



Article

Who Wants School Vouchers in America? A Comprehensive Study Using Multilevel Regression and Poststratification

Yu-Sung Su ^{1,*} and Andrew Gelman ² ¹ Department of Political Science, Tsinghua University, Beijing 100084, China² Department of Statistics and Political Science, Columbia University, New York, NY 10027, USA; gelman@stat.columbia.edu

* Correspondence: suyusung@tsinghua.edu.cn

Abstract: The debate surrounding school vouchers in educational policy remains contentious, with conflicting survey data presenting contradictory levels of public endorsement. To gain a more nuanced comprehension of viewpoints towards vouchers, we propose deconstructing the American populace into distinct demographic and geographical sectors. However, this approach encounters challenges due to data insufficiency arising from small sample sizes in individual segments. To address this quandary, we advocate employing a model-based simulation methodology called multilevel regression and poststratification to derive more accurate estimates of voucher attitudes. Our exploration reveals that vouchers enjoy the most favor among affluent White Catholics and Evangelicals, with popularity escalating alongside income within the White demographic. In contrast, among non-White individuals, voucher support exhibits a different pattern, with less favor observed within the middle-income bracket and greater acceptance among those in lower-income categories. Our findings shed light on the complex interplay of demographic and geographic factors influencing public opinion on school vouchers, offering valuable insights for policymakers and education reform efforts.

Keywords: school vouchers; multilevel regression; poststratification; educational policy; public opinion



Citation: Su, Yu-Sung, and Andrew Gelman. 2023. Who Wants School Vouchers in America? A Comprehensive Study Using Multilevel Regression and Poststratification. *Social Sciences* 12: 430. <https://doi.org/10.3390/socsci12080430>

Academic Editor: Nigel Parton

Received: 6 July 2023

Revised: 21 July 2023

Accepted: 26 July 2023

Published: 31 July 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

School vouchers, a contentious component of educational policy, offer families a financial stipend to defray tuition costs at a public or private educational institution of their choosing (Metcalf and Legan 2002). Predominantly, such vouchers facilitate an exodus from public schools, perceived as subpar, to more expensive private institutions presumed to furnish superior education. Proponents thus champion vouchers as conduits to rendering high-caliber education more accessible for economically disadvantaged families, cultivating a broader spectrum of choice, fostering competition, and ultimately improving education universally. They also present an immediate economic alleviation for families presently investing in private education. However, detractors express apprehension that vouchers may syphon resources and political backing from public schools, exacerbating educational disparities. Furthermore, the use of vouchers in religious schools broaches the prickly subject of the separation between church and state. In conclusion, the allocation of public funds for private schooling remains a disputed issue at the primary and secondary education levels, notwithstanding widespread endorsement of tuition assistance programs at tertiary educational institutions and beyond (see Chubb and Moe 1990; Levin 2002; Moe 2001, for more comprehensive reviews of the debate).

Over the past two decades, the majority of scholarly studies on school vouchers have been dedicated to assessing their impact on student performance. Until recently, these diligent academic endeavors have yielded somewhat divergent outcomes. Mills and Wolf

(2017) discovered adverse effects of school vouchers on students' English learning and math scores in Louisiana. In contrast, Wolf et al. (2013) presented compelling evidence indicating that school vouchers exert a positive influence on students' graduation rates and reading achievements in Washington D.C. Conversely, Waddington and Berends (2018) demonstrated that, on average, students in Indiana experienced a decline in mathematics achievement, while the school vouchers exhibited no discernible effects on students' English learning. Evidently, the effects of school vouchers on students' academic achievements exhibit considerable geographical variation.

In the quest to uncover the reasons behind the divergent results regarding the effectiveness of vouchers, numerous studies have examined the comparison between public and private schools and sought to quantify the potential impacts of vouchers and other school choice initiatives (Bush 2004; Chubb and Moe 1990; Ferreyra 2007; Howell 2004; Moe 2001; Witte 1998; Witte and Thorn 1996). In a comprehensive analysis, Jabbar et al. (2022) utilized systematic reviews and meta-analysis to reveal that the slight positive effects of school vouchers are contingent upon students' demographics, acting as moderating factors. However, within these studies, limited attention has been given to another pivotal aspect of the political landscape: public sentiment (Chubb and Moe 1988, 1990; Moe 2001). Beyond the realm of educational policy, the discourse surrounding school choice revolves around three paramount demographic variables:

- *Income*. Do vouchers represent an avenue for economically disadvantaged families to access improved educational prospects, or do they merely serve as a financial reprieve for affluent parents who opt for private education for their offspring?
- *Religion*. To what degree do vouchers confer a unique advantage to Roman Catholics or other religious factions?
- *Race/ethnicity*. Do vouchers provide an opportunity for ethnic minorities to afford a superior alternative to their local public schools?

While we abstain from attempting to resolve these policy dilemmas within this paper, we aim to delineate the demographic segments of the populace that endorse or oppose school vouchers. Moreover, we disaggregate responses according to state residency, given the significant role state policies play in shaping educational practices, and the demonstrated influence of public sentiment on such policies (Gelman et al. 2009; Lax and Phillips 2009).

The contributions of this paper are twofold: Theoretically, it seeks to enrich the existing literature on school vouchers by incorporating political perspectives. Specifically, the paper endeavors to address its primary research question—"who supports school vouchers"—by examining the major breakdown of American constituencies. The resulting insights will enhance the understanding of the ongoing debates surrounding school vouchers and highlight their contemporary relevance. From a methodological standpoint, the paper utilizes multilevel regression and poststratifications, considered the gold standard in survey post-analysis (Selb and Munzert 2017), to ensure robust statistical power and offer a comprehensive depiction of public opinions on school vouchers. Despite a limitation in the availability of national representative surveys on public opinions of school vouchers, the study remains confident that the two accessible surveys, National Annenberg Election Survey (NAES) in 2000 and 2004, will yield valuable insights into the issues of public preferences concerning school vouchers.

This paper delves into the contentious topic of school vouchers and examines the inconsistency in American consensus over time. We begin by surveying public perspectives on vouchers across different polls, highlighting the varying viewpoints on the subject. To gain a deeper understanding of voucher attitudes, we further divide the populace into distinct segments. In this section, we introduce the statistical method used in this study, multilevel regression and poststratification (MrP), which allows us to effectively categorize the varying demographic segments that support vouchers. Moving on, we present the results of the MrP analysis, which shed light on the factors influencing voucher popularity. Specifically, we find that vouchers enjoy the greatest support among affluent white Catholics and Evangelicals, as well as low-income Hispanics. Notably, voucher

endorsement among white groups increases with income, while the opposite holds true for non-White groups. We conclude the paper, summarizing our findings and discussing the implications of the nuanced perspectives on school vouchers in American society.

2. Public Opinions on Vouchers

Disparate survey data frequently present conflicting results regarding public support for school vouchers (Moe 2001). For instance, the *Phi Delta Kappan* (PDK) polls, which longitudinally capture public viewpoints on school vouchers, vividly illustrate this inconsistency. Figure 1 traces the fluctuations in national sentiment spanning several decades. The graph's darker trajectory reveals that in 1970 and 1971, vouchers garnered scant backing from the American populace. However, as the 1970s unfolded, a growing segment of the population displayed a proclivity towards voucher endorsement. The apex of voucher support transpired between 1981 and 1985, with a roughly 10% differential between those favoring and opposing vouchers. This margin then diminished to 5% from 1986 to 1991.

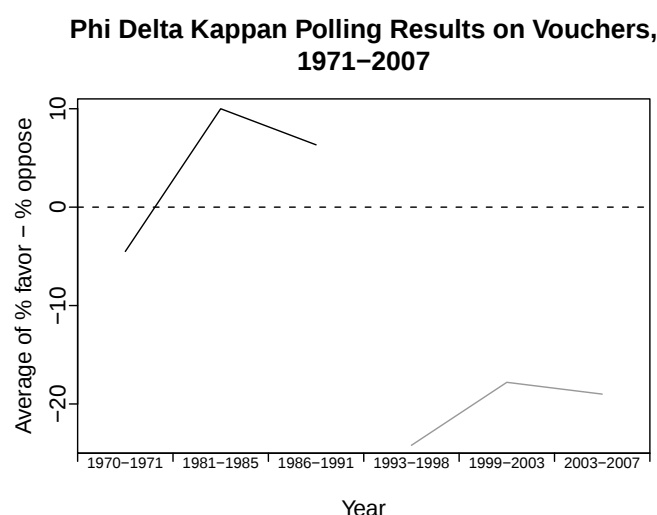


Figure 1. Tracing the evolution of national perspectives on school vouchers over previous decades utilizing *Phi Delta Kappan* (PDK) polling data. The implementation of a moving average across years is intended to neutralize annual fluctuations and more effectively illuminate the overarching trend. The dark-hued trajectory and the light-hued trajectory depict national attitudes towards school vouchers under two divergent question phrasings. The shift in phrasing precipitated a marked change in sentiment, with public support for school vouchers prevalent pre-1993, and opposition ascendant post-1993.

Yet, a dramatic shift occurred in the early 1990s—as voucher discourse garnered greater attention, and Milwaukee emerged as the first American city to implement a school voucher program—public sentiment towards vouchers veered sharply (as indicated by the graph's lighter trajectory). During this period, the populace expressing opposition to vouchers markedly exceeded those in support. Between 1993 and 1998, the discrepancy between those favoring and opposing vouchers approximated 25%. This gap slightly contracted to 17% from 1999 to 2003, before stabilizing at around 20% from 2003 to 2007.

Moe (2001) attributed this dramatic oscillation primarily to alterations in the PDK polls' phrasing of voucher-related queries, suggesting that the introduction of the phrase “public expense” triggered adverse perceptions of vouchers.¹ This variability underscores either a pervasive lack of comprehensive understanding of vouchers among Americans, or the inability of survey questions to accurately elicit valid opinions.

Additionally, the inability to derive a consistent image of American sentiments on school vouchers from survey data may arise from the inappropriate granularity of these surveys' analytical scope. In essence, by attempting to capture the opinions of the American

populace as a monolithic entity, we risk obfuscating critical nuances within the broader constituency. As Moe (2001, p. 207) articulates, “what we aspire to discern is not whether individuals express support for vouchers during a particular survey, but what factors truly influence them. The current surveys provide limited insight into that”.

In response to these data-related shortcomings, Chubb and Moe (2001) devised a fresh survey, conducted via telephonic interviews in 1995. Comprising a sample of 4700 adults, it succeeded in delivering a nationally representative cross-section of the American adult populace. Their survey question on vouchers was crafted with clarity and efficacy, providing respondents with substantial information. It stated:

“... Under a voucher plan, the parents of each school-aged child would be eligible for a state grant or voucher, representative of a designated sum of tax money. They could then opt to send their child to a public school, as previously. Alternatively, they could apply the voucher towards the cost of their child’s education at a private or parochial school of their choice”.

Their findings indicated that parents were more likely to support vouchers than non-parents; among these parents, those with children in private schools expressed a greater inclination towards vouchers than their counterparts with children in public schools. Pertaining to racial demographics, African Americans demonstrated stronger support for vouchers than Whites and Hispanics. Of these three groups, Whites expressed the least endorsement of vouchers. Education level inversely correlated with support for school vouchers, while political party affiliation held minimal sway over voucher opinions. However, Republicans displayed slightly higher levels of voucher support than Democrats.

Echoing the findings of Moe (2001), Witte and Thorn (1996) identified similar demographic characteristics among voucher proponents. Analyzing data from the Milwaukee Parental Choice program, they found that 70% of participating students were African American, with Hispanics comprising 20% and virtually no participation from Asian students. Gender disparity was minimal, although female students outnumbered male students. In terms of reported household income, the average was below USD 22,000, with the majority of households being single-parent (75%). Furthermore, more than half of these mothers were employed either full or part time, and possessed at least some college education.

In essence, they discerned a consistent sentiment towards vouchers among the American populace. As Moe (2001, p. 211) ascertains, “[t]here is an underlying structure to the issue [of school vouchers] that is coherent”. The individuals expressing support for vouchers are those with vested interests in the scheme.

3. Estimating Voucher Opinion with Multilevel Regression and Poststratification

Drawing on the insights of Moe (2001) and Witte and Thorn (1996), we approach the understanding of voucher opinions by examining Americans across diverse segments. To estimate public opinion within these segments, two predominant methods exist: disaggregation (Erikson et al. 1993), and simulation (Gelman and Little 1997; Park et al. 2006). Although easier to implement, disaggregation carries inherent limitations. As we segment the survey data further (for instance, by states), we encounter issues of inadequate sample sizes for each segment (i.e., state-level data scarcity). Additionally, the segmented data may not correspond precisely to the original sample design, thereby jeopardizing sample randomness. As a result, the estimates derived from disaggregation tend to be less efficient and accurate. In contrast, simulation-derived estimates model responses as a function of each segment (multilevel regressions). For segments with smaller samples, their estimates are pooled towards the group mean. However, these estimates are also vulnerable to sample insufficiency. Park et al. (2006) and Gelman and Little (1997) enhanced this method by poststratifying (or weighting) these estimates using population data. In the following sections, we apply their methodology—multilevel regression and poststratification—to estimate voucher opinions.

3.1. Data

To estimate responses regarding school voucher opinions, we utilized the 2000 and 2004 National Annenberg Election Survey (NAES), which encompassed data from over 100,000 respondents. Although the data may be considered outdated, they remain the only available and most recent national representative dataset that gauges respondents' preferences on school vouchers. Among the respondents, approximately 50,000 individuals provided answers to the voucher question and expressed their opinions. The specific voucher question was as follows: "Should the federal government give tax credits or vouchers to help parents send their children to private schools?" We coded the responses as 1 for those favoring vouchers and 0 for those opposing them. In 2000, 45% of those who expressed an opinion on this question responded affirmatively, while in 2004, this figure rose to 52%.

Income is coded into five categories (under USD 20,000, USD 20,000–USD 40,000, USD 40,000–USD 75,000, USD 75,000–USD 150,000, and over USD 150,000); religion and race/ethnicity are combined into a variable of seven categories (White Catholics, White evangelical Protestants, White non-evangelical Protestants, White other/no religion, Blacks, Hispanics, and other races). We also include two geographical variables: fifty-one states including DC as a separate "state", and four regions (Northeast, Midwest, South, and West). For each state, we include the average state income and the Republican presidential election share in 2004.

Figure 2 presents the raw estimates (disaggregation) of the percentages of voucher support from the 2000 and 2004 NAES and the data from Moe (2001). The percentages exhibit significant variability by state, income level, and religious/ethnic group. A notable discrepancy arises between the estimates of Moe (2001) and those from the 2000 and 2004 NAES within the high-income group. This difference may be attributed to Moe (2001)'s under-sampling within this group, resulting in wide standard error bars on these estimates, signifying high levels of uncertainty.

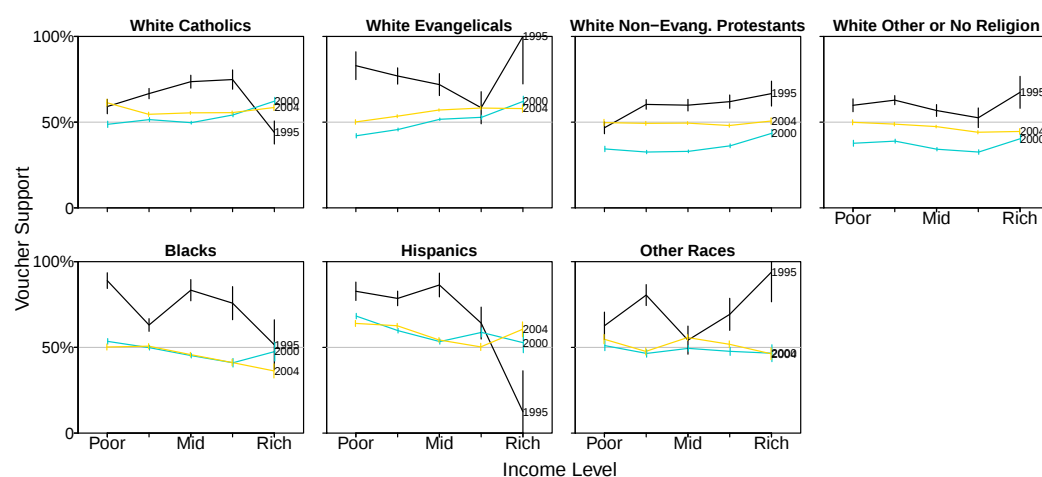


Figure 2. Plot of the percentage who support vouchers by religious/ethnic group: White Catholics, White born-again Protestants, White non-born-again Protestants, White other/no-religion, African-Americans, Latinos, and other. The estimates from Moe (2001) are represented by black lines, those from the 2000 NAES by yellow lines, and those from the 2004 NAES by blue lines. Each estimate is accompanied by ± 1 standard error bars. Overall, the patterns in 2000 and 2004 are comparable. Significant discrepancies exist between the estimates of Moe (2001) and those of the NAES within the wealthy demographic. The estimates for the wealthy group in Moe (2001) exhibit wide error bars, indicating a high degree of uncertainty. One possible explanation for this discrepancy between Moe (2001) and the NAES may be that Moe (2001) under-sampled this particular demographic.

