Health inspector ratings of Asian restaurants during the early COVID-19 pandemic

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Abstract
The COVID-19 pandemic has devastated the restaurant industry, with Asian restaurants having perhaps suffered the most, as many reported business losses well before shelter-in-place orders were announced. Media outlets argue that this decline in business reflects biases that are linked to the China- and food-related origin of COVID-19. However, discrimination against Asian Americans and their cuisine is not new, as it is rooted in a long and history of assimilation and racism. Overlooked in this body of literature, as well as in conversations on the impacts of COVID-19 on Asian restaurants, is the role of how government institutions shape these biases against a cuisine that has hundreds of years of history in the US yet remains distinctly ‘foreign’. In this study, we use 3-years of New York City restaurant health inspection data to examine trends in citation scores before and after the onset of the news of the COVID-19 pandemic. Using a synthetic control approach, we find that Asian restaurants uniquely received more citations after news of the pandemic became pervasive in the US. We end by discussing the implications of this finding for the history of Asian cuisine in the US, theoretical frameworks to understand assimilation, and the restaurant industry.

Keywords
Asian American, racism, inequality, immigration, restaurant ratings

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Introduction

As one of the worst global health crises in human history, the COVID-19 pandemic has also devastated many industries and perhaps none more so than restaurants. While virtually all restaurants in the US have suffered substantial economic losses, early reports suggest that Asian restaurants, which can encompass a number of global cuisines, were impacted the most. The Pew Research Center found that the highest increase in unemployment observed between February and May of 2020 was among Asian Americans, from 2.5 to 20.3% (Pew Research Center, 2020). Moreover, numerous media outlets and empirical studies reported that Asian restaurants had less business starting as early as January 2020 (Alcorn, 2020; Shen-Berro, 2020; Yi et al., 2022). Estimates of food businesses that closed due to COVID showed that Chinese enclaves in both Brