Using a Latent Profile Analysis to Identify Profiles of State Policies under the Child Care and Development Block Grant (CCDBG)

Project Team: Rebecca Madill, Principal Investigator; Van-Kim Lin, Project Manager and Analyst; Sarah Friese, Analyst; Katherine Paschall, Analyst

Introduction and Purpose

This brief describes a strategy for categorizing U.S. states based on their child care subsidy policies. We focus specifically on state policies related to the allocation of funds from the federal Child Care and Development Block Grant (CCDBG). In addition, this report describes methodological challenges that we encountered in this process, along with our solutions to these challenges. We hope that sharing our process and lessons learned will benefit others interested in grouping states based on multiple policy features—and ultimately in understanding how these categories or "packages" of policies relate to outcomes of interest. The brief includes the following sections: an overview of CCDBG and its implications for state policies; the rationale for identifying policy packages; and details of the present study, including our research questions, method, results, methodological challenges and limitations, and the implications for future work.

The Child Care and Development Block Grant (CCDBG).

CCDBG is a federal block grant that provides child care subsidies for low-income families under the Child Care and Development Fund (CCDF). The subsidy program has the dual goals of *supporting parental employment* and *providing children with high-quality child care*. The CCDBG Act of 2014 added several concrete goals to the program, including (1) promoting parental choice for child care that meets families' needs, and (2) increasing the percentage of low-income children in high-quality child care settings[1].

Because CCDF is federally funded but state-administered, states have considerable freedom when developing policies to achieve the goals of the program. Examples of the policy decisions that states have flexibility on include income-eligibility thresholds, family copayment requirements, and reimbursement rates for child care providers serving subsidized children. With the current allocation of CCDF funds to states, however, state agencies often cannot serve all children who qualify for subsidy based on federal eligibility guidelines.[2] Thus, state policymakers must balance the goals of the program with the limited availability of funds when setting state subsidy policies.

States develop policy packages that aim to increase access to higher-quality care for disadvantaged families in different ways. Some states may prioritize serving a greater number of these families, but then may need to cover a smaller proportion of the cost of care. Others may seek to cover a larger proportion of the cost of care, but can focus only on the neediest families. Still other states may set policies that encourage families receiving subsidies to use higher-quality care, by offering tiered reimbursement to child care providers when they achieve a higher rating on the state's Quality Rating and Improvement System (QRIS) or other quality measure defined by the state. The following methodology offers a strategy for grouping states based on the types of subsidy policies they set, illuminating the different approaches states take to providing child care subsidies to disadvantaged families.

Examining Policy Features Holistically.

Researchers and policy analysts commonly examine how a single policy feature varies across multiple states. However, individual policies are not developed in isolation; often they are developed in conjunction with other related policy decisions. Thus, it is important to identify specific packages of policies. We can then examine how frequently states adopt a particular set of policies (e.g., how many states have a given policy package?), and the qualities of a given policy packages (e.g., how generous and/or inclusive is it?). The results reported here contribute to our understanding of the types of policies that may

affect the availability and use of early care and education (ECE); our ultimate goal is to link these policy packages to families' access to early care and education (ECE).

Research Questions

Two related questions guided our work:
1. Are there groups of states that set subsidy policies similarly in 2011?
2. How can we describe states based on their packages of subsidy policies?

Hypotheses. We utilized a data-driven approach (latent profile analysis) to examine the number, structure, and prevalence of each policy package. Thus, we did not have a priori hypotheses regarding the number of such categories, their structure (e.g., features), or their prevalence (e.g., number of states associated with each package).

Methods

Sample. Our sample includes all 50 states and the District of Columbia. Subsidy policy data were drawn from each state and DC for each year between 2009 and 2013. Thus, the total sample included 255 cases.

