The Impact of Food Service workers' Unions on Student Performance

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Agenda

1. Motivations

Why do we have to care about food workers in schools? What are the role of their unions?

2. Literature

What has been done so far regarding food workers and their unions?

3. Data

District- and county-level panel data based on four data sources: SEDA, F33, CPS, and ACS

4. Model

District and time fixed effects + IV regression

5. Results

Positive correlations between food service worker compensation & students' test scores. Ultimately, on causation!
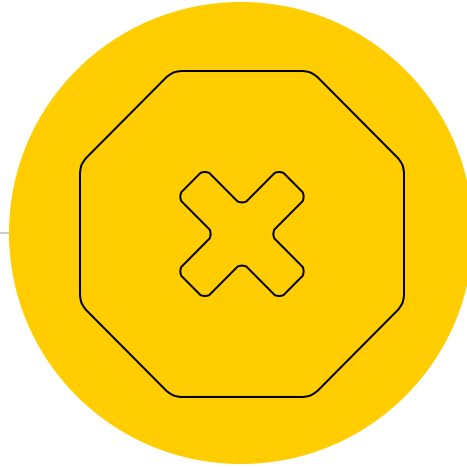
6. Discussion

What are mechanisms behind the results, and what can we do further in this project?

1 Motivations

Why do we need to discuss food service workers?

39 Billion

school meals have been missed globally since the onset of the COVID-19 pandemic
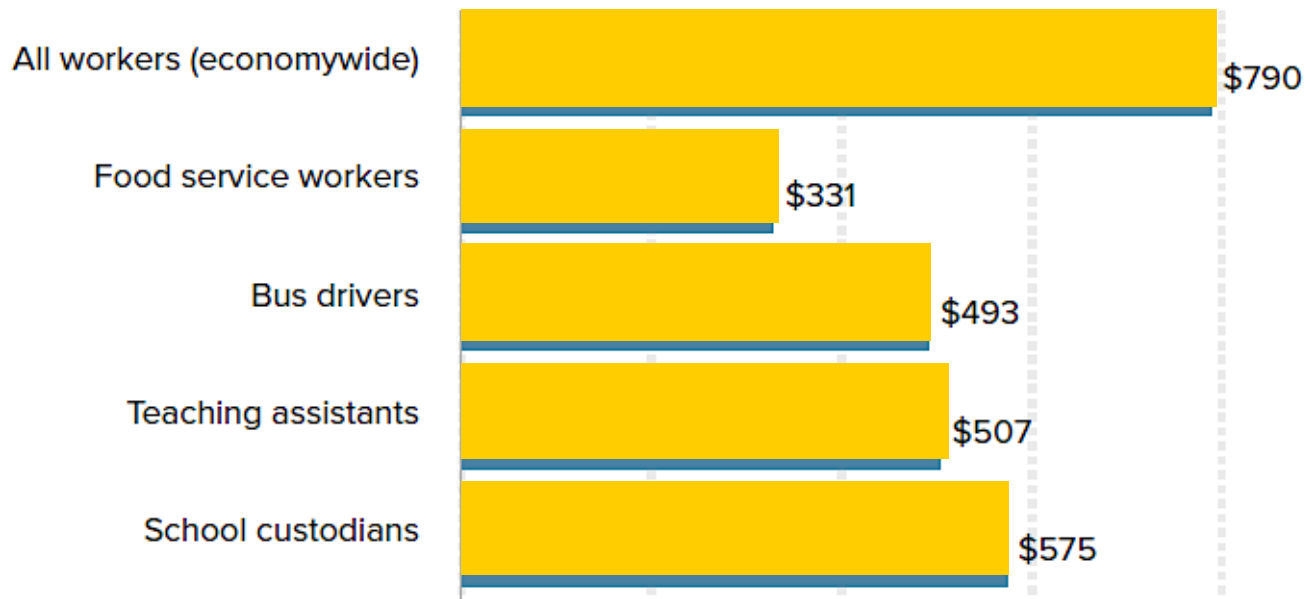
(UNICEF, 2021)

"Big Food companies have largely replaced the nation's school cooks by supplying cafeterias with cheap food. So why not empower 'lunch ladies' to do more than just unbox and reheat factory-made food?"

The Labor of Lunch: Why We Need Real Food and Real Jobs in American Public Schools
(Jennifer Gaddis, School of Human Ecology, UW–Madison, 2019)

"

Education support staff are paid very low wages

Weekly median wages of all workers and K–12 public education support workers

All workers (economywide) — $790
Food service workers — $331
Bus drivers — $493
Teaching assistants — $507
School custodians — $575

Notes: Weekly wages in 2020 dollars.

Source: Economic Policy Institute (2022), based on CPS (2014–2019)

Cafeteria staffing shortage causes change to SLC Schools meal programs, cuts in food options FOX13 SALT LAKE CITY

Parents stepping in to help with support staff shortage

BY ALEXIS BELL | BUNCOMBE COUNTY
PUBLISHED 10:39 AM ET SEP. 28, 2022

Food and staff shortages are still vexing school lunch programs. Costs may keep rising, too. Chalkbeat

By Kalyn Belsha | Mar 10, 2022, 2:40pm MDT

Schools struggle to keep up with meals amid supply, labor problems KSL TV 5

Nov 2, 2021, 6:20 PM | Updated: 9:25 pm

No Bus Drivers, Custodians, or Subs. What's Really Behind Schools' Staffing Shortages? EducationWeek.

By Mark Lieberman — September 20, 2021 | Corrected: September 21, 2021 | 10 min read

BROOKLYN

Staff Shortage Shuts Down Cafeteria at Brooklyn School

Published September 27, 2021 • Updated on September 27, 2021 at 6:32 am

Staffing shortages plague many Utah school districts on 1st day of school

By Mike Anderson, KSL-TV | Posted - Aug. 15, 2022 at 8:27 p.m.

Carlmont cafeteria experiences staffing shortages

Ethan Kam, Staff Writer | October 10, 2021

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2 Literature

What have researchers done so far in this field?

Literature Review

School Food Programs

In the US, several school food programs – School Breakfast Program (SBP), National School Lunch Program (NSLP), and Community Eligibility Provision (CEP) – show that school foods play an important role in promoting students' health and academic outcomes.

School Funding/Spending

The question of "does money matter for school?" is well-established. In contrast to previous literature, recent studies show that greater school fundings are important for students' performance.

Allocation of Resources

Several studies have investigated different types of school spending. The results vary depending on spending categories and study locations.

None of these studies examines spending on food service workers or their unions!

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School Food Programs

◉ School meal provisions improve student outcomes

❖ Health Outcomes
(Bhattacharya et al., 2006; Gundersen et al., 2012; Gleason & Suitor, 2003)

❖ Test Scores
(Kleinman et al., 2002; Ruffini, 2022; Bartfeld et al., 2019; Schwartz et al., 2020)

❖ School Attendance
(Bartfeld et al., 2019; Gordanier et al., 2020)

◉ Positive association between nutrition and academic performance of students
(Cohen et al., 2016)

School Funding/Spending

◉ Early studies found the failures of input-based schooling policy
(Hanushek; 1981, 2003)

◉ Recent studies with better identification strategies find evidence that school spending positively affects student performance
(Hedge et al., 1994; Lafortune et al., 2018; Jackson et al., 2015, 2018)

Resource Allocation

◉ General spending (S): Positive impact
(Guryan et al., 2001; Lee and Polacheck, 2018; Gigliotti and Sorensen, 2018)

◉ Textbook spending (S): Positive impact
(Holden, 2016)

◉ Teacher salary (N): Positive impact
(Garcia and Han, 2022)

◉ Infrastructure spending (S): Mixed impact
(Colin and Thompson, 2017; Hong and Zimmer, 2016; Cellini et al., 2010; Goncalves, 2015)

Research Questions

◉ Do spendings on food service workers influence students' standardized test scores in the US?

◉ Are there heterogeneous effects across:

    1.   Different grade levels

    2.   Different subgroups of students

    3.   Different SES status of districts

3 Data

Stanford Education Data Archive (SEDA)
Local Education Agency Finance Survey (AKA F33)
American Community Survey (ACS)

Data

SEDA

provides information on students' standardized test scores in Math and English. The data are available at the county and district level and are disaggregated by grade-level and ethnicity.

F33

contains information on itemized expenditures and revenues from all US school districts. For instance, salary and benefit information of each position is included.

ACS & CPS

ACS contains detailed demographic, social, economic, and housing data for communities nationwide. CPS contains union membership information.

District-level Panel Data

2008-2018
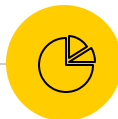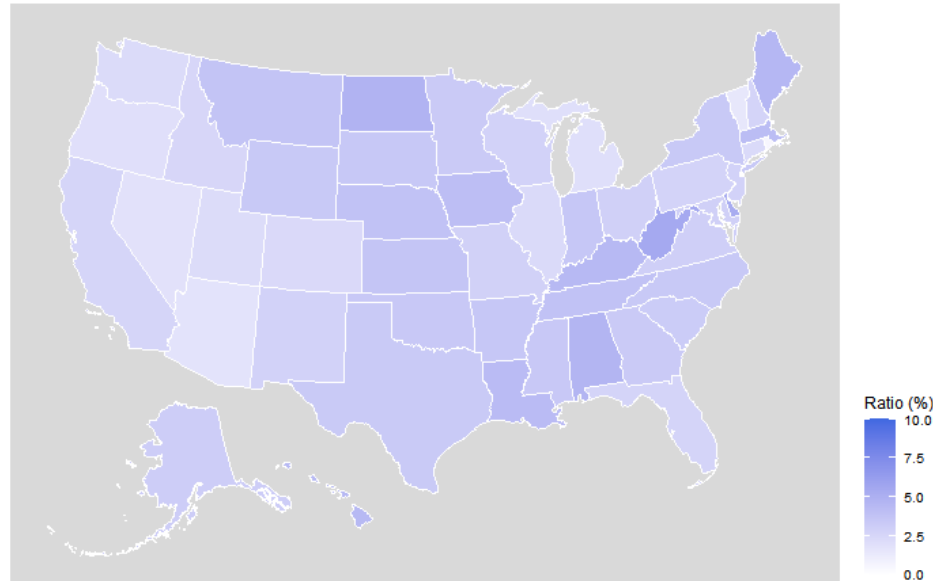School Years

11,757
School districts

1,119,763
Total observations

State Variation in Salary Expenditure on Food Service Personnel Per Student

4 Models

Panel regression with two-way fixed effects & IV estimation (not yet)

$$Y_{it} = \beta_0 + \beta_1 C_{it} + \beta_2 X_{it} + \alpha_i + \lambda_t + \varepsilon_{it},$$

where i represents district and t represents school year

Y_{it} : Students' test scores (Math/English) by grade levels (3-8)

C_{it} : Salaries, benefits, and total compensation of food workers, as well as total food service spending

X_{it} : Control variables

- District characteristics
  - Compositions of each ethnicity in the district, %receive free/reduced price lunch, %economically disadvantaged, %English Language Learners, %special education, total enrollment
- Community characteristics
  - %schools located in town, urban, suburban, or rural, median income, % adults with bachelor degree or higher, poverty rate, unemployment rate, SNAP receipt rate, % single-mother household

α_i : District fixed effects

λ_t : Year fixed effects

IV Regression (TBC)

First Stage Regression

Using labor union as an IV for compensation of food service workers

$$C_{jt} = \beta_0 + \beta_1 Union_{jt} + \beta_2 X_{jt} + S_j + \lambda_t + \varepsilon_{jt},$$

where j represents individual and t represents year

C_{jt} : Labor earnings (weekly and hourly) of food workers

X_{it} : Control variables for worker demographic characteristics

S_{ji} : State dummies & λ_t : Year dummies

The problem we are facing now is to merge district and county information….

5 Results (only half)

Positive association between students' performance and several measures of district spending on food service

Math

Variables	Model 1	Model 2	Model 3
	Panel A: Math		
Log (Salary)	0.0133***	0.0058	0.0068
	(0.004)	(0.006)	(0.006)
Log (Benefit)	0.0098***	0.0384***	0.0386***
	(0.004)	(0.005)	(0.005)
Log (Total compensation)	0.0096**	0.0179***	0.0186***
	(0.004)	(0.005)	(0.005)
Log (Current expenditure)	0.0247***	0.0364***	0.0382***
	(0.008)	(0.011)	(0.011)
District Controls	N	Y	Y
Neighborhood Controls	N	N	Y
District FE	Y	Y	Y
Year FE	Y	Y	Y

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses (clustered at school district level)

