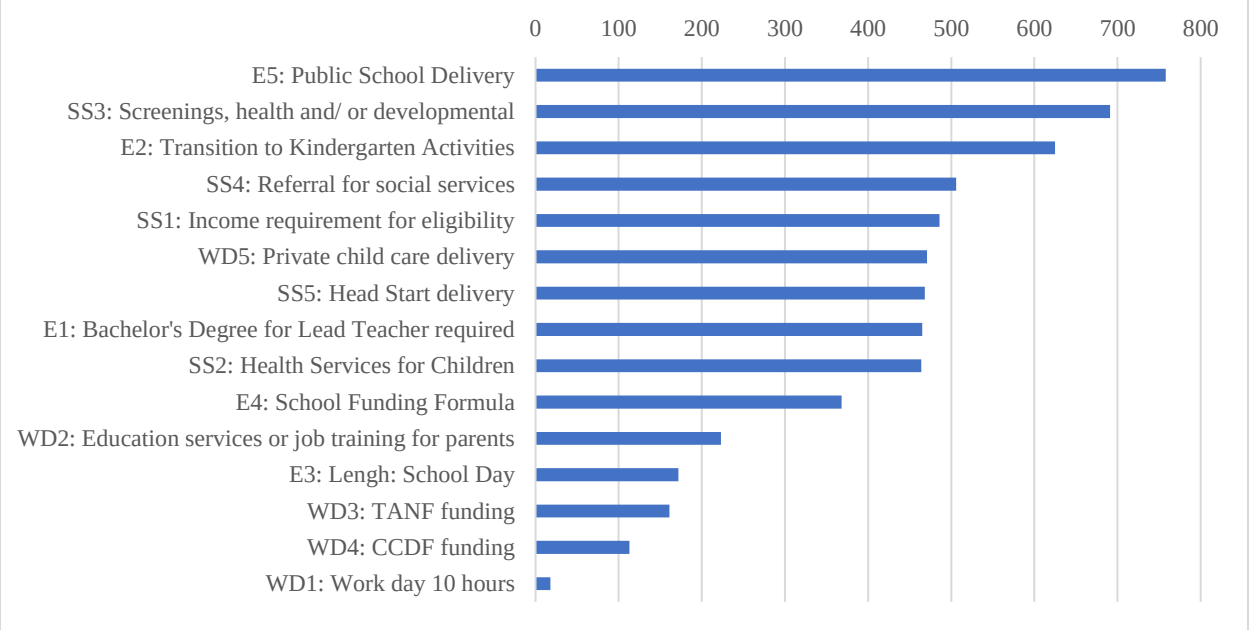
*Correlation of Dependent Variable Characteristics*

| | Bach Degree | K Transition | School Day | School Fund Form | Public School Deliv | Income Elig | Health Svcs | Screenings | Social Serv Ref | Head Start Deliv | Work Day | Job Training | TANF | CCDF | Private CC Deliv |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bach Degree | 1.00 | 0.00 | 0.21 | 0.17 | 0.18 | -0.25 | -0.13 | 0.06 | -0.13 | -0.31 | 0.05 | -0.18 | -0.02 | -0.08 | -0.20 |
| K Transition | 0.00 | 1.00 | 0.15 | -0.01 | -0.04 | 0.16 | 0.36 | 0.31 | 0.36 | 0.21 | -0.01 | 0.29 | 0.03 | -0.01 | 0.18 |
| School Day | 0.21 | 0.15 | 1.00 | -0.02 | 0.11 | -0.05 | 0.08 | 0.18 | 0.02 | -0.03 | -0.07 | -0.02 | 0.14 | -0.07 | 0.02 |
| School Fund Form | 0.17 | -0.01 | -0.02 | 1.00 | 0.08 | -0.13 | 0.03 | -0.01 | 0.01 | -0.37 | -0.11 | -0.01 | -0.06 | -0.01 | -0.35 |
| Public School Deliv | 0.18 | -0.04 | 0.11 | 0.08 | 1.00 | -0.12 | -0.12 | -0.01 | -0.15 | 0.06 | -0.25 | -0.22 | -0.06 | 0.01 | 0.28 |
| Income Elig | -0.25 | 0.16 | -0.05 | -0.13 | -0.12 | 1.00 | 0.21 | 0.07 | 0.20 | 0.14 | 0.08 | 0.21 | 0.03 | -0.02 | 0.01 |
| Health Svcs | -0.13 | 0.36 | 0.08 | 0.03 | -0.12 | 0.21 | 1.00 | 0.37 | 0.62 | 0.13 | 0.03 | 0.43 | 0.12 | -0.03 | 0.01 |
| Screenings | 0.06 | 0.31 | 0.18 | -0.01 | -0.01 | 0.07 | 0.37 | 1.00 | 0.33 | 0.11 | 0.07 | 0.18 | 0.17 | 0.03 | 0.03 |
| Social Serv Ref | -0.13 | 0.36 | 0.02 | 0.01 | -0.15 | 0.20 | 0.62 | 0.33 | 1.00 | 0.15 | 0.02 | 0.43 | 0.06 | -0.02 | 0.03 |
| Head Start Deliv | -0.31 | 0.21 | -0.03 | -0.37 | 0.06 | 0.14 | 0.13 | 0.11 | 0.15 | 1.00 | -0.03 | 0.12 | 0.00 | 0.04 | 0.69 |
| Work Day | 0.05 | -0.01 | -0.07 | -0.11 | -0.25 | 0.08 | 0.03 | 0.07 | 0.02 | -0.03 | 1.00 | -0.09 | 0.10 | -0.01 | 0.07 |
| Job Training | -0.18 | 0.29 | -0.02 | -0.01 | -0.22 | 0.21 | 0.43 | 0.18 | 0.43 | 0.12 | -0.09 | 1.00 | -0.02 | -0.01 | -0.02 |
| TANF | -0.02 | 0.03 | 0.14 | -0.06 | -0.06 | 0.03 | 0.12 | 0.17 | 0.06 | 0.00 | 0.10 | -0.02 | 1.00 | 0.25 | 0.01 |
| CCDF | -0.08 | -0.01 | -0.07 | -0.01 | 0.01 | -0.02 | -0.03 | 0.03 | -0.02 | 0.04 | -0.01 | -0.01 | 0.25 | 1.00 | 0.05 |
| Private CC Deliv | -0.20 | 0.18 | 0.02 | -0.35 | 0.28 | 0.01 | 0.01 | 0.03 | 0.03 | 0.69 | 0.07 | -0.02 | 0.01 | 0.05 | 1.00 |

Understanding the relative frequencies and correlations of the individual characteristics that comprise the frames offers a deeper understanding of the construction of the seven typologies. The frequencies of the characteristics reported present in the states over the years of the study are shown in Figure 4.1 below.

**Figure 4.1**

*Frequency of Characteristics Over All Years and All Programs*

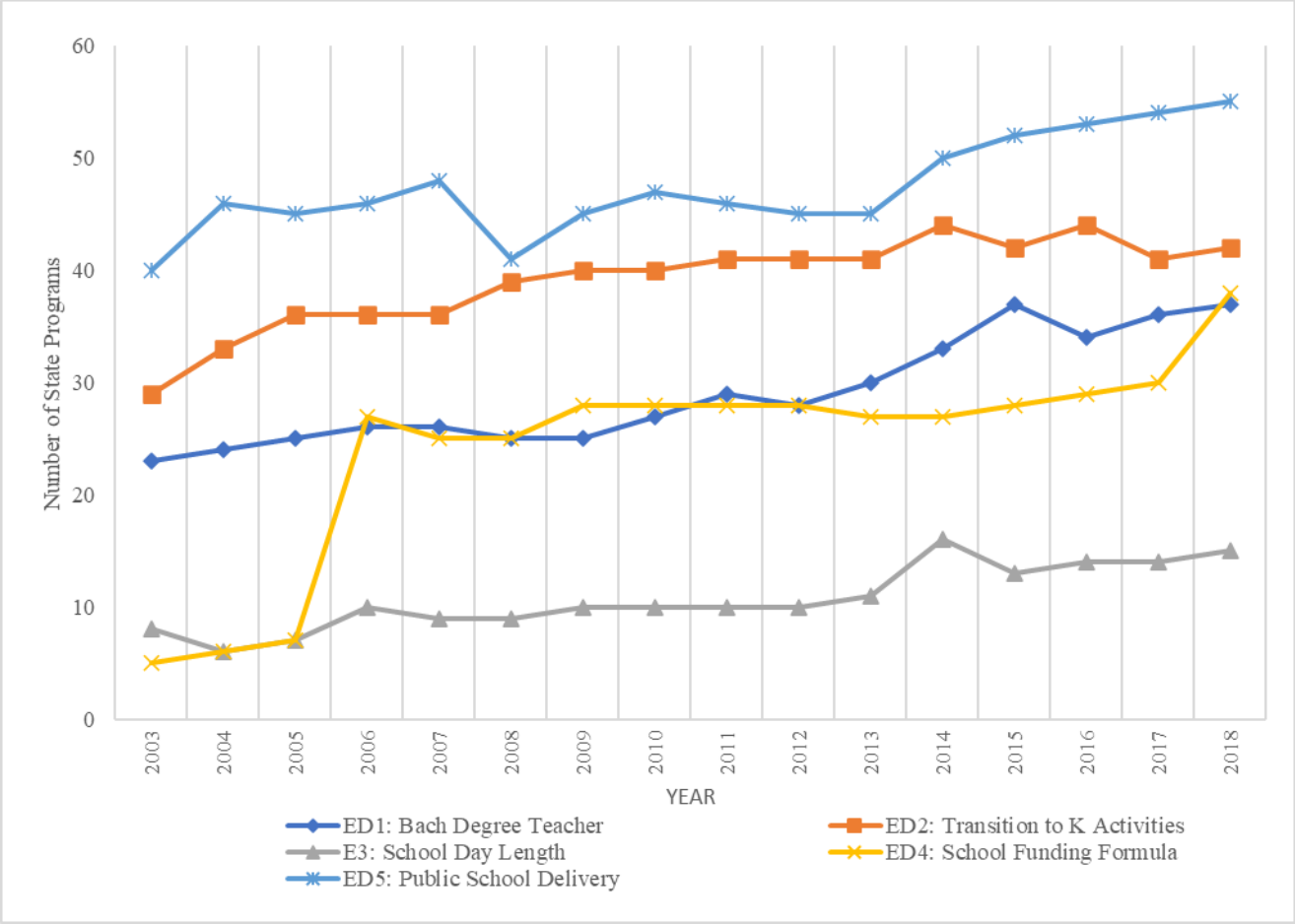



Over the 844 observations of state preschool programs from 2003 – 2018, 758 reported that the delivery system was at least in part through public schools. Of the most frequently reported classified characteristics of state pre-kindergarten programs, the top five characteristics are in the Education and Social Service typologies. Overall, the Workforce Development typology characteristics are the least represented across all years and all programs.

As shown in Figure 4.2, the overall number of education characteristics demonstrated through the survey has increased from 2003-2018.

**Figure 4.2**

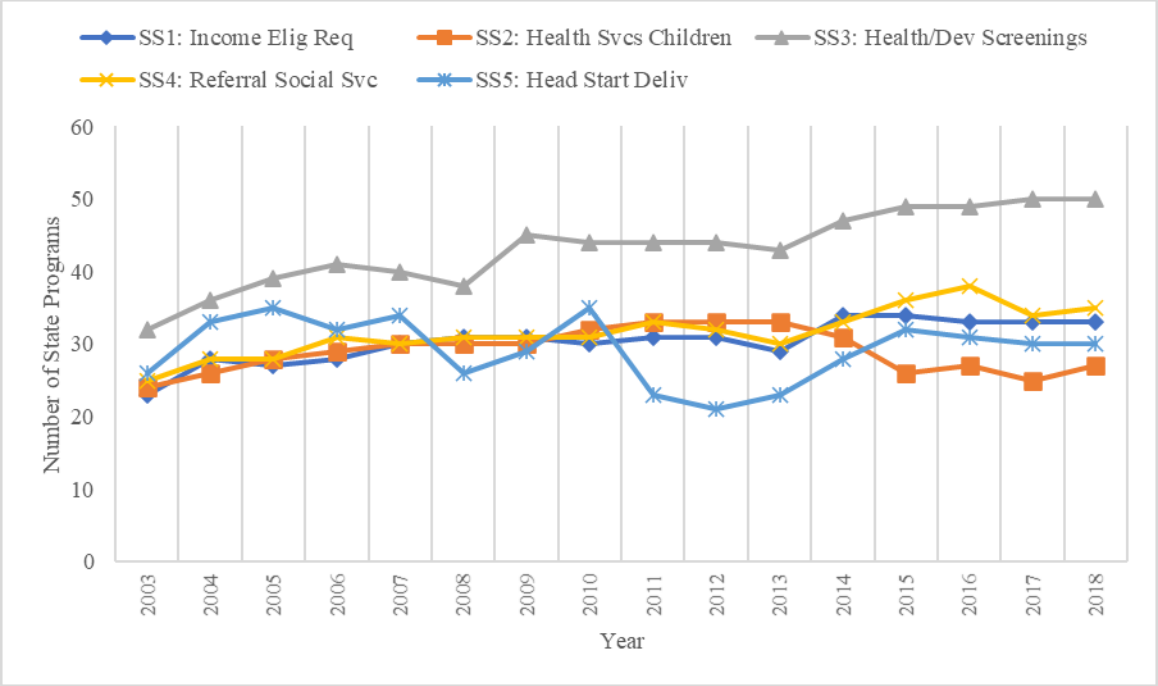
*Number of Education Characteristics of State Preschool Programs by Year*




The characteristic with the most dramatic increase is whether the state preschool program is funded, at least in part, through the state's school funding formula (ED4). The overall most prevalent characteristic of all characteristics in any of the typologies is whether the delivery of the pre-kindergarten program is delivered either wholly or in part in the public-school setting (ED5). By comparison, the number of social service characteristics have been relatively stable from 2003-2018 as shown in Figure 4.3 below.

**Figure 4.3**

*Number of Social Service Characteristics of State Preschool Programs by Year*

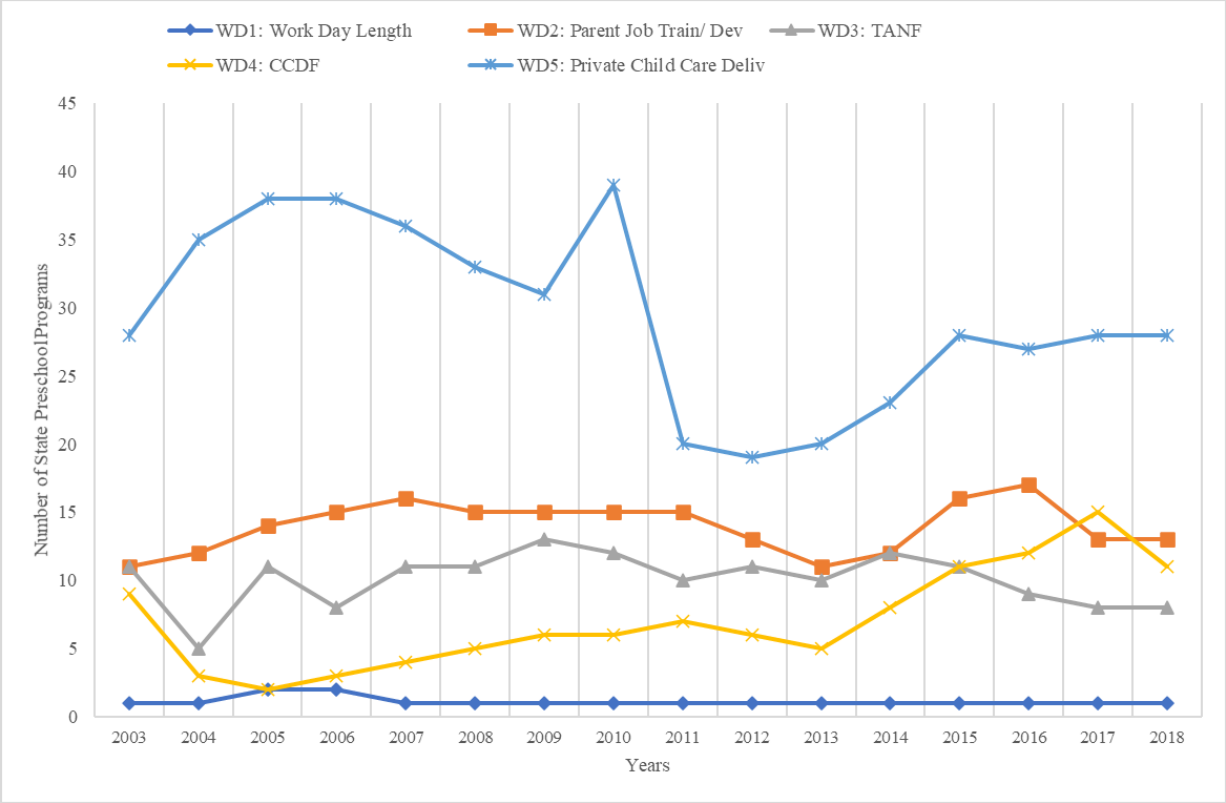



The exception to the stability of the social service characteristics is the requirement that programs screen children for health and/ or developmental issues. This increase coincides with the broad awareness of and publication about the importance of screening children for health and developmental delays prior to school entry (Lipkin, Macias, & Council on Children With Disabilities, 2020). The other four social service characteristics have remained relatively stable and consistent over time even as the number of state preschool programs has grown.

