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Nourishing Young Minds: The Effect of Access to Free School Lunches on Student Achievement

According to the organization No Kid Hungry, 1 in 5 kids in the US are living in hunger, meaning as many as 13 million children in the US are facing some level of food insecurity.[1] When children lack the nutrition they need to grow and prosper, they can begin to experience educational risks such as behavioral problems, short-term thinking, lack of motivation, and disengagement from learning which all increase the risk of poor educational outcomes such as low grades or test scores.[2] As a result, for some students who are unable to obtain a nutritious meal at home, school becomes one of the few places where they can obtain a meal that can provide them with the nutrients they need to thrive both in school and life.

In the US, the conversation surrounding nutrition in schools intensified following the start of the COVID-19 pandemic. During this time, Congress implemented a national Universal Free School Meal Program to help alleviate the rising rates of food insecurity that many families and children were facing as a result of the pandemic. While Congress cut funding to the program in 2022 and many states reverted to the Free and Reduced School Lunch Program the US has been using since 1946, California became one of the few states to implement a similar Universal Free School Meal Program straight away as they recognized the benefits the program could have

[1] "How Many Kids in the United States Live With Hunger?," No Kid Hungry, published October 25, 2023, https://www.nokidhungry.org/blog/how-many-kids-united-states-live-hunger.

[2] Food and Nutrition Board; Board on Children, Youth, and Families; Institute of Medicine, "The Role of National Standards: Workshop Summary," in *Nutrition Education in the K-12 Curriculum*, (Washington (DC): National Academies Press (US), 2013. https://nap.nationalacademies.org/catalog/18361/nutrition-education-in-the-k-12-curriculum-the-role-of.

on students.[3] This is why for my research I posed the question: *When looking at California Counties, how does access to universal free school meals affect student achievement?*

This paper will analyze the effects of Universal Free School Meal Programs on student achievement, as well as dive deeper to see if there is a larger effect on areas of high vs areas of low child food insecurity. I will collect data over time to show results both before and after the implementation of the Universal Free School Meals Program in California at the county level. I will then analyze the effect the program has on student achievement by examining variables that I believe represent a positive effect on student achievement if going in the direction I'll be predicting. I will then look at food insecurity rates in the counties among children to see if counties with higher rates of child food insecurity are reaping greater benefits in student achievement. Overall, my analysis aims to provide insight into the efficiency of Universal Free School Meal Programs and ultimately demonstrate the positive influence of universal free school meals on children, their academic success, and their overall nutritional intake.

Significance of Issue

In California, there are a total of 5,852,500 students enrolled in K-12 schools throughout the state.[4] Additionally, in California, there are 1,182,720 children facing food insecurity and an overall child food insecurity rate of 13.5%.[5] Out of those 1,182,720 children, 34% are likely ineligible for federal nutrition programs as their family's income falls above 185% of the poverty line.[6] While not all the children facing food insecurity are of school attending age (older than 6),

[3]"School Meals for All," California Food For California Kids, accessed March 19, 2024, https://www.californiafoodforcaliforniakids.org/school-meals-for-all.
[4]"California Public K-12 Graded Enrollment and High School Graduate Projections by County– 2023 Series," State of California Department of Finance, last modified October, 2023, https://dof.ca.gov/forecasting/demographics/public-k-12-graded-enrollment/#:~:text=State%20Enrollment,student)%2C%20enrolling%205%2C852%2C500%20students.
[5]"Food Insecurity among Child (<18 years) Population in California," Feeding America *Map the Meal Gap*, Accessed March 18, 2024, https://map.feedingamerica.org/county/2021/child/california.
[6]Feeding America *Map the Meal Gap*, "Food Insecurity among Child (<18 years) Population in California."

the majority of them likely do fall within the nearly 6 million students enrolled in a K-12 school.[7] It is important to understand this data on child food insecurity as it draws attention to one major issue within the Free and Reduced School Lunch Program that the Universal Free School Meals Program sets out to fix: the 34% that is above the 185% poverty level will also be ineligible for a free or reduced school lunch.[8] This is because, in the Free and Reduced School Lunch Program, the rules are that children whose families live below 130% of the federal poverty level are eligible for free school meals, children who live below 185% can purchase meals at a reduced price, and children that live above the 185% poverty have to purchase their meals at full price.[9] Therefore, this means that despite the free and reduced lunch program being created to help students in need get a meal during the school day, some of the students who need the school meals the most will not qualify for a free or reduced meal, having to instead opt to either not eat or pay full price. This is just one of many major issues with the Free and Reduced School Lunch Program that the Universal Free School Meals Program is expected to fix. Some other issues that arise include eligible students opting out due to the stigma of the program, some experiencing shame in receiving a free school meal, and some having reluctant parents who don't want to complete the paperwork as it labels them as low-income households.[10]

While the free and reduced school lunch program worked in 1946, the world has changed and evolved greatly in the nearly 80 years since the program's implementation. What I am

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[7]"A Review of California's Compulsory Education Laws," Legislative Analyst's Office, *California's Nonpartisan Fiscal and Policy Advisor*, Published on February, 2004, https://www.lao.ca.gov/2004/compulsory_ed/020304_Compulsory_Education_Laws.htm#:~:text=California's%20compulsory%20education%20laws%20require,limited%20number%20of%20specified%20exceptions.