English

Variables	Model 1	Model 2	Model 3
Panel B: English			
Log (Salary)	0.0093***	0.0032	0.0041
	(0.003)	(0.005)	(0.005)
Log (Benefit)	-0.0026	0.0271***	0.0273***
	(0.003)	(0.004)	(0.004)
Log (Total compensation)	0.0041	0.0135***	0.0141***
	(0.003)	(0.005)	(0.005)
Log (Current expenditure)	0.0071	0.0231**	0.0230**
	(0.005)	(0.010)	(0.010)
District Controls	N	Y	Y
Neighborhood Controls	N	N	Y
District FE	Y	Y	Y
Year FE	Y	Y	Y

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses (clustered at school district level)

By Grade Levels - Math

Variables	G3	G4	G5	G6	G7	G8
			Panel A: Math			
Log (Salaries)	0.0047	0.0041	0.0107**	0.0052	0.0027	0.0054
	(0.005)	(0.005)	(0.005)	(0.0054)	(0.005)	(0.006)
Log (Benefit)	-0.0058	-0.0060	0.0029	-0.0003	0.0014	0.0119**
	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.005)
Log (Total compensation)	0.0003	0.0009	0.0071	0.0022	-0.0010	0.0044
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)
Log (Current expenditure)	0.0245***	0.0197**	0.0228***	0.0188**	0.0052	0.0012
	(0.008)	(0.008)	(0.009)	(0.010)	(0.009)	(0.010)

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses (clustered at school district level)

By Grade Levels – English

Variables	G3	G4	G5	G6	G7	G8
			Panel B: English			
Log (Salaries)	0.0169***	0.0178***	0.0190***	0.0173***	0.0057	0.0057
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Log (Benefit)	-0.0004	0.0021	0.0057	0.0073*	0.0040	0.0019
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Log (Total compensation)	0.0098**	0.0116***	0.0154***	0.0142***	0.0033	0.0031
	(0.0045)	(0.004)	(0.004)	(0.0040)	(0.004)	(0.004)
Log (Current expenditure)	0.0234***	0.0335***	0.0281***	0.0216***	0.0106	0.0068
	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses (clustered at school district level)

By Race/Ethnicity

Variables	White	Black	Hispanic	Asian
Panel A: Math				
Log (Salaries)	0.0008	0.0336**	0.0170	-0.0268
	(0.007)	(0.016)	(0.012)	(0.023)
Log (Benefit)	0.0429***	0.0661***	0.0606***	0.0444**
	(0.006)	(0.013)	(0.010)	(0.022)
Log (Total compensation)	0.0180***	0.0509***	0.0370***	-0.0087
	(0.006)	(0.014)	(0.010)	(0.022)
Log (Current expenditure)	0.0328**	0.1528***	0.1119***	-0.0379
	(0.014)	(0.035)	(0.031)	(0.058)
Panel B: English				
Log (Salaries)	-0.0033	0.0320**	-0.0018	-0.0270
	(0.006)	(0.016)	(0.012)	(0.018)
Log (Benefit)	0.0280***	0.0602***	0.0430***	0.0425**
	(0.005)	(0.013)	(0.009)	(0.017)
Log (Total compensation)	0.0110**	0.0516***	0.0198**	-0.0057
	(0.005)	(0.014)	(0.010)	(0.017)
Log (Current expenditure)	0.0077	0.1533***	0.0796***	-0.0555
	(0.012)	(0.041)	(0.028)	(0.045)

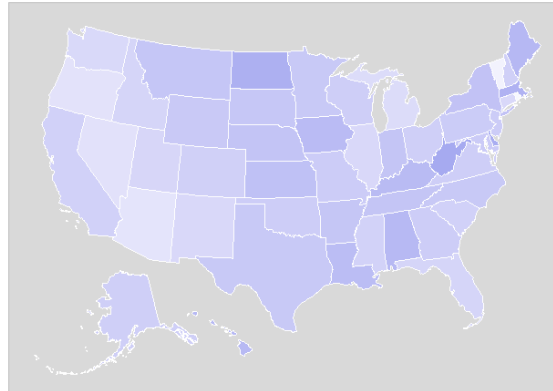Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses (clustered at school district level)

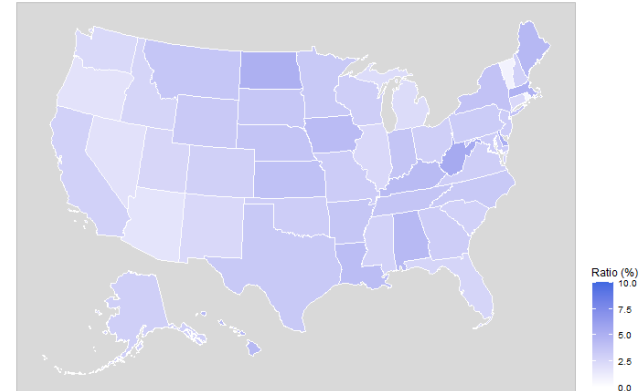# By SES: State Variation in Salary Expenditure on Food Service Personnel Per Student

