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Local Educational Autonomy and Student Achievement: Constructing a State-Level School District Autonomy Index in the United States

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Abstract: Drawing on data from the U.S. Census Bureau, the National Center for Education Statistics, and state property tax indicators, the analysis employs exploratory factor analysis and hierarchical regression to assess the relationship between district autonomy and student achievement. Results suggest that fiscal flexibility and administrative discretion are positively associated with higher mathematics and SAT performance, whereas punitive oversight mechanisms correlate negatively with performance. These findings underscore that autonomy enhances educational effectiveness only when accompanied by institutional capacity and accountability. By providing a replicable framework for measuring school district autonomy, this study advances empirical understanding of decentralization in K–12 education and offers

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policymakers a measurement framework for balancing local discretion with equitable governance.
Keywords: school district autonomy; decentralization; educational governance; fiscal capacity; student achievement

Autonomía educativa local y rendimiento estudiantil: Construcción de un índice estatal de autonomía de los distritos escolares en los Estados Unidos
Resumen: Basándose en datos de la Oficina del Censo de los Estados Unidos, el Centro Nacional de Estadísticas de Educación y los indicadores estatales de impuestos a la propiedad, el análisis emplea análisis factorial exploratorio y regresión jerárquica para evaluar la relación entre la autonomía distrital y el rendimiento estudiantil. Los resultados sugieren que la flexibilidad fiscal y la discrecionalidad administrativa se asocian positivamente con un mayor desempeño en matemáticas y en el SAT, mientras que los mecanismos de supervisión punitiva se correlacionan negativamente con el rendimiento. Estos hallazgos subrayan que la autonomía mejora la efectividad educativa solo cuando va acompañada de capacidad institucional y rendición de cuentas. Al proporcionar un marco replicable para medir la autonomía de los distritos escolares, este estudio amplía la comprensión empírica de la descentralización en la educación K–12 y ofrece a los responsables de políticas públicas un marco de medición para equilibrar la discreción local con una gobernanza equitativa.
Palabras clave: autonomía de los distritos escolares; descentralización; gobernanza educativa; capacidad fiscal; rendimiento estudiantil

Autonomia educacional local e desempenho estudantil: Construção de um índice estadual de autonomia dos distritos escolares nos Estados Unidos
Resumo: Com base em dados do U.S. Census Bureau, do National Center for Education Statistics e de indicadores estaduais de impostos sobre a propriedade, a análise utiliza análise fatorial exploratória e regressão hierárquica para avaliar a relação entre a autonomia dos distritos escolares e o desempenho dos estudantes. Os resultados indicam que a flexibilidade fiscal e a discricionariedade administrativa estão positivamente associadas a um melhor desempenho em matemática e no SAT, enquanto mecanismos de supervisão punitiva apresentam correlação negativa com o desempenho. Esses achados ressaltam que a autonomia aumenta a eficácia educacional apenas quando acompanhada de capacidade institucional e mecanismos de responsabilização. Ao fornecer um modelo replicável para medir a autonomia dos distritos escolares, este estudo contribui para o avanço do entendimento empírico da descentralização na educação básica (K–12) e oferece aos formuladores de políticas públicas um referencial de mensuração para equilibrar a discrição local com uma governança equitativa.
Palavras-chave: autonomia dos distritos escolares; descentralização; governança educacional; capacidade fiscal; desempenho estudantil

Local Educational Autonomy and Student Achievement: Constructing a State-Level School District Autonomy Index in the United States

Decentralization in education governance remains a central theme in democratic systems. In the United States, state governments hold plenary authority, while local school districts function as the primary operational units. The degree of local district autonomy—particularly regarding fiscal discretion, administrative capacity, and policy latitude—has long been debated. Proponents argue that local autonomy enhances responsiveness and innovation, whereas critics highlight its potential

to exacerbate inequities and inefficiencies. Despite the ongoing importance of this issue, empirical, state-level measures of school district autonomy remain limited. This study introduces the School District Autonomy Index (SDAI), a systematic framework designed to assess district autonomy and tests its relationship with student achievement.

Recent research (Bastianen & Keuffer, 2024) demonstrates a significant relationship between local autonomy, democratic legitimacy, and governmental effectiveness. Local decentralization, realized through the autonomy of local governments, is grounded in the belief that local institutions are better equipped to deliver public services and foster democratic engagement (Connolly et al., 2010). Especially within federal systems like that of the United States, robust local self-governance is often framed as a normative good (Connolly et al., 2010), offering benefits such as economic efficiency, political responsiveness, administrative accountability, and policy innovation (Wolman, 1990). Within K–12 education, governance is uniquely characterized by the complex interplay between federal, state, and local authorities. While states hold plenary authority over education, local school districts traditionally manage daily instruction, personnel, and finances.

Methodologically, assessing school district autonomy is challenging due to its varied conceptualizations—ranging from fiscal discretion and taxation authority to broader notions of home rule—and the lack of standardized, cross-state measures. Most existing studies focus narrowly on fiscal autonomy for general-purpose governments such as cities and counties, often neglecting the distinctive governance structures of school districts (Wolman et al., 2010). Research also has focused on school-level or international analyses, frequently emphasizing charter schools or PISA-based autonomy metrics (e.g., Buerger et al., 2023; Hanushek, 2013; Jackson, 2023; Ladner & Keuffer, 2021). Yet, no comprehensive, state-level School District Autonomy Index (SDAI) has been developed to empirically compare how state governance frameworks enable or constrain district-level discretion. This study addresses this critical gap by constructing and applying a novel, multidimensional SDAI across all 50 U.S. states.

Specifically, this study seeks to answer three key questions:

1. How can local school district autonomy in the United States be conceptually defined and empirically measured across different dimensions?
2. What are the comparative levels of school district autonomy across the 50 U.S. states?
3. Is there an empirical association between varying degrees of school district autonomy and student academic achievement?

To address these questions, the study develops a robust conceptual framework based on three key dimensions of autonomy, identifies measurable variables for each dimension, and employs factor analysis to construct component indices. These are combined into a composite School District Autonomy Index (SDAI). Finally, the study examines the association between this index and student academic outcomes, offering empirical insights into the relationship between decentralization and educational performance.

Literature Review and Conceptual Framework

Theoretical Background and Existing Research

The concept of local autonomy has been traditionally approached through diverse terms, such as fiscal decentralization, financial autonomy, and taxation autonomy, reflecting its inherently multidimensional character (Harguindéguy et al., 2021; Oulasvirta & Turala, 2009). Decentralization is expected to foster responsiveness, efficiency, and accountability by empowering local stakeholders

(Afonso et al., 2024). Within federal systems like the US, local autonomy has long been viewed as a democratic virtue and a means to tailor education to community needs. Local autonomy has been analyzed across multiple dimensions— administrative, fiscal, personnel, political and/or curricular forms—each offering a unique lens on subnational governance (Faguet, 2014; Hooghe & Marks, 2001; Treisman, 2007). These dimensions are especially salient in education, where decentralization is often championed as a strategy for increasing responsiveness, accountability, and policy innovation (OECD, 2018). Building on these typologies, recent measurement frameworks such as Ladner et al. (2023) and Hooghe et al. (2016) have refined our understanding of subnational power. These tools disaggregate authority into components such as tax autonomy, administrative discretion, and policy scope. In public education systems, fiscal autonomy is often foundational. Studies show that school districts' ability to raise local revenue, control expenditures, and access unrestricted funds is central to their strategic flexibility (Brunori, 2007; Gendzwill, 2021; Sokolow, 2000). For instance, property tax limitations—whether through rate caps or assessment freezes—significantly constrain local discretion and exacerbate dependence on state transfers (Connolly et al., 2010). Moreover, the Education Governance Indicators (OECD, 2019) emphasize that not only the ability to raise funds, but the freedom to allocate them, marks true fiscal autonomy.