[8]Juliana FW Cohen et al., "Implementation of universal school meals during COVID-19 and beyond: Challenges and benefits for school meals programs in Maine," *Nutrients* 14, no. 19 (2022): 4031, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9571988/#B1-nutrients-14-04031.

[9]Cohen et al., ""Implementation of universal school meals during COVID-19 and beyond: Challenges and benefits for school meals programs in Maine."

[10]California Food for California Kids, "School Meals for All."

hoping to illustrate through my research is the positive effect that has occurred on students in California since the implementation of the Universal Free School Meals Program so that not only California politicians can see the benefits that came out of their decision to change the program, but so that the federal government and other states that still use the Free and Reduced School Meals Program can see the positive benefits as well.

In California, some of these positive effects are already starting to appear according to some research and data. In a survey by the Nutrition Policy Institute Universal (NPI), they found that in California student stigma around unpaid meal charges dropped by 46%, which then also increased students' participation in breakfast and lunch.[11] Additionally, 66% of students had unpaid meal charges eliminated because of the program.[12] This is just one of the many ways in which California is already beginning to see the positive changes from the new program. If past authors on research and data for the topic are correct in their assumptions, then it is probable that the implementation of a Universal Free School Meal Program in California will result in a diminished stigma associated with school meals, enhancement in child nutrition intake, and heightened levels of student achievement.[13]

Overall, California serves as an example of how implementing a Universal Free School Meal Program can solve the issues that come with the Free and Reduced School Lunch Program and have a plethora of benefits for students in the long run. It is time that other states and the federal government as a whole start dedicating the right resources to make sure that all children

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[11]Hecht C, Hecht K, Zuercher M, Ritchie L, Gosliner W, "Research Brief: School Meals for All in California: Parents Value School Meals for All and Offer Suggestions to Strengthen Meal Programs," *Nutrition Policy Institute, University of California, Agriculture and Natural Resources*, May, 9 2023, https://ucanr.edu/sites/NewNutritionPolicyInstitute/files/384115.pdf.

[12]Hecht C, et al., "Research Brief: School Meals for All in California: Parents Value School Meals for All and Offer Suggestions to Strengthen Meal Programs," 2.

[13] Cohen et al., ""Implementation of universal school meals during COVID-19 and beyond: Challenges and benefits for school meals programs in Maine."

get the nutrition they need to fully prosper and succeed within school. The youth are our future, so if we aren't finding ways to help better nurture their bodies along with their minds while in school, then how can we say that we set them up to succeed in the future?

Background

During the COVID-19 Pandemic, the government recognized the need to create a Universal Free School Meals Program to help counteract the increasing growth in food insecurity among children and their families as unemployment began to rise. This realization led to Congress authorizing the USDA to provide waivers for all schools nationally to have universal free school meals, which provided school meals to every student in the country, regardless of economic status.[14] The program was only implemented from March 2020 through June 2022, as Congress eventually cut costs to the program, resulting in many states reverting to the previous school lunch program due to the high costs of keeping up universal free school meals within their states.[15] The only two states that implemented a Universal Free School Meal Program directly following the end of the national program were California and Maine, with Colorado, Minnesota, New Mexico, Vermont, Michigan, and Massachusetts following suit about a year later.[16] While the program is no longer implemented nationally and most states have since reverted to the free and reduced lunch program we've been using since 1946, democrats are continuously trying to pass another federal Universal School Meals Program to the dismay of republicans, with the most recent attempt being in 2023.[17] With a disagreement among politicians on whether the

[14]"FNS Response to COVID-19 Public Health Emergency," U.S. Department of Agriculture, *Food and Nutrition Service*, Accessed March 18, 2024, https://www.fns.usda.gov/coronavirus.
[15]U.S. Department of Agriculture, "FNS Response to COVID-19 Public Health Emergency."
[16]Bylander, Alexis. "States Show Us What Is Possible With Free Healthy School Meals for All Policies," *Food Research and Action Center*, September 6, 2023. https://frac.org/blog/free-healthy-school-meals-for-all-policies.
[17]"Text - H.R.3204 - 118th Congress (2023-2024): Universal School Meals Program Act of 2023," Congress.gov, June 1, 2023, https://www.congress.gov/bill/118th-congress/house-bill/3204/text.

program should be reimplemented, states like California and their Universal Meals Program will serve as an example of the possible effects of having a Universal Free School Meal Program nationwide again, whether good or bad.