Low-SES
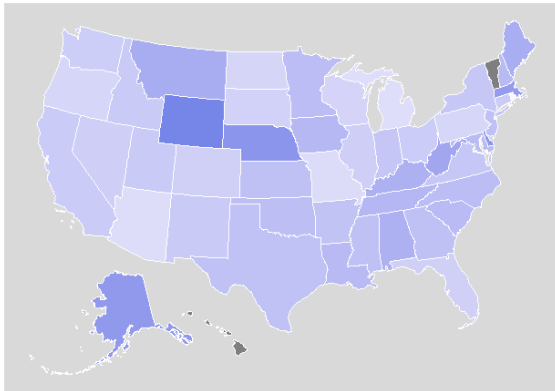
Mid-SES

High-SES

By SES Status

Variables	Low-SES	Mid-SES	High-SES
	Panel A: Math		
Log (Salaries)	0.0467***	0.0072	-0.0231**
	(0.013)	(0.008)	(0.010)
Log (Benefit)	0.0637***	0.0446***	0.0266***
	(0.010)	(0.007)	(0.009)
Log (Total compensation)	0.0545***	0.0194***	-0.0052
	(0.011)	(0.007)	(0.009)
Log (Current expenditure)	0.1050***	0.0965***	-0.0386**
	(0.033)	(0.018)	(0.017)
	Panel B: English		
Log (Salaries)	0.0377***	0.0046	-0.0220**
	(0.013)	(0.007)	(0.009)
Log (Benefit)	0.0525***	0.0358***	0.0085
	(0.009)	(0.006)	(0.008)
Log (Total compensation)	0.0472***	0.0165**	-0.0100
	(0.011)	(0.007)	(0.008)
Log (Current expenditure)	0.0905***	0.0736***	-0.0578***
	(0.032)	(0.017)	(0.014)

Note: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses (clustered at school district level)

By SES Status

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	(0.010)	(0.007)	(0.009)
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	(0.033)	(0.018)	(0.017)
Panel B: English			
Log (Salaries)	0.0377***	0.0046	-0.0220**
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	(0.032)	(0.017)	(0.014)

Note: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses (clustered at school district level)

Food Service Workers across Sector

	Public School	Private School	Non-educational Private sector
Age	51.3	49.2	31.4
Female	92.8%	91.3%	51.9%
Hispanic	25.5%	26.2%	32.1%
Full-time	49.1%	59.8%	44.3%
Multiple Job holding	7.8%	5.1%	5.4%
health Insurance	66.3%	59.1%	43.2%
Paid Leave	46.1%	32.2%	10.3%
Union Membership	21.1%	11.5%	2.4%

Unions and Worker Compensation

	Log(Weekly Earning)	Log(Hourly Earning)	Paid leave
Panel A: Public School			
Union member	0.166*** (0.021)	0.112*** (0.022)	0.049 (0.031)
Panel B: Private School			
Union member	0.151*** (0.054)	0.032 (0.072)	N/A
Panel C: Non-educational Private sector			
Union member	0.136*** (0.010)	0.130*** (0.023)	0.051 (0.043)

➢ Overall, strong first Stage result. More significant for public schools.

6 Discussion

What are the possible mechanisms?

Possible Mechanisms – Health

Quality of food

About half of food-borne outbreaks in school is associated with the practices of food workers.
(Venuto et al., 2015)

Higher labor standards and paid sick days may reduce spread of food-borne illness and the seasonal flu.
(Jacobs and Graham-Squire, 2010)

Amount of time to eat

Many students have insufficient time to eat, which is associated with reduced consumption of entrée, milk, and vegetable.
(Cohen et al., 2016)

Lunch time is lost waiting in lunch line. Higher wages can increase food workers' productivity, allowing more time for students to eat.

Scratch cooking

Most school meals are not prepared from scratch and do not use fresh fruits or vegetables. Incentive to reduce schools' operations costs results in outsourcing food services. Food contracts usually provide heat-and-serve items to maximize their profits.