Various decentralization indices have been developed to capture local autonomy (Arzaghi & Henderson, 2005; Hooghe & Marks, 2001; Ladner et al., 2023). Despite these trends, empirical studies of local autonomy have primarily focused on general-purpose governments, overlooking the unique structural and fiscal characteristics of school districts (Harguindéguy et al., 2021; Wolman et al., 2010). Early work by Wirt (1980) constructed a categorical scale of centralization across education policy areas, yet paid limited attention to fiscal discretion. Shock (2010) advanced this line of research by emphasizing own-source and unrestricted revenues, expenditure authority, and state intervention tools (e.g., textbook policy and takeover statutes) as central indicators of district discretion. While Wirt (1980) pioneered one of the earliest efforts to construct an educational autonomy scale, his model underemphasized critical fiscal dimensions—elements now widely recognized as central to governance capacity (Shock, 2010). Building on this gap, Shock (2010) highlighted the importance of unrestricted local revenues, discretion over expenditure categories, and the absence of conditional mandates as key indicators of local autonomy. However, these efforts have not yielded a unified, multidimensional index that is empirically scalable and comparable across all U.S. states. A gap remains in integrating measurable indicators of local autonomy that account for both formal structures and operational practices (Channa & Faguet, 2016; Fiseha, 2020).

Accordingly, a key measurement gap remains in integrating formal legal constraints and operational fiscal capacity into a state-comparable autonomy metric for school districts. Beyond fiscal matters, administrative autonomy—the authority to make decisions on curriculum, personnel, and school operations—has also been shown to influence educational outcomes. Hanushek et al. (2013) argue that administrative discretion, when matched with accountability, correlates with higher student performance in cross-national studies. Similarly, Elacqua et al. (2021) identifies school-level discretion in budgeting and hiring as critical variables in Latin American decentralization reforms.

In synthesizing international theory with U.S. institutional realities, this study contributes to the growing field of comparative education governance and responds to calls for more nuanced, context-sensitive metrics of decentralization (Piattoni, 2010; Rodden, 2004). Drawing on McGinn and Welsh (1999) and the OECD's operational definitions of education governance (OECD, 2018, 2019), we conceptualize school district autonomy as a multidimensional construct comprising three domains: importance (the institutional and fiscal salience of districts within a state system), discretion (the scope of decision-making authority under state rules), and capacity (the fiscal resources available for independent action). Ladner and Keuffer (2021) identify four analytical

approaches to conceptualizing local autonomy and argue that the coexistence of these approaches underscores the construct's multidimensional nature. On this basis, they develop a seven-dimension model from 11 indicators, capturing distinct facets of subnational authority, aggregated into triangle of local autonomy. In an autonomy study across U.S. states, Wolman et al. (2010) define it in terms of three dimensions: Local importance, local discretion, and local capacity. In studies measuring the degree of decentralization or closeness of the government to the people, Ivanyna and Shah (2014) distinguished three dimensions: political, administrative, and fiscal. Examining variation of authorities across European states, Hooghe et al. (2016) make distinction between self-rule and shared rule.

The general consensus is that well-structured and effectively implemented decentralization has the potential to improve service delivery and thus enhance educational quality (Caby & Frehen, 2021; Kameshwara et al., 2020; Winkler & Yeo, 2007). Empirical research on the relationship between local autonomy and student achievement has yielded mixed results. Strietholt and Rosário (2022), using PISA data, found that decentralization improved outcomes only in systems with strong local administrative and financial capacities. Similarly, Ehren and Baxter (2021) emphasized that autonomy alone is insufficient and must be accompanied by robust accountability frameworks. Hanushek et al. (2013) noted that autonomy's effect is context-dependent—positive in high-capacity systems but potentially harmful in low-capacity ones. Luschei and Chudgar (2020) warned that decentralization might exacerbate inequities when local political or fiscal capacity is lacking. Trujillo (2013) further argued that district effectiveness must be understood within institutional and political contexts, not merely structural configurations.

At the school level, numerous empirical studies have found positive effects of local educational autonomy on student performance across various national contexts (Faguet & Sanchez, 2007; Falch & Fischer, 2012; Letelier & Dávila, 2015; Letelier & Ormeño, 2018;). However, international research has examined the effect of school autonomy on student outcomes with mixed results. Studies in Chile, Indonesia, and Mexico have reported modest performance gains from decentralized management (Di Gropello, 2002; Gertler et al., 2006; Leer, 2016), while others note increased disparities and implementation challenges, especially in developing contexts (Elacqua et al., 2021; Jackson, 2023; Suggett, 2017). In the US, Hanushek et al. (2013) found that even modest gains in student achievement can yield substantial long-term economic returns, reinforcing the importance of understanding how governance structures shape educational quality. Nonetheless, Martin et al. (2001) caution that socio-demographic variables often outweigh autonomy in explaining performance variation.

Conceptual Framework and Measurement of the Indicators

Building on the typologies and empirical insights reviewed above, this study organizes school district autonomy into three conceptual domains: School District Importance, School District Discretion, and School District Capacity. *Importance* captures the institutional and fiscal significance of school districts as distinct governmental actors within state systems, reflecting their administrative footprint and economic weight (Diaz-Serrano & Meix-Llop, 2019; Wolman et al., 2010). *Discretion* refers to the degree of policymaking latitude available to districts under state-imposed legal and regulatory constraints, including limits on taxation, expenditure, curriculum, and state intervention authority (Channa & Faguet, 2016; Shock, 2010). *Capacity* reflects the fiscal viability of districts, emphasizing access to unrestricted or unconditional revenues that enable districts to translate formal authority into effective action (Augustine et al., 2009; Brunori, 2007). Each domain is operationalized using multiple state-level indicators drawn from prior research and administrative datasets, as detailed in the sections that follow.

- Importance: fiscal and institutional significance of school districts within state systems.
- Discretion: policymaking latitude constrained or enabled by state regulation.
- Capacity: fiscal independence measured through access to unrestricted revenue.

Sixteen indicators, including property tax limits, takeover statutes, revenue shares, and employment shares, were compiled at the state level. Factor analysis reduced dimensionality, producing five factors aligned with the three domains. Equal weights were applied to construct the SDAI. Student academic achievement was measured using NAEP (math and reading, Grades 4 and 8), SAT, ACT, and graduation rates. Control variables included socioeconomic indicators and student demographics. Hierarchical regression models tested the association between SDAI factors and achievement outcomes.

Although autonomy is defined at the district level, data are aggregated to the state level to ensure policy comparability, reflect uniform regulation patterns, and align with prior decentralization research (Kameshwara et al., 2020; Veliganio & Galigao, 2024). State-level aggregation is justified on three grounds.

- Policy Relevance: U.S. states remain the primary unit of education policymaking, particularly in determining funding formulas, accountability systems, and district-level discretion (Manna, 2006).
- Data Harmonization: Certain autonomy dimensions—such as instructional control or personnel policies—are often regulated uniformly within states.
- Comparability: State-level analysis facilitates benchmarking and identification of broader policy trends that cannot be captured at the district level alone.

Hence, while the unit of measurement is local, the unit of policy implication remains state-centric, warranting this analytical choice. Therefore, unless otherwise noted, the unit of analysis is the state-level school district system, even though autonomy is exercised at the district level.

To compare the local government systems for two or more countries, the fundamental rule for classification is that the scheme must be exhaustive and mutually exclusive (Wolman, 2008). The SDAI developed in this study integrates the conceptual and empirical insights described earlier. It captures autonomy across three core dimensions constructed with indicators draw from validated international typologies and U.S.-specific policy instruments. For example, takeover statutes limiting local governance are a key measure of constrained discretion (Shock, 2010), while own-source revenue shares reflect foundational aspects of fiscal capacity (Oates, 2005; U.S. Census F-33 data). To advance prior indices such as Wirt's (1980) centralization scale or Shock's typology, the SDAI offers a multidimensional, empirically validated tool tailored to comparative state-level analysis.

Dimension 1: School District Importance

Building on the frameworks in previous studies (McGinn & Welsh, 1999; OECD, 2018), "School District Importance" reflects the structural and fiscal significance of school districts as distinct entities within the broader state economy and intergovernmental system. This dimension captures the extent to which school districts operate as independent, substantial governmental units with their own resource bases and administrative capacities, rather than as mere extensions of state or general-purpose local governments. The following indicators are used:

1. School district employment as a percentage of total state employment.
2. School district employment as a share of combined state, general-purpose local, and school district employment.
3. School district expenditures as a share of total state government expenditures.

4. School district expenditures as a share of total public sector spending in the state.
5. Local school district own-source general-purpose revenue as a share of total school district revenue.
6. Local school district own-source general-purpose revenue as a share of total local own-source revenue.

Indicators 1 and 2 capture the administrative and institutional prominence of school districts validated as indicators on local autonomy studies (Sellers & Lidström, 2007). By reflecting the significant human resource base and distinct operational footprint, these indicators highlight the independent functional capacity of school districts as major public service providers, separate from general-purpose municipal or state agencies. Indicators 3 and 4 quantify the economic scale and operational magnitude of school districts within the overall state public economy (do Vale, 2015; Sellers & Lidström, 2007). A larger share of expenditures managed by school districts indicates their substantial role in public service delivery and their distinct fiscal importance (Wolman et al., 2010). Indicators 5 and 6 are included to measure importance of local educational districts in the state economy and in the intergovernmental system (Ladner et al., 2016; Sellers & Lidström, 2007; Wolman et al., 2010).

Dimension 2: School District Discretion

This dimension captures the policymaking latitude of local school districts, particularly in areas where state-imposed limitations and mandates directly constrain the autonomous decision-making power of districts across various functional domains (Shock, 2010). The indicators include:

7. Takeover authority: Whether state law permits state government takeovers of local school districts or individual schools.
8. Textbook adoption policy
9. Property tax rate limits.
10. Property assessment limits.
11. Property tax levy limits.
12. General revenue limits on school districts.
13. General expenditure limits on school districts.

Indicator 7 reflects the most severe form of state intervention, directly limiting a district's administrative and governance autonomy by allowing the state to supersede local control due to performance failures or fiscal distress. Such "hard" constraints are critical measures of the limits to genuine local self-governance (Schueler & Bleiberg, 2022). Indicator 8 captures programmatic discretion, specifically the extent of local control over instructional content (Shock, 2010). State-level textbook mandates directly restrict a district's ability to tailor curriculum to local needs or adopt innovative pedagogical approaches, a key aspect of educational autonomy (Whinnery et al., 2022).

Indicators related to property tax (rate, assessment, levy limits) and general revenue/expenditure limits directly assess fiscal discretion (Ladner et al., 2016; Ladner & Keuffer, 2021; Shock, 2010; Wolman et al., 2010). These state-imposed restrictions dictate a school district's ability to raise and allocate its own financial resources, profoundly impacting its capacity to fund essential services and respond to local priorities. As Sokolow (2000) argues, such limitations can lead to fiscal recentralization and erode local autonomy, making them essential measures of fiscal control. Despite its significance, the property tax has faced substantial challenges. It has been undermined by rate and assessment limitations, expansive residential relief programs, aggressive tax incentives for economic development, and widespread public dissatisfaction (Augustine et al., 2009). Thus, the property tax limits have been considered as crucial factors for local autonomy. The property assessment limits variable is coded dichotomously. For the other variables related to fiscal

limitations, we developed a six-point ordinal scale to measure the degree of restriction based on Wen and Warner (2015) and Wen et al. (2020). This nuanced ordinal scale captures the varying degrees of fiscal discretion permitted by state law, allowing for a more precise measurement of the spectrum of local autonomy than a simple dichotomous presence or absence of limits such as Shock (2010) and Wolman et al.'s (2010) studies. The scale is structured as follows:

0 = No limits (maximum fiscal discretion)
1 = Limits with override by local council majority
2 = Limits with override by local council supermajority
3 = Limits with override by public referendum (simple majority)
4 = Limits with override by public referendum (supermajority)
5 = Limits with no override provision (minimum fiscal discretion)

Dimension 3: School District Capacity

This dimension measures the fiscal capacity of school districts to operate independently, focusing on the availability of unrestricted or unconditional revenues (Shock, 2010; Wolman et al., 2010). These indicators directly reflect the financial independence of a school district, a key aspect identified by fiscal federalism theories (Ladner & Keuffer, 2021). These three indicators directly quantify the availability of financial resources over which school districts have full discretion. A higher proportion of unrestricted or unconditional revenue signifies greater financial flexibility, enabling districts to respond to local priorities, invest in innovative programs, and adapt to changing circumstances without state or federal mandates dictating spending.

The following indicators are used:

14. Percentage of unconditional total revenue as a share of total school district revenue.
15. Percentage of unconditional local revenue as a share of total school district revenue.
16. Percentage of unrestricted revenue in total revenue.

This financial independent capability is a fundamental component of true operational autonomy, allowing districts to effectively translate their discretionary powers (as measured in Dimension 2) into tangible educational outcomes (Ladner & Keuffer, 2021). Indicators 14 and 15 directly measure the financial independence and self-sufficiency of school districts (Wolman et al., 2010). A higher reliance on unrestricted and unconditional revenue sources, particularly from local taxes, signifies a robust local fiscal base and a distinct financial identity, reflecting a core aspect of fiscal autonomy within federal systems (e.g., Oates, 2005; Tiebout, 1956).

Methods

Hypotheses

This study hypothesizes that higher levels of school district autonomy correspond with higher student achievement across U.S. states. In particular, states that provide districts with greater fiscal flexibility and administrative discretion are expected to demonstrate higher scores on NAEP test. Conversely, states maintaining restrictive oversight mechanisms, such as takeover policies or assessment limits, are anticipated to show lower outcomes. These expectations rest on the premise that autonomy enhances educational performance when paired with sufficient capacity and accountability. Accordingly, the analysis examines the relationship between the School District Autonomy Index (SDAI) and variations in student achievement while accounting for socioeconomic, demographic, and resource conditions.

Research Procedures and Data Sources

After the variables are identified, exploratory factor analysis (EFA) is used to reduce dimensionality and identify underlying latent constructs. Each retained factor is converted into a continuous variable, and factor scores are computed for each state. Prior to aggregation, the inter-factor correlations are examined to ensure statistical independence or acceptable levels of association for index construction. Given the absence of a consistent framework in the literature for weighting different dimensions of school district autonomy, this study applies equal weights to each of the three dimensions. The results of the analysis—along with factor loadings and state-level rankings by factor—are presented to illustrate how each state performs along the retained dimensions. We computed standardized factor scores for each state on the five retained components from the EFA. These standardized scores capture each state's relative level of school district autonomy across the three dimensions identified through factor analysis. The scores permit cross-state comparison within each dimension and are subsequently aggregated—subject to correlation diagnostics—to construct the composite SDAI. In the absence of a theoretically justified weighting scheme, each dimension is assigned equal weight. The datasets used in the analysis are summarized below.

School District Financial Data: Data on revenues, expenditures, debt, and assets of elementary and secondary school systems are sourced from the United States Census Bureau's Census of Governments database. These data span all 50 states and include the District of Columbia. Financial indicators provide insights into school districts' capacity to generate and allocate resources—an essential element of local autonomy.

Property Tax Authority and Autonomy Variables: Property tax-related indicators are drawn from the *Significant Features of the Property Tax* project, conducted by the George Washington Institute of Public Policy with support from the Lincoln Institute of Land Policy. These variables inform the revenue autonomy dimension of SDAI.

Student Achievement Data: Student performance data are obtained from the National Center for Education Statistics (NCES), specifically from the National Assessment of Educational Progress (NAEP). The study uses average state-level scores in mathematics and reading for 4th and 8th grade students. Although NAEP provides longitudinal data dating back to 2003, the 2022 dataset is used to align with the fiscal data year and to ensure temporal consistency. Collectively, these datasets provide a comprehensive foundation for evaluating variations in school district autonomy across the United States and their potential implications for educational quality.

Regression Analysis

To explore the impact of SDA on educational performance, multiple regression analyses were conducted using SDAI scores as the main independent variable and average student achievement scores as the dependent variable. Control variables include per capita income, poverty rate, and economic characteristics of each state. This approach enables an examination of the extent to which autonomy is associated with educational outcomes and identifies which aspects of autonomy are most strongly correlated with performance.

A central hypothesis of this study posits that states with higher levels of local school district autonomy—measured by the Index of Local School District Autonomy (SDAI)—will demonstrate higher average student achievement, as measured by National Assessment of Educational Progress (NAEP) scores. Specifically, this study hypothesizes that increased levels of school district autonomy are positively correlated with student performance on the 2022 NAEP assessments in mathematics and reading for students in Grades 4 and 8. The dependent variable for this model is each state's average NAEP scale score in mathematics and reading for fourth- and eighth-grade students in 2022. The independent variable is the SDAI score, developed using the multidimensional framework

outlined previously in this study. To address potential confounding effects, we include several control variables categorized as follows:

(1) Student Demographics
- Percentage of minority students
- Percentage of economically disadvantaged students (measured by eligibility for free and reduced-price lunch)

These variables are hypothesized to have a negative association with student achievement.

(2) State Socioeconomic Characteristics
- Percentage of adults aged 25 and older with a bachelor's degree or higher
- Average household income
- Average teacher salary
- State-level literacy and numeracy rates

These factors are hypothesized to have a positive association with student achievement.

(3) Educational Resource Indicators
- Instructional expenditure per pupil
- Pupil-teacher ratio

Instructional expenditure is expected to positively influence achievement, while a higher pupil-teacher ratio has a negative impact.

The inclusion of demographic, socioeconomic, and educational resource controls reflects well-established determinants of academic performance in education policy research. Prior studies demonstrate that student composition—particularly the proportion of economically disadvantaged and minority students—strongly influences achievement outcomes (Coleman et al., 1966; Hanushek & Rivkin, 2009). Likewise, state-level socioeconomic indicators, including adult educational attainment, household income, and poverty rates, are consistently linked to variation in student performance (Baker & Corcoran, 2012; Reardon, 2011). Furthermore, educational resource variables, such as instructional expenditure per pupil and pupil–teacher ratios, are key predictors of learning conditions and instructional quality (Jackson et al., 2016; Lafortune et al., 2018). Including these covariates enables a more rigorous assessment of the independent association between school district autonomy and student achievement.

The demographic variables—including minority student ratio, free and reduced lunch eligibility, literacy and numeracy rates—are drawn from the 2022 Common Core of Data (CCD), specifically the Public Elementary/Secondary School Universe Survey by NCES. The educational attainment of adults aged 25 and above, along with average teacher salaries, is sourced from the 2022 Current Population Survey (CPS) conducted by the United States Census Bureau. Household income data for each state is also drawn from the CPS. The instructional expenditure per pupil is obtained from the 2022 National Public Education Financial Survey of the CCD, while pupil-teacher ratios are taken from the 2022 State Non-Fiscal Survey of Public Elementary/Secondary Education.

Results

Factor Analysis for the Autonomy Index

The initial dataset is comprised of 16 variables designed to measure school district autonomy across the 50 states. These variables span nominal, ordinal, and continuous data types, requiring standardization prior to analysis. Accordingly, a data preprocessing step was conducted to transform and normalize the variables as necessary for statistical consistency. Among the variables in

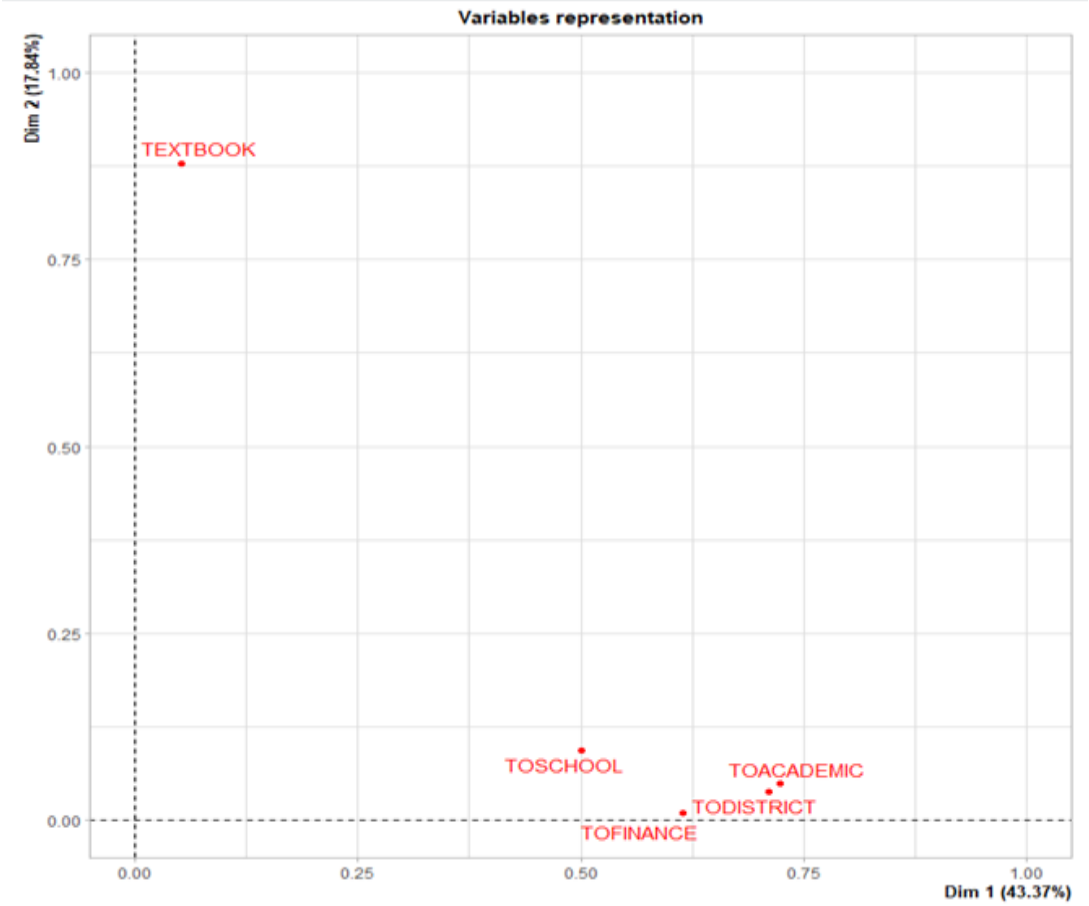
Dimension 2 (School District Discretion), two measures—textbook adoption policy and state-authorized takeovers—were identified as categorical variables requiring distinct treatment. The takeover variable is composed of four subcomponents:

TOSCHOOL: Takeover of individual schools
TODISTRICT: Takeover of entire school districts
TOFINANCE: Takeover based on financial mismanagement
TOACADEMIC: Takeover due to persistently low academic outcomes

All four subcomponents are nominal-scale variables, which cannot be directly included in traditional factor analysis. Therefore, Multiple Correspondence Analysis (MCA) was employed to reduce dimensionality and standardize the categorical data. The results of the MCA are summarized in Figure 1.