3.2. Method: Multilevel Regression and Poststratification (MRP)

We use a multilevel regression to model voucher opinions (y) based on relevant covariates: income, a combination of religion and race/ethnicity (releth), region, state, and interactions between these categories. Additionally, we include average state income and Republican presidential election share in 2004 as state-level predictors to enhance the estimation of state effects. The model is fitted with a multilevel logistic regression, employing the `glmer` function (generalized linear mixed effects in R) (Bates et al. 2015). The model can be formally expressed as shown in Equation (1):

$$\Pr(y_i = 1) = \text{logit}^{-1} \left(\alpha^0 + \alpha_{m[i]}^{\text{releth}} + \alpha_{k[i]}^{\text{income}} + \alpha_{s[i]}^{\text{state}} + \alpha_{r[i]}^{\text{region}} + \alpha_{k[i],s[i]}^{\text{income,state}} + \alpha_{k[i],r[i]}^{\text{income,region}} + \alpha_{m[i],s[i]}^{\text{releth,state}} + \alpha_{m[i],r[i]}^{\text{releth,region}} \right) \quad (1)$$

In the equation above, the terms following the intercept (α^0) represent effects for the different groups and categories of respondents (these are varying intercepts). Varying intercepts at the income, income-state, income-region, and religion/ethnicity-state levels are drawn from a normal distribution with a mean of 0.

$$\begin{aligned} \alpha_{k[i]}^{\text{income}} &\sim N(0, \sigma_{\text{income}}^2), \text{ for } k = 1, \dots, 5, \\ \alpha_{k[i],s[i]}^{\text{income,state}} &\sim N(0, \sigma_{\text{income,state}}^2), \text{ for } k = 1, \dots, 5 \text{ and for } s = 1, \dots, 51, \\ \alpha_{k[i],r[i]}^{\text{income,region}} &\sim N(0, \sigma_{\text{income,region}}^2), \text{ for } k = 1, \dots, 5 \text{ and for } s = 1, \dots, 4, \\ \alpha_{m[i],s[i]}^{\text{releth,state}} &\sim N(0, \sigma_{\text{releth,state}}^2), \text{ for } m = 1, \dots, 7 \text{ and for } s = 1, \dots, 51, \\ \alpha_{m[i],r[i]}^{\text{releth,region}} &\sim N(0, \sigma_{\text{releth,region}}^2), \text{ for } m = 1, \dots, 7 \text{ and for } r = 1, \dots, 4. \end{aligned}$$

The varying intercepts at the religion/ethnicity and region group levels are modeled as a function of the average income of respondents in those groups. The varying intercepts at the state level are modeled as a function of the average income of respondents in each state, the average state income, and the Republican presidential election share in 2004.

$$\begin{aligned} \alpha_{m[i]}^{\text{releth}} &\sim N(\beta_{\text{releth}}^{\text{income}} \times \text{income}_m, \sigma_{\text{releth}}^2), \text{ for } m = 1, \dots, 7 \\ \alpha_{r[i]}^{\text{region}} &\sim N(\beta_{\text{region}}^{\text{income}} \times \text{income}_r, \sigma_{\text{region}}^2), \text{ for } r = 1, \dots, 7 \\ \alpha_{s[i]}^{\text{state}} &\sim N(\beta_{\text{state}}^{\text{income}} \times \text{income}_s + \beta_{\text{state}}^{\text{state.income}} \times \text{state.income}_s + \beta_{\text{state}}^{\text{rep.vote}} \times \text{rep.vote}_s, \sigma_{\text{state}}^2), \text{ for } s = 1, \dots, 51 \end{aligned}$$

The variances σ of these varying intercepts are modeled from the correlated grouping structures (Gelman and Hill 2006).

After fitting the multilevel logistic regression, we compute the predictive probability of support for the voucher opinion for each demographic-geographic type θ . There are 7140 combinations of these types (51 states $\times$ 4 regions $\times$ 5 income categories $\times$ 7 religion/ethnicity). For the purpose of our analysis, we exclude the region aspects and concentrate on state-level responses. This leaves us with 1785 cells of estimates.

Next, to rectify the efficiency problem, we poststratify these estimates θ 's with population percentages N 's. The corresponding population percentages of these 1785 cells are calculated from the IPUMS 5-Percent Public Use Microdata Sample from the United States census data. Therefore, for each θ_j in each state s , the weighted predictive probability ($\hat{y}_s$) is:

$$\hat{y}_s = \frac{\sum_{j \in s} N_j \theta_j}{\sum_{j \in s} N_j} \quad (2)$$

The rationale behind MrP is to disaggregate data into smaller cells by delineating it based on geographical and demographic variables through multilevel modeling. Subsequently, the model's predictions aid in reassembling these granulated estimates into larger groups. During this process, cells with inefficient sample sizes are pooled towards grand means, resulting in the larger groups becoming more than just simple aggregations of small cells but rather modeled estimates. This is the first aspect where MrP outperforms the simple segmentation method. In the final step, poststratification with population weights ensures that the ultimate estimates, as well as the overall means, better represent the population estimates. This constitutes the second aspect where MrP provides more reasonable estimates compared to the simple segmentation and regression methods.

4. Results of MRP

Figures 3 and 4 provide a comprehensive display of 1785 estimates for each survey year, investigating the support for federal school vouchers among respondents. The color-coded maps differentiate support as brown and opposition as blue, with other shades indicating variations close to the national average in gray.