While workforce development is often a reason advocates give for the need for state preschool programs, the workforce development characteristics are the least frequent as shown in Figure 4.4 below.

**Figure 4.4**

*Number of Workforce Development Characteristics of State Preschool Programs by Year*

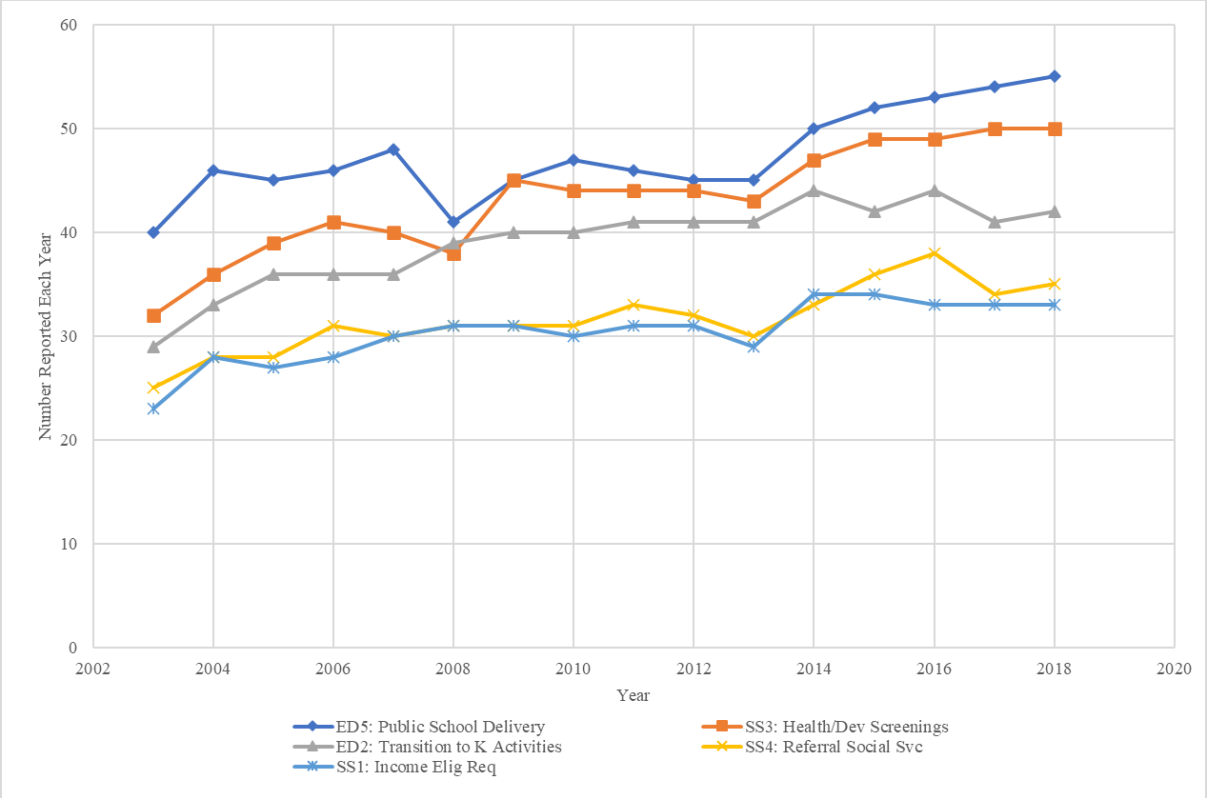



In particular, the number of state pre-kindergarten programs each year that are required to offer full work day programs has declined or remained flat over time. The most interesting line is that of the private child care delivery characteristic. As discussed in Chapter 2, child care is uniquely positioned as both a public good as well as a provision of service of the market. Additionally, child care has been characterized by some as educational and others as a day nursery or simply a place to keep children safe while parents work. The inconsistency of this line suggests that the identity and characterization of the purpose of child care may contribute to its lack of consistency as a provider of state pre-kindergarten and warrants further research as will be discussed in Chapter 5.

Education characteristics appear to be growing, social service characteristics appear to remain relatively steady, and workforce development characteristics are either flat or mostly in decline. This may indicate that states are not conscious of the presence of or need for particular characteristics to meet specific policy goals. One reason is that the policies associated with the Workforce Development characteristics, such as providing workforce training or providing full day care for young children, have a substantial cost associated with them. Workforce development as a policy issue continues to be on the agenda of nearly every national, state, and local association and policy body, particularly as the country recovers from the Coronavirus pandemic of 2020-2021 and the impact on businesses and the workforce. A google search of workforce development policy returns nearly 64 million results. However, states have not chosen to apply characteristics consistent with workforce development efforts to state pre-kindergarten programs. Of the five most frequently reported characteristics using the pooled state years, those five characteristics fit in the social service or education typologies as shown in Figure 4.5 below. Of note is that none of the most five frequently reported characteristics are in the workforce development frame. This analysis of the individual characteristics provides insight into the choices for typologies for each of the state pre-kindergarten programs.

**Figure 4.5**

*Most Frequently Reported Characteristics by Year*




## Defining the Typologies of Institutional Form

The three categories of institutional form were defined by five characteristics each. While there are were initially three categories for institutional form, the combination of the characteristics shows that there are eight distinct typologies of institutional form for state preschool. As shown in Table 4.2, the base typologies of Education (ED), Social Service (SS), and Workforce Development (WD) combined to form seven possible combinations of the three base categories and one category that is for programs that do not meet the threshold of having three characteristics of any single frame.

**Table 4.2**

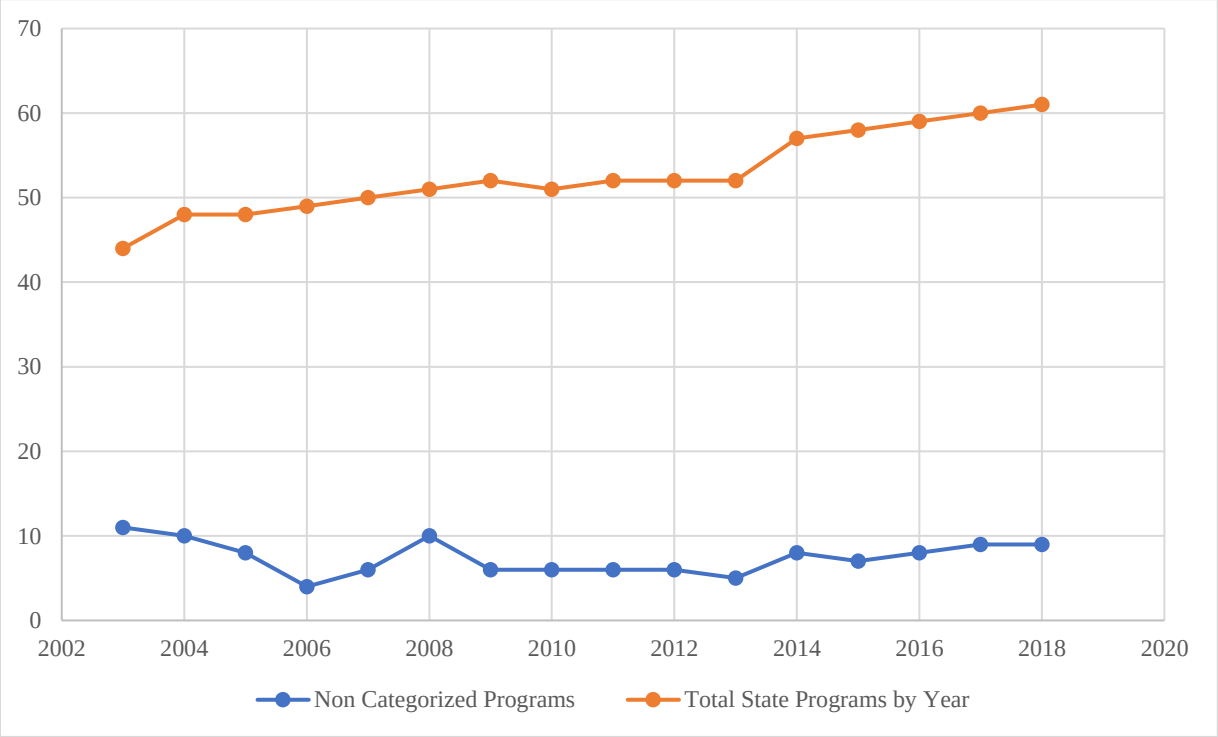
*Typologies By Year*

| Year | EDSS | SS | No Program | ED | No Type | SSWD | EDSSWD | EDWD | WD | Total State Programs by Year | Total Observations |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 5 | 14 | 12 | 8 | 11 | 2 | 2 | 0 | 2 | 44 | 56 |
| 2004 | 12 | 16 | 12 | 8 | 10 | 2 | 0 | 0 | 0 | 48 | 60 |
| 2005 | 15 | 18 | 12 | 4 | 8 | 1 | 1 | 1 | 0 | 48 | 60 |
| 2006 | 25 | 10 | 12 | 6 | 4 | 1 | 3 | 0 | 0 | 49 | 61 |
| 2007 | 22 | 11 | 12 | 6 | 6 | 1 | 2 | 2 | 0 | 50 | 62 |
| 2008 | 20 | 11 | 12 | 6 | 10 | 2 | 0 | 2 | 0 | 51 | 63 |
| 2009 | 18 | 11 | 10 | 10 | 6 | 2 | 3 | 2 | 0 | 52 | 62 |
| 2010 | 21 | 12 | 11 | 8 | 6 | 1 | 2 | 1 | 0 | 51 | 62 |
| 2011 | 25 | 11 | 10 | 7 | 6 | 3 | 0 | 0 | 0 | 52 | 62 |
| 2012 | 22 | 13 | 10 | 8 | 6 | 3 | 0 | 0 | 0 | 52 | 62 |
| 2013 | 24 | 11 | 10 | 9 | 5 | 3 | 0 | 0 | 0 | 52 | 62 |
| 2014 | 23 | 11 | 7 | 11 | 8 | 3 | 0 | 0 | 1 | 57 | 64 |
| 2015 | 19 | 13 | 7 | 14 | 7 | 2 | 2 | 0 | 1 | 58 | 65 |
| 2016 | 22 | 11 | 9 | 14 | 8 | 4 | 0 | 0 | 0 | 59 | 68 |
| 2017 | 20 | 10 | 5 | 16 | 9 | 4 | 1 | 0 | 0 | 60 | 65 |
| 2018 | 25 | 6 | 5 | 17 | 9 | 1 | 3 | 0 | 0 | 61 | 66 |
| Totals by Type | 318 | 189 | 156 | 152 | 119 | 35 | 19 | 8 | 4 | 844 | 1000 |

The trend of the programs that were considered No Type or non-categorized is shown in Figure 4.6 below. The comparison of the two lines indicates a leveling off of the number of non-categorized programs over the past three years as compared to the increase in overall number of state pre-kindergarten programs.

**Figure 4.6**

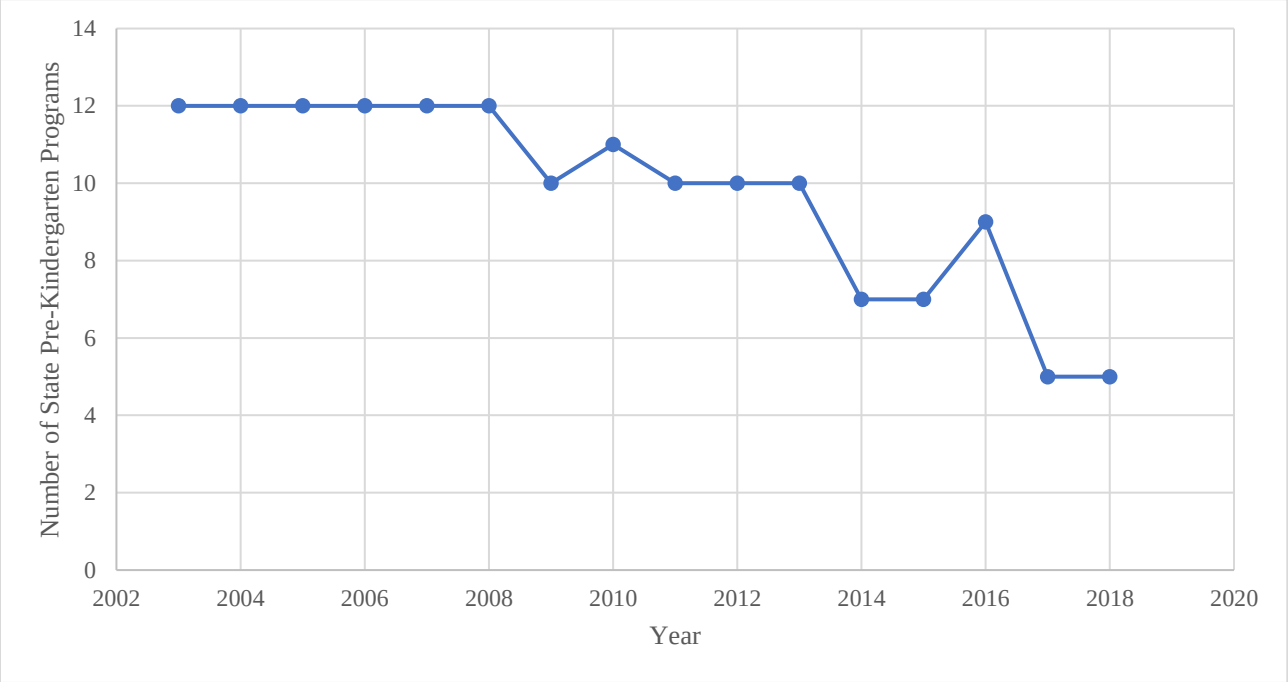
*Non-Categorized State Pre-Kindergarten Programs and All Programs*




Finally, the number of states without programs proved to be an interesting and important observation to place perspective around the number of states over time without a state preschool program. The number of states with state preschool programs has grown over time. Some states have as many as four different programs that are considered state pre-kindergarten or preschool programs. As show in Figure 4.7 below, the number of states without state preschool programs has declined over time. While the reason for such decline in numbers will be the focus of future studies, the inclusion and recognition that more states overall have chosen to create and implement state pre-kindergarten programs is an interesting observation to provide context about state choices for the current research.

**Figure 4.7**

*States Without State Preschool Programs*



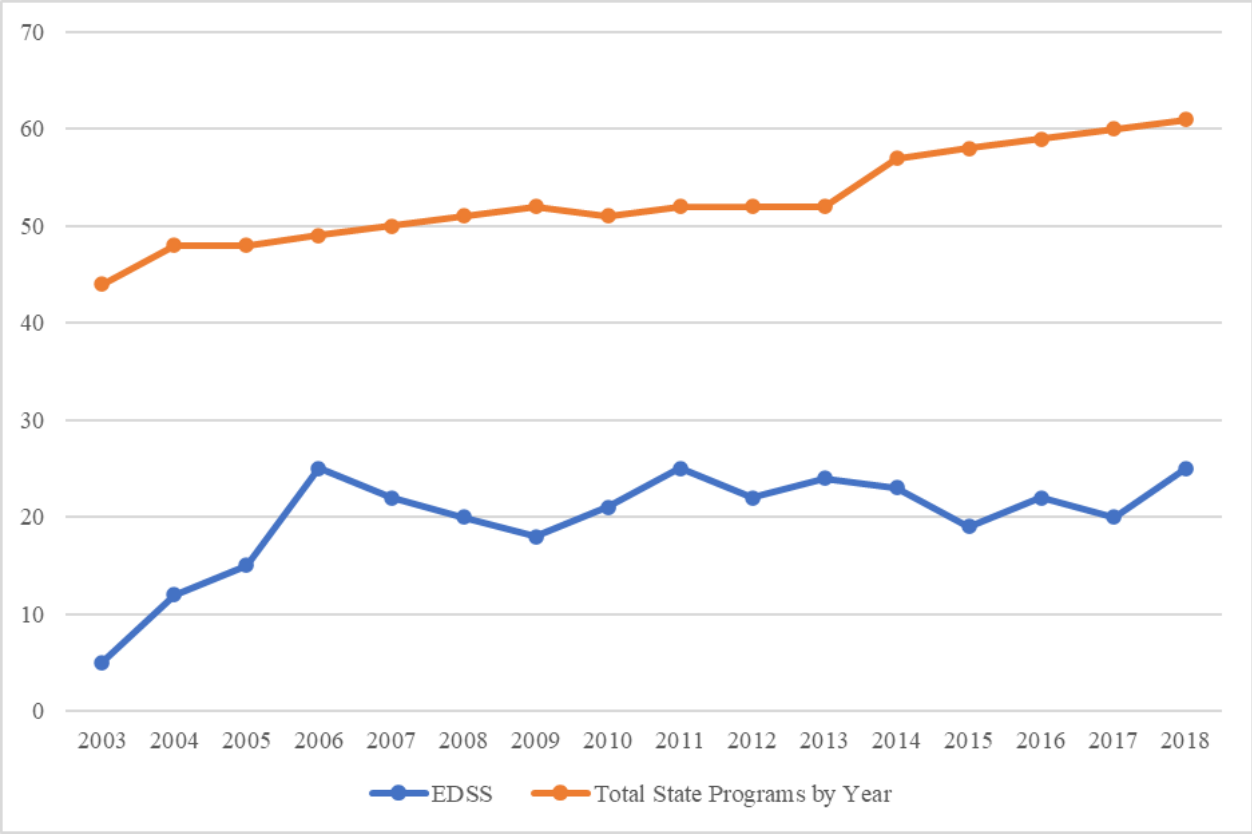

Each program was initially assigned its category if that program scored at least three of five possible characteristics in a specific category of ED, SS, or WD. If that program scored at least three of five possible characteristics in more than one base category of ED, SS, or WD, that program was assigned a combination typology. The four combinations are Education & Social Service (EDSS), Education & Workforce Development (EDWD), Social Service & Workforce Development (SSWD), and Education, Social Service, & Workforce Development (EDSSWD). Additionally, there were multiple occurrences of programs that did not meet the threshold of having three or more characteristics of any one typology. These programs, designated as No Typology, were in substantial enough numbers that it would have been an error not to include them in the analysis. Finally, over time, there are states that have no program. While the states with No Program are included in the descriptive analysis of the dependent variable of typology,

they are not included in the analysis of state characteristics and their association with choice of typology.

The most prevalent typology of institutional form of state preschool is the Education & Social Service (EDSS) typology. Of the 844 state years of programs, 318 are classified as the EDSS typology. Figure 4.8 shows the trend of the EDSS typology year over year.

**Figure 4.8**

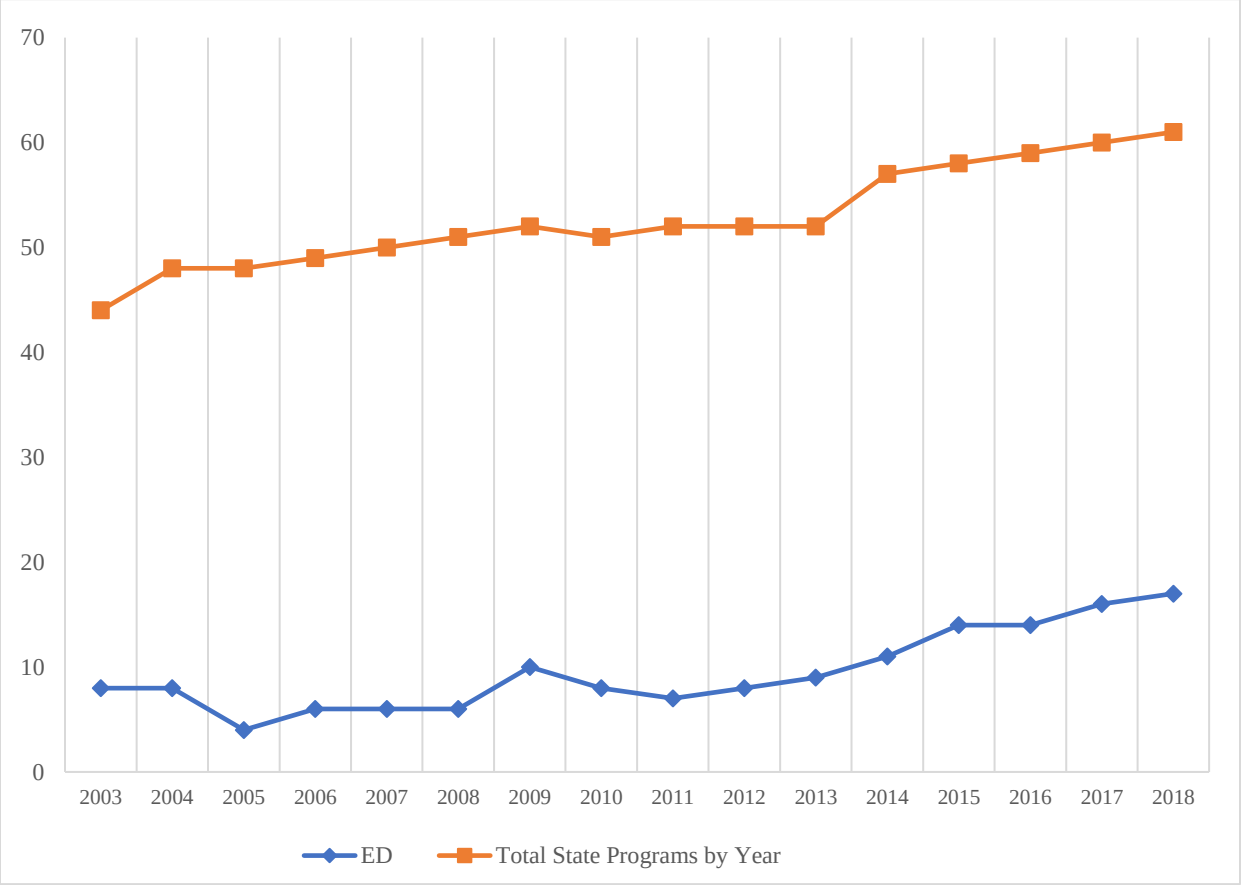
*Education & Social Service (EDSS) Over Time*




The growth of the EDSS typology is reflective of the increase in programs with a focus on education over time. The Education (ED) typology shows the increase in programs focusing specifically on education as shown in Figure 4.9 below.

**Figure 4.9**

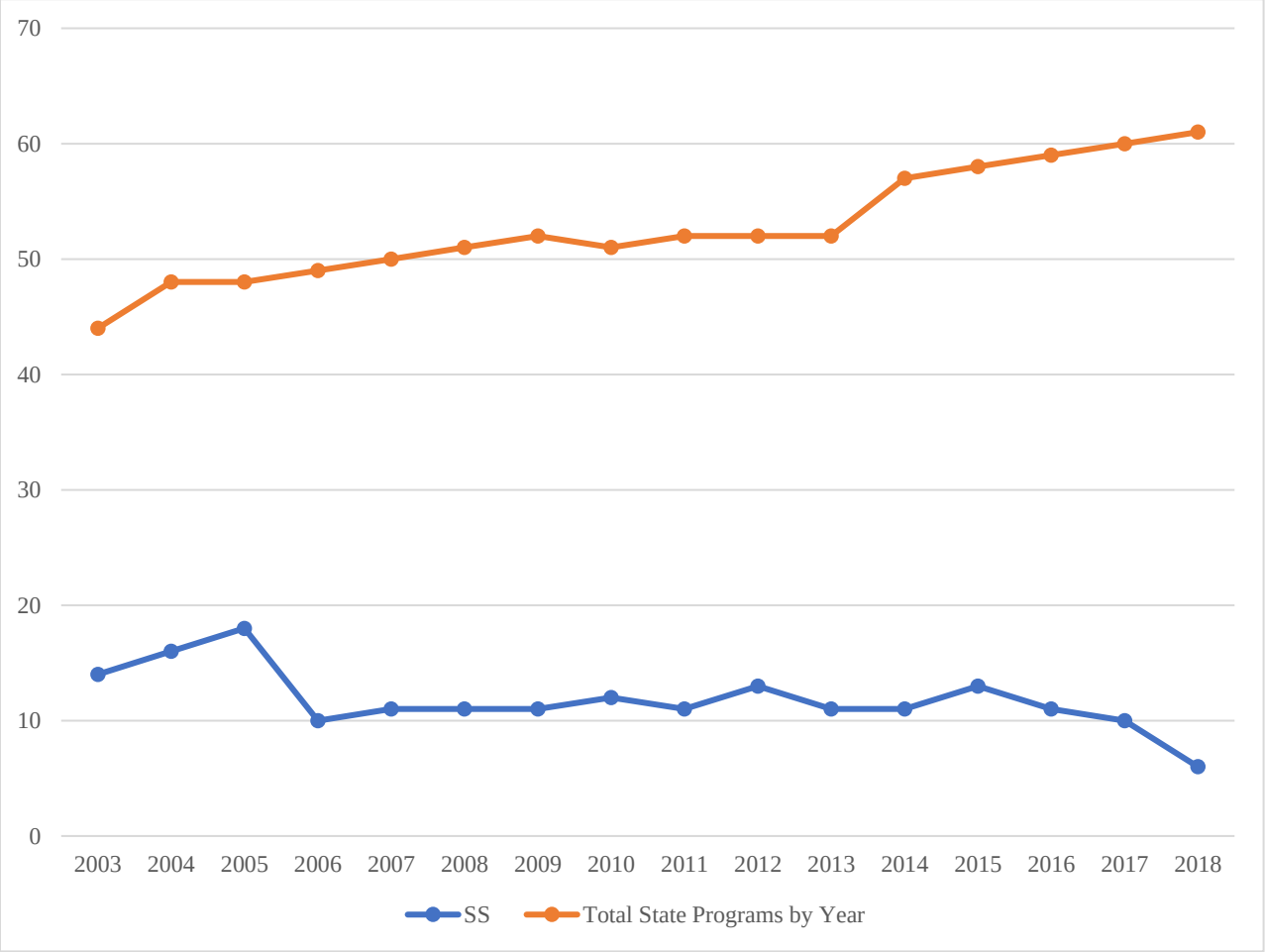
*Education Frame Over Time*




Conversely, as shown in Figure 4.10 below, the overall number of social service type state pre-kindergarten programs has decreased.

**Figure 4.10**

*Social Services Frame Over Time*




The three most prominent named typologies are EDSS, ED, and SS. Additionally, the states with no state pre-kindergarten programs account for a large number of cases as do the states with programs that do not have enough characteristics in one typology to meet the base requirement for that typology. The remaining typologies each have a Workforce Development (WD) component and have very low frequencies. As shown in Table 4.1, the only WD typology characteristic that appears in the ten most frequently reported characteristics is the delivery through the private child care system.

## Predictor Variables

The predictors were chosen based on the literature and to provide a broad picture of state characteristics that may be provide insight into the choices of institutional form. Table 4.3 below shows the correlations among the predictors.

**Table 4.3**

*Correlations of Predictor Variables*

| | K12 5-year Enrollment Change | Per Student Spending K12 | NAEP 4th Grade Avg Scale Score | Total Population | Per Capita Income (Adj. 2019) | Unempl. Rate | % Pop Non-White | % Pop <High School | Gini Index | % Births to Unwed Mothers | Repub. Leg. | Repub. Gov | Trifecta Repub. | Citizen Ideology |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K12 5 year Enrollment Change | 1.00 | | | | | | | | | | | | | |
| Per Student Spending K12 | -0.38 | 1.00 | | | | | | | | | | | | |
| NAEP 4th Grade Avg Scale Score | -0.20 | 0.56 | 1.00 | | | | | | | | | | | |
| Total Population | 0.02 | 0.01 | -0.03 | 1.00 | | | | | | | | | | |
| Per Capita Income (Adj. 2019) | -0.11 | 0.76 | 0.58 | 0.19 | 1.00 | | | | | | | | | |
| Unemployment Rate | -0.11 | -0.04 | -0.13 | 0.14 | -0.21 | 1.00 | | | | | | | | |
| Percent of Population Non-White | 0.08 | 0.05 | -0.29 | 0.23 | 0.18 | 0.19 | 1.00 | | | | | | | |
| Percent of Population < High School | 0.14 | -0.40 | -0.57 | 0.22 | -0.53 | 0.22 | 0.15 | 1.00 | | | | | | |
| Gini Index of Income Inequality | -0.05 | 0.15 | -0.03 | 0.42 | 0.28 | 0.08 | 0.46 | 0.25 | 1.00 | | | | | |
| Percent Births to Unwed Mothers | -0.07 | -0.25 | -0.51 | -0.01 | -0.41 | 0.26 | 0.41 | 0.41 | 0.39 | 1.00 | | | | |
| Republican Legislature | 0.16 | -0.35 | -0.11 | 0.09 | -0.25 | -0.06 | 0.05 | 0.00 | 0.09 | 0.26 | 1.00 | | | |
| Republican Governor | 0.09 | -0.14 | -0.10 | 0.01 | -0.10 | -0.01 | 0.12 | 0.01 | 0.09 | 0.17 | 0.24 | 1.00 | | |
| Trifecta Republican | 0.16 | -0.36 | -0.13 | 0.10 | -0.25 | 0.01 | 0.14 | 0.05 | 0.17 | 0.33 | 0.74 | 0.58 | 1.00 | |
| Citizen Ideology | -0.34 | 0.68 | 0.44 | 0.02 | 0.54 | -0.11 | -0.11 | -0.25 | 0.02 | -0.24 | -0.46 | -0.26 | -0.41 | 1.00 |

The original model included the variable Government Ideology that showed strong negative correlations with the Republican Legislature (-0.68), Republican Governor (-0.74), and Trifecta Republican (-0.79) variables. Additionally, Government Ideology shows strong correlation with Citizen Ideology (0.64). While some correlations among variables in the model are expected due to the interrelatedness of the independent variables, this one raised a red flag. As a result, collinearity diagnostics were downloaded into Stata and run on the predictor variables. While some tolerance for collinearity exists in the model, the Government Ideology exceeded the thresholds for collinearity (UCLA: Statistical Consulting Group, n.d.). As a result, Government Ideology was dropped from the model.

The variables of Per Capita Income and Trifecta Republican also showed more than one strong predictor. Additionally, the NAEP 4$^{th}$ Grade Average Scale Score was shown to have a correlation of 0.56 with the Per Student State Spending variable. When the collinearity diagnostics were completed on the model, these variables were within the parameters of what the model will allow for collinearity and were thus left in the model. Table 4.3 above shows the model with the predictive variables as finalized based on diagnostic testing results.

**Construction of the Model**

The unit of analysis for the independent variables is the state year coded through a combination of the second year of a program year and the state abbreviation. As an example, the 2002-2003 school year spans from approximately September 2002 through approximately May 2003. The year would be coded as 2003. The 2002-2003 Alabama program year was coded as 2003AL. Characteristics of the state for the 2003AL state year were derived from 2003 state data. While there are arguments for using either of the calendar years that are represented in the school year, the decision was made to use the data from the concluding calendar of the school

year due to the fact that more months of the school year are contained within the second calendar year as well as the need to reduce opportunities for error in recording and thus analyzing data.

**Methodology**

The data allow for a variety of methods. For the purposes of this study, the data are considered a pooled cross section to increase the number of cases and thus learn more about the patterns of state characteristics and state choices for institutional form. While the dependent variable for this research is at the program level and programs are nested within states, it was not found to be helpful to use Hierarchical Linear Modeling (HLM) regression that accounts for the two levels and potential clustering. The two factors that led to the decision not to use a multilevel model are that first, there are no predictor variables at level one (the program level), and second, the number of groups relative to the number of observations does not meet the threshold of multilevel modeling. As a result, it was determined to use a single level logistic regression analysis as the method for this research.

In the analysis of the observations and variables, two different structures were created. The first structure describes the dependent variable construction of typology of institutional form and includes all states in all years from 2003 – 2018. This dataset had 1,000 observations over the 16-year period and included states and years that did not have state pre-k programs. Each program in each state year was assigned one of the seven typologies which are in one or more of the three frames of Education, Social Service, and Workforce Development; no program could fit into more than one typology for that year. For the 1,000 observations, there were 798 groups that would have served as the level two unit of analysis. The second dataset is a subset of the larger data and is used to analyze the relationship of the dependent variable of typology to state characteristics; these data did not include the states and years with no state pre-k programs. This

dataset has 844 observations with 700 groups. As such, the number of groups and the related number of observations did not meet the threshold established in the literature (Bell, Ferron, & Kromrey, 2004, p. 1122). Therefore, logistic regression for each of the constructed typologies was selected as the method of choice to analyze state choices of institutional form.

**Analysis of Independent and Dependent Variables**

A logistic regression analysis was conducted on each of the typologies but not all typologies were analyzed through the model due to model errors. The Workforce Development frame only had one of its typologies to successfully make it through the modeling process. Five of the eight typologies were successfully completed. Due to the low number of cases of any of the Workforce Development (WD) combinations with the exception of the Social Service & Workforce Development (SSWD) typology, the analysis did not yield valid results for the other WD combinations. The logistic regression analysis for the WD, EDWD, and EDSSWD yielded zero successes in the analysis. Four of the established typologies are included in the models as well as the No Type model which includes state programs that do not meet the threshold of at least three characteristics in any one frame.

Table 4.3 shows the coefficients as well as significance and standard errors of the five logistic regression analyses that were successfully analyzed using Stata. In many cases of the analysis, state characteristics may have shown statistically significant impacts, but the size of the impact was essentially zero.

**Table 4.3**

*Logistic Regression Results*

| | | EDSS | | ED | | SS | | No Type | | SSWD | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category of Predictor | Predictor | Coefficient | *SE* | Coefficient | *SE* | Coefficient | *SE* | Coefficient | *SE* | Coefficient | *SE* |
| Education | K12 5 Year Enrollment Change | -0.0479* | 0.0248 | 0.0148* | 0.0278 | -0.0510* | 0.0254 | 0.1527* | 0.0341 | -0.0349 | 0.0779 |
| | Per Student Spending K12 | 0.0001*** | 0.0000 | 0.0002*** | 0.0001 | -0.0003*** | 0.0001 | -0.0001*** | 0.0001 | -0.0006*** | 0.0002 |
| | NAEP 4th Grade Avg Scale Score | 0.0555* | 0.0207 | 0.0098* | 0.0245 | -0.0201* | 0.0209 | 0.0149* | 0.0270 | -0.0004 | 0.0526 |
| | % < High School Attainment | 0.0005* | 0.0478 | -0.0574 | 0.0572 | 0.0305 | 0.0554 | -0.0832 | 0.0754 | -0.1457 | 0.1410 |
| Socio-Economic | Total Population | -0.0000*** | 0.0000 | -0.0000*** | 0.0000 | 0.0000*** | 0.0000 | 0.0000*** | 0.0000 | 0.0000*** | 0.0000 |
| | Per Capita Income (2019) | -0.0001*** | 0.0000 | -0.0001*** | 0.0000 | 0.0001*** | 0.0000 | 0.0001*** | 0.0000 | 0.0001*** | 0.0001 |
| | Unemployment Rate | 0.0118* | 0.0449 | -0.1900 | 0.0609 | 0.0653* | 0.0497 | 0.1297 | 0.0671 | 0.2943 | 0.1077 |
| | % Population Non-White | 0.0500** | 0.0098 | -0.0033* | 0.0121 | -0.0208* | 0.0110 | -0.0729* | 0.0199 | -0.0410* | 0.0406 |
| | Gini Index of Income Inequality | 40.4442 | 6.8730 | 11.1016 | 7.9270 | -50.1101 | 7.5632 | -29.7685 | 10.0733 | 22.6263 | 21.7403 |
| | % Births to Unmarried Mothers | -0.0514* | 0.0218 | -0.0413* | 0.0265 | 0.0345* | 0.0245 | 0.1622* | 0.0346 | -0.0559 | 0.0623 |
| Political | Republican Legislature | -0.5133 | 0.2868 | -0.2664 | 0.3428 | 0.0778 | 0.2866 | 1.8908 | 0.3782 | 0.2426 | 0.7647 |
| | Republican Governor | -0.0788 | 0.2120 | -0.0958 | 0.2524 | -0.2493 | 0.2351 | 0.8301 | 0.3193 | -0.9130 | 0.5497 |
| | Trifecta Republican | 0.3310 | 0.3574 | 0.9822 | 0.4279 | -0.1942 | 0.4001 | -1.4976 | 0.4771 | -1.1053 | 1.3530 |
| | Citizen Ideology | -0.0375** | 0.0080 | -0.0142** | 0.0092 | 0.0120** | 0.0089 | 0.0486* | 0.0137 | 0.0927* | 0.0291 |
| | Intercept | -24.7241*** | 5.0528 | -3.4269 | 5.7994 | 20.9974*** | 4.8741 | -2.8053 | 6.4248 | -13.3206 | 13.8467 |
| | Wald Test/ LR Chi-squared | 158.88*** | | 42.04*** | | 104.10*** | | 128.62*** | | 84.72*** | |
| | Pseudo R-squared | 0.1421 | | 0.0528 | | 0.1160 | | 0.1873 | | 0.2908 | |
| | N | 844 | | 844 | | 844 | | 844 | | 844 | |

**p ≤.05; **p≤.01; ***p≤.001*

**Summary of Actual Results Versus Expected Results**

The expected results included the expected direction of the likelihood of state choices for the Education-Workforce Development (EDWD), the Education-Social Service-Workforce Development (EDSSWD). Neither of these typologies were in sufficient enough numbers to be estimated through the logistic regression models. The same is true for the Workforce Development (WD) frame. Table 4.4 below provides a summary of the expected versus actual findings of the frames with results that are discussed in depth later in this chapter.

**Table 4.4**

*Expected Versus Actual Results*

| Category of Predictors | Sub Category | ED | | SS | |
|---|---|---|---|---|---|
| | | Expected | Actual | Expected | Actual |
| Education | Capacity | + | + | + | — |
| | Need | + | + | — | — |
| | Capacity & Need | + | + | — | — |
| Socio Economic | Capacity | + | * | + | + |
| | Need | — | — | — | ND |
| | Capacity & Need | + | — | — | ND |
| Political | Conservative | + | — | — | + |

*+ indicates positive relationship, - indicates negative relationship, * indicates statistically significant but close to 0; ND = Not Defined*

The Workforce Development frame is not included as there were no results from the model. One of the challenges of this research is the combination of the primary categories of Education, Social Service, and Workforce Development and their interactions. Policy and social science literature often focus on one of these types of policies, but there is little literature on their interactions as well as specific characteristics of the policies themselves. The point of this dissertation is to offer a unique perspective by associating individual policies with typologies

that may be useful in future research. The most frequently appearing typology, however, is the combination of Education and Social Service frames.

**Education & Social Service (EDSS) Typology Model**

As the most frequently appearing typology, Education-Social Service (EDSS) results are considered first in the analysis. The analysis included 844 observations, which is the full population of state pre-k programs from the years 2003-2018. The likelihood ratio Chi-square test was statistically significant at $p \leq .001$ which indicates virtually no likelihood of obtaining the Chi-square statistic if the null hypothesis is true. This test of model fit is the first step in determining whether to accept or reject the null hypothesis. Due to the lack of consensus on the value of the pseudo-R-square statistic, this statistic was not considered in the evaluation of any of the models.

The second test executed to determine the appropriateness of the model was the linktest command in Stata which is an indicator of the correctness of the specification of the model. The linktest as shown in Table 4.4 below indicates that this model does not appear to have omitted relevant variables nor has used incorrectly specified measures of the dependent or independent variables.

**Table 4.4**

*Linktest of Specification of Model*

| EDSS | Coefficient | *SE* | *p value* |
|---|---|---|---|
| _hat | 1.020 | 0.112 | 0.000 |
| _hatsq | 0.023 | 0.075 | 0.762 |
| _cons | -0.013 | 0.097 | 0.893 |

The _hat variable[1] is a statistically significant predictor of the model while the _hatsq variable is not statistically significant. Thus, the EDSS model appears to be correctly specified as well as inclusive of the predictive measures of the model (UCLA: Statistical Consulting Group, n.d.). As a result of the post-estimate diagnostics, this model is determined to be acceptable.

The predictors are organized into the three categories of education, socioeconomic, and political. Education related predictors that showed statistical significance of the choice of the EDSS typology include State Spending per Student for K-12 and the NAEP Fourth Grade Scale scores. However, the state spending variable is not substantively significant. Neither the odds ratio nor the coefficient of the logistic regression indicates a substantial impact although it is statistically significant in both cases. Each one dollar increase in per student state spending increases the odds of a state's choice for the EDSS typology by a statistically significant .014%, holding all other variables in the model constant. The NAEP Fourth Grade score variable is both statistically and substantively significant. Each one-point increase in NAEP score increases the odds of a state choosing the EDSS typology by a statistically significant 5.70%, *ceteris paribus*. The analysis shows that as a state's Fourth Grade NAEP scores increase, so does the likelihood that the state will make policy choices that are reflective of the Education & Social Service (EDSS) institutional form for state preschool.

While five of the six economic and demographic state characteristics show statistically significant impacts on the state choice for the EDSS institutional form, two of those characteristics do not have a measurable impact due to their closeness to zero. The explanatory variables of total state population and per capita income are statistically significant but show

[1] In Stata, "linktest uses the linear predicted value (_hat) and linear predicted value squared (_hatsq) as the predictors to rebuild the model" (UCLA: Statistical Consulting Group, n.d.). To pass this test of specification, the _hat value should be statistically significant, and the _hatsq value should not be statistically significant.

virtually no substantive impact. However, the higher the percent of the population that is considered non-white, the higher the likelihood that the state will choose the EDSS typology. Additionally, the higher the income inequality of the state as measured by the Gini Index of Income Inequality, the higher the likelihood that the state's institutional form will be the EDSS typology. An interesting note across Table 4.3 is that the Gini index is not statistically significant in the choice of the Education typology. However, the Gini index is statistically significant and negatively correlated with the Social Service typology. As income equality increases, the likelihood of the state choosing the SS typology also increases. Income inequality is an indicator of the distribution of resources in a state, and when resources are more equally distributed, states are more likely to be generous with welfare type benefits such as those characteristics found in the Social Service frame (Fellowes & Rowe, 2004; Hisnanick & Rogers, n.d.). The final variable in the socioeconomic category of state characteristic is the percent of births to unwed mothers. States with lower percentages of births to unwed mothers are statistically significantly more likely to choose the EDSS typology for state preschool.

The only political variable that was shown to have a statistically significant and functional impact on state choice of the EDSS typology is citizen ideology. This correlation is a negative one; states with a more conservative citizen ideology are less likely to choose the EDSS institutional form for state pre-kindergarten. The results show that income inequality was a strong positive and statistically significant predictor of the EDSS choice. Unemployment rates did not have statistically significant predictive power of the choice of EDSS.

In summary, the predictors of the choice of EDSS in states are higher NAEP scale scores, percent of population that is non-white, and higher income inequality. Predictors that have a negative relationship with the EDSS choice are percent of births to unwed mothers and citizen

ideology. While other predictors have a statistically significant relationship, the numbers are too small to have any predictive ability.

**Education (ED) Typology Model**

The likelihood ratio Chi-square statistic is statistically significant in the Education (ED) model as well indicating little to no probability that the null hypothesis is true. However, the linktest indicated a potential problem with the model specification. While the _hat statistic was statistically significant, so was the _hatsq statistic. This finding indicates that there is possibly a problem with either the specification of the dependent variable or omitted variables. This means that either the definition of the ED typology as the dependent variable is not appropriately defined or that there are omitted variables or interactions that should be considered. This problem will be considered in future analyses.

As in the EDSS typology model, there were predictors that were statistically significant while not functionally measurable with regards to impact. The Per Student State Spending in K-12 education variable showed a statistically significant yet miniscule impact on the choice of Education as the typology for institutional form. Similarly, the Per Capita Income predictor was statistically significant and small, but negative, relationship with the ED choice. The Unemployment Rate predictor showed both a statistically significant and substantive impact on choice for the ED frame. The results show that lower rates of unemployment predicted a stronger likelihood that states would choose the Education typology of institutional form for state pre-kindergarten programs. Overall, it was expected that state education characteristics would have predictive value in relationship to the choice of the Education typology. However, the only characteristic that was consistently predictive of state choice for the institutional form for state pre-kindergarten was the per student state spending predictor.

Within the political predictors, only the Trifecta Republican variable was statistically significant and positively related to the Education choice as a frame for state preschool. If the Governor's office and both houses of the state legislature were all Republican in a state, that state was nearly two and half times (2.42) more likely to frame state preschool as an education type program. This finding matches the hypothesis that states with more conservative leaning characteristics are more likely to frame the state pre-kindergarten program as Education.

**Social Service Typology Model**

In the Social Service (SS) Model, the likelihood ratio Chi-square statistic was statistically significant indicating that this model also rejects the null hypothesis. As with the other models, the number of observations includes the full universe of 844 state pre-kindergarten programs from the years 2003-2018. The post-estimate linktest for the SS Model shows a statistically significant _hat while the _hatsq was not statistically significant, indicating that the model is likely correctly specified.

For the SS typology, many predictors were hypothesized to have a negative correlation with the likelihood of a state's choice of the Social Service frame. It was predicted that declining school enrollment in the K-12 system of a state would be a predictor of the state's choice of the Education typology. Instead, the declining school enrollment is a statistically significant predictor of the state's choice of a Social Service frame. As K-12 school enrollment declines, the likelihood of the state choosing the Social Service typology increases. An additional education need predictor is also related to the choice of Social Service; states with higher state spending on K-12 are less likely to choose the Social Service frame. However, there is no indication that the K-12 spending is correlated with the probability that states will frame the program as Education

as was hypothesized. While the relationship between K-12 spending and the choice of Social Service frame is small, it is statistically significant.

The socioeconomic factors that were expected to be negatively correlated with the choice for the SS frame are percent of population that is non-white as well as the percent of unwed mothers. However, neither of these predictors showed a statistically significant relationship with the state choice of the SS typology. The socioeconomic predictor that does have a statistically significant and measurable impact on the choice of the SS typology is income inequality. As income inequality increases in a state, that state is less likely to select the Social Service frame as the institutional form of state pre-kindergarten. The Gini index of income inequality was the most consistently and substantively predictive of each of the predictive variables across all models.

Of the political variables, the presence of a Republican governor was a predictor of the lack of likelihood of a state choosing the SS typology for pre-k. However, it was surprising that the more conservative the citizen ideology is in the state, the more likely the state is to choose the Social Service institutional form for state preschool. The literature indicates that social services are associated with more liberal ideology rather than conservative. This may be consistent with the fact that state pre-kindergarten is not a cash based assistance program and is perceived overall as more developmental in nature per Peterson's typing of social service programs (T. L. Gais, 2009; Peterson, 1995). The Trifecta Republican variable was statistically significant and positively correlated with the choice of ED and with EDSS. However, it was not shown to have a statistically significant negative relationship with the choices of SS nor WD.

**Social Service-Workforce Development (SSWD) Typology Model**

The final measurable institutional form for state preschool is the Social Service-Workforce Development (SSWD) typology. There were no hypotheses related specifically to this combination of characteristics as social services and workforce development are treated in the literature as different types of policies (see Peterson, 1995). It was hypothesized that any combination of Social Service and Workforce Development would also include education and be a result of state capacity to invest in programs that delivered assistance to low-income families as well as developed the capacity for all families to become contributing members of the workforce through education and workforce development activities.

The SSWD typology holds a positive and statistically significant relationship with the presence of a Republican legislature as well as conservative citizen ideology. While this is not surprising with the Workforce Development characteristics, it is surprising that Social Service characteristics are also included. The unemployment rate also holds a statistically significant relationship to the SSWD choice and may provide a context for the seemingly surprising finding related to a state's conservatism. As the unemployment rate increases, the likelihood of the SSWD typology decreases. Unemployment may also be an indicator of state fiscal health and may provide insight into the fact that the state has slack resources to be able to fund programs which are optional. The combination of the Workforce Development characteristics and the Social Service characteristics may provide enough cover for a more conservative government to fund these additional programs and services as an investment in future growth.

**States With No Typology of Institutional Form**

The most surprising finding was the number of states that have invested in a state pre-kindergarten program that has less than three characteristics in any one typology. As shown previously in Figure 4.6, there are states each year with programs that do not meet the criteria of

any of the seven typologies. This means that the program has less than three characteristics of either Education, Social Service, or Workforce Development. Because this subset of the population of state preschool programs was a substantial number, an additional model was added to the study that includes those state programs without a typology or frame. In Figure 4.6, they are referred to as Non - Categorized State Pre-Kindergarten Programs.

Because this model was an unexpected model, there are no hypotheses related to the predictors of the choice of groups of characteristics that comprise the frames. The results of the model, however, are presented in Table 4.3 as part of the overall table of results. Within the education category of predictors, the five - year enrollment change is statistically significant and positively predictive of the state having a program with no typology. Within the socioeconomic predictors, the population of non-white and the Gini index were both statistically significant and negatively correlated with the programs with no specified category. As income inequality increases, the likelihood of states having a program without specification decreases. As the percent of the population that is non-white increases, the likelihood that the state will have a program that meets none of the criteria of any category decreases.

The percent of births to unwed mothers, however, is determined to be a statistically significant positive predictor of the choice of a state not having enough characteristics in any one category to meet the threshold of a typology. Within the political predictor variables, there appears to be some inconsistency. The presence of a Republican legislature as well as a more conservative citizen ideology are statistically significant positive predictors of the state having a program that does not meet the typology threshold. However, the presence of a Republic trifecta has a statistically significant negative impact on the state having a program with no typology.

The post estimation tests offer some insight into the problems with this model. In conducting the linktest in Stata, both the _hat and the _hatsq are statistically significant indicating that either the dependent variable is not correctly specified or that there are omitted variables. This is a limitation of this study and may be addressed in future studies. The intent of this dissertation is to identify state characteristics that are related to state choices. The No Category model may also be summarized as the lack of state choice and is a different research question. Two additional variables that would be helpful in this future analysis include the age of the state pre-kindergarten program and the presence of other pre-kindergarten or preschool programs in the state. Limitations of the overall study as well as future directions for research are presented in more detail in Chapter 5 of this dissertation.

Overall, direction of the hypotheses was consistent with the findings. However, it was unexpected that the Workforce Development frame would nearly disappear from the results with the exception of the SSWD typology. The lack of appearance of the five Workforce Development characteristics in the analysis caused significant impacts on the models. With two remaining frames of Education and Social Service. There were two exceptions to the expected hypotheses within the two remaining frames. It was expected that higher education capacity would have a likely positive relationship with the choice of Social Service characteristics of the institutional form of state pre-kindergarten. However, education capacity's relationship with Social Service characteristics was a negative one. The second surprising finding was that political conservatism as measured through citizen ideology was positively correlated with the state pre-k program having characteristics consistent with the Social Service frame. While the party of the policy makers did not have a statistically significant relationship as expected, the

conservative citizen ideology was positively and statistically significant predictors of social service characteristics.

The prominence of the presence of the EDSS model and the five characteristics that most frequently appeared throughout the 16 years of the NIEER survey data indicate that the most prominent institutional form of state pre-kindergarten is a program located in public schools that implements kindergarten transition activities. While the location of the program and the transition activities fit squarely in the Education frame, the other three characteristics fit squarely in the Social Service frame. State pre-kindergarten programs remaining three most frequently reported characteristics are eligibility for participation is based on income, the provision of health and development screenings, and referrals for social services. To summarize the most prominent institutional form of state preschool, it is a social service program located in an education environment.

The most prominently present typology of state pre-kindergarten, EDSS, is more likely in states where school enrollment is decreasing, freeing up space in public schools. It is also more likely in states where the fourth grade NAEP scores are higher and where a larger percent of the population has at least a high school diploma or equivalent. This form of state pre-k is also more prominent in states where unemployment is higher and the percent of the population that is non-white is higher. However, as the number of births to unwed mothers decreases, so does the likelihood of a state implementation of the EDSS typology. This typology is also more likely to appear in state with more liberal citizen ideology. State pre-kindergarten that takes this institutional form is not strictly welfare nor strictly education as defined in the academic literature. Chapter 5 identifies research and practical questions related to future academic and practitioner research.

## Chapter 5: Summary of Findings and Next Steps

This dissertation was designed to accomplish two research objectives: the construction of a typology for institutional form of state pre-kindergarten and insight into why states make choices they do related to the institutional form of state preschool. The construction of the typologies is perhaps the most interesting of the two objectives by applying a classification or frame of institutional form. The concept of institutional form for this dissertation is based on the seminal work of Soss et al. (2001) explaining the variation in state choices and form for the provision of welfare services as states transitioned from federal mandates to state choice. Their work also provided the basis for the state characteristics identified as potentially relevant to state preschool choices.

State pre-kindergarten programs are a relatively new policy area for the states but are growing and continuing to receive more attention, particularly with the introduction of President Biden's universal pre-k goal, part of the broader agenda currently being debated in congress. There is much debate across the states and the federal government about how the administration of state pre-kindergarten fits with the current Head Start and Child Care Subsidy programs. Policy questions are about who should receive the services, how the services should be delivered, and what rules characterize access to the service. How services will be funded and at what levels, who will staff the services, and how the services will be administered are among the administrative questions that are continuing to be asked as the country debates the role of early childhood policy in the public policy and administration realm.

### Summary of Findings

The findings of this research show that the primary drivers of the characteristics of the program are education capacity and need related as well as socioeconomic need of the states. The conservatism of government has no statistically significant impacts on the types of policies adopted, but citizen ideology shows some impact. Of the three categories of predictor variables, education predictors offer the most insight into state choices.

### *Workforce Development Frame*

In looking through the individual findings to identify themes, it is clear that the Workforce Development frame and its composite typologies are the least frequently implemented. With the exception of the child care delivery component, Workforce Development individual characteristics are the least frequently reported by states. Although states may gain political credibility talking about the framing of pre-kindergarten in terms of workforce development, the characteristics of such frame are expensive to put into place and administer. Additionally, the WD frame has, in the past, been politicized as an overreach of government into the raising of children and an overstep into the family's role (e.g. Nixon's veto of the 1971 Comprehensive Child Development bill). However, the Coronavirus pandemic has begun to change the narrative and once again shown the need for child care through emergency situations as the examples provided in Chapter 1 related to war and economic depression.

In addition to the political debate over the role of government in the provision of child care, the characteristics of the WD frame often have an increased cost as compared to other frames. The WD frame and its associated typologies have as a characteristic the provision of a full work day of instruction and care. This is a dosage over and above the Education frame's dosage of a school day. The difference between delivering services to allow parents of young children to work a full eight- or nine-hour day while allowing time for drop-off and pick-up of

the children amounts to the equivalent of ten hours per day and is more expensive to staff and deliver. Additionally, WD programs are expected to provide such services throughout the year beyond the school year. This dosage is also an additional expenditure. Workforce Development typologies also include as characteristics the provision of job training services for parents; this too is an additional expense and is not broadly associated with early childhood policy. This type of characteristic may evolve in the years to come but is not currently part of the early childhood programming in most states.

Two of the characteristics of the Workforce Development frames are the use of existing federal funding sources, CCDF and TANF, for state pre-kindergarten. CCDF and TANF have been in existence longer than state preschool programs and have, in most states, already been obligated to provide ongoing programs and assistance through established policies and procedures. At the same time, there have not been more than incremental increases in either funding source for long term allocation of new funds for state preschool. To add to the challenge of using TANF for child care is the increase in complex accountability measures required by the federal government (Schumacher, Greenberg, & Duffy, 2001). Reallocating existing fund sources for a new purpose is a core challenge in politics and public policy with both political and economic implications. As workforce development and early childhood policy converge, it becomes a conversation about equal rights as the burden for care falls primarily on women. It is expected that the workforce development issue will grow in attention and that funds will be invested in ensuring that supports are in place for families, particularly women, to have child care that includes both an education component as well as a custodial care component. It may no longer be enough to provide custodial care that is of questionable quality as is currently pervasive in the policy realm. The debates over whether child care is a public good or a market

driven commodity appear to be arriving more quickly than expected on the policy agenda as the Coronavirus pandemic impacts the workforce, specifically women.

### *Education and Social Service Frames*

The five most frequently reported characteristics fit in either the Education or Workforce Development frames as shown in Table 5.1 below.

**Table 5.1**

*Five Most Frequently Reported Characteristics*

| Characteristic | Number of Appearances | Percent of Total Characteristics |
|---|---|---|
| E5: Public School Delivery | 758 | 12.66% |
| SS3: Screenings, health and/ or developmental | 691 | 11.54% |
| E2: Transition to Kindergarten Activities | 625 | 10.44% |
| SS4: Referral for social services | 506 | 8.45% |
| SS1: Income requirement for eligibility | 486 | 8.11% |

This combination of the top five characteristics shows that the program characteristics might be best summarized as a social service program in an education setting. In fact, the most frequently reported characteristic overall is delivery in a public-school setting. The implications from delivering a social service program in a setting which has traditionally been focused on education brings about tensions in the goals of the program. Without clear goals, it is difficult, if not impossible, to measure effectiveness. In fact, early care and education has been criticized for not being clear about its goals. School readiness is a construct that has multiple definitions and perspectives (Brown, 2017; Carlton & Winsler, 1999). The tension between the social service perspective and the education perspective is a larger tension between social emotional concerns and cognitive goals. Kindergarten teachers, depending on the orientation of their education, also have different perspectives about the definition of school readiness. In its most basic terms, the question is about whether children know the cognitive skills necessary to learn to read such as

their alphabet and letter sounds. Or is the goal of ECE to ensure that children are socially and developmentally ready to learn? Or are there multiple goals for early childhood policies and programs? While these questions have been asked in the early childhood education and child development fields, the questions about how to ensure that the institutional form matches the policy goals is a conversation that has yet to appear in the literature.

States are making decisions about the institutional form of a program that has multiple goals. Such decisions are, according to the data, often inconsistent with state need and capacity. These policy decisions made by the states do not indicate a clarity in desired outcomes for the program. As the federal government continues to debate if, or how, it will fund and implement universal pre-kindergarten programs, this research provides a guiding framework for making intentional policy decisions focused on state outcomes. Without clear goals and a clear understanding of how policy choices may or may not impact outcomes, the issue of state pre-kindergarten may become a policy problem exacerbated by federal funds that offer incentives that are not consistent with program goals. Head Start is a social service program backed by research and is intended to change communities by improving a broad variety of outcomes for children and families in poverty. If, however, Head Start is the model on which state pre-kindergarten is to be built, but the outcomes to be measured are primarily cognitive school readiness skills, the policy may be perceived as unsuccessful. Instead, a broader conversation is necessary about ensuring that incentives, policies, and goals are clear and that the policies match the goals. This is ultimately a policy debate about goals, state choice, and the role of the federal government.

**Limitations of the Research**

While this research provides the first typology of state pre-kindergarten programs according to the literature, there are missing characteristics that would help create more robust typologies. For example, the variable about the administrative home of the program was only collected in the survey for a small number of years and was not gathered with a question or set of questions consistent across time. The administrative home of the pre-kindergarten program would provide important insight into the creation of the typologies. The NIEER yearbook is an invaluable resource about the administration of state pre-kindergarten as well as the structural quality of the programs. Through the years since the survey first began, the yearbook has evolved in its definition of quality as has the definition according to the research. In 2016, NIEER changed the definition of quality to align with research that showed the importance of curriculum and continuous quality improvement efforts of state pre-kindergarten program administration (S. W. Barnett et al., 2016). The survey follows the research on quality and has made a priority to also offer timely and relevant research as part of the Yearbook each year. However, to build a more robust definition of each of the typologies, more characteristics specific to pre-kindergarten program policy and administration would provide an important resource.

An additional limitation of the research is the fact that the survey results are self-reported by the states. Although NIEER conducts training prior to sending out the survey as well as multiple follow-up and verification of information, there is still the risk that states do not accurately report information as a result of a lack of understanding or knowledge. This limitation is true for all self-reporting surveys, but particularly of one that is as comprehensive as the NIEER survey of state preschool programs.

The limitation of the number of cases in the Workforce Development frame also provides a basis for developing future research. With so few states reporting Workforce Development characteristics of state pre-kindergarten programs, the limitation of this research is more the need for a more in-depth and possibly qualitative component of this research.

Finally, the limitation of the characteristics in terms of comparing structural quality with institutional form is one that should be highlighted. It was the original intent to include the quality score as a controlling factor and to gain insight about structural quality and typology. However, multiple variables are included as both a criterion of quality and in some form within the characteristics of typologies. Characteristics such as bachelor's degree requirement for the lead teacher and the provision of comprehensive services are examples of characteristics that are part of both quality and framing. This potential multicollinearity could have caused bias of the research and thus prevented this question from being addressed.

**Implications for Research**

This research has attempted to define the importance of ensuring that the institutional form matches the policy goals in terms that can be understood by policy makers and practitioners. Additionally, this study has attempted to provide a foundation for future research in several areas of both public policy and early childhood education. The guiding theory behind this research is that related to Soss et al. (2001) definition of institutional form that is more broad than administrative home or funding stream but a set of conditions that define access to, and type of, services provided. State pre-kindergarten programs are a relatively new policy at the state level but provide an example for state comparative research about choice for institutional form through defining the specific characteristics and components that create the form.

Even larger than a comparison of state choices is an interesting perspective about whether or not states realize that the choices they make about institutional form will be directly related to the desired outcomes. If the stated desired outcome is an improvement in third grade reading scores, then placing a social service-oriented program within a public-school setting will most likely not provide the desired outcome. Program development and administration requires a thought toward the desired outcome and if the policies of the program are indeed designed to achieve the desired outcomes.

While Soss et al. (2001) and Lieberman and Shaw (2006) both studied the issue of welfare reform at a time when nationwide changes were concurrently happening, state pre-kindergarten has seen a more incremental approach in growth than the welfare reform issue they studied. However, 2021 and 2022 offer opportunities for federal intervention and guidance through additional funding and supports. There is some advocacy from the National Head Start Association to build the future of state pre-kindergarten on the Head Start model. This research may help inform those policy decisions, and the policy decisions will provide opportunities for future research. The current proposals are unclear, and it is unknown if they will exacerbate the lack of system of early care and education or if they will create solutions. Universal pre-kindergarten as a component of President Biden's agenda implies that all children will have access thus fundamentally changing one of the most frequently reported characteristics of state pre-kindergarten programs: eligibility based on income. Universal pre-kindergarten is only available in three states and takes on very different institutional forms in the states of Florida, Georgia, and Oklahoma where it is available. As shown in this research, each state has a unique set of education, socioeconomic, and political influencing factors that impact the choice of institutional form. It is unknown if the federal government's funding of universal pre-

kindergarten across the states will change the current lack of system or impose a uniform system on all states.

**Future Research**

The next natural research question is about measuring effectiveness of programs with certain typologies of institutional form. There is much research that structural quality is at least indirectly related to child outcomes; however, there is not research that looks at the institutional form of state pre-kindergarten to understand how it related to child outcomes. Answering questions about the relationship of child outcomes and institutional form is the next task for this research.

This dataset offers a myriad of potential research in addition to the outcomes. While this dataset was used as a pooled cross section dataset for the purpose of this dissertation, it can also be treated as a panel data set to look at change over time as well as the evolution of individual characteristics and typologies over time in relation to events in the states. Additionally, the dataset offers an opportunity to look through the diffusion of innovation lens so that there may be a predicted evolution over time by typology.

Two additional research questions can also be considered starting with this data set. First, an exploration of states without a state pre-kindergarten program offers an interesting case in understanding state behavior. Which states do not offer a state program and what are the characteristics of those states? By the same token, states that offer multiple programs are an interesting subject for future research. Understanding the characteristics of those states can also offer insight into choices for institutional form. The second additional research question is about the states with programs with no typology. A potential research question related to this could ask

if this is a function of the age of the program or characteristics of the states. It would have been an omission from this research to not address the "No Type" state years as a finding, but these states do not actually answer the research questions around this dissertation. As such, it is an important next step in continuing this research.

State choices of institutional form are important indicators of state values and politics. In this research, it was found that state choices for the institutional form of state preschool are directly related to education capacity and education need. This important insight provides a foundation for future research to test theory as well as to have implications for practice in this growing policy area.

## References


Acosta, R. A., & Martin, E. J. (2013). *California Urban Crisis and Fiscal Decline: Trends in High School Dropout Rates and Economic Implications*.

Adams, G., & Heller, C. (2015). *The Child Care Development Fund and Workforce Development for Low-Income Parents*.

Adams, G., & Rohacek, M. (2002). More than a work support? Issues around integrating child development goals into the child care subsidy system. *Early Childhood Research Quarterly*, *17*(4), 418–440. https://doi.org/10.1016/S0885-2006(02)00184-9

Barnett, S., & Carolan, M. (2013). Trends in State Funded Preschool in the United States: Findings from 10 Years of Policy Surveys. *International Journal of Child Care and Education Policy*, *7*(1), 5–23. https://doi.org/10.1007/2288-6729-7-1-5

Barnett, S. W. (2016). Laying a Solid Floor: What's Important to Know about the NIEER Pre-K Benchmarks. Retrieved from https://www.newamerica.org/education-policy/edcentral/nieer-benchmarks/

Barnett, S. W., Friedman-Kraus, A. H., Weisenfeld, G. G., Horowitz, M., Kasmin, R., & Squires, J. H. (2016). *The State of Preschool 2016*.

Barnett, W. S. (2011). Four Reasons the United States Should Offer Every Child a Preschool Education. In E. F. Zigler, W. S. Gilliam, & W. S. Barnett (Eds.), *The Pre-K Debates: Current Controversies and Issues* (pp. 34–39). Baltimore, MD: Paul H. Brookes Publishing Company.

Barnett, W. S. (2015). Universal and Targeted Approaches to Preschool Education in the United

States. *International Journal of Child Care and Education Policy*, *4*(1), 1–12. https://doi.org/10.1007/2288-6729-4-1-1

Barnett, W. S., & Frede, E. (2010). *The Promise of Preschool Why We Need Early Education for All*.

Barnett, W. S., Robin, K. B., Hustedt, J. T., & Schulman, K. L. (2003). *The state of preschool: 2003 state preschool yearbook*.

Belfield, C. R., Nores, M., Barnett, S., & Schweinhart, L. (2006). The High/Scope Perry Preschool Program: Cost-benefit analysis using data from the age-40 followup. *Journal of Human Resources*, *41*(1), 162–190. https://doi.org/10.3368/jhr.xli.1.162

Bell, B. A., Ferron, J. M., & Kromrey, J. D. (2004). *Cluster Size in Multilevel Models: The Impact of Sparse Data Structures on Point and Interval Estimates in Two-Level Models*. *Regnerus*. Wickrama & Bryant.

Berry, F. S., & Berry, W. D. (1990). State Lottery Adoptions as Policy Innovations : An Event History Analysis. *The American Political Science Review*, *84*(2), 395–415.

Berry, W. D., Fording, R. C., Ringquist, E. J., Hanson, R. L., & Klarner, C. E. (2010). Measuring Citizen and Government Ideology in the U.S. States: A Re-appraisal. *State Politics & Policy Quarterly*, *10*(2), 117–135.

Berry, W. D., Ringquist, E. J., Fording, R. C., & Hanson, R. L. (1998). Measuring Citizen and Government Ideology in the American States , 1960-93. *American Journal of Political Science*, *42*(1), 327–348.

Bill and Melinda Gates Foundation Washington State. (2021).

Brown, C. (2017). “School Readiness.” In *The SAGE Handbook of Early Childhood Policy* (pp. 287–302).

Bushouse, B. K. (2009a). The Pew Charitable Trusts and Universal Preschool. In *Universal Preschool: Policy Change, Stability, and the Pew Charitable Trusts*. New York: State University of New York Press.

Bushouse, B. K. (2009b). *Universal Preschool: Policy Change, Stability, and the Pew Charitable Trusts* (Vol. 0). Albany: State University of New York Press. https://doi.org/10.1017/CBO9781107415324.004

Carlton, M. P., & Winsler, A. (1999). School readiness: the need for a paradigm shift. *School Psychology Review*, *28*(3), 338–352. https://doi.org/10.1093/cid/ciy062

Casto, H. G., & Sipple, J. W. (2011). *Who and what influences school leaders' decisions: An institutional analysis of the implementation of universal prekindergarten*. *Educational Policy* (Vol. 25). https://doi.org/10.1177/0895904810387591

Cohen, A. J. (1996). A brief history of federal financing for child care in the United States. *Journal of Health Care for the Poor and Underserved*, *7*(2), 26–40.

Curran, F. C. (2015). Expanding Downward: Innovation, Diffusion, and State Policy Adoptions of Universal Preschool. *Education Policy Analysis Archives*, *23*(36), 1–29.

Erikson, R. S., Wright, G. C., & McIver, J. P. (2007). Measuring the Public ' s Ideological Preferences in the 50 States : Survey Responses versus Roll Call Data. *State Politics & Policy Quarterly*, *7*(2), 141–151.

Federico, C. M. (2004). When Do Welfare Attitudes Become Racialized? The Paradoxical

Effects of Education. *American Journal of Political Science*, *48*(2), 374–391. https://doi.org/10.1177/1354068810386841

Fellowes, M. C., & Rowe, G. (2004). Politics and the New American Welfare States. *American Journal of Political Science*, *48*(2), 362–373. https://doi.org/10.1111/j.0092-5853.2004.00075.x

Fernandez, R., & Rogerson, R. (2001). *The Determinants of Public Education Expenditures: Longer-Run Evidence from the States*. *Source: Journal of Education Finance* (Vol. 27).

Flanagan, R. M. (2001). Lyndon Johnson, Community Action, and Management of the Administrative State. *Presidential Studies Quarterly*, *31*(4), 585–608. https://doi.org/10.1111/j.0000-0000.2001.00189.x

Friedman-Krauss, A., Barnett, S. W., Garver, K. A., Hodges, K. S., Weisenfeld, G. G., & Gardiner, B. A. (2020). *STATE PRESCHOOL YEARBOOK THE STATE OF PRESCHOOL 2019 STATE PRESCHOOL YEARBOOK*.

Friedman-Krauss, A., Barnett, W. S., Garver, K. A., Hodges, K. S., Weisenfeld, G., & Gardiner, B. A. (2021). *The State of Preschool: 2020 State Preschool Yearbook*.

Friedman-Krauss, A., Barnett, W. S., Garver, K., Hodges, K. S., Weisenfeld, G. G., & DiCrecchio, N. (2019). *The State of Preschool 2018*.

Friedman-Krauss, A. H., Barnett, W. S., Garver, K. A., Hodges, K. S., Weisenfeld, G. G., & Gardiner, B. A. (2020). *The State of Preschool 2019: State Preschool Yearbook*.

Gais, T., Dadayan, L., & Bae, S. (2009). The Decline of States in Financing the U.S. Safety Net: Retrenchment in State and Local Social Welfare Spending, 1977-2007. In *Reducing*

*Poverty: Assessing Recent State Policy Innovations and Strategies*.

Gais, T. L. (2009). Stretched Net: The Retrenchment of State and Local Social Welfare Spending Before the Recession. *Publius: The Journal of Federalism*, *39*(3), 557–559.

Gilliam, W. S., & Ripple, C. H. (2004). What Can Be Learned From State-Funded Prekindergarten Initiatives? A Data-Based Approach to the Head Start Devolution Debate. In E. Zigler & S. J. Styfco (Eds.), *The Head Start Debates* (pp. 477–497). New Haven, CT: Yale University Press.

Goffin, S. G., Martella, J., & Coffman, J. (2011). Vision to Practice: Setting a New Course for Early Childhood Governance.

Gormley, W. T. (2011). From Science to Policy in Early Childhood Education. *Science*, *333*(6045), 978–981.

Gormley, W. T., Phillips, D., Adelstein, S., & Shaw, C. (2010). Head Start ' s Comparative Advantage : Myth or Reality ? *Policy Studies Journal*, *38*(3), 397–418.

Greenberg, M. H., Lombardi, J., & Schumacher, R. (2000). *The Child Care and Development Fund: An Overview*. Washington, D.C.

Grubb, W. N. (1987). *Young Children Face the States: Issues and Options for Early Childhood Programs*. New Brunswick, NJ.

Heckman, J. J. (2011). Effective Child Development Strategies. In Edward Zigler, W. S. Gilliam, & W. S. Barnett (Eds.), *The Pre-K Debates: Current Controversies and Issues* (pp. 2–8). Baltimore, MD: Paul H. Brookes Publishing Company.

Heckman, J. J., Moon, S. H., Pinto, R., Savelyev, P. A., & Yavitz, A. (2010). The rate of return

to the HighScope Perry Preschool Program. *Journal of Public Economics*, *94*(1–2), 114–128. https://doi.org/10.1016/j.jpubeco.2009.11.001

Hernandez, D. J. (2012). *Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation*. Baltimore, MD.

Hisnanick, J. J., & Rogers, A. L. (n.d.). *Household Income Inequality Measures Based on the ACS Data: 2000-2005*.

Hustedt, J. T., & Barnett, S. W. (2011). Financing Early Childhood Education Programs: State, Federal, and Local Issues. *Educational Policy*, *25*(1), 167–192. https://doi.org/10.1177/0895904810386605

Hwang, S.-D., & Gray, V. (1991). *External Limits and Internal Determinants of State Public Policy* (Vol. 44).

Jackson, C. K. (2020). Does school spending matter? The new literature on an old question. In *Confronting inequality: How policies and practices shape children's opportunities.* (pp. 165–186). American Psychological Association. https://doi.org/10.1037/0000187-008

Jones, D., & Kelly, P. (2007). *The Emerging Policy Triangle: Economic Development, Workforce Development, and Education*.

Kagan, S. L., & Cohen, N. E. (1997). *Not by Chance: Creating an Early Care and Education System for America's Children. Abridged Report. The Quality 2000 Initiative.* https://doi.org/ED419696

Kalifeh, P., Lora, C.-V., & Grass, S. (2011). The federal role in early childhood education: Evolution in the goals, governance, and policy instruments of Project Head Start. *Educ*

*Policy*, *25*(1), 36–64. https://doi.org/10.1177/0895904810387413

Karch, A. (2010). Policy feedback and preschool funding in the American States. *Policy Studies Journal*, *38*(2), 217–234. https://doi.org/10.1111/j.1541-0072.2010.00359.x

Karch, A. (2013). *Early Start: Preschool Politics in the United States*. *Early Start*. University of Michigan Press. https://doi.org/10.1353/book.22707

Kauerz, K. A. (2010). *The early childhood and elementary education continuum: Constructing an understanding of p--3 as state-level policy reform. Dissertation Abstracts International Section A: Humanities and Social Sciences*.

Kauerz, K., & Schaper, A. (2021). *Transition to Kindergarten: Findings From Recent Research*. Denver, CO.

Lieberman, R. C., & Shaw, G. M. (2006). Looking Inward, Looking Outward: The Politics of State Welfare Innovation under Devolution. *Political Research Quarterly*, *53*(2), 215. https://doi.org/10.2307/449279

Lipsey, M. W., Farran, D. C., & Durkin, K. (2018). Effects of the Tennessee Prekindergarten Program on children's achievement and behavior through third grade. *Early Childhood Research Quarterly*, *45*, 155–176. https://doi.org/10.1016/j.ecresq.2018.03.005

Lowenstein, A. E. (2011). Early care and education as educational panacea: What do we really know about its effectiveness? *Educational Policy*, *25*(1), 92–114. https://doi.org/10.1177/0895904810387790

McCabe, L. A., & Sipple, J. W. (2011). Colliding Worlds: Practical and Political Tensions of Prekindergarten Implementation in Public Schools. *Educational Policy*, *25*(1), e1–e26.

https://doi.org/10.1177/0895904810387415

Michel, S. (1999). *Children's Interests/ Mothers' Rights: The Shaping of America's Child Care Policy*. New Haven, CT: Yale University Press.

Nice, D. (1994). *Policy Innovation in State Government*. Ames, IA: Iowa State University Press.

Nichols, S., & Jurvansuu, S. (2008). Partnership in integrated early childhood services: An analysis of policy framings in education and human services. *Contemporary Issues in Early Childhood*, *9*(2), 118–130. https://doi.org/10.2304/ciec.2008.9.2.118

Olson, S. (2016). *Moving from Evidence to Implementation of Early Childhood Programs*. *Moving from Evidence to Implementation of Early Childhood Programs: Proceedings of a Workshop—in Brief*. National Academies Press (US). https://doi.org/10.17226/23669

Peterson, P. E. (1995). *The Price of Federalism*. Washington, D.C.: Brookings Institution Press.

Pianta, R. C., Barnett, W. S., Burchinal, M., & Thornburg, K. R. (2009). The effects of preschool education: What we know, how public policy is or is not aligned with the evidence base, and what we need to know. *Psychological Science in the Public Interest, Supplement*, *10*(2), 49–88. https://doi.org/10.1177/1529100610381908

Pianta, R. C., Hamre, B. K., & Nguyen, T. (2020). Measuring and improving quality in early care and education. *Early Childhood Research Quarterly*, *51*, 285–287. https://doi.org/10.1007/978-1-4615-2219-5_12

Pianta, R. C., Steven Barnett, W., Burchinal, M., & Thornburg, K. R. (2009). The Effects of Preschool Education: What We Know, How Public Policy Is or Is Not Aligned With the Evidence Base, and What We Need to Know. *Psychological Science in the Public Interest*,

*10*(2), 49–88. https://doi.org/10.1177/1529100610381908

Regenstein, E., & Lipper, K. (2013). *Early Childhood Governance*.

Ringquist, E. J., Hill, K. Q., Leighley, J. E., & Hinton-Anderson, A. (1997). *Lower-Class Mobilization and Policy Linkage in the U.S. States: A Correction*. *American Journal of Political Science* (Vol. 41).

Schumacher, R., Greenberg, M., & Duffy, J. (2001). *The Impact of TANF Funding on State Child Care Subsidy Programs*. Washington, D.C.

Shonkoff, J. P., & Levitt, P. (2010). Neuroscience and the Future of Early Childhood Policy: Moving from Why to What and How. *Neuron*, *67*(5), 689–691. https://doi.org/10.1016/J.NEURON.2010.08.032

Smith, K. B. (2020). Learning without widespread policy adoption: Early childhood education in the American States. *Publius*, *50*(1), 3–29. https://doi.org/10.1093/publius/pjz008

Soss, J., Schram, S. F., Vartanian, T. P., & O'Brien, E. (2001). Setting the Terms of Relief : Explaining State Policy Choices in the Devolution Revolution. *American Journal of Political Science*, *45*(2), 378–395.

Stoney, L., & Greenberg, M. H. (1996). The Financing of Child Care: Current and Emerging Trends. *The Future of Children*, *6*(2), 83–102.

Tandberg, D. (2010). Interest Groups and Governmental Institutions: The politics of State Funding of Public Higher Education. *Educational Policy*, *24*(5), 735–778. https://doi.org/10.1177/0895904809339163

Tarr, G. A. (2001). Laboratories of Democracy? Brandeis, Federalism, and Scientific

Management. *Publius: The Journal of Federalism*, *31*(1), 37–46. https://doi.org/10.1093/oxfordjournals.pubjof.a004880

U.S. Department of Health and Human Services. (n.d.). Fundamentals of CCDF Administration. Retrieved October 23, 2021, from https://childcareta.acf.hhs.gov/ccdf-fundamentals/allocation-formulas

U.S. Department of Health and Human Services. (2019). Head Start Program Facts: Fiscal Year 2018. Retrieved from https://eclkc.ohs.acf.hhs.gov/about-us/article/head-start-program-facts-fiscal-year-2018

U.S. Department of Labor. (2019). Employment Characteristics of Families - 2018, (202), 14.

UCLA: Statistical Consulting Group. (n.d.). Lesson Three: Logistic Regression Diagnostics.

Valentino, R. (2018). *Will Public Pre-K Really Close Achievement Gaps? Gaps in Prekindergarten Quality Between Students and Across States*. *American Educational Research Journal* (Vol. 55). https://doi.org/10.3102/0002831217732000

Van Huizen, T., & Plantenga, J. (2018). Do children benefit from universal early childhood education and care? A meta-analysis of evidence from natural experiments. *Economics of Education Review*, *66*, 206–222. https://doi.org/10.1016/j.econedurev.2018.08.001

Watson, S. D. (2011). The Pew Prekindergarten Campaign. In E. F. Zigler, W. S. Gilliam, & W. S. Barnett (Eds.), *The Pre-K Debates: Current Controversies and Issues* (pp. 9–20). Baltimore, MD: Paul H. Brookes Publishing Company.

Weisbrod, B. A. (1998). Institutional Form and Organizational Behavior. In W. W. Powell & E. S. Clemens (Eds.), *Private Action and the Public Good* (pp. 69–84). New Haven, CT: Yale

University Press.

## Appendix 1: Program Coding Sample

| Yearbook Year | Program Year | State | State Program | Program Coc | Unique Program ID |
|---|---|---|---|---|---|
| 2004 | 2003 | Alabama | Alabama | AL1 | 2003AL1 |
| 2004 | 2003 | Arkansas | Arkansas | AR1 | 2003AR1 |
| 2004 | 2003 | Arizona | Arizona | AZ1 | 2003AZ1 |
| 2004 | 2003 | California | California | CA1 | 2003CA1 |
| 2004 | 2003 | Colorado | Colorado | CO1 | 2003CO1 |
| 2004 | 2003 | Connecticut | Connecticut | CT1 | 2003CT1 |
| 2004 | 2003 | Delaware | Delaware | DE1 | 2003DE1 |
| 2004 | 2003 | Georgia | Georgia | GA1 | 2003GA1 |
| 2004 | 2003 | Hawaii | Hawaii | HI1 | 2003HI1 |
| 2004 | 2003 | Iowa | Iowa | IA1 | 2003IA1 |
| 2004 | 2003 | Illinois | Illinois | IL1 | 2003IL1 |
| 2004 | 2003 | Kansas | Kansas | KA1 | 2003KA1 |
| 2004 | 2003 | Kentucky | Kentucky | KY1 | 2003KY1 |
| 2004 | 2003 | Louisiana | Louisiana NSECD | LA1 | 2003LA1 |
| 2004 | 2003 | Louisiana | Louisiana 8 (g) | LA2 | 2003LA2 |
| 2004 | 2003 | Louisiana | Louisiana LA4 & Starting Pts | LA3 | 2003LA3 |
| 2004 | 2003 | Massachusetts | Massachusetts | MA1 | 2003MA1 |
| 2004 | 2003 | Maryland | Maryland | MD1 | 2003MD1 |
| 2004 | 2003 | Maine | Maine | ME1 | 2003ME1 |
| 2004 | 2003 | Michigan | Michigan | MI1 | 2003MI1 |
| 2004 | 2003 | Minnesota | Minnesota HdSt | MN1 | 2003MN1 |
| 2004 | 2003 | Missouri | Missouri | MO1 | 2003MO1 |
| 2004 | 2003 | North Carolina | North Carolina | NC1 | 2003NC1 |
| 2004 | 2003 | Nebraska | Nebraska | NE1 | 2003NE1 |
| 2004 | 2003 | New Jersey | New Jersey Abbott | NJ1 | 2003NJ1 |
| 2004 | 2003 | New Jersey | New Jersey ECPA | NJ2 | 2003NJ2 |
| 2004 | 2003 | New Mexico | New Mexico | NM1 | 2003NM1 |
| 2004 | 2003 | Nevada | Nevada | NV1 | 2003NV1 |
| 2004 | 2003 | New York | New York EPK | NY1 | 2003NY1 |
| 2004 | 2003 | New York | New York UPK | NY2 | 2003NY2 |
| 2004 | 2003 | Ohio | Ohio PSP | OH1 | 2003OH1 |
| 2004 | 2003 | Ohio | Ohio HdSt | OH3 | 2003OH3 |
| 2004 | 2003 | Oklahoma | Oklahoma | OK1 | 2003OK1 |
| 2004 | 2003 | Oregon | Oregon | OR1 | 2003OR1 |
| 2004 | 2003 | Pennsylvania | Pennsylvania | PA1 | 2003PA1 |
| 2004 | 2003 | South Carolina | South Carolina | SC1 | 2003SC1 |
| 2004 | 2003 | Tennessee | Tennessee | TN1 | 2003TN1 |
| 2004 | 2003 | Texas | Texas | TX1 | 2003TX1 |
| 2004 | 2003 | Virginia | Virginia | VA1 | 2003VA1 |
| 2004 | 2003 | Vermont | Vermont | VT1 | 2003VT1 |
| 2004 | 2003 | Washington | Washington | WA1 | 2003WA1 |
| 2004 | 2003 | Wisconsin | Wisconsin 4K | WI1 | 2003WI1 |
| 2004 | 2003 | Wisconsin | Wisconsin HdSt | WI2 | 2003WI2 |
| 2004 | 2003 | West Virginia | West Virginia | WV1 | 2003WV1 |

# Appendix 2: Stata Output

## Logit Command (Coefficient)

```
Iteration 0:   log likelihood = -559.11993
Iteration 1:   log likelihood = -481.42891
Iteration 2:   log likelihood =  -479.6887
Iteration 3:   log likelihood = -479.67884
Iteration 4:   log likelihood = -479.67884

Logistic regression                                     Number of obs =    844
                                                        LR chi2(14)   = 158.88
                                                        Prob > chi2   = 0.0000
Log likelihood = -479.67884                             Pseudo R2     = 0.1421
```

| EDSS | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | -.0479041 | .0247757 | -1.93 | 0.053 | -.0964636 | .0006555 |
| PerStudentSpending | .0001441 | .0000481 | 3.00 | 0.003 | .0000499 | .0002383 |
| AverageScaleScoreNAEP4thGra | .0554794 | .0207216 | 2.68 | 0.007 | .0148657 | .0960931 |
| PercentLessThanHSAttainment | .0005284 | .0477747 | 0.01 | 0.991 | -.0931083 | .0941651 |
| TotalPop | -8.12e-08 | 1.77e-08 | -4.60 | 0.000 | -1.16e-07 | -4.66e-08 |
| PerCapInc2019Dollars | -.0000982 | .0000246 | -3.99 | 0.000 | -.0001464 | -.00005 |
| UnemploymentRate | .0117974 | .0448507 | 0.26 | 0.793 | -.0761083 | .0997031 |
| PercentNonWhite | .0500196 | .0097642 | 5.12 | 0.000 | .0308822 | .069157 |
| Gini | 40.44419 | 6.873048 | 5.88 | 0.000 | 26.97326 | 53.91511 |
| PercentBirthstoUnmarriedMoth | -.0513963 | .0217883 | -2.36 | 0.018 | -.0941007 | -.008692 |
| RepubLeg | -.5132823 | .2867652 | -1.79 | 0.073 | -1.075332 | .0487671 |
| RepubGov | -.0788304 | .2120209 | -0.37 | 0.710 | -.4943837 | .3367229 |
| TrifectaRepublican | .3309765 | .3573942 | 0.93 | 0.354 | -.3695033 | 1.031456 |
| CitizenIdeology | -.0375304 | .0080296 | -4.67 | 0.000 | -.0532681 | -.0217927 |
| _cons | -24.72412 | 5.05284 | -4.89 | 0.000 | -34.6275 | -14.82073 |

## Logistic Command (Odds Ratios)

```
Logistic regression                                     Number of obs =    844
                                                        LR chi2(14)   = 158.88
                                                        Prob > chi2   = 0.0000
Log likelihood = -479.67884                             Pseudo R2     = 0.1421
```

| EDSS | Odds ratio | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | .9532252 | .0236169 | -1.93 | 0.053 | .9080429 | 1.000656 |
| PerStudentSpending | 1.000144 | .0000481 | 3.00 | 0.003 | 1.00005 | 1.000238 |
| AverageScaleScoreNAEP4thGra | 1.057047 | .0219038 | 2.68 | 0.007 | 1.014977 | 1.100862 |
| PercentLessThanHSAttainment | 1.000529 | .0478 | 0.01 | 0.991 | .9110948 | 1.098741 |
| TotalPop | .9999999 | 1.77e-08 | -4.60 | 0.000 | .9999999 | 1 |
| PerCapInc2019Dollars | .9999018 | .0000246 | -3.99 | 0.000 | .9998536 | .99995 |
| UnemploymentRate | 1.011867 | .0453829 | 0.26 | 0.793 | .9267158 | 1.104843 |
| PercentNonWhite | 1.051292 | .010265 | 5.12 | 0.000 | 1.031364 | 1.071604 |
| Gini | 3.67e+17 | 2.52e+18 | 5.88 | 0.000 | 5.18e+11 | 2.60e+23 |
| PercentBirthstoUnmarriedMoth | .9499021 | .0206968 | -2.36 | 0.018 | .9101911 | .9913457 |
| RepubLeg | .5985278 | .1716369 | -1.79 | 0.073 | .3411846 | 1.049976 |
| RepubGov | .9241967 | .195949 | -0.37 | 0.710 | .6099467 | 1.400351 |
| TrifectaRepublican | 1.392327 | .4976097 | 0.93 | 0.354 | .6910775 | 2.805148 |
| CitizenIdeology | .9631651 | .0077338 | -4.67 | 0.000 | .9481258 | .978443 |
| _cons | 1.83e-11 | 9.25e-11 | -4.89 | 0.000 | 9.15e-16 | 3.66e-07 |

## Linktest

| EDSS | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| _hat | 1.019068 | .111469 | 9.14 | 0.000 | .8005928 | 1.237543 |
| _hatsq | .0222629 | .0753527 | 0.30 | 0.768 | -.1254257 | .1699515 |
| _cons | -.0128513 | .097384 | -0.13 | 0.895 | -.2037203 | .1780177 |

## Logit Command (Coefficient)

```
Iteration 0:   log likelihood = -397.97738
Iteration 1:   log likelihood = -378.12165
Iteration 2:   log likelihood = -376.96101
Iteration 3:   log likelihood = -376.95767
Iteration 4:   log likelihood = -376.95767

Logistic regression                                     Number of obs =    844
                                                        LR chi2(14)   =  42.04
                                                        Prob > chi2   = 0.0001
Log likelihood = -376.95767                             Pseudo R2     = 0.0528
```

| ED | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | .0147603 | .0278062 | 0.53 | 0.596 | -.0397389 | .0692596 |
| PerStudentSpending | .0002398 | .0000565 | 4.24 | 0.000 | .0001291 | .0003506 |
| AverageScaleScoreNAEP4thGra | .0097979 | .024542 | 0.40 | 0.690 | -.0383035 | .0578992 |
| PercentLessThanHSAttainment | -.0574123 | .0571769 | -1.00 | 0.315 | -.169477 | .0546524 |
| TotalPop | -1.81e-08 | 2.11e-08 | -0.86 | 0.391 | -5.95e-08 | 2.33e-08 |
| PerCapInc2019Dollars | -.000086 | .0000299 | -2.88 | 0.004 | -.0001445 | -.0000274 |
| UnemploymentRate | -.1899878 | .0608616 | -3.12 | 0.002 | -.3092744 | -.0707012 |
| PercentNonWhite | -.0032597 | .0120655 | -0.27 | 0.787 | -.0269076 | .0203882 |
| Gini | 11.10159 | 7.926961 | 1.40 | 0.161 | -4.434971 | 26.63814 |
| PercentBirthstoUnmarriedMoth | -.0412769 | .0264889 | -1.56 | 0.119 | -.0931942 | .0106404 |
| RepubLeg | -.2664201 | .3428444 | -0.78 | 0.437 | -.9383829 | .4055426 |
| RepubGov | -.0957954 | .2524285 | -0.38 | 0.704 | -.5905461 | .3989553 |
| TrifectaRepublican | .9822185 | .4279292 | 2.30 | 0.022 | .1434928 | 1.820944 |
| CitizenIdeology | -.0142194 | .0092367 | -1.54 | 0.124 | -.0323231 | .0038842 |
| _cons | -3.42688 | 5.799417 | -0.59 | 0.555 | -14.79353 | 7.939768 |

## Logistic Command (Odds Ratios)

```
Logistic regression                                     Number of obs =    844
                                                        LR chi2(14)   =  42.04
                                                        Prob > chi2   = 0.0001
Log likelihood = -376.95767                             Pseudo R2     = 0.0528
```

| ED | Odds ratio | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | 1.01487 | .0282197 | 0.53 | 0.596 | .9610403 | 1.071714 |
| PerStudentSpending | 1.00024 | .0000565 | 4.24 | 0.000 | 1.000129 | 1.000351 |
| AverageScaleScoreNAEP4thGra | 1.009846 | .0247836 | 0.40 | 0.690 | .9624208 | 1.059608 |
| PercentLessThanHSAttainment | .9442047 | .0539867 | -1.00 | 0.315 | .8441062 | 1.056173 |
| TotalPop | 1 | 2.11e-08 | -0.86 | 0.391 | .9999999 | 1 |
| PerCapInc2019Dollars | .999914 | .0000299 | -2.88 | 0.004 | .9998555 | .9999726 |
| UnemploymentRate | .8269693 | .0503307 | -3.12 | 0.002 | .7339794 | .9317403 |
| PercentNonWhite | .9967456 | .0120262 | -0.27 | 0.787 | .9734512 | 1.020598 |
| Gini | 66276.24 | 525369.2 | 1.40 | 0.161 | .0118554 | 3.71e+11 |
| PercentBirthstoUnmarriedMoth | .9595634 | .0254178 | -1.56 | 0.119 | .9110166 | 1.010697 |
| RepubLeg | .7661172 | .262659 | -0.78 | 0.437 | .39126 | 1.500116 |
| RepubGov | .9086499 | .2293691 | -0.38 | 0.704 | .5540247 | 1.490267 |
| TrifectaRepublican | 2.670374 | 1.142731 | 2.30 | 0.022 | 1.154298 | 6.177689 |
| CitizenIdeology | .9858812 | .0091063 | -1.54 | 0.124 | .9681937 | 1.003892 |
| _cons | .0324882 | .1884124 | -0.59 | 0.555 | 3.76e-07 | 2806.71 |

Note: _cons estimates baseline odds.

## Linktest

| ED | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| _hat | 2.025213 | .4390114 | 4.61 | 0.000 | 1.164767 | 2.88566 |
| _hatsq | .3223967 | .1192051 | 2.70 | 0.007 | .088759 | .5560345 |
| _cons | .6956451 | .3808826 | 1.83 | 0.068 | -.0508711 | 1.442161 |

## Logit Command (Coefficient)

Logistic regression — Number of obs = 844; LR chi2(14) = 104.10; Prob > chi2 = 0.0000; Log likelihood = -396.82607; Pseudo R2 = 0.1160

| SS | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | -.0509996 | .0253514 | -2.01 | 0.044 | -.1006873 | -.0013118 |
| PerStudentSpending | -.000306 | .000064 | -4.78 | 0.000 | -.0004314 | -.0001806 |
| AverageScaleScoreNAEP4thGra | -.020114 | .0208623 | -0.96 | 0.335 | -.0610034 | .0207754 |
| PercentLessThanHSAttainment | .0304664 | .0554386 | 0.55 | 0.583 | -.0781912 | .1391241 |
| TotalPop | 6.45e-09 | 1.59e-08 | 0.41 | 0.684 | -2.47e-08 | 3.76e-08 |
| PerCapInc2019Dollars | .0001373 | .0000284 | 4.83 | 0.000 | .0000816 | .0001931 |
| UnemploymentRate | .0653075 | .0496941 | 1.31 | 0.189 | -.0320912 | .1627061 |
| PercentNonWhite | -.0208274 | .0110002 | -1.89 | 0.058 | -.0423875 | .0007326 |
| Gini | -50.11011 | 7.563185 | -6.63 | 0.000 | -64.93368 | -35.28653 |
| PercentBirthstoUnmarriedMoth | .034546 | .0245049 | 1.41 | 0.159 | -.0134827 | .0825747 |
| RepubLeg | .0778447 | .286611 | 0.27 | 0.786 | -.4839025 | .6395919 |
| RepubGov | -.2492639 | .2351174 | -1.06 | 0.289 | -.7100856 | .2115578 |
| TrifectaRepublican | -.1941846 | .4000602 | -0.49 | 0.627 | -.9782882 | .589919 |
| CitizenIdeology | .0119554 | .0088893 | 1.34 | 0.179 | -.0054674 | .0293781 |
| _cons | 20.9974 | 4.874119 | 4.31 | 0.000 | 11.4443 | 30.55049 |

## Logistic Command (Odds Ratios)

Logistic regression — Number of obs = 844; LR chi2(14) = 104.10; Prob > chi2 = 0.0000; Log likelihood = -396.82607; Pseudo R2 = 0.1160

| SS | Odds ratio | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | .9502791 | .0240909 | -2.01 | 0.044 | .9042157 | .9986891 |
| PerStudentSpending | .999694 | .0000639 | -4.78 | 0.000 | .9995687 | .9998194 |
| AverageScaleScoreNAEP4thGra | .980087 | .0204469 | -0.96 | 0.335 | .9408201 | 1.020993 |
| PercentLessThanHSAttainment | 1.030935 | .0571536 | 0.55 | 0.583 | .9247876 | 1.149267 |
| TotalPop | 1 | 1.59e-08 | 0.41 | 0.684 | 1 | 1 |
| PerCapInc2019Dollars | 1.000137 | .0000284 | 4.83 | 0.000 | 1.000082 | 1.000193 |
| UnemploymentRate | 1.067487 | .0530478 | 1.31 | 0.189 | .9684183 | 1.176691 |
| PercentNonWhite | .979388 | .0107735 | -1.89 | 0.058 | .9584983 | 1.000733 |
| Gini | 1.73e-22 | 1.31e-21 | -6.63 | 0.000 | 6.30e-29 | 4.73e-16 |
| PercentBirthstoUnmarriedMoth | 1.03515 | .0253662 | 1.41 | 0.159 | .9866078 | 1.08608 |
| RepubLeg | 1.080955 | .3098135 | 0.27 | 0.786 | .6163733 | 1.895707 |
| RepubGov | .7793743 | .1832445 | -1.06 | 0.289 | .4916021 | 1.235601 |
| TrifectaRepublican | .8235059 | .3294519 | -0.49 | 0.627 | .3759541 | 1.803842 |
| CitizenIdeology | 1.012027 | .0089962 | 1.34 | 0.179 | .9945475 | 1.029814 |
| _cons | 1.32e+09 | 6.41e+09 | 4.31 | 0.000 | 93367.49 | 1.85e+13 |

## Linktest

| SS | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| _hat | 1.196704 | .2502239 | 4.78 | 0.000 | .7062746 | 1.687134 |
| _hatsq | .0801294 | .089588 | 0.89 | 0.371 | -.0954598 | .2557186 |
| _cons | .0650514 | .1640898 | 0.40 | 0.692 | -.2565587 | .3866615 |

## Logit Command (Coefficient)

Logistic regression — Number of obs = 844; LR chi2(14) = 84.72; Prob > chi2 = 0.0000; Log likelihood = -103.30417; Pseudo R2 = 0.2908

| SSWD | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | -.034877 | .077881 | -0.45 | 0.654 | -.187521 | .1177669 |
| PerStudentSpending | -.0005805 | .0001784 | -3.25 | 0.001 | -.0009301 | -.0002309 |
| AverageScaleScoreNAEP4thGra | -.0004147 | .0526312 | -0.01 | 0.994 | -.1035699 | .1027406 |
| PercentLessThanHSAttainment | -.1456582 | .1410239 | -1.03 | 0.302 | -.42206 | .1307435 |
| TotalPop | 4.72e-08 | 3.45e-08 | 1.37 | 0.171 | -2.03e-08 | 1.15e-07 |
| PerCapInc2019Dollars | .0000971 | .0000634 | 1.53 | 0.126 | -.0000272 | .0002213 |
| UnemploymentRate | .2942862 | .1077029 | 2.73 | 0.006 | .0831924 | .5053799 |
| PercentNonWhite | -.0409981 | .0406027 | -1.01 | 0.313 | -.1205778 | .0385817 |
| Gini | 22.62634 | 21.74028 | 1.04 | 0.298 | -19.98383 | 65.2365 |
| PercentBirthstoUnmarriedMoth | -.0559289 | .0622606 | -0.90 | 0.369 | -.1779575 | .0660997 |
| RepubLeg | .2425915 | .7646798 | 0.32 | 0.751 | -1.256153 | 1.741336 |
| RepubGov | -.9130459 | .5496652 | -1.66 | 0.097 | -1.99037 | .164278 |
| TrifectaRepublican | -1.105281 | 1.352993 | -0.82 | 0.414 | -3.757098 | 1.546537 |
| CitizenIdeology | .0927084 | .0291282 | 3.18 | 0.001 | .0356182 | .1497986 |
| _cons | -13.32057 | 13.84671 | -0.96 | 0.336 | -40.45962 | 13.81848 |

## Logistic Command (Odds Ratios)

Logistic regression — Number of obs = 844; LR chi2(14) = 84.72; Prob > chi2 = 0.0000; Log likelihood = -103.30417; Pseudo R2 = 0.2908

| SSWD | Odds ratio | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | .9657242 | .0752116 | -0.45 | 0.654 | .8290117 | 1.124982 |
| PerStudentSpending | .9994197 | .0001783 | -3.25 | 0.001 | .9990703 | .9997691 |
| AverageScaleScoreNAEP4thGra | .9995854 | .0526094 | -0.01 | 0.994 | .901613 | 1.108204 |
| PercentLessThanHSAttainment | .8644531 | .1219085 | -1.03 | 0.302 | .6556947 | 1.139675 |
| TotalPop | 1 | 3.45e-08 | 1.37 | 0.171 | 1 | 1 |
| PerCapInc2019Dollars | 1.000097 | .0000634 | 1.53 | 0.126 | .9999728 | 1.000221 |
| UnemploymentRate | 1.342168 | .1445553 | 2.73 | 0.006 | 1.086751 | 1.657615 |
| PercentNonWhite | .959831 | .0389717 | -1.01 | 0.313 | .8864081 | 1.039336 |
| Gini | 6.71e+09 | 1.46e+11 | 1.04 | 0.298 | 2.09e-09 | 2.15e+28 |
| PercentBirthstoUnmarriedMoth | .9456063 | .058874 | -0.90 | 0.369 | .836978 | 1.068333 |
| RepubLeg | 1.274548 | .9746211 | 0.32 | 0.751 | .2847472 | 5.704963 |
| RepubGov | .4013 | .2205807 | -1.66 | 0.097 | .1366449 | 1.178542 |
| TrifectaRepublican | .3311179 | .4480003 | -0.82 | 0.414 | .0233514 | 4.695182 |
| CitizenIdeology | 1.097142 | .0319577 | 3.18 | 0.001 | 1.03626 | 1.1616 |
| _cons | 1.64e-06 | .0000227 | -0.96 | 0.336 | 2.68e-18 | 1002975 |

## Linktest

| SSWD | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| _hat | 1.514043 | .3612661 | 4.19 | 0.000 | .8059741 | 2.222111 |
| _hatsq | .0929481 | .057096 | 1.63 | 0.104 | -.018958 | .2048543 |
| _cons | .4604464 | .4550414 | 1.01 | 0.312 | -.4314184 | 1.352311 |

## Logit Command (Coefficient)

Logistic regression — Number of obs = 844; LR chi2(14) = 128.62; Prob > chi2 = 0.0000; Log likelihood = -278.99855; Pseudo R2 = 0.1873

| NoType | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | .152682 | .0341068 | 4.48 | 0.000 | .0858339 | .2195301 |
| PerStudentSpending | -.0000578 | .0000728 | -0.79 | 0.428 | -.0002005 | .000085 |
| AverageScaleScoreNAEP4thGra | .0148629 | .0270497 | 0.55 | 0.583 | -.0381535 | .0678792 |
| PercentLessThanHSAttainment | -.0831714 | .0753815 | -1.10 | 0.270 | -.2309164 | .0645736 |
| TotalPop | 1.05e-07 | 1.88e-08 | 5.60 | 0.000 | 6.85e-08 | 1.42e-07 |
| PerCapInc2019Dollars | .0000557 | .0000374 | 1.49 | 0.136 | -.0000175 | .000129 |
| UnemploymentRate | .129697 | .0670969 | 1.93 | 0.053 | -.0018105 | .2612046 |
| PercentNonWhite | -.0729487 | .0198676 | -3.67 | 0.000 | -.1118885 | -.0340088 |
| Gini | -29.76852 | 10.07331 | -2.96 | 0.003 | -49.51184 | -10.02519 |
| PercentBirthstoUnmarriedMoth | .1621909 | .0345595 | 4.69 | 0.000 | .0944556 | .2299263 |
| RepubLeg | 1.890754 | .3782355 | 5.00 | 0.000 | 1.149426 | 2.632082 |
| RepubGov | .830081 | .3193008 | 2.60 | 0.009 | .204263 | 1.455899 |
| TrifectaRepublican | -1.497563 | .4770758 | -3.14 | 0.002 | -2.432614 | -.5625117 |
| CitizenIdeology | .0486109 | .0136753 | 3.55 | 0.000 | .0218077 | .075414 |
| _cons | -2.805283 | 6.424768 | -0.44 | 0.662 | -15.3976 | 9.787031 |

## Logistic Command (Odds Ratios)

Logistic regression — Number of obs = 844; LR chi2(14) = 128.62; Prob > chi2 = 0.0000; Log likelihood = -278.99855; Pseudo R2 = 0.1873

| NoType | Odds ratio | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | 1.164954 | .0397329 | 4.48 | 0.000 | 1.089625 | 1.245491 |
| PerStudentSpending | .9999422 | .0000728 | -0.79 | 0.428 | .9997995 | 1.000085 |
| AverageScaleScoreNAEP4thGra | 1.014974 | .0274547 | 0.55 | 0.583 | .9625652 | 1.070236 |
| PercentLessThanHSAttainment | .9201934 | .0693655 | -1.10 | 0.270 | .7938059 | 1.066704 |
| TotalPop | 1 | 1.88e-08 | 5.60 | 0.000 | 1 | 1 |
| PerCapInc2019Dollars | 1.000056 | .0000374 | 1.49 | 0.136 | .9999825 | 1.000129 |
| UnemploymentRate | 1.138483 | .0763887 | 1.93 | 0.053 | .9981911 | 1.298493 |
| PercentNonWhite | .9296485 | .0184699 | -3.67 | 0.000 | .8941439 | .966563 |
| Gini | 1.18e-13 | 1.19e-12 | -2.96 | 0.003 | 3.14e-22 | .0000443 |
| PercentBirthstoUnmarriedMoth | 1.176085 | .0406449 | 4.69 | 0.000 | 1.09906 | 1.258507 |
| RepubLeg | 6.624364 | 2.50557 | 5.00 | 0.000 | 3.156382 | 13.90269 |
| RepubGov | 2.293505 | .7323178 | 2.60 | 0.009 | 1.226621 | 4.288337 |
| TrifectaRepublican | .2236746 | .1067097 | -3.14 | 0.002 | .087807 | .5697762 |
| CitizenIdeology | 1.049812 | .0143565 | 3.55 | 0.000 | 1.022047 | 1.078331 |
| _cons | .0604896 | .3886319 | -0.44 | 0.662 | 2.06e-07 | 17801.38 |

## Linktest

| NoType | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| _hat | 1.707108 | .1868562 | 9.14 | 0.000 | 1.340877 | 2.07334 |
| _hatsq | .2001382 | .0349046 | 5.73 | 0.000 | .1317265 | .2685499 |
| _cons | .3546618 | .2203949 | 1.61 | 0.108 | -.0773042 | .7866278 |

Logit Command (Coefficient)

Logistic regression — Number of obs = 844
LR chi2(14) = 21.27
Prob > chi2 = 0.0950
Log likelihood = -80.232445 — Pseudo R2 = 0.1170

| EDSSWD | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | -.0089375 | .0563719 | -0.16 | 0.874 | -.1194244 | .1015493 |
| PerStudentSpending | -3.43e-06 | .0001375 | -0.02 | 0.980 | -.000273 | .0002661 |
| AverageScaleScoreNAEP4thGra | -.0203768 | .0603368 | -0.34 | 0.736 | -.1386347 | .097881 |
| PercentLessThanHSAttainment | .2022203 | .1411721 | 1.43 | 0.152 | -.0744719 | .4789125 |
| TotalPop | -3.83e-08 | 4.10e-08 | -0.93 | 0.350 | -1.19e-07 | 4.21e-08 |
| PerCapInc2019Dollars | .0000412 | .000059 | 0.70 | 0.485 | -.0000745 | .0001568 |
| UnemploymentRate | -.1623983 | .1518302 | -1.07 | 0.285 | -.4599799 | .1351834 |
| PercentNonWhite | .011468 | .0265422 | 0.43 | 0.666 | -.0405538 | .0634898 |
| Gini | 7.673499 | 18.63528 | 0.41 | 0.681 | -28.85097 | 44.19797 |
| PercentBirthstoUnmarriedMoth | .0382034 | .0603658 | 0.63 | 0.527 | -.0801114 | .1565181 |
| RepubLeg | -14.17432 | 1213.99 | -0.01 | 0.991 | -2393.552 | 2365.203 |
| RepubGov | .6063385 | .5264406 | 1.15 | 0.249 | -.4254661 | 1.638143 |
| TrifectaRepublican | 12.73194 | 1213.99 | 0.01 | 0.992 | -2366.646 | 2392.11 |
| CitizenIdeology | .0091855 | .0224857 | 0.41 | 0.683 | -.0348856 | .0532566 |
| _cons | -8.776397 | 15.00212 | -0.59 | 0.559 | -38.18002 | 20.62722 |

Note: 92 failures and 0 successes completely determined.

Logit Command (Coefficient)

Logistic regression — Number of obs = 844
LR chi2(14) = 44.72
Prob > chi2 = 0.0000
Log likelihood = -22.870425 — Pseudo R2 = 0.4944

| EDWD | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | .5809886 | .2550602 | 2.28 | 0.023 | .0810798 | 1.080897 |
| PerStudentSpending | .001875 | .0007608 | 2.46 | 0.014 | .0003838 | .0033661 |
| AverageScaleScoreNAEP4thGra | .0017713 | .2174208 | 0.01 | 0.993 | -.4243656 | .4279082 |
| PercentLessThanHSAttainment | .8203303 | .437283 | 1.88 | 0.061 | -.0367286 | 1.677389 |
| TotalPop | -2.25e-07 | 1.83e-07 | -1.23 | 0.219 | -5.83e-07 | 1.34e-07 |
| PerCapInc2019Dollars | -.0004943 | .0002489 | -1.99 | 0.047 | -.000982 | -6.53e-06 |
| UnemploymentRate | .2157057 | .2923263 | 0.74 | 0.461 | -.3572434 | .7886548 |
| PercentNonWhite | -.0624037 | .0879327 | -0.71 | 0.478 | -.2347485 | .1099412 |
| Gini | 12.46627 | 76.16877 | 0.16 | 0.870 | -136.8218 | 161.7543 |
| PercentBirthstoUnmarriedMoth | -.014345 | .142222 | -0.10 | 0.920 | -.293095 | .264405 |
| RepubLeg | -15.74397 | 3105.186 | -0.01 | 0.996 | -6101.796 | 6070.308 |
| RepubGov | -17.1811 | 2331.202 | -0.01 | 0.994 | -4586.254 | 4551.892 |
| TrifectaRepublican | 36.25731 | 3882.872 | 0.01 | 0.993 | -7574.031 | 7646.546 |
| CitizenIdeology | .0701747 | .074282 | 0.94 | 0.345 | -.0754154 | .2157647 |
| _cons | -31.69439 | 68.25013 | -0.46 | 0.642 | -165.4622 | 102.0734 |

Note: 345 failures and 0 successes completely determined.

Logit Command (Coefficient)

Logistic regression — Number of obs = 628
LR chi2(13) = 7.64
Prob > chi2 = 0.8661
Log likelihood = -20.390918 — Pseudo R2 = 0.1578

| WD | Coefficient | Std. err. | z | P>\|z\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| YearEnrollmentChangeK12 | -.3220744 | .2045576 | -1.57 | 0.115 | -.723 | .0788511 |
| PerStudentSpending | -.0004099 | .0004058 | -1.01 | 0.312 | -.0012052 | .0003854 |
| AverageScaleScoreNAEP4thGra | .1716959 | .1526465 | 1.12 | 0.261 | -.1274858 | .4708775 |
| PercentLessThanHSAttainment | .2597805 | .3681707 | 0.71 | 0.480 | -.4618208 | .9813818 |
| TotalPop | -1.31e-07 | 1.91e-07 | -0.69 | 0.492 | -5.06e-07 | 2.43e-07 |
| PerCapInc2019Dollars | .0000783 | .0001706 | 0.46 | 0.646 | -.0002561 | .0004126 |
| UnemploymentRate | -.0233773 | .3244032 | -0.07 | 0.943 | -.6591958 | .6124413 |
| PercentNonWhite | .0479998 | .0691266 | 0.69 | 0.487 | -.0874858 | .1834854 |
| Gini | 29.97346 | 55.99415 | 0.54 | 0.592 | -79.77306 | 139.72 |
| PercentBirthstoUnmarriedMoth | -.1180255 | .1752161 | -0.67 | 0.501 | -.4614428 | .2253918 |
| RepubLeg | 1.672797 | 1.851361 | 0.90 | 0.366 | -1.955804 | 5.301399 |
| RepubGov | 1.539097 | 1.418238 | 1.09 | 0.278 | -1.240599 | 4.318794 |
| TrifectaRepublican | 0 | (omitted) | | | | |
| CitizenIdeology | -.0172081 | .0548343 | -0.31 | 0.754 | -.1246814 | .0902652 |
| _cons | -54.73676 | 36.63232 | -1.49 | 0.135 | -126.5348 | 17.06127 |

## Appendix 3: NIEER Yearbook Appendices Table of Contents

# Appendices Table of Contents



TO DIRECTLY VIEW AND DOWNLOAD THE APPENDICES, VISIT OUR WEBSITE WWW.NIEER.ORG/YEARBOOK

189