Figure 1

Multiple Correspondence Analysis (MCA) of Takeover Subcomponents



Multiple correspondence analysis (MCA) was used to summarize four nominal indicators of state takeover authority (TOSCHOOL, TODISTRICT, TOFINANCE, TOACADEMIC) into a single standardized composite variable, referred to as *"Takeover."* Given the strong associations among the four subcomponents, this aggregated measure was retained as a robust indicator of state intervention authority for subsequent factor analysis. In contrast, the textbook adoption policy

variable demonstrated sufficient internal consistency and interpretability and was therefore retained as an individual component in the construction of the autonomy index.

Using the 16 identified variables, a principal component factor analysis was conducted to reduce dimensionality and identify a smaller set of underlying latent constructs that explain the interrelationships among the original variables. An exploratory factor analysis (EFA) approach was employed, as there were no prior assumptions regarding the factor structure or variable loadings. This inductive method is appropriate given the exploratory nature of the study and the absence of a predefined theoretical model specifying how variables should cluster. Prior to factor extraction, we assessed the suitability of the data for factor analysis using two standard diagnostic tests:

The Kaiser–Meyer–Olkin (KMO) statistic and Bartlett's Test of Sphericity indicated that the data were sufficiently compact to justify factor analysis. The KMO value is 0.650, which meets the minimum threshold for adequacy and indicates that the data are moderately suitable for factor analysis. The Bartlett's Test of Sphericity produced a significance value of $p < 0.001$, thereby rejecting the null hypothesis that the correlation matrix is an identity matrix. These results further confirm that the dataset is appropriate for factor extraction. Communality values were all above 0.40, supporting the robustness of the factor solution. An Exploratory Principal Component Analysis (PCA) was performed, assigning factor loadings to each variable across component factors. Factor analysis produced five interpretable factors explaining 70.9% of the total variance: unrestricted revenue, district significance, administrative constraints, assessment & takeover, and property limits. These factors correspond primarily to the three conceptual dimensions defined earlier, and summarized below:

- Dimension 1: Importance (EFA factor: *District Significance*)
- Dimension 2: Discretion (EFA factors: *Administrative Constraints*, *Assessment Limits & Takeover*, *Property Limits*)
- Dimension 3: Capacity (EFA factor: *Unrestricted Revenue*)

Table 1 summarizes the eigenvalues, the percentage of variance explained by each factor, and the cumulative variance explained by the five retained components. Although some factors explain more variance than others, all factors were retained drawing on the eigenvalue-greater-than-one criterion (Kaiser's rule) and the overall fitness of the dataset, as determined by the KMO and Bartlett's tests. For the purposes of index construction, each factor is considered equally significant, given their statistical legitimacy and conceptual relevance.

Table 1

Exploratory Factor Analysis (PCA with Varimax Rotation): Rotated Component Loadings, Eigenvalues, and Variance Explained

Indicator	1 Unrestricted Revenue	2 District Significance	3 Administrative Constraints	4 Assessment Limit & Takeover	5 Property Limit
Unconditional % of Local Revenue	0.986	0.045	0.032	0.056	-0.035
Unconditional % of Total Revenue	0.984	0.047	0.046	0.052	0.001

Indicator	1 Unrestricted Revenue	2 District Significance	3 Administrative Constraints	4 Assessment Limit & Takeover	5 Property Limit
% Local Total Revenue	0.982	0.027	0.050	0.051	-0.047
% Local Own-Source	0.945	0.249	-0.033	0.023	0.012
Unrestricted Revenue %	0.547	-0.131	0.176	-0.380	-0.007
Education Exp. % of State Total	-0.115	0.838	-0.097	-0.009	0.145
Education Exp. % of Public Total	0.358	0.798	-0.043	-0.158	0.015
School Employment % of Public	0.227	0.611	0.105	0.212	-0.272
School Employment % of State	-0.246	0.564	-0.216	0.167	-0.301
General Expenditure Limit (GEL)	0.039	-0.051	0.773	0.114	-0.148
General Revenue Limit (GRL)	0.009	-0.130	0.709	0.096	0.019
Textbook Selection	-0.147	-0.449	-0.579	0.376	-0.065
Assessment Limit	0.102	-0.157	0.182	0.759	-0.031
Takeover (MCA composite)	0.003	0.259	0.012	0.683	0.368
Levy Limit	0.009	-0.038	-0.091	0.076	0.821
Rate Limit	-0.145	-0.425	-0.017	0.261	0.432
Eigenvalue	4.639	2.252	1.656	1.511	1.013
% Variance	28.996	15.779	10.350	9.446	6.330
Cumulative %	28.996	44.775	55.125	64.571	70.902

Note: Extraction = principal components; rotation = Varimax with Kaiser normalization; rotation converged in 6 iterations.

Creating a School District Autonomy Index (SDAI)

The exploratory factor analysis (EFA) yielded five latent root factors that consolidate the 16 original variables into broader dimensions of school district autonomy. These factors act as composite indicators, capturing distinct but related aspects of autonomy while preserving the majority of variance within the dataset. In the next phase of the study, these five components were integrated to construct a single, comprehensive School District Autonomy Index (SDAI) that reflects the multidimensional nature of local school district governance across states. Two key challenges arise in constructing such an index:

(1) Ensuring that the five extracted factors are not highly correlated with one another—so as to avoid redundancy or "double-counting"; and
(2) Determining the appropriate weighting scheme for aggregating the factors.

Regarding the first concern, it is important to note that factors extracted from the same principal component analysis are, by definition, orthogonal and uncorrelated. However, since the five factors may have been informed by conceptually distinct dimensions or from separate sub-analyses, collinearity among them remains a possibility. A review of the factor correlation matrix reveals that inter-factor correlations are generally low to moderate, confirming that the components are sufficiently distinct for use in composite index construction.

On the second issue, there is no theoretically established method to determine differential weights for each factor. In the absence of a clear theoretical rationale, equal weighting is applied by default. But this raises the question: equal weighting of what? We considered multiple approaches, including assigning equal weights to each of the five extracted factors or weighting by the variance explained. Ultimately, however, given that the five factors align with three broader conceptual dimensions of autonomy—district importance, discretion, and capacity—the final index was constructed by assigning equal weight to each of the three dimensions, regardless of how many factors were extracted within each. Table 2 presents the final state rankings drawing on the overall School District Autonomy Index, from highest to lowest.

Table 2

Overall School District Autonomy Ranking, with Each Dimension Weighted Equally

Ranking	State	SDAI	Ranking	State	SDAI
1	Colorado	4.9337	26	Iowa	0.32984
2	New Jersey	4.61966	27	New Mexico	0.08116
3	Illinois	4.17962	28	Indiana	-0.75611
4	New York	3.25334	29	Oregon	-0.86872
5	Connecticut	3.16437	30	Louisiana	-1.15105
6	Pennsylvania	3.05394	31	South Dakota	-1.15913
7	Michigan	2.86285	32	Utah	-1.24917
8	Ohio	2.36554	33	Washington	-1.37168
9	California	2.3371	34	Georgia	-1.3992
10	Arkansas	1.91805	35	Mississippi	-1.56155
11	Texas	1.71904	36	Montana	-1.56363
12	Maryland	1.61986	37	Minnesota	-1.6269
13	Wisconsin	1.46811	38	Kansas	-1.7143

Ranking	State	SDAI	Ranking	State	SDAI
14	Missouri	1.45616	39	Alabama	-2.09182
15	Arizona	1.06081	40	North Dakota	-2.19884
16	Kentucky	1.01354	41	Florida	-2.20066
17	West Virginia	0.80063	42	Tennessee	-2.26842
18	South Carolina	0.76155	43	Virginia	-2.41778
19	Nebraska	0.75783	44	Wyoming	-2.53084
20	Rhode Island	0.74227	45	Delaware	-2.76425
21	Vermont	0.71177	46	Alaska	-2.77268
22	New Hampshire	0.55287	47	Nevada	-2.79482
23	Oklahoma	0.53069	48	North Carolina	-2.87351
24	Maine	0.4188	49	Idaho	-3.27107
25	Massachusetts	0.33496	50	Hawaii	-4.44188

The values to the right of each state name represent standardized factor scores, which serve as relative indicators of the degree of school district autonomy. The magnitude of differences between scores reflects meaningful differences in autonomy levels among states. The SDAI rankings identified Colorado, New Jersey, Illinois, New York, and Connecticut as high-autonomy states, while Hawaii, Idaho, North Carolina, and Nevada ranked lowest. These findings are consistent with long-standing expectations that states in the New England and Middle Atlantic regions—known for strong traditions of local governance—would rank highly in autonomy measures (Wolman et al., 2010). Conversely, states in the South and West, such as Nevada, North Carolina, Idaho, and Hawaii, are found to have the lowest autonomy scores. Thus, the constructed index both confirms and quantifies conventional wisdom regarding geographic patterns of educational decentralization in the United States.

The Effect of School District Autonomy on Student Achievement

Regression Statistics

The regression analysis employs the five extracted factors rather than the composite SDAI rankings presented in Table 2 to better capture the multidimensional structure of district autonomy and to avoid potential information loss through aggregation. While the composite SDAI provides a useful summary for descriptive comparison, it integrates dimensions—fiscal, administrative, policy, and oversight discretion—that may exert distinct and even opposing effects on student outcomes. Analyzing the individual factor scores enables a more precise examination of which specific autonomy dimensions drive performance variation across states. This approach is consistent with prior decentralization research emphasizing that fiscal and policy discretion often influence outcomes differently (Channa & Faguet, 2016; Hanushek et al., 2013; Ladner et al., 2023). Moreover, multicollinearity diagnostics indicated moderate correlations among dimensions, suggesting that estimating separate models using the five latent constructs yields greater explanatory clarity and reduces the risk of conflating offsetting effects within a single index measure.

These factor-based scores serve as the key independent variables for analyzing the relationship between school district autonomy and student achievement at the state level. As outlined previously, ten control variables are included to account for potential confounding effects. These controls encompass student demographic characteristics, socioeconomic indicators, and

educational resource variables across states. A total of seven dependent variables are used to measure student achievement outcomes. These include:

> NAEP scores for 4th and 8th grade students in mathematics and reading (2022);
> SAT and ACT average scores (2022); and high school graduation rates (2022).

Together, these variables provide a multidimensional perspective on student performance across states, capturing both standardized test achievement and broader educational attainment indicators. The descriptive analysis establishes the descriptive distributional properties of the autonomy scores, control variables, and student outcome measures prior to inferential testing. In this stage of the analysis, we examine the relationship between local school district autonomy and student achievement. This analysis is grounded in the theoretical premise that greater local autonomy facilitates more efficient and responsive allocation of resources, which is expected to enhance educational outcomes.

Prior to conducting a multiple regression analysis, we performed a Pearson correlation analysis to evaluate potential multicollinearity among the extraneous (control) variables. The results indicate one high correlation between literacy rate and numeracy rate ($r = 0.972$, $p < 0.01$), suggesting a redundancy that may violate the assumptions of multiple linear regression. High intercorrelations among predictors can distort the estimation of regression coefficients and reduce model interpretability. The lowest positive correlation observed was between the percentage of adults with a bachelor's degree or higher and numeracy rate ($r = 0.301$, $p = 0.034$), indicating a moderate association. The strongest negative correlation was found between numeracy rate and minority student ratio ($r = –0.845$, $p < 0.001$), suggesting a substantial inverse relationship. The weakest negative correlation was between pupil–teacher ratio and per pupil current spending (PPCS) ($r = –0.299$, $p = 0.035$). These findings informed variable inclusion decisions and ensured that the subsequent regression models met assumptions of independence and stability.

This study investigates the relationship between educational autonomy at the state level in 2022 and student achievement, as measured by NAEP scores in mathematics and reading for fourth and eighth graders, as well as SAT, ACT, and high school graduation rates. During the preliminary analytical stage, multicollinearity was detected among three extraneous variables: literacy rate, numeracy rate, and poverty rate, each of which showed variance inflation factor (VIF) values exceeding 10 or Tolerance values below 0.10. These thresholds indicate a serious collinearity issue that could undermine the validity of regression coefficients. After removing the three problematic variables, multicollinearity was resolved, and the model stabilized.

A hierarchical multiple regression analysis was subsequently conducted to assess the effect of school district autonomy on student achievement, while controlling for the remaining seven extraneous variables. Separate regression models were estimated for each of the seven dependent variables. However, only three models showed acceptable levels of model fit and statistical significance:

- Grade 4 Math NAEP Scores
- Grade 8 Math NAEP Scores
- SAT Scores

Thus, the following analysis focuses exclusively on these three outcomes. In each model, Model 1 includes only the control variables, while Model 2 adds the five autonomy factors. extracted through factor analysis. This approach enables assessment of both the independent contribution of school district autonomy and its added explanatory power beyond that of demographic and contextual variables.

Grade 4 Mathematics Models

Model 1 produced an R^2 of 0.347, with $F = 3.182$, $p < 0.01$, indicating that the seven control variables collectively explain approximately 34.7% of the variance in fourth-grade math scores. Model 2, which includes the five autonomy factors, resulted in an R^2 of 0.499, with $F = 3.069$, $p < 0.01$. The R^2 change was 0.152, and the associated F-change statistic was 2.249, $p < 0.05$, confirming that the addition of autonomy factors significantly improved the model's explanatory power. The results also indicate no multicollinearity among predictors in either model (Tolerance > 0.10, VIF < 10), satisfying standard diagnostic criteria.

Table 3 presents the regression coefficients for both of the fourth-grade mathematics models. In Model 2, among the five autonomy factors, only "Unrestricted Revenue" made a statistically significant contribution to the model ($\beta = .0.315$, $p < .05$), emerging as the strongest predictor. The remaining four autonomy dimensions were not statistically significant, suggesting limited independent effects on 4th-grade math performance.