Data sources. Our analytic database drew upon three different data sources.
1. CCDF Policies Database: The CCDF Policies Database is an inventory of state policies related to the operation of subsidy programs that use CCDF funds. The database catalogues policies related to family eligibility requirements, family copayments for care, application procedures, and provider-related policies, such as reimbursement rates and training requirements.[3] The Database includes policies from the 50 states, the District of Columbia, and five U.S. territories. We used Databases from 2009–2013.
2. U.S. Department of Commerce: We adjusted dollar amounts for comparison of income-eligibility thresholds, family copayments, and provider reimbursement rates across states. The regional price parity,[4] calculated by the Regional Prices Branch of the Bureau of Economic Analysis at the U.S. Department of Commerce, is an index that represents how the average cost of living in different states and regions compares to the

national average. The regional price parity is calculated by fixing the national average for cost of goods and services at 100. For instance, the regional price parity for Maryland in 2011 was 110.9, which means that the cost for goods and services was 10.9 percent higher than the national average. On the other hand, West Virginia's 2011 regional price parity was 88.5, so goods and services cost 11.5 percent less than the national average. We used each year's regional price parity metric for each state to adjust subsidy policies that specified state-specific dollar amounts for 2009–2013.
3. Bureau of Labor Statistics – Consumer Price Index: The annual inflation rate is the rate at which the prices for goods and services rise each year.[5] Because we used five years of policy data in our sample to identify policy packages, we adjusted subsidy policies that specify dollar amounts across the five years, using the annual inflation rates from the Bureau of Labor Statistics' Consumer Price Index to match 2013 prices.

Variables. In this section, we describe our process for selecting CCDF policies to consider for inclusion in the subsidy policy packages. We then describe the variables that were included in the final analysis; descriptive statistics are presented in Table 1.

Variable selection. First, we reviewed the CCDF Policies Database to identify policies that may affect a low-income family's ability to receive a subsidy and that may be adjusted by how each state allocates CCDBG funds. We considered two types of policies: 1) policies that may affect a family's eligibility to receive subsidies (e.g., income eligibility, work requirements, household size, application methods), and 2) policies that affect the quality of care a family could access (e.g., copayment and reimbursement rates). Second, we examined the distribution of each policy across the 255 cases from 2009 through 2013. Policies that did not substantially vary (i.e., were shared by more than 75 percent of the states) were excluded because these policies would not distinguish profiles. Specifically, most states (a) did not exempt very low-income families from the copay, (b) allowed child care providers to charge

families an additional fee beyond the copay, (c) had alternatives to in-person subsidy applications, and (d) required documentation to verify the applicant's identity. We included the remaining policies, described below, in the latent profile analyses.

CCDF policies that dictate a specific dollar amount (i.e., copayment rate and income eligibility threshold) specify varying amounts, depending on a family's situation (e.g., household size). For each policy, the CCDF Policies Database provides calculated dollar amounts for several scenarios. For our analyses, we selected the policies with dollar amounts that correspond to a three-person household with a single mother, a two-year-old, and a four-year old; with an annual income of $15,000; and using center-based care. This scenario describes a situation that is comparable to how other researchers have selected policies for comparison across states.[6] We focused on center-based care, given evidence that low-income families are more likely to use center-based care if they receive subsidies.[7,8] The high cost of center-based care relative to other types of care (e.g., care from family, friends, or neighbors) means that many low-income families can access center-based care only with financial assistance.

Included variables – Child care subsidy policies that affect a family's eligibility.
Initial income eligibility threshold. Household incomes must be at or below a monthly dollar amount—the initial income eligibility threshold—to be eligible to receive subsidies as a new applicant. Initial income eligibility thresholds for our sample family scenario were drawn from the CCDF Policies Database.
Higher income threshold for continuing eligibility (tiered eligibility). In some states, families are no longer eligible for a subsidy once their income surpasses the initial eligibility threshold. In other states, as subsidy-receiving families increase their monthly income over time, states continue to cover the cost of care by increasing the eligibility threshold. This tiered eligibility is designed to support families' continued access to care as they gain increasing financial stability.[9] The CCDF Policies Database lists the monthly dollar threshold under which a family can remain eligible for subsidy, for families of one through five

people; we used the monthly dollar amount for a family of three. For this analysis, we created a binary variable to indicate whether a state had tiered eligibility.

Copayment rates. A copayment is an out-of-pocket payment made by a subsidy-receiving family. States set their child care copayment rates differently. Some (e.g., Iowa) set a specific dollar amount based on household size and income level, whereas others set copayment rates based on a percentage of the family's income (e.g., North Carolina) or a percentage of the child care cost (e.g., Vermont). Copayment rates for our sample family scenario were drawn from the CCDF Policies Database. The copayment rate reflects any additional state policies that affect the rate; for example, some states exempt families who are below 100 percent of the federal poverty guidelines from paying a copayment, or they may adjust copayment rates for families with multiple children.

Included variables – Child care subsidy policies that affect the quality of care received
Base center reimbursement rate for a preschooler. The CCDF Policies Database lists the base and maximum monthly dollar amount that providers are reimbursed for different types of care (i.e., center, family child care home, group child care home, and in-home child care) and for children of different ages (i.e., infants, toddlers, preschoolers, and school-aged children). When reimbursement rates for licensed providers were unavailable, the maximum reimbursement rate for licensed, registered, or certified providers was used. In addition, rates are based on a child who receives care for eight hours a day, five days a week. Because reimbursement rates within a state may differ across geographical regions, the Database uses rates for the areas where care was provided for the most children.[10] We used the base center reimbursement rate for a preschooler to correspond to the sample family scenario.

Higher reimbursement rate for higher quality (tiered reimbursement). For this analysis, we created a binary variable to indicate whether a state had tiered reimbursement. To categorize states as having tiered reimbursement (i.e., reimbursing a child care provider above the base

rate when the provider meets quality standards), we examined the difference between the base and maximum reimbursement rate for centers serving preschoolers. Tiered reimbursement may allow families to access higher-quality care (though a tiered rate may not cover the full price of care that a family selects). Over time, many states have changed their policies to include tiered reimbursement, but many did not have tiered reimbursement in our target year (2011).

Table 1. Descriptive statistics for state subsidy policies, 2009 through 2013

	Mean (n=255)	Std. Dev. (n=255)	Min (n=255)	Max (n=255)
Initial income eligibility threshold (monthly)	$3,038	$545	$1,732	$5,366
Tiered eligibility threshold (Percent "Yes")	33%	47%	0%	100%
Tiered eligibility threshold[1] (monthly)	$252	$473	$0	$2,377
Copayment rate (monthly)~	$67	$58	$0	$234
Base center reimbursement rate (monthly)	$605	$140	$324	$989
Tiered reimbursement (Percent "Yes")	45%	50%	0%	100%
Tiered reimbursement[2] (monthly)	$52	$78	$0	$276

[1]A continuous variable calculated by subtracting initial income eligibility threshold from continuing income eligibility threshold.
[2]A continuous variable calculated by subtracting base center reimbursement rate from maximum center reimbursement rate.
~Excludes Hawaii

Analytic approach. We used Mplus Version 7 to classify states based on the five selected subsidy policies. Latent profile analysis (LPA) identifies groups of states based on policies in such a way that states in a given profile are more similar to one another than to states in other profiles. LPA provides a variety of fit statistics to determine the best-fitting model. We tested two-, three-, four-, five-, six-, seven-, eight-, nine-, and ten-profile models to determine which model best grouped states.

We considered each model's fit using the Akaike information criteria (AIC), Bayes information criteria (BIC), sample size adjusted BIC, entropy, Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMRT), and the Vuong-Lo-Mendell Adjusted Likelihood Ratio Test (VLMT). Smaller AIC and BIC values indicate better model fit.[11] Although there are no cut-offs for entropy values, values closer to 1 signal greater differentiation between profiles and greater certainty that states belong in a particular profile.[12] LMRT and VLMT compare the tested number of profiles (k) with one less profile (k-1) to test improvement in model fit. P-values less than 0.05 suggest that the current model (k) is a better fit than the k-1 profile model.[13] Finally, states were assigned to a policy profile based on their most likely profile membership (probability > .80). Additionally, the assignment was based on 2011 subsidy policies, because in future work, these profiles will be linked with families' access to care in 2012.

Results

Latent profile analysis. Using the five subsidy policies and five years of CCDF policy data, we compared the fit of nine models including between two and ten profiles (Table 2). Fit indices according to the AIC, BIC, and adjusted BIC decreased, indicating that model fit improved, with an increasing number of profiles.[14] Across all models, entropy values were close to 1, signifying that each model reasonably differentiated between profiles. Both the LMRT and the VLMT indicated that the five-profile model provided a significantly better fit than the four-profile model, and, further, that a six-profile model was not a better fit than the five-profile model. In addition, the five-profile model did not have any profiles with fewer than 5 percent of the sample. We selected the five-profile model based on the LMRT and VLMT.

Table 2. Model fit indices

Fit Statistic	2-Profile	3-Profile	4-Profile	5-Profile	6-Profile	7-Profile	8-Profile	9-Profile	10-Profile
AIC	10535.9	10468.6	10438.1	10402.3	10369.1	10335.5	10284.2	10232.7	10207.9
BIC	10585.5	10539.4	10530.2	10515.7	10503.6	10491.3	10461.2	10431.1	10427.5
Adj. BIC	10541.1	10476.0	10447.8	10414.2	10383.2	10351.8	10302.7	10253.5	10230.9
Entropy	0.776	0.832	0.844	0.865	0.897	0.916	0.948	0.941	0.947
VLMT p	0.007	0.005	0.005	0.025	0.14	0.04	0.004	0.022	0.011
LMRT p	0.008	0.0056	0.005	0.028	0.147	0.044	0.004	0.024	0.012

AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, Adj. BIC = sample size-adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Test, VLMT = Vuong-Lo-Mendell Test

State subsidy policy profile assignments and descriptions. Using the five-profile model across the full sample (n=255), almost one-third of cases were assigned to Profile 1 (n=81, 32 percent). More than one-quarter of cases were assigned to Profile 5 (n=69, 27 percent). About one-fifth of cases were assigned to Profile 3 (n=47, 18 percent), and about one-tenth of cases were assigned to Profile 2 (n=31, 12 percent) and Profile 3 (n=27, 11 percent).

Table 3 shows the standardized scores and probability for each of the five state subsidy profiles (n=255), and notes which states were assigned to each profile in our target year of 2011 (n=51). Figure 1 graphs the standardized scores and standardized probabilities across the five profiles. Table 4 describes each profile and lists the states that were assigned to each profile in 2011.

Methodological Challenges and Solutions
Challenge 1. Initially, we analyzed data from 2011 (51 cases), which resulted in consistently poor fit statistics. We tested whether this was because the model was poor, or because of other analytic factors, such as a small sample or the number of variables included in the model. We found that the sample was too small for a latent profile analysis, resulting in poor fit regardless of the variables included.

Solution 1. We included a larger sample—five years of policy information (2009–2013)—to define the state subsidy profiles. This new sample included 255 cases.

Challenge 2. Initially, we included a broader range of policies (e.g., whether states prioritized TANF recipients) in the latent profile analysis. The profiles that resulted were similar to one another; in other words, the analysis provided no information about how states set policies differently.

Solution 2. We restricted the analysis by focusing on a small number of policies we expected to have the greatest impact on a disadvantaged family's subsidy eligibility and the quality of care they could access. For the final latent profile analysis, we included five variables, which differentiated between profiles of states' policy groupings. Researchers with different agendas can conduct LPA using subsidy policies that are relevant to their outcomes of interest. For example, researchers interested in the impact of subsidy policies on families' administrative burden might look at policies related to the application process (e.g., whether parents must apply in-person).

Figure 1. Characteristics of the subsidy policies in the five CCDF Policy Profiles, 2009–2013 (standardized values)
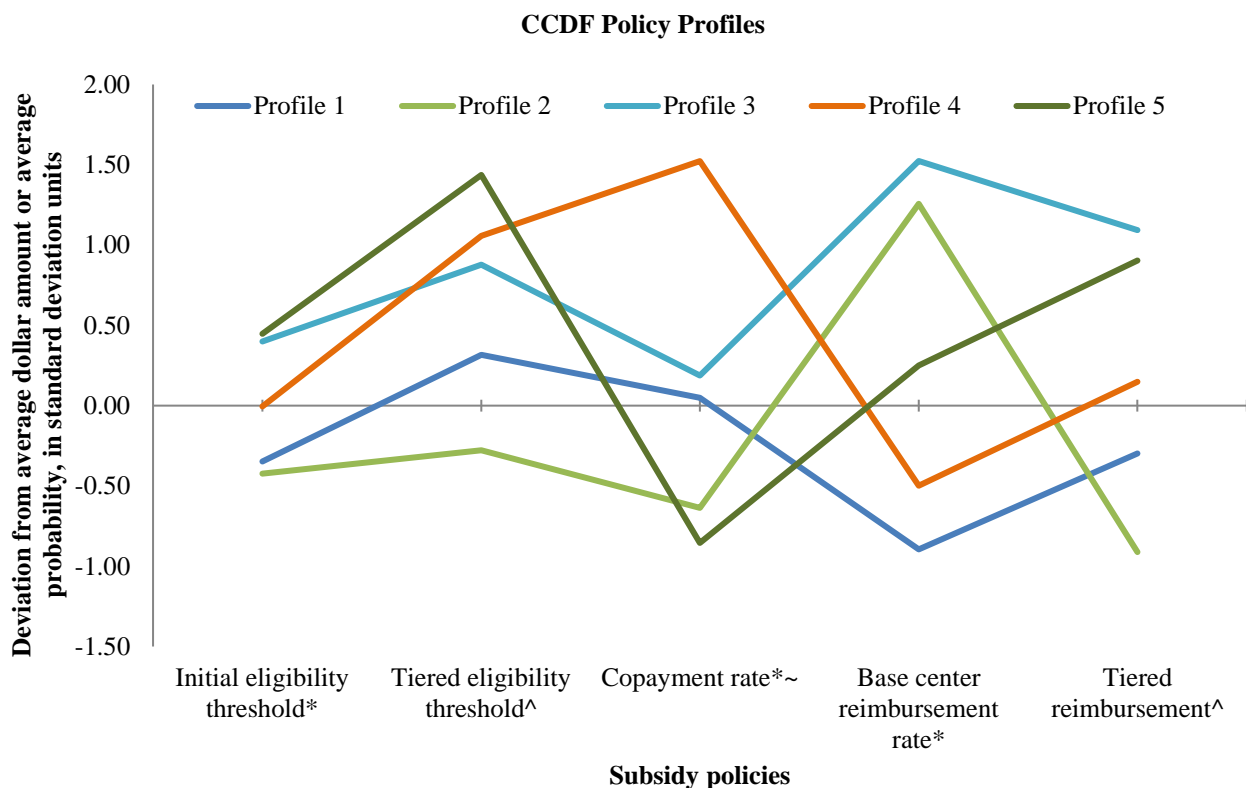
*Standardized dollar amount calculated by subtracting the mean of a continuous variable from the value and dividing by the standard deviation.
^Standardized probability calculated by subtracting the mean of a binary variable from the value and dividing by the standard deviation. The binary variable is coded such that the presence of the policy = 1 and the absence of the policy = 0.
~Excludes Hawaii
Source: Authors' analysis of the CCDF Policies Database, 2009–2013

Challenge 3. States set copayment rates differently. For example, some states calculate copayment rates as a percent of the cost of care, while other states charge a flat fee. The CCDF Policies Database calculated copayment rates for states without a flat fee, using information about household income and/or cost of care. It may not be appropriate to compare these calculated copayment rates to the rates in states with flat fees. *Solution 3.* We examined how each state calculated the copayment rates to determine if there were any strategies that might affect profile development. Although we did not find any overarching strategies, Hawaii's copayment amount, even after adjustments, was more than three standard deviations above the mean. As a result, the analysis consistently loaded Hawaii into its own profile. We treated Hawaii as an outlier on this measure, and excluded its copayment information from analyses. Nevertheless, Hawaii was assigned to the profile where, in general, states had the highest copayment rates.
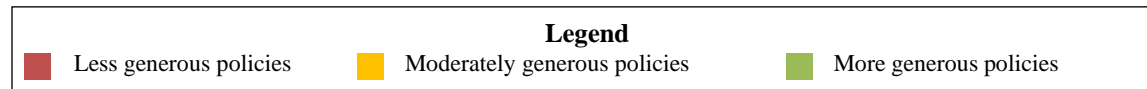
Challenge 4. The cost of living differed across states. For instance, in 2011, a family in Alabama could spend $87.70 for goods and services that would have cost $107.80 in Massachusetts. *Solution 4*. We adjusted dollar amounts for income eligibility thresholds and reimbursement rates using the regional price parity for each corresponding year to account for differences in standing of living in each state.

Table 3. Policy characteristics of the five CCDF Policy Profiles, 2009–2013

	Initial eligibility threshold (monthly amount)*	Tiered eligibility threshold (probability that a state has this policy)^	Copayment rate (monthly amount)*	Base center reimbursement rate (monthly amount)*	Tiered reimbursement (probability that a state has this policy)^	Percent of cases from 2009-2013 (n=255)	Which states were in this profile in 2011? (n=51)
Profile 1: Serving the neediest families	$2,848.90	47%	$70.19	$479.36	31%	32%	AL, AZ, DC, FL, KS, KY, MD, MI, MS, MO, NJ, NM, OK, SC, UT, WV
Profile 2: Larger benefits for fewer families, emphasizing access to high-quality care	$2,807.49	20%	$30.44	$780.37	0%	12%	CT, IN, MN, NE, OH, PA
Profile 3: More inclusive income guidelines with an emphasis on access to high-quality care, at increased cost to families	$3,255.49	74%	$78.18	$817.67	100%	11%	ME, MA, NY, OR, VA, WI
Profile 4: More inclusive income guidelines, with the largest cost to families	$3,035.44	82%	$155.60	$534.83	53%	18%	CO, DE, GA, HI, ID, LA, NC, ND, TN, TX
Profile 5: More inclusive income guidelines, incentivizing providers to offer high-quality care at a low cost to families	$3,282.21	100%	$17.74	$639.67	91%	27%	AL, AK, CA, IL, IA, MT, NV, NH, RI, SD, VT, WA, WY

Legend

■ Less generous policies   ■ Moderately generous policies   ■ More generous policies

Notes. For continuous variables (i.e., dollar amounts), "less generous policies" (red) are at least 0.3 standard deviations less generous than the average, "more generous policies" (green) are at least 0.3 standard deviations more generous than the average, and "moderately generous policies" (yellow) are in between. For binary variables (i.e., probabilities), "less generous policies" (red) occur when the probability that a state in the profile will have this policy is less than 30 percent, "more generous policies" occur when the probability is greater than 70 percent, and "moderately generous policies" are in between.

*Dollar amounts are adjusted for inflation and reflect 2013 dollars. Prices are also adjusted to account for differences in states' cost of living.

^Probability representing the likelihood that a given state in that profile will have the policy.

~Excludes Hawaii

Source: Authors' analysis of the CCDF Policies Database, 2009–2013

Table 4. Policy profile descriptions, and states that fell in these profiles in one year (2011)

Description
Profile 1: Serving the neediest families (n=16) AL, AZ, DC, FL, KS, KY, MD, MI, MS, MO, NJ, NM, OK, SC, UT, WV These states focus on providing care to only the neediest families, characterized by their lower income eligibility threshold. Families are expected to contribute to the cost of care, although copayments are about average compared with other states. Additionally, about half of the states in this profile have policies that allow families to continue receiving subsidized care when their household income increases, to a certain threshold. These states are likely to reimburse center-based care at lower rates than states in other profiles, and are unlikely to increase reimbursement rates for higher-quality care.
Profile 2: Larger benefits for fewer families, emphasizing access to high-quality care (n=6) *CT, IN, MN, NE, OH, PA* These states cover a larger proportion of the cost of care for families receiving subsidies, as evidenced by center reimbursement rates that are higher than average, and copayment rates that are below average. However, states in this profile appear to be adopting these relatively generous provisions at the cost of serving only the neediest of families (i.e., having a lower income eligibility threshold, and not covering care once a family's financial situation has improved). These states do not incentivize centers to increase their quality by offering a tiered reimbursement structure, although the higher-than-average reimbursement rate may encourage higher-quality centers to serve subsidized children.
Profile 3: More inclusive income guidelines, with an emphasis on access to high-quality care, at increased cost to families (n=6) *ME, MA, NY, OR, VA, WI* These states have an above-average income eligibility threshold, allowing more families to be eligible for child care subsidies. These states also allow families to continue receiving subsidized care when their household income increases, up to a certain threshold. These states tend to reimburse center care at rates that are higher than average; however, they also require a copayment that is slightly higher than average. All these states reimburse higher-quality care at higher rates than lower-quality care, potentially allowing families greater access to higher-quality care.
Profile 4: More-inclusive income guidelines, with the largest cost to families (n=10) *CO, DE, GA, HI, ID, LA, NC, ND, TN, TX* With a higher-than-average income eligibility threshold, these states are likely to allow families with higher incomes to access subsidized care. All of these states allow families to continue receiving subsidies as their income increases, up to a certain threshold. Possibly to cover a greater number of families, these states typically reimburse centers at lower rates than states in other profiles. These states also did not emphasize quality as much as others: The center reimbursement rate is lower than average, and only about half of the states in this profile have a tiered reimbursement system to incentivize quality.
Profile 5: More-inclusive income guidelines, incentivizing providers to offer high-quality care at a low cost to families (n=13) *AK, AR, CA, IL, IA, MT, NV, NH, RI, SD, VT, WA, WY* These states focus on offering higher-quality care with minimal family contribution. With higher income thresholds, more families are able to apply for child care subsidies, and they can stay covered as their income increases. Although reimbursement rates in these states are just average (compared to other profiles), most states in this profile reimburse higher-quality care at higher rates. They have lower-than-average copayment rates, which reduces the financial burden on families.

Challenge 5. Because of inflation, the cost of goods and services differed across years. For example, in 2012, a family in Alabama would spend $88.10 for goods and services that they would have paid $87.70 in 2011.
Solution 5. We adjusted dollar amounts for income eligibility thresholds, reimbursement rates, and copayment rates, to 2013 dollars, to compare across years.

Challenge 6. In 2011, many states did not have tiered eligibility or tiered reimbursement. As a result, continuous measures calculated as the difference between initial and continuing eligibility income thresholds, or as the difference between maximum and base reimbursement rates, were positively skewed.
Solution 6. We developed a binary variable for each measure, where a value of 0 was given to states where there were no differences and a value of 1 was given to states where there were differences.

Challenge 7. Policies were scaled differently, which made it difficult to interpret the underlying characteristics of each resulting profile (see Table 1 for descriptive statistics). For instance, tiered eligibility and reimbursement variables were binary, whereas income thresholds, copayment rates, and reimbursement rates were continuous dollar amounts. Additionally, the scale for continuous dollar amounts varied greatly: Income thresholds were in the thousands of dollars, but copayment and reimbursement rates were in the tens or hundreds of dollars.
Solution 7. We calculated the mean and standard deviation for each variable. Then, we subtracted the mean from each value and divided by the standard deviation to create a standardized score.

Limitations of the methodology. Our findings and the methodology have some limitations. First, the policies we examined are from 2009 through 2013. Since then, policies have changed in both large and small ways. Of note was the implementation of Race to The Top – Early Learning Challenge Grants, which recently ended, and a substantial change to subsidy administration within the CCDBG in 2014. Thus, the policies displayed here might not be representative of their current iteration, since many states' policies,

including early childhood education infrastructures and funding sources, have changed.

It is also important for researchers to remember that policies that implement child care subsidies may sometimes include practices that essentially override another policy that is in place. For example, a state may have a generous initial income eligibility threshold of $5,366 per month, but the state may freeze intake of families at the upper end of this income range.[15] This limitation should be kept in mind when interpreting policy profiles and linking profiles to outcomes of interest.

In addition, assignment to profiles does not mean that groupings of states have identical subsidy policies. A latent profile analysis assigns to a state a probability of being assigned to a certain profile, which may not always be 100 percent. It is important to keep in mind that the profiles represent a package of policies, and assigning a state to a particular profile means that its set of policies most closely aligns with that profile as modeled in the analysis. There is imprecision in the match between state and profile. This error should be accounted for in future analyses linking profiles to outcomes.

Implications for Research

The methodology described here offers researchers an alternative method for examining the complex interactions between subsidy policies, and helps elucidate how states use a limited set of funds to serve children and families. A latent profile analysis allows researchers to distinguish how states may create distinctive packages of subsidy policies, taking into account multiple policy components. Thus, it may provide greater understanding of how early childhood policies interact and affect outcomes, as well as capitalizing on an array of existing data sources.

Opportunities afforded by using the methodology.

Using latent profile analysis to better understand early childhood policies. A latent profile analysis approach offers flexibility for researchers who are interested in different early childhood policies, or are interested in understanding the effects of different policies on various outcomes.

Researchers can use any set of policies in the model; however, they should identify their study goals early, to refine the selection of policies to be included in the model. Additionally, researchers will want to consider different strategies for ensuring an appropriate sample size. Researchers should also keep in mind the type of adjustments that may be necessary to compare policies across states or across time (e.g., regional price parity and inflation adjustments).

Developing a profile based on multiple policies, as opposed to examining how individual policies affect family outcomes, also provides a more accurate understanding about how policies affect families in the real world. How states set policies is influenced by the amount of funds available, the priorities a state has for use of program funds, and the larger political context. Thus, policies interact with one another to create a context in which families are affected. By considering a package of policies, researchers are able to have a more comprehensive picture of how families make child care decisions. Researchers can use the described methodology to group entities (e.g., states or other political jurisdictions) based on their similar approaches to setting a policy environment, rather than focusing exclusively on particular policies. This may yield to a broader understanding of early childhood policies and their interactive effect on children and families.