Past research on the benefits of free school meals has mostly drawn a similar conclusion of benefits: reduces the stigma that caused limited participation, reduces food insecurity for low-income students, improves student readiness to learn, eliminates school lunch debt, and reduces administrative burden.[18] Additionally, some reports on the effect of access to universal free school meals address the effect of the policy on student behavioral incidents, saying that they decrease with free universal school meal access.[19] When it comes to research illustrating the effects of Free School Meal Programs, there is a limited amount from throughout the years. In a paper from 2020, the author found that by extending free school lunches to all students, there was an improvement in academic performance for all no matter their socioeconomic status.[20] In another paper from 2018, the author found that access to universal free school meals improved math performance among students who were unlikely to receive free meals traditionally, meaning White and Hispanic students.[21] All these reports illustrate the positive effects of Universal Free School Meal Programs on academic achievement and performance, a factor I plan to use when evaluating student achievement. However, it is important to also acknowledge that

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[18]Schwartz, Amy Ellen, and Michah W. Rothbart, "Let them eat lunch: The impact of universal free meals on student performance," *Journal of Policy Analysis and Management 39*, no. 2 (2020): 376-410. https://onlinelibrary.wiley.com/doi/abs/10.1002/pam.22175?casa_token=YcSHeQPOF-QAAAAA%3AOk6WqrLfdNMuhFGQ3xt5p0njAlby5reBpO32cMm_JAtjc6mlAoK8ZZ1T-8k7OoUO-KIOClEoPxgndqs.

[19]Altindag, Duha T., Deokrye Baek, Hong Lee, and Jessica Merkle, "Free lunch for all? The impact of universal school lunch on student misbehavior," *Economics of Education Review 74* (2020): 101945, https://www.sciencedirect.com/science/article/abs/pii/S0272775719302559?casa_token=ro_EcJHG83gAAAAA:oYD1VW68IOfVV0N1c6cgOWMrPWARESF0t382fA3IBbt7gCXMT24yoc4aj_Ot6SSOlL3gThvy0A.

[20]Schwartz and Rothbart, “Let them eat lunch: The impact of universal free meals on student performance.”

[21]Krista Ruffini, "Universal access to free school meals and student achievement: Evidence from the Community Eligibility Provision," *Journal of Human Resources* 57, no. 3 (2022): 776-820, https://jhr.uwpress.org/content/57/3/776.short.

these reports, like a large amount of the research out there on free school meals, happened before COVID and therefore before states implemented Universal Free School Meal Programs. Therefore, when considering the previous research, it needs to be acknowledged that some of the findings might not be justifiable when looking at the state level.

In research surrounding the effects of universal free school meals on food insecurity, all the research I have found has illustrated a positive effect of universal free school meals on areas with high rates of food insecurity, which then additionally resulted in an overall decline. In a report from 2022, it was found that access to universal free school meals had a meaningful impact on grocery spending for households with children, declining monthly food purchases by 5%.[22] Additionally, a 2021 article suggests that access to universal free school meals will likely benefit children's nutrition security and their academic achievement, particularly if they are from economically vulnerable families.[23] Lastly, in a different report from 2021, the authors discuss how food insecure and marginally secure students were significantly more likely to participate in a Universal Free School Meals Program which then had large impacts on their energy and diet quality needs.[24] They also found that that same group of students were more likely to attend a school that provides universal free school meals.[25] Overall, what all the past data has shown is that often universal free school meals greatly impact students who are food insecure more than

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[22]Michelle Marcus and Katherine G. Yewell, "The Effect of Free School Meals on Household Food Purchases: Evidence from the Community Eligibility Provision," *Journal of Health Economics 84* (2022): 102646, https://www.sciencedirect.com/science/article/abs/pii/S0167629622000650?casa_token=SgmE2J_f3WcAAAAA:TUmCrihsMTXmYDfZVNI5DieyL2UCH9cHVr-MEIVCogoBhcUuTexEqlLwk5ZDmUpa0LA-qQ__DQ.

[23]Cohen, Juliana FW, Amelie A. Hecht, Gabriella M. McLoughlin, Lindsey Turner, and Marlene B. Schwartz, "Universal school meals and associations with student participation, attendance, academic performance, diet quality, food security, and body mass index: A systematic review," *Nutrients 13*, no. 3 (2021): 911. https://www.mdpi.com/2072-6643/13/3/911.

[24]Sarah Forrestal, et al., "Associations among Food Security, School Meal Participation, and Students' Diet Quality in the First School Nutrition and Meal Cost Study," *Nutrients* 13, no. 2 (2021): 307, https://www.mdpi.com/2072-6643/13/2/307.

[25]Forrestal, et al., "Associations among Food Security, School Meal Participation, and Students' Diet Quality in the First School Nutrition and Meal Cost Study."

students who are food secure, alluding to the likelihood that student achievement will increase more in counties where there are larger amounts of food insecure students. However, past research is yet to explore if there is a difference in the level of impact in areas of high vs areas of low food insecurity. All past research mainly focuses on food insecurity broadly rather than focusing specifically on the differentiating effects between high and low areas of child food insecurity. This is why for my research I will need to consider that while the broader scale of data shows that children facing food insecurity are being positively affected by increased access to universal free school meals, there might not be a difference between high and low areas of child food insecurity. As a result, I might then not see a major difference in the effects of student achievement in areas of high vs low child food insecurity.