Table 3

Coefficients, Grade 4 Mathematics

Variables	Model 1				Model 2			
	B	SE	*β*	*t*(*p*)	B	SE	*β*	*t*(*p*)
(Constant)	242.010	7.772		31.139***	240.306	7.374		32.589***
Bachelor's degree & Higher	.102	.091	.171	1.117	.083	.093	.139	.890
Pupil per Teacher Ratio	-.287	.222	-.195	-1.294	-.097	.220	-.066	-.441
Minority Ratio	-.014	.053	-.045	-.258	-.017	.056	-.056	-.299
Free or Reduced Lunch Rate	-.133	.073	-.401	-1.828	-.076	.074	-.228	-1.022
PPCS	-.001	.000	-.520	-2.130*	-.001	.000	-.818	-2.971**
Average Teacher Salary	-2.530	.000	-.005	-.018	.000	.000	.275	.894
Average Income	.000	.000	.295	1.267	4.531	.000	.098	.418
Unrestricted Revenue					1.599	.648	**.315**	**2.469***
District Significance					1.568	.895	.309	1.751
Administrative Constraints					.635	.711	.125	.893
Assessment Limit & Takeover					-1.580	.800	-.311	-1.975
Property Limit					-.829	.694	-.163	-1.195
F(p)	3.182**				3.069**			
R^2	.347				.499			
adj.R^2	.238				.339			

a. Dependent Variable: 4th Math

*p<.05, **p<.01, ***p<.001

Grade 8 Mathematics Models

The relationship between school district autonomy and eighth-grade mathematics achievement was examined using hierarchical multiple regression analysis. The results indicate that the independent variables explain 53.0% of the variance in NAEP 8th grade math scores, with statistical significance ($p < 0.05$). The ANOVA results confirm the model's fit:

Model 1 (control variables only): $F = 6.761$, $p < 0.01$
Model 2 (control + autonomy variables): $F = 5.690$, $p < 0.01$

These findings suggest that both models significantly predict the outcome variable and that the addition of autonomy factors enhances the model's explanatory capacity. Multicollinearity diagnostics for both models indicate no serious violations, with Tolerance values above 0.10 and VIF values below 10, supporting the robustness of the regression estimates.

Table 4 presents the standardized regression coefficients for all predictors included in the 8th-grade mathematics models.

Table 4

Coefficients, Grade 8 Mathematics

Variables	Model 1				Model 2			
	B	SE	*β*	*t*(*p*)	B	SE	*β*	*t*(*p*)
(Constant)	271.968	7.645		35.574***	271.363	7.161		37.895***
Bachelor's degree & Higher	.138	.090	.200	1.545	.171	.091	.247	1.885
Pupil per Teacher Ratio	-.296	.218	-.173	-1.358	-.099	.213	-.058	-.462
Minority Ratio	-.059	.052	-.169	-1.138	-.055	.055	-.159	-1.015
Free or Reduced Lunch Rate	-.145	.072	-.375	-2.014*	-.082	.072	-.214	-1.147
PPCS	-.001	.000	-.446	-2.156*	-.001	.000	-.642	-2.784**
Average Techer Salary	5.921	.000	.108	.435	.000	.000	.215	.837
Average Income	.000	.000	.412	2.086*	.000	.000	.241	1.226
Unrestricted Revenue					1.452	.629	**.246**	**2.309***
District Significance					1.275	.869	.217	1.467
Administrative Constraints					1.210	.691	.205	1.752
Assessment Limit & Takeover					-1.849	.777	**-.314**	**-2.380***
Property Limit					-.013	.674	-.002	-.019
F(*p*)	6.761***				5.690***			
R^2	.530				.649			
adj.R^2	.451				.535			

a. Dependent Variable: 8th Math
*p<.05, **p<.01, ***p<.001

In Model 2, a total of three variables reached statistical significance. Among the five autonomy-related factors, the following two were statistically significant:

Unrestricted Revenue: $\beta = 0.246$, $p = 0.027$
Assessment Limits & Takeover: $\beta = -0.314$, $p = 0.023$

These results indicate that greater fiscal discretion and more flexible oversight mechanisms are positively associated with higher eighth-grade mathematics scores. The remaining three autonomy factors were not statistically significant ($p > 0.05$), suggesting that their effects are negligible in this context.

SAT models

The regression results for SAT scores as the dependent variable are presented in Table 5. Model 1 explained 17.1% of the variance ($R^2 = 0.171$), and Model 2 increased explained variance to 43.4% ($R^2 = 0.434$) following the inclusion of the autonomy factors, indicating improved explanatory power under the hierarchical specification. The ANOVA results confirm the adequacy of the regression model:

Model 1 (control variables only): $F = 1.238$, $p < 0.05$
Model 2 (control + autonomy variables): $F = 2.236$, $p < 0.05$

These findings suggest that the model demonstrates strong fit, and the inclusion of school district autonomy factors significantly enhances explanatory power. Multicollinearity diagnostics confirmed that no predictors in either model exceeded acceptable thresholds (Tolerance > 0.10, VIF. < 10), indicating that the estimates are stable and interpretable. Table 5 displays the standardized coefficients for each variable included in the SAT models. In Model 2, three variables reached statistical significance. Among the five school district autonomy factors, the following two were statistically significant:

Administrative Constraints: $\beta = 0.294$, $p = 0.050$
Assessment Limits & Takeover: $\beta = -0.599$, $p = 0.001$

Assessment Limits & Takeover showed the largest standardized effect, suggesting that more restrictive oversight mechanisms are strongly and negatively associated with SAT performance. The remaining three autonomy-related factors did not contribute significantly to the model ($p > 0.05$), indicating a limited role in explaining variation in SAT scores across states.

The analysis found no statistically significant effect ($p > 0.05$) of school district autonomy on 4th and 8th grade reading scores, ACT scores, or high school graduation rates. For 8th grade reading, only two extraneous variables—parents' educational attainment (bachelor's degree or higher) and numeracy rate—were statistically significant predictors ($\beta = –105.290$, $p < 0.05$). In the case of ACT scores, none of the five autonomies factors showed a significant association. However, two extraneous variables—per-pupil current spending (PPCS) and poverty rate—were statistically significant predictors ($p < 0.05$), indicating that these socioeconomic indicators have a stronger relationship with ACT outcomes than local governance structures. For high school graduation rates, none of the independent or control variables reached significance, except for minority student ratio, which demonstrated a statistically significant negative relationship.

The results reveal a positive and statistically significant association between the School District Autonomy Index (SDAI) and both NAEP performance and graduation readiness. However, the strength of this association varies across different components of the index. Fiscal and personnel-related autonomy demonstrate stronger predictive power than policy-related autonomy. Districts with higher autonomy tend to outperform in academic outcomes when coupled with

strong institutional capacity—measured through local revenue levels and instructional staff qualifications. The interaction terms suggest that autonomy alone is insufficient without a supportive governance infrastructure.

Table 5

Coefficients, SAT

Variables	Model 1				Model 2			
	B	SE	*β*	t(*p*)	B	SE	*β*	t(*p*)
(Constant)	1239.732	161.270		7.687***	1189.547	144.409		8.237
Bachelor Degree & Higher	.532	1.890	.048	.282	1.315	1.830	.120	.718
Pupil per Teacher Ratio	-2.318	4.599	-.085	-.504	2.082	4.305	.077	.484
Minority Ratio	-1.713	1.092	-.310	-1.569	-.909	1.103	-.165	-.825
Free or Reduced Lunch Rate	.394	1.515	.064	.260	1.470	1.451	.240	1.013*
PPCS	-.006	.005	-.318	-1.157	-.012	.006	-.581	-1.986
Average Techer Salary	-.001	.003	-.069	-.208	.002	.003	.247	.758
Average Income	.001	.002	.098	.375	-.002	.002	-.254	-1.017
Unrestricted Revenue					-3.520	12.681	-.038	-.278
District Significance					22.272	17.529	.238	1.271
Administrative Constraints					27.490	13.926	**.294**	**1.974***
Assessment Limit & Takeover					-56.026	15.664	**-.599**	**-3.577***
Property Limit					-20.357	13.595	-.218	-1.497
F(p)	1.238***				2.236***			
R^2	.171				.434			
adj.R^2	.033				.250			

a. Dependent Variable: SAT

*p<.05, **p<.01, ***p<.001

Regression results indicate that fiscal capacity (unrestricted revenue) was the most consistent positive predictor of math (4th and 8th grade) and SAT outcomes. Restrictive oversight mechanisms (assessment limits and takeover) showed negative associations with both NAEP and SAT. Administrative discretion showed mixed, context-dependent effects. No significant association was found with reading, ACT, or graduation rates.