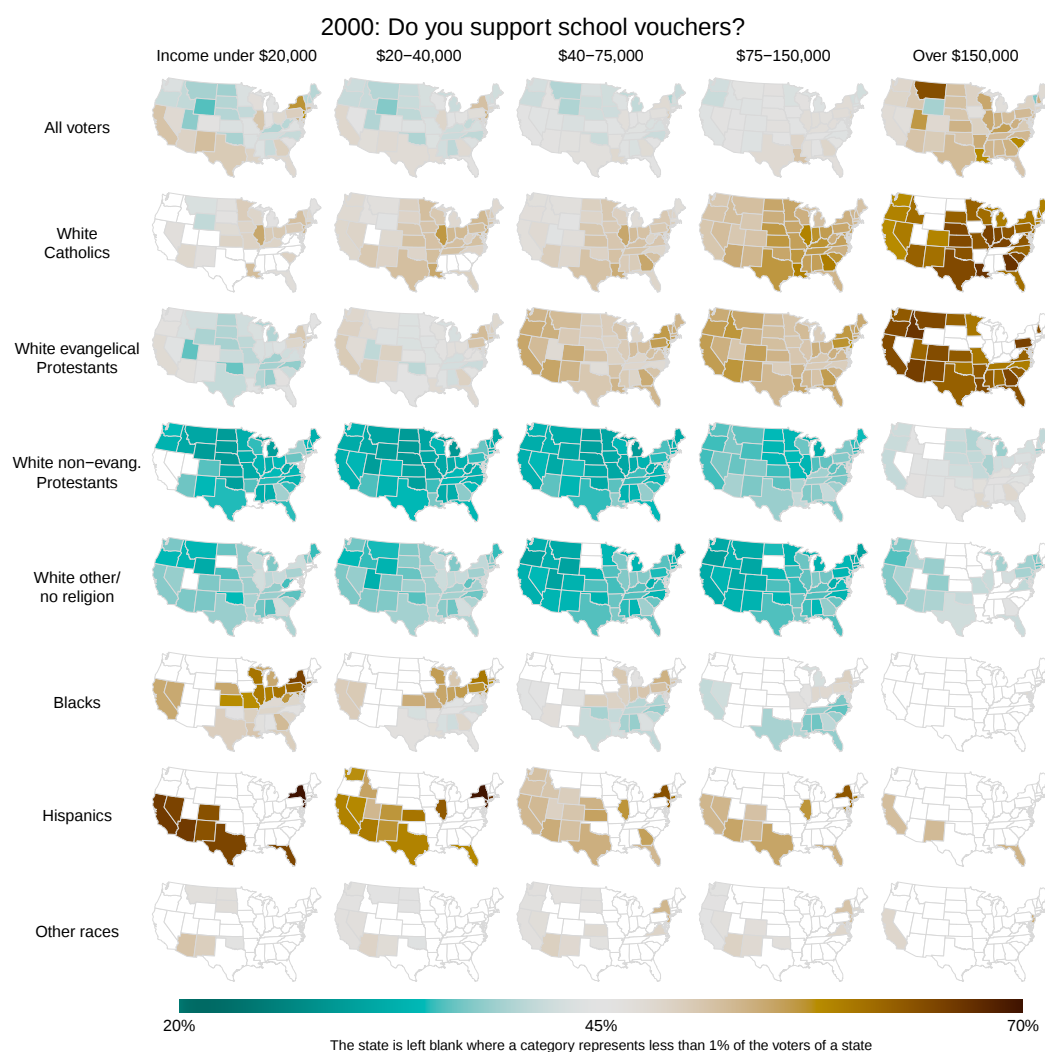


Figure 3. Estimates of the proportion of voters who support school vouchers in each state in 2000, for voters of different religious/ethnic categories and five different categories of family income. Colors (brown for support and blue for opposition) indicate support relative to the national average (gray).

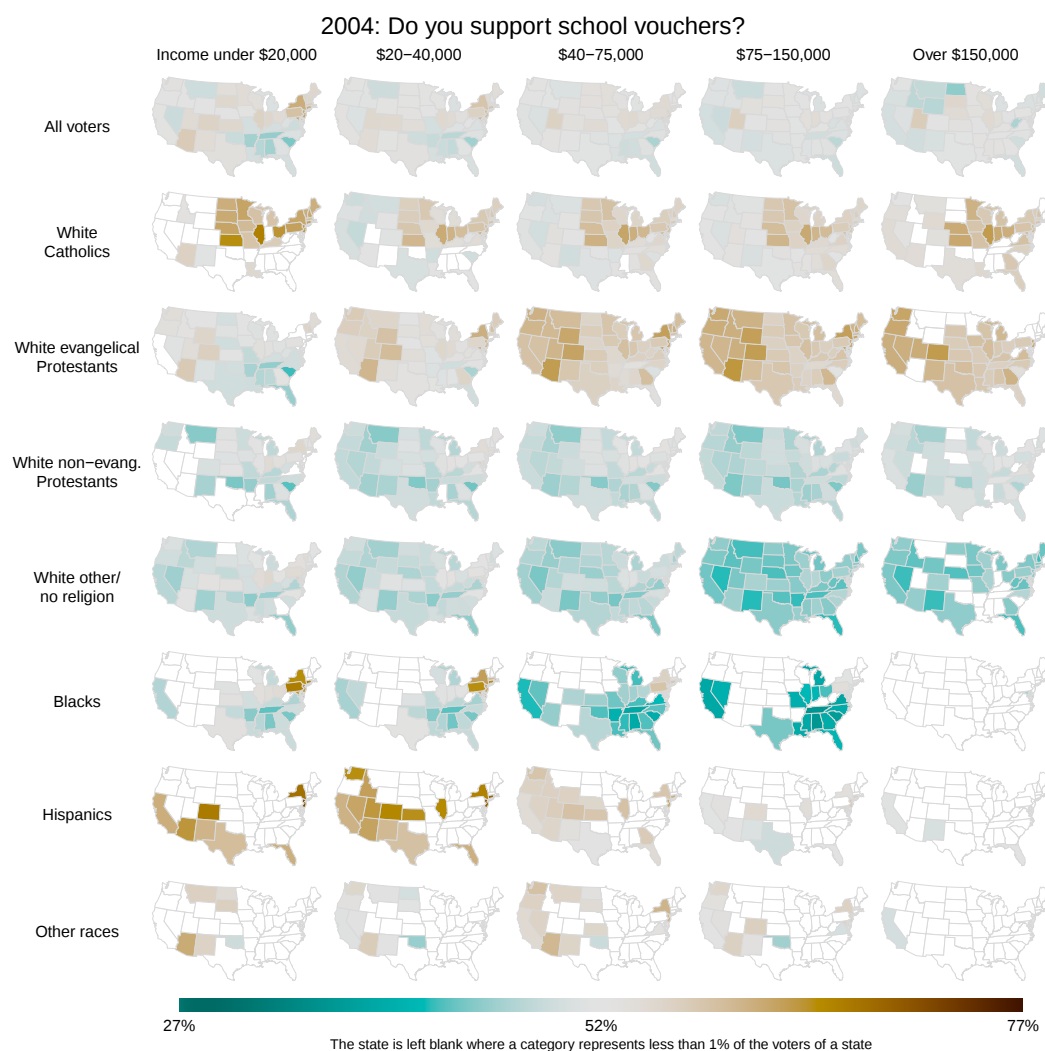


Figure 4. Estimates of the proportion of voters who support school vouchers in each state in 2004, for voters of different religious/ethnic categories and five different categories of family income. Colors (brown for support and blue for opposition) indicate support relative to the national average (gray). The patterns are similar to those in 2000; see Figure 3.

When examining American voters broadly, without considering race and religion, no distinct state-to-state patterns emerge. However, a notable observation in 2000 is the somewhat higher support for vouchers among those with income levels over USD 150,000 in the eastern regions, a trend that diminished by 2004.

On dissecting voters into various racial and religious groups, patterns become more discernable, echoing the findings of [Moe \(2001\)](#) and [Witte and Thorn \(1996\)](#). School vouchers receive considerable support among Roman Catholics and, to a lesser extent, born-again Protestants. Additionally, African Americans demonstrate general support for vouchers, although this varies with income and geographical factors.

The analysis unveils that school vouchers find more favor among high-income white Catholics and Evangelicals, as well as low-income Hispanics. Among white populations, higher income correlates with greater support for school vouchers, whereas within non-White groups, support appears stronger in lower income brackets, tapering in the middle-income categories. This may be attributed to varying levels of social capital, in line with the discussions of Orr (1999).

While support for vouchers generally aligns with Republican voting patterns, it is not a perfect fit. Vouchers attract significant popularity in predominantly Catholic regions

of the Northeast and California, while facing less enthusiasm in many heavily Protestant Southeast states.

Interestingly, geographic patterns surface in the data, as African Americans display the strongest voucher support in regions outside the South. This pattern also holds for low-income African American and non-White individuals. Particularly, African Americans exhibit heightened voucher support at lower income levels, consistently more pronounced in the Northeast and Midwest compared to the South. Local political influences and leadership, as emphasized by Rich (1996), likely contribute to these regional disparities.

The 2004 Annenberg survey's patterns closely mirror those of 2000, though direct comparison poses challenges due to a change in the survey question format, offering five responses in 2004. We handled this change by excluding the 30% of middle-category responses (neither favor nor oppose). Despite these methodological shifts, the most notable change between 2000 and 2004 was a general increase in voucher support, warranting further investigation into the reasons behind this shift.

The utilization of MRP offers more nuanced insights by dividing the data into numerous categories, overcoming the limitations of simple raw state estimates (disaggregation) where sample size constraints might hinder obtaining reliable estimates. The MRP method effectively addresses this issue. Nevertheless, since our estimates rely on predictive probabilities derived from a sophisticated multilevel logistic regression (Equation (1)), their accuracy hinges on the model's goodness of fit. For assessment, we present Figure 5, depicting estimates and raw data for white Catholics in each state.

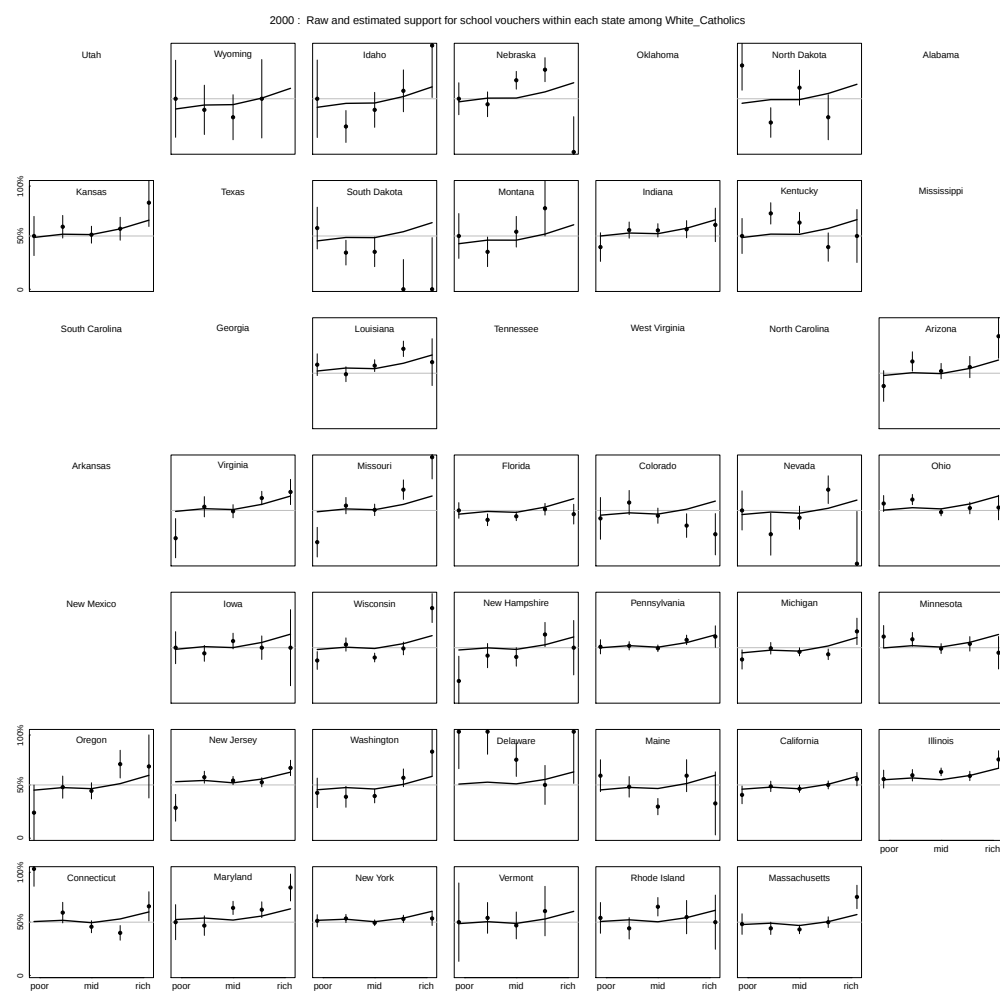


Figure 5. Example of model evaluation: estimated support for vouchers among White Catholics in each state in 2000 (as mapped in Figure 3, and ordered by Democratic vote share), along with corresponding

raw proportions and standard errors based on survey data. States in which White Catholics represent less than 10% of the population are excluded. The multilevel model does more pooling in smaller states such as Wyoming and Idaho. In contrast, in larger states such as California and New York, the multilevel estimates are close to the data. Similar plots exist for other ethnic/religious categories, shown in the rows of Figures 3 and 4.

Comparing Figure 5 to Figure 3, we observe that the multilevel model estimates exhibit more pooling in smaller states such as Wyoming and Idaho. Conversely, in larger states such as California and New York, the multilevel estimates closely align with the data. We have similar plots for the other ethnic/religious categories shown in the rows of Figures 3 and 4.

5. Conclusions

In this comprehensive inquiry, our study delves deep into the intricate dynamics of public sentiments surrounding school vouchers, harnessing insights from an exhaustive analysis of the 2000 and 2004 National Annenberg Election Survey data. Leveraging the potent method of Multilevel Regression and Post-Stratification (MrP), we unearth nuanced variations in support for school vouchers across diverse demographic categories, illuminating the complex interplay of factors such as income, race, religion, and geographic region.

Our study makes valuable contributions to the ongoing debates surrounding school choice and educational policy. When considering American voters as a whole, without considering race and religion, no strong state-to-state patterns emerged. However, upon analyzing the data from different racial and religious perspectives, distinct patterns became evident. There was significant support for school vouchers among Roman Catholics and, to a lesser extent, born-again Protestants, which aligns with previous research. Additionally, African Americans showed notable favor for vouchers, particularly in regions outside the South, revealing regional variations in their preferences.

The salience of income surfaces as a pivotal factor shaping preferences for school vouchers, spotlighting the intricate intertwinement of economic standing and education policy. Among white cohorts, elevated income levels aligned with amplified support for school vouchers, whereas non-White segments evinced more pronounced advocacy among lower income brackets. These discoveries bear momentous implications for policymakers endeavoring to tackle issues of educational access and equity, particularly for marginalized communities.

Our exploration further unveils regional diversities in voucher support, mirroring broader political currents coursing through the nation. While vouchers generally harmonized with Republican voting patterns, they found fervent favor in predominantly Catholic enclaves of the Northeast and California, while encountering lesser acclaim in numerous heavily Protestant Southeastern states. Moreover, African Americans exhibited heightened support for vouchers in the Northeast and Midwest, relative to the South, underscoring enthralling regional variations in their predilections.

In contrasting the outcomes between the 2000 and 2004 surveys, a steady pattern of voucher support emerged across both years. However, direct comparisons proved arduous, for the survey question underwent methodological changes. Nonetheless, an overall upswing in voucher support manifested in 2004, warranting further scrutiny to comprehensively apprehend the underlying impetuses behind this transformation.

The assimilation of MrP proves transformative, proffering richer insights by parsing the data into multiple categories, transcending the limitations of rudimentary raw state estimates. This approach engendered more incisive estimation of support in smaller states, while concurrently delivering reliable assessments in their larger counterparts. The multilevel regression phase of the model adeptly addressed the challenge of diminutive sample sizes by coalescing estimates towards the overarching mean, bolstering the rigor of our findings.

To be forthright, we acknowledge that the use of 2000 and 2004 National Annenberg Election Survey (NAES) data might be deemed antiquated. However, it behooves us to underscore that this corpus remains the most exhaustive and contemporaneous national representative dataset available for gauging public preferences on school vouchers. While the temporal span may seem extensive, the trends discerned through our study offer invaluable historical context, underpinning a foundational understanding of the dynamics of public opinion on this contentious educational policy. Moreover, the relevance of our inquiry endures, punctuated by the perpetual debates and exigencies surrounding school choice and educational equity in the United States. The imperatives of accessing quality education and appraising the ramifications of school vouchers on academic outcomes remain acutely germane, etching themselves into the fabric of contemporary policy discussions.

In conclusion, our study reveals a new perspective on the dynamics of public opinions regarding school voucher policies among the American population. The intricacies animating educational choice, access, and equity underscore the indispensability of cogitating on demographic, regional, and political dimensions in shaping attitudes toward school vouchers. As education policy discourses endure, grasping the evolving dynamics of public opinion becomes imperative for fashioning equitable and effective educational reforms. Our innovative methodologies, entwined with our findings, lay the groundwork for further explorations into the bedrock of voucher support. Future investigations can harness the potential of the MrP model to unveil subtler patterns and interplay within the data, thus advancing a more profound comprehension of public opinion dynamics pertaining to school vouchers. This comprehensive understanding portends momentous implications for our education system, undergirding evidence-based decision-making and fostering policies that respond to the diverse needs and inclinations of our communities. Acknowledging the imperative to update this research with more recent data, we remain steadfast in capturing potential shifts in public opinion and amplifying our grasp of the intricate dynamics enveloping school voucher policies, thus charting a course toward an ever more enlightened educational landscape.

Author Contributions: Conceptualization, A.G. and Y.-S.S.; methodology, A.G.; software, Y.-S.S.; validation, A.G. and Y.-S.S.; formal analysis, Y.-S.S.; resources, A.G.; writing—original draft preparation, A.G. and Y.-S.S.; writing—review and editing, Y.-S.S.; visualization, Y.-S.S.; supervision, A.G. All authors have read and agreed to the published version of the manuscript.

Funding: The research project was financially supported by the Spring Breeze Fund (No. 20203080027) at Tsinghua University.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The National Annenberg Survey data is readily available and accessible online for free through the Annenberg Public Policy Center webpage: <https://www.annenbergpublicpolicycenter.org/tag/data-sets/>, accessed on 6 July 2023. To ensure ease of access and reproducibility, all corresponding R codes and workspaces have been openly provided at the following link: <https://doi.org/10.7910/DVN/BOJCGC>, accessed on 6 July 2023.

Acknowledgments: The authors express their sincere gratitude to two anonymous referees and the Editor for providing invaluable comments that significantly enhanced the quality of the paper. Special thanks are extended to Terry M. Moe for generously sharing his data and code from his book, *Schools, Vouchers, and the American Public*. The authors also acknowledge with thanks the constructive feedback received from Robert Maranto on earlier drafts of this paper.

Conflicts of Interest: The authors declare no conflict of interest.

Note

- ¹ Prior to 1993, the query was phrased as: “In some nations, the government allots a certain amount of money for each child’s education. The parents can then send the child to any public, parochial, or private school they choose. This is called the ‘voucher

system'. Would you like to see such an idea adopted in this country?" Post-1993, the revised phrasing was: "Do you favor or oppose allowing students and parents to choose a private school to attend at public expense?"

References

- Bates, Douglas, Martin Mächler, Ben Bolker, and Steve Walker. 2015. Fitting linear mixed-effects models using lme4. *Journal of Statistical Software* 67: 1–48. [\[CrossRef\]](#)
- Bush, Lawson V. 2004. Access, school choice, and independent black institutions: A historical perspective. *Journal of Black Studies* 34: 386–401.
- Chubb, John E., and Terry M. Moe. 1988. Politics, markets, and the organization of schools. *The American Political Science Review* 82: 1066–1087. [\[CrossRef\]](#)
- Chubb, John E., and Terry M. Moe. 1990. *Politics, Markets, and America's Schools*. Washington, DC: Brookings Institution.
- Erikson, Robert S., Gerald C. Wright, and John P. McIver. 1993. *Statehouse Democracy: Public Opinion and Policy in the American States*. Cambridge: Cambridge University Press.
- Ferreira, Maria Marta. 2007. Estimating the effects of private school vouchers in multidistrict economies. *The American Economic Review* 97: 789–817. [\[CrossRef\]](#)
- Gelman, Andrew, and Jennifer Hill. 2006. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. Cambridge: Cambridge University Press.
- Gelman, Andrew, and Thomas Little. 1997. Poststratification into many categories using hierarchical logistic regression. *Survey Methodology* 23: 127–35.
- Gelman, Andrew, David Park, Boris Shor, Joseph Bafumi, and Jeronimo Cortina. 2009. *Red State, Blue State, Rich State, Poor State: Why Americans Vote the Way They Do?* 2nd ed. Princeton: Princeton University Press.
- Howell, William G. 2004. Dynamic selection effects in means-tested, urban school voucher programs. *Journal of Policy Analysis and Management* 23: 225–50. [\[CrossRef\]](#)
- Jabbar, Huriya, Carlton J. Fong, Emily Germain, Dongmei Li, Joanna Sanchez, Wei-Ling Sun, and Michelle Devall. 2022. The competitive effects of school choice on student achievement: A systematic review. *Educational Policy* 36: 247–81. [\[CrossRef\]](#)
- Lax, Jeffrey R., and Justin H. Phillips. 2009. Gay rights in the states: Public opinion and policy responsiveness. *American Political Science Review* 103: 367–86. [\[CrossRef\]](#)
- Levin, Henry M. 2002. A comprehensive framework for evaluating educational vouchers. *Educational Evaluation and Policy Analysis* 24: 159–74. [\[CrossRef\]](#)
- Metcalf, Kim K., and Natalie A. Legan. 2002. Educational vouchers: A primer. *The Clearing House* 76: 25–29. [\[CrossRef\]](#)
- Mills, Jonathan N., and Patrick J. Wolf. 2017. Vouchers in the bayou: The effects of the louisiana scholarship program on student achievement after 2 years. *Educational Evaluation and Policy Analysis* 39: 464–84. [\[CrossRef\]](#)
- Moe, Terry M. 2001. *Schools, Vouchers, and the American Public*. Washington, DC: Brookings Institution Press.
- Orr, Marion. 1999. *Black Social Capital*. Lawrence: University Press of Kansas.
- Park, David, Andrew Gelman, and Joseph Bafumi. 2006. State level opinions from national surveys: Poststratification using multilevel logistic regression. In *Public Opinion in State Politics*. Edited by Jeffrey E. Cohen. Stanford: Stanford University Press, pp. 209–28.
- Rich, Wilbur C. 1996. *Black Mayors and School Politics*. New York: Garland.
- Selb, Peter, and Simon Munzert. 2017. Estimating constituency preferences from sparse survey data using auxiliary geographic information. *Political Analysis* 19: 455–70. [\[CrossRef\]](#)
- Waddington, R. Joseph, and Mark Berends. 2018. Impact of the indiana choice scholarship program: Achievement effects for students in upper elementary and middle school. *Journal of Policy Analysis and Management* 37: 783–808. [\[CrossRef\]](#)
- Witte, John F. 1998. The milwaukee voucher experiment. *Educational Evaluation and Policy Analysis* 20: 229–51. [\[CrossRef\]](#)
- Witte, John F., and Christopher A. Thorn. 1996. Who chooses? voucher and interdistrict choice programs in milwaukee. *American Journal of Education* 104: 186–217. [\[CrossRef\]](#)
- Wolf, Patrick J., Brian Kisida, Babette Gutmann, Michael Puma, Nada Eissa, and Lou Rizzo. 2013. School vouchers and student outcomes: Experimental evidence from Washington, DC. *Journal of Policy Analysis and Management* 32: 246–70. [\[CrossRef\]](#)

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.