Theory and Argument

For my research, I propose that when counties officially gain access to universal free school meals in California through the blanket rollout of the program, there will be an increase in student achievement. To then dive deeper into the topic, I propose that when the program is implemented throughout California there will be a greater increase in student achievement in counties with high rates of child food insecurity over counties with low rates. To adequately explore my arguments, it is important to split my theory into two separate statements.

Firstly, I will be examining if an increase in access to universal free school meals will lead to an increase in student achievement. I theorize that likely as California implements the Universal Free School Meal Program across all the K-12 schools, the data will show a positive relationship with student achievement. I expect to see this through an improvement in test scores (both math and ELA), an increase in graduation rate, a decline in absenteeism rate, and a decline in suspension and expulsion rates in California counties. All the measurements for student

achievement (except graduation rate) will be collected across all K-12 schools in each county. I predict this to hold as often past data has shown that there is a positive relationship between student achievement and access to free school meals on smaller scales in states like New York where select schools or districts have universal free school meals.[26] I theorize that likely the statewide scale will show similar results to the smaller scale. By gathering data from multiple measurements to represent student achievement, I hope to be able to control for possible data that could be missing or skewed due to changes in policies within schools during the pandemic. The connection of these multiple measurements will come together to represent student achievement, and if they all follow the pattern I hypothesize, then it would prove the causal mechanism from universal free school meals to student achievement.

Secondly, I will be examining if there is an increase in access to universal free school meals, and if there is a change in the level of increased student achievement in counties with high vs counties with low child food insecurity rates. I theorize that in areas with higher rates of food insecurity and an increase in access to universal free school meals, there will be a larger increase in overall student achievement than in areas where there is a lower food insecurity rate. I expect my theory to be true as past research has shown that US children facing high levels of food insecurity often have worse test scores, higher rates of absenteeism, and other educational risks that children who are food secure won't have. As a result, it is likely that in counties where food insecurity is higher overall, there will be more children who are facing these educational risks and will positively benefit from having a nutritional source of food that they are unable to get from home. Overall, logically in areas where more children are facing high levels of food

[26]Ruffini, "Universal access to free school meals and student achievement: Evidence from the Community Eligibility Provision."

insecurity, there will be a greater change in overall student achievement as those are the students that will more greatly benefit from the change in the school meal program.

Therefore, to thoroughly explore my topic, I will propose two different hypotheses that connect back together. My first hypothesis will be: *An increase in access to universal free school meals will lead to an increase in student achievement in California counties.* My second hypothesis will be: *In counties with a higher rate of food insecurity and an increase in access to universal free school meals there will be a greater increase in student achievement than in counties with lower rates of food insecurity*. I will be exploring these hypotheses using my unit of analysis of California counties.

The biggest limitation I will face in my research is the aftereffects of the COVID-19 pandemic. As a result of the pandemic, some data is missing or skewed from schools. Also, child food insecurity data will likely be somewhat abnormally skewed due to the pandemic leading to a huge increase in food insecurity as many people and families lost their livelihoods. Therefore, I will need to consider that in some counties, data might be skewed and might not follow a pattern that I would expect to see. Another limitation I will face is that my area of focus and the policies surrounding universal free school meals are relatively new. Therefore, there won't be a plethora of data to compare my results to. With understanding these limitations, I hope to try and analyze the different effects of access to free school meals on student achievement throughout California, but especially in areas with high and low child food insecurity.

Research Design and Data

For my research, I performed a large-n, overtime analysis where I gathered data from all 58 counties across five school years: 2018-2019; 2019-2020; 2020-2021; 2021-2022; and 2022-2023. As such, my unit of analysis was California counties and I had to gather data for every

single county for every school year which resulted in my total number of observations being 290. I gathered my data over five years so that I could compare the changes that occurred from when California was still using the Free and Reduced School Lunch Program to when they began using the Universal Free School Meals Program. Additionally, to efficiently take into account the variation in county sizes I gathered my data for my independent variable of food insecurity and my dependent variable of student achievement as a percentage. Then over time, when I was measuring if there was a change in the child food insecurity and the student achievement variables, I was able to calculate if the percentage value drastically increased or decreased in the counties across the five years.

For my main independent variable of access to universal free school meals, I measured by either saying yes or no based on whether there was an established Universal Free School Meals Program in California during that school year. I focused my research on a statewide policy, rather than on specific policies within each county as many different schools or districts can have different school meal policies that I cannot fully account for. To know exactly when there was a Universal Free School Meals Program established in California, I gathered my data from the California Department of Education's website under the Nutrition section where they go into detail about the implementation of California's Universal Meals Program. Additionally, to account for the federal-level implementation that occurred during COVID-19, I gathered data from the U.S. Department of Agriculture, Food and Nutrition Services website where they discuss the COVID-19 relief program for universal free school meals on the national scale. Also, I assigned a numerical value to both yes and no, with 1=yes and 0=no. I did this so that all the data being presented could be quantitative and numerical to make the analysis more straightforward.

For my other independent variable of food insecurity, I gathered my data from Feeding America's *Map the Meal Gap* which has data for food insecurity from both the county and state level from 2017-2021 and across multiple different demographics. For my research, I changed the demographic to "child (<18 years)" and gathered the "child (<18 years) food insecurity rate" from each county from 2019-2021.[27] For the child food insecurity rates, I ran into the limitation that the data only goes to 2021 and doesn't include 2022 and 2023. However, for food insecurity data, I was mainly testing to see the six counties with the highest percentage of child food insecurity and the six counties with the lowest percentage of child food insecurity. The six counties with the highest percentage of child food insecurity were: Del Norte County, Imperial County, Siskiyou County, Tehama County, Trinity County, and Tulare County. The six counties with the lowest percentage of child food insecurity were: Marin County, Napa County, Placer County, San Francisco County, San Mateo County, and Santa Clara County. I chose six counties over five for both the low and high values because I wanted to compare the top and bottom 10% of the data, and 6/58 is 10.3%. Additionally, to best analyze which were the top and bottom six counties, I transformed the data into quintiles to adequately compare the data in 2019 to the data in 2021. To make sure that the quintiles were consistent across the full-time span, I used all the data across all three years to create the range. The quintiles ended up being the following: first quintile 3.70-10.4%; second quintile 10.41-14.10%; third quintile 14.11-19.70%; fourth quintile 17.11-19.70% and fifth quintile 19.71%-32.70%. **Figure 1** and **Figure 2** show how the quintiles were used to illustrate the changes in each county from 2019 to 2021.

[27] Feeding America, "Food Insecurity among Child (<18 years) Population in California."

Figure 1: Child Food Insecurity Quintiles for 2019

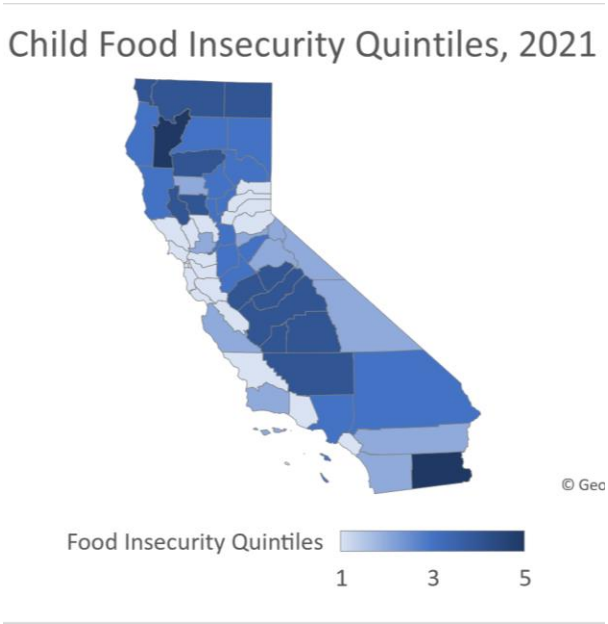

Figure 2: Child Food Insecurity Quintiles for 2021

For my dependent variable of student achievement, I measured the change in math test scores, ELA test scores, chronic absenteeism rates, graduation rates, suspension rates, and expulsion rates. The changes seen in these measurements across the five school years will help illustrate if there is or isn't an increase in student achievement when access to universal free

school meals increases. As previously mentioned, for each of these variables I scaled the measurements as a percentage from 0-100% to account for the variation in the sizes of the student population in each county.

For ELA and math test scores, I gathered the data from the CAASPP website (California Assessment of Student Performance and Progress) under the section titled Smarter Balanced Assessments Test Results. There I found a list of the counties where for each of the years, I was able to obtain the results of students within each assessment level for both the math and ELA tests. From these results, I gathered the percentage of the number of students that met or exceeded the standard for either the math or ELA exam for each year. By gathering the percentage in which students either met or exceeded the standard, I can better perceive if student test scores have been improving or getting worse over the five years.

For expulsion and suspension rates, I gathered the data from the California Department of Education's *DataQuest* website where they have suspension and expulsion data listed for every county and school year from 2011-2023. Then from the data, I was able to obtain the suspension and expulsion rate percentages as well as the raw numbers being used to create the percentages. They both used the same "cumulative enrollment" number and then suspension used an "unduplicated count of students suspended"[28] and expulsion used an "unduplicated count of students expelled."[29] It was important to use the unduplicated counts as some students are suspended or expelled more than once. Therefore, if the percentages were calculated by the overall number of suspensions and expulsions, the percentages would be skewed as they would be counting one student's multiple suspensions as belonging to other students.

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[28]"Suspension Rate," California Department of Education, *DataQuest,* Accessed March 18, 2024. https://dq.cde.ca.gov/dataquest/dqCensus/DisSuspRate.aspx?year=2022-23&agglevel=County&cds=01.
[29]"Expulsion Rate," California Department of Education, *DataQuest,* Accessed March 18, 2024. https://dq.cde.ca.gov/dataquest/dqCensus/DisExpRate.aspx?year=2022-23&agglevel=County&cds=01.

For graduation rate, I also gathered my data from the California Department of Education's *DataQuest* website where they have data on four-year cohort graduation rates for each county and school year from 2011-2023. Then from the data, I obtained the cohort graduation rate percentage as well as the raw numbers that are being divided to make that percentage which were "cohort size" and "regular HS diploma graduates."[30] As the majority of graduation rates within the counties hung within the 80-100% range of my scale, I created a set of quintiles from the data similar to what I had done for food insecurity. I used the data from across all five years and got the following ranges for each quintile: first quintile 41-81.9%; second quintile 82-85.24%; third quintile 85.25-87.6%; fourth quintile 87.7-90.3%; and fifth quintile 90.4-100%. As shown in **Figure 3** and **Figure 4**, the quintiles help distinguish if there was a change between the 2018-2019 and 2022-2023 school years for the graduation rate more clearly than the raw percentage values would.

Figure 3: Graduation Rate Quintiles for 2018-2019

[30]"Four-Year Adjusted Cohort Graduation Rate," California Department of Education, *DataQuest*, Accessed March 18, 2024. https://dq.cde.ca.gov/dataquest/dqcensus/CohRate.aspx?agglevel=county&year=2022-23&cds=01.

Figure 4: Graduation Rate Quintiles for 2022-2023

Lastly, for chronic absenteeism, I once again gathered the data from the California Department of Education's *DataQuest* website where they have chronic absenteeism rates for each county and school year from 2011-2023. From the data, I obtained the chronic absenteeism rate as a percentage as well as the raw numbers for the rate which were "chronic absenteeism eligible enrollment" and "chronic absenteeism count."[31] The chronic absenteeism rate helps indicate the percentage of students in K-12 schools who were absent for 10% or more of the school year's instructional days.

It is important to note that while I collected as much data as possible for the five school years I was looking at, there was some missing and skewed data due to COVID-19. For math and ELA test scores, there was no data for the 2019-2020 school year as the government did not require schools to partake in state testing, and data was heavily skewed for the 2020-2021 school

[31]"Chronic Absenteeism Rate," California Department of Education, DataQuest, Accessed March 18, 2024, https://dq.cde.ca.gov/dataquest/DQCensus/AttChrAbsRate.aspx?cds=35&agglevel=county&year=2018-19&initrow=Yr&ro=y.

year as there was still a level of flexibility allowed for the assessments as not every district could safely administer the exam. Additionally, for chronic absenteeism, there was no data given for the 2019-2020 school year for the reason once again being the COVID-19 Pandemic. While the data wasn't missing for suspension and expulsion rates from the pandemic, the data was still heavily skewed due to schools pivoting to remote learning. Graduation rate was the only variable not having missing or heavily skewed data from the COVID-19 Pandemic, but there was no data given for the graduation rate for one county (Alpine County) so within both **Figure 3** and **Figure 4** there is one county that is missing any sort of coloration as there was no data given across any of the five years. To account for this missing data, I chose to have multiple different measurements for student achievement in hopes of trying to balance out the effects of the data that is either missing or heavily skewed as a result of COVID-19.

For my research project, some concerns of reliability and validity arose from my data, specifically for my measurements of student achievement and child food insecurity. First, for the validity of student achievement, the concern that arose was that there is a plethora of different measurements that can constitute student achievement. My inability to account for every single possible measurement creates a slight concern for my research's validity. Then for the reliability of student achievement, the concern arose from the fact that we can't be certain how every county, district, or school is reporting their data or performing their assessments. While schools have a set of guidelines, it doesn't mean that some districts, schools, or even teachers might alter their numbers or administer their tests differently to get a slight boost to their school or district's scores. Lastly, for child food insecurity, the largest concern is with the validity of my data. It is often hard to account for every single family or child facing food insecurity, so there may be a good amount of people missing from the data overall that should be counted. As a result, there is

some concern that arises with the validity of the child food insecurity rate as I can't be certain that the number and percentage given are accurate for each county.

Findings and Analysis

After conducting my research, I found that I can't be certain if there is a relationship between universal free school meals and student achievement, therefore making my results inconclusive. The reason I am claiming that my results are inconclusive rather than just not supported is that while the majority of the measurements I used for my variable of student achievement don't follow the hypothesized pattern I expected to see, one does.

The graduation rate was the only measurement that followed my hypothesized pattern. As shown once again in the maps of **Figure 3** and **Figure 4**, in a lot of the counties there was some sort of growth from the 2018-2019 school year when we were using the Free and Reduced School Lunch Program, to the 2022-2023 school year when we officially had the California Universal Meals Program. To be exact, 45 out of 58 California counties had an increase in graduation rates from the beginning to the end of the five years, with the average increase being 2.04%. With 77.6% of counties having an increase in graduation rate rather than a decline, I believe that I can more confidently say that most of the California counties followed my hypothesized pattern for graduation rates. Yet, as I previously stated, for the other measurements of student achievement, I am unable to make the same claim of confidence that I was able to make with graduation rates.

For test scores, there was not a single county that followed my hypothesized pattern which was that there would be an increase in the percentage that met or exceeded the standard test score. Instead, to be exact, 58 out of 58 counties had a decline in the test scores. As shown in **Figure 5** for math test scores, the largest decrease between the two years was 22.40% while the

smallest was 0.20%. No matter the size of the decline, not a single county had an increase in math test scores with the average being a 5.64% decrease. For ELA test scores, the decline is relatively the same, just slightly larger. As shown in **Figure 6** for ELA test scores, the largest decrease between the two years was 23.80% while the smallest was 1%. Similarly to math test scores, the average ended up being a 5.85% decrease. As neither measurement followed my hypothesis pattern, I can't be certain that there is a relationship.

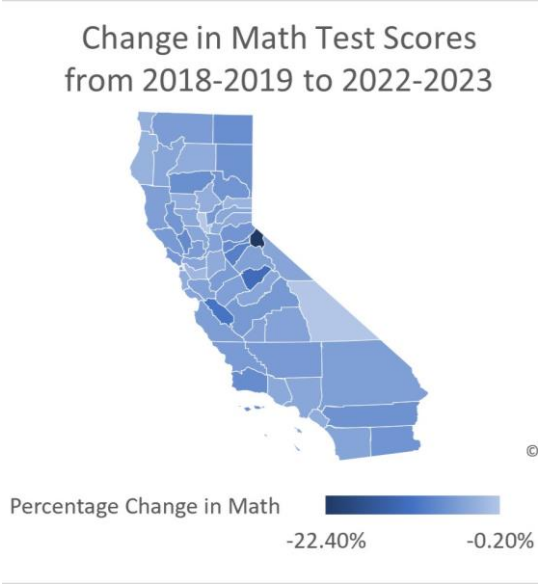

Figure 5: Change in Math Test Scores from 2018-2019 to 2022-2023

Figure 6: Change in ELA Test Scores from 2018-2019 to 2022-2023

I came to a similar conclusion for chronic absenteeism as I did with both math and ELA test scores as 0 of the 58 counties had a decrease in chronic absenteeism which is what I had hypothesized would occur. Instead, each county had a rather drastic increase in absenteeism with the average increase being 13.37%. As shown in **Figure 7** with data from the six highest and six lowest counties of child food insecurity percentage, there was a rather drastic increase for all the counties from the 2018-2019 school year to the 2022-2023 school year. Out of all the measurements I used to measure student achievement, the chronic absenteeism rate had the most drastic change as there was a rather large negative growth over the five years.

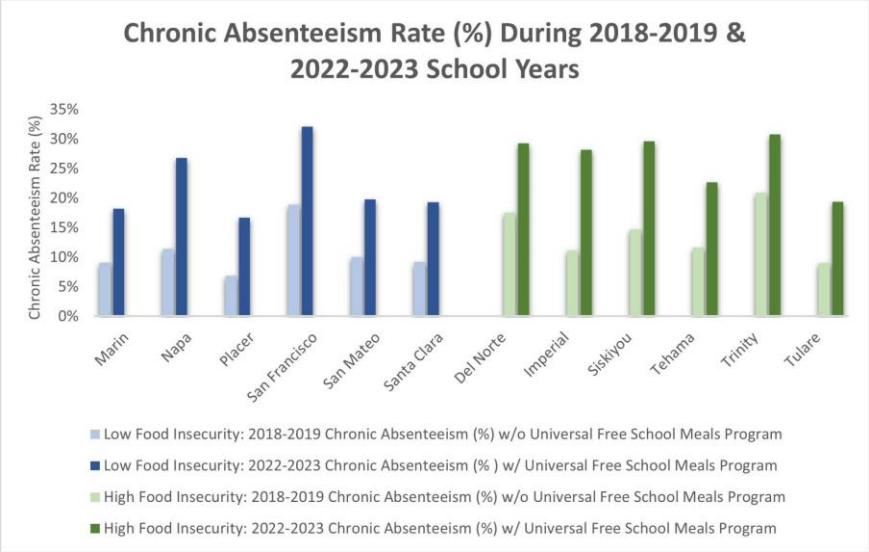

Figure 7: Chronic Absenteeism Rate of Six Highest and Six Lowest Counties of Child Food Insecurity from 2018-2019 & 2022-2023

While I wouldn't claim that I'm confident that the suspension and expulsion rates followed my hypothesized pattern, some counties did. For suspension rates, 20 out of 58 counties had a decrease in suspension rates with the average being a 0.03% increase. For the expulsion rate, 10 out of 58 counties had a decrease in expulsion rates, with the average being an increase

of 0.02%. Both measurements had rather small average increases which indicates that while the majority of counties did increase, the increase wasn't on average very drastic from 2018-2019 to 2022-2023. While yes, some counties followed my hypothesized pattern, I cannot confidently claim that there is a relationship between both the measurements for student achievement and access to universal free school meals as less than half the counties followed the pattern.