Discussion

The findings partially support the central hypothesis that greater autonomy enhances student achievement, particularly in mathematics and college readiness outcomes. However, not all autonomy dimensions matter equally. Fiscal flexibility emerges as essential for improved outcomes, whereas punitive oversight mechanisms appear to undermine performance. These findings align with previous studies emphasizing that the benefits of autonomy are conditional on local capacity and accountability mechanisms (Ehren & Baxter, 2021; Strietholt & Rosário, 2022). The United States context demonstrates that decentralized authority must be matched with sufficient resources and institutional strength. Moreover, autonomy is significantly associated with mathematics performance and college readiness, particularly through fiscal flexibility and regulatory discretion.

This may reflect the greater sensitivity of mathematics performance to resource allocation and administrative efficiency, or the cumulative. influence of external factors on upper-grade achievement.

Why School District Autonomy Matters Today

As American education systems face renewed debates over equity, governance, and accountability, the question of school district autonomy has re-emerged as a central issue in policy discourse. The COVID-19 pandemic exposed both the potential and limitations of decentralized education systems, prompting renewed calls for greater responsiveness to local needs. In this context, understanding how state governance frameworks enable—or constrain—district-level decision-making is more urgent than ever. This study addresses that need by developing a systematic, multidimensional measure of school district autonomy and examining its association with student achievement.

As federal and state governments reassess their roles in K–12 education—especially in response to persistent achievement gaps and pressures for innovation—the balance between centralized oversight and local discretion has re-emerged as a central policy concern (Peters et al., 2022). This study responds to that moment by offering a systematic, empirical framework to assess school district autonomy across the United States.

The findings are especially timely amid growing calls for context-sensitive, community-based educational reform. Research on adaptive governance has emphasized the importance of tailoring policies to local needs (Ansell & Gash, 2008), while recent decentralization literature stresses the need to empower subnational actors with both discretion and capacity (Channa & Faguet, 2016; Faguet, 2014). In this context, our School District Autonomy Index (SDAI) offers not only a diagnostic tool but also a conceptual and empirical lens through which policymakers can better understand the institutional enablers and barriers to effective decentralization in public education.

Contributions to the Literature

This study advances the existing body of scholarship in three primary ways, thereby strengthening theoretical and empirical understanding of decentralization in education. First, it constructs a state-level, multidimensional index of school district autonomy—an empirical tool that has been notably absent from existing research by responding to critiques that prior studies focused narrowly on fiscal indicators or legal provisions without integrating them into a composite framework (Ladner et al., 2023; Shock, 2010; Wolman et al., 2010). While earlier efforts like Wirt (1980) and Shock (2010) offered significant conceptual advances, they lacked empirical scalability and comparability across jurisdictions.

Second, the SDAI draws on and extends prior frameworks in decentralization research—such as the Local Autonomy Index by Ladner et al., (2023) and the OECD's education governance indicators (2018, 2019)—by tailoring them specifically to United States, K–12, school districts. It disaggregates autonomy into three theoretically grounded domains: importance, discretion, and capacity. These reflect not only governance theory (e.g., Treisman, 2007) but also practical administrative considerations such as takeover authority, textbook policy, and fiscal flexibility.

Third, the study provides empirical evidence linking school district autonomy to student performance. While international studies have reported mixed findings (Elacqua et al., 2021; Hanushek et al., 2013), few United States-based studies have tested these claims using state-level autonomy data. Our results show that not all forms of autonomy matter equally. Fiscal capacity—especially access to unrestricted local revenues—is consistently associated with higher achievement. In contrast, state-imposed mechanisms such as takeover policies or assessment limits are negatively correlated with outcomes.

Policy Implications

The proposed School District Autonomy Index (SDAI) serves as a diagnostic and evaluative tool for policymakers seeking to balance decentralization with accountability. States with lower autonomy scores may consider revising regulations that overly centralize decision-making, particularly in personnel and instructional domains. Conversely, high-autonomy states must ensure that decentralized authority is matched with capacity-building efforts to prevent disparities in local implementation. Furthermore, the SDAI can inform federal programs such as Title I and Every Student Succeeds Act (ESSA) by identifying states where structural constraints hinder district-level responsiveness. Rather than assuming decentralization is inherently beneficial, this index enables a nuanced understanding of how autonomy functions under different governance arrangements. The specific policy implications derived from this study are summarized below:

Differentiated Policy Interventions Based on Autonomy Profiles

States exhibit diverse autonomy profiles—some scoring high on fiscal capacity but low on policy discretion, and vice versa. For example, a state like Texas, with relatively high district Significance but restrictive levy limits may benefit from revisiting its regulatory framework to allow more localized budgetary discretion. Conversely, New Jersey, with strong autonomy across all dimensions, must ensure that such discretion is matched with equity-focused capacity-building mechanisms to avoid amplifying inter-district disparities.

Aligning Federal mandates with local capacity

Programs under Every Student Succeeds Act (ESSA) and Title I can be tailored based on the SDAI. In high-autonomy states, federal programs could emphasize accountability. metrics and data-driven innovation, while in low-autonomy states; they might prioritize resource supplementation and capacity development. This stratified approach helps balance decentralization with national equity goals.

Reducing Over-centralization without Losing Coherence

States with low SDAI scores—such as Hawaii or North Carolina—may experience excessive centralization, limiting responsiveness to local needs. Policymakers in such states should consider decentralization reforms in curriculum flexibility or local revenue authority. However, reforms must maintain coherence in standards and equity, especially in resource-constrained districts.

Avoiding Assumptions of Autonomy's Universal Benefits

The study highlights that not all forms of autonomy yield positive outcomes. For instance, the Assessment Limits & Takeover factor negatively predicted student achievement in SAT and NAEP scores, suggesting that punitive oversight mechanisms may erode trust or efficiency. Rather than assuming that more autonomy is always better, policymakers must assess which types of autonomy—and in what combinations—foster improved outcomes.

Supporting Local Capacity for Equitable Implementation

Autonomy without administrative and fiscal capacity may exacerbate inequality. State education agencies should support local districts through technical assistance, data infrastructure and training in governance and finance. Federal agencies could incentivize this through grants that conditionally support autonomy expansion with documented capacity gains.

The SDAI developed in this study can be used as a test variable in future models assessing the effects of educational governance on both fiscal and non-fiscal outcomes. It may also be used as

a control variable in policy evaluation research, and the construction methodology can be adapted for application in other countries or policy contexts. Policymakers may use these findings to inform local governance reforms, particularly efforts to enhance school-level empowerment. Results highlight the importance of preserving revenue discretion and minimizing administrative constraints, which appear to be linked to improved academic outcomes in math and standardized assessments.

Future Research Directions

This study introduces the first state-level, multidimensional School District Autonomy Index for the United States and demonstrates its empirical relevance to student outcomes. Autonomy in fiscal capacity is consistently linked to improved performance, while discretionary and oversight-related autonomy yield more complex effects. Future research should extend SDAI longitudinally, explore intra-state variation, and adapt the framework for comparative international studies. Future work should also investigate how institutional culture, leadership capacity, and community engagement mediate the effects of autonomy on student outcomes and equity. Ultimately, autonomy is not a panacea—its impact depends on governance quality, institutional capacity, and equitable resource distribution.

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