Using rich, existing data sources to examine early childhood policies. Researchers can expand the usefulness of existing data sources by looking to the political context. The present project will use the National Survey of Early Care and Education (NSECE), together with these policy profiles, to better understand access to ECE on a national level. Profiles of subsidy policies can be used in conjunction with a variety of data sources to examine links between policies and outcomes. For example, linking the subsidy policy profiles with child and family outcomes from the NSECE capitalizes on two rich data sources that, together, may yield insights on access to high-quality early care and education, especially for disadvantaged families.

For more information:
See "Access to Early Care and Education for Disadvantaged Families: Do Levels of Access Reflects States' Child Care Subsidy Policies*?*" by Rebecca Madill, Van-Kim Lin, Sarah Friese, and Katherine Paschall.
https://www.childtrends.org/publications/access-early-care-education-disadvantaged-families-levels-access-reflect-states-child-care-subsidy-policies/

Disclaimer:
The views expressed in this publication do not necessarily reflect the views or policies of the Office of Planning, Research and Evaluation, the Administration for Children and Families, or the U.S. Department of Health and Human Services.

References

[1] Child Care and Development Fund (CCDF) Program, 81 Fed. Reg. 67438 (September 30, 2016)

[2] U. S. Government Accountability Office (2016, December). *Child care: Access to subsidies and strategies to manage demand vary across states.* (Publication No. GAO-17-60). Retrieved from http://www.gao.gov/assets/690/681652.pdf

[3] Office of Planning, Research & Evaluation (2008). *Child Care and Development Fund (CCDF) Policies Database, 2008-2018.* Washington, D.C.: Administration for Children and Families. Retrieved from https://www.acf.hhs.gov/opre/research/project/child-care-and-development-fund-ccdf-policies-database-2008-2013

[4] Aten, B., Figueroa, E., & Martin, T (2012). Regional price parities for states and metropolitan areas, 2006-2010. U.S. Department of Commerce: Bureau of Economic Analysis. Retrieved from https://www.bea.gov/scb/pdf/2012/08%20August/0812_regional_price_parities.pdf

[5] Bureau of Labor Statistics (2013). *Overview of BLS statistics on inflation and prices.* Washington, D.C.: U.S. Department of Labor. Retrieved from https://www.bls.gov/bls/inflation.htm

[6] Schulman, K. & Blank H. (2011). State child care assistance policies 2011: Reduced support for families in challenging times. Washington, D.C.: National Women's Law Center.; Kim, W. (2014). *Policy variations among states and impact on the choice of child care service.* (Doctoral dissertation).

[7] Ryan, R., Johnson, A., Rigby, E., & Brooks-Gunn, J. (2011). The impact of child care subsidy use on child care quality. *Early Child Research Quarterly, 26*(3), 320-331.

[8] Huston, A., Chang, Y., & Gennetian, L. (2002). Family and individual predictors of child care use by low-income families in different policy contexts. New York, NY: Manpower Demonstration Research Corporation. Retrieved from https://www.mdrc.org/sites/default/files/full_102.pdf

[9] Vesly, C. & Anderson, E. (2009) Child care and development fund: A policy analysis. *Journal of Sociology and Social Welfare, 36*(1), 39-59.

[10] Administration for Children and Families. (2011). CCDF Policies Database 2011 Book of Tables. Washington, D.C.: Administration for Children and Families. Retrieved from https://www.acf.hhs.gov/sites/default/files/opre/ccdf_policies_database_2011_book_of_tables.pdf

[11] Nylund, K., Asparouhov, T., & Muthén, B. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling, 14*(4), 535-569.

[12] Jung, T., & Wickrama, K. (2008). An introduction to latent class growth analysis and growth mixture modeling. Social and Personality Psychology Compass, 2(1), 302-317.; Kline, R. B. (2005). Principles and Practice of Structural Equation Modeling (2nd ed.). New York: Guilford.

[13] Lo, Y., Mendell, N., & Rubin, D. (2001). Testing the number of components in a normal mixture. *Biometrika, 88*(3), 767-778.

[14] Oxford, M. (2001, March 19). Latent profile analysis. Message posted to http://www.statmodel.com/discussion/messages/13/115.html

[15] U. S. Government Accountability Office (2016, December). *Child care: Access to subsidies and strategies to manage demand vary across states.* (Publication No. GAO-17-60). Retrieved from http://www.gao.gov/assets/690/681652.pdf