Similarly, when looking at food insecurity and if there was a greater effect on student achievement in areas of high vs areas of low child food insecurity percentage, both ranges followed a relatively similar pattern of growth or decline between the two years. As shown in **Figure 8** which compared the suspension rates of the six highest and lowest counties of food insecurity, they all followed the same relative pattern of slightly increasing or decreasing. While yes, areas of low food insecurity had a relatively smaller percentage of suspension rates overall, they still followed the same pattern as high food insecurity areas. This is even more evident in **Figure 7** of chronic absenteeism rates as all counties, no matter if high or low, had a drastic increase in chronic absenteeism from 2018-2019 to 2022-2023. As there is no statistical difference found between high and low child food insecurity rates, I cannot support my additional hypothesis that in areas with higher rates of child food insecurity and increased access to universal free school meals, there will be a larger increase in student achievement than areas with lower rates of child food insecurity.

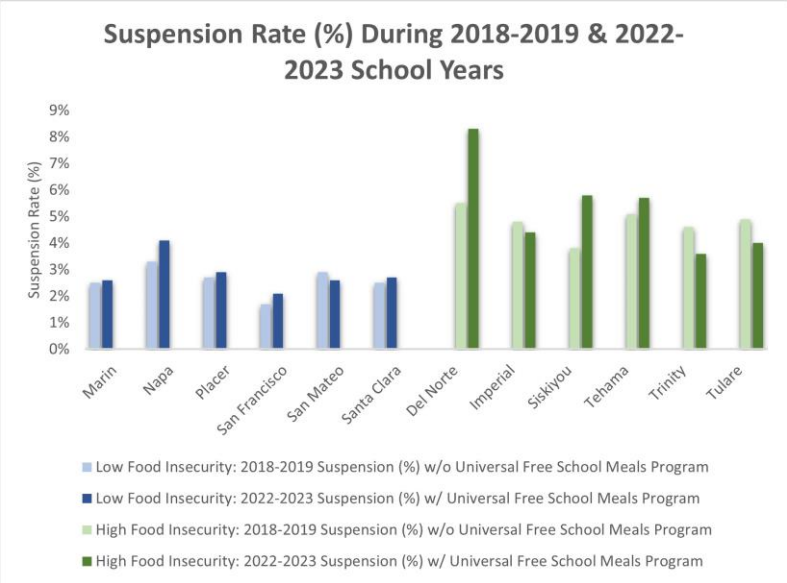

Figure 8: Suspension Rate of Six Highest and Six Lowest Counties of Child Food Insecurity from 2018-2019 & 2022-2023

Implications and Further Suggestions

Through conducting this research, I aimed to show how California's Universal Free School Meals Program could serve as a model for other states and the federal government. My goal was to have my findings illustrate why transitioning from the Free and Reduced School Lunch Program to a Universal Free School Meals Program would have greater benefits for students in the long run. However, in the end, my findings were inconclusive as there was no clear relationship between universal free school meal access and student achievement. There wasn't even any major statistical difference between counties with high and low child food insecurity. Therefore, my findings and analysis imply that I can't definitively say that a Universal Free School Meals Program is better than the Free and Reduced School Lunch Program despite what past research has indicated. However, it is also important to acknowledge that this could greatly change within the next few years.

I believe that if future research waits a few more years for data to not be so heavily skewed by the aftereffects of COVID-19 and looks at the district level or individual schools to broaden the scope of data, the real relationship between access to universal free school meals and student achievement will become clearer. Additionally, expanding the range of data would also likely indicate a clearer difference between high and low areas of child food insecurity. Lastly, broadening the scope of the research measures for student achievement could also help establish a clearer relationship between the two variables. I only chose five out of a vast majority of measurements that could have been selected for student achievement, meaning that there could be other measurements that I didn't select or consider that could have followed my hypothesized pattern.

Conclusion

In conclusion, through this research, my goal was to analyze the relationship between universal free school meal access and student achievement within California counties, as well as dive deeper to see if the relationship was possibly greater in counties with higher rates of child food insecurity. Ultimately, my research goal was to explore whether or not students were more positively impacted by changing the state's school meals program from Free and Reduced to Universal Free School Meals. What the findings in my research ended up illustrating is that unfortunately at this time I can't make a definitive claim to support Universal Free School Meal Programs. While most past data has illustrated that universal free school meals positively affect student achievement, the majority of past data was done on a relatively small and limited scale, looking solely at a few specific schools rather than the state as a whole. With so many factors that could affect student achievement and its measurements, it is difficult to explain why only graduation rates followed my hypothesized pattern. However, despite my findings being

inconclusive, I still believe that lawmakers should at the very least consider trying the Universal Free School Meals Program for a few years when the country is no longer attempting to socially and economically recover from a pandemic.

While my results don't draw the same conclusions as past research, that doesn't mean that a Universal Free School Meals Program isn't effective on a state scale. I believe that it is still extremely likely that universal free school meals affect student achievement in general, and most of my data is just heavily skewed from the aftermath of COVID-19. Overall, despite my findings indicating otherwise, I believe that down the line after the program has been implemented for a longer period of time and there is more data available, the relationship I hypothesized and that was described in past research will appear on the state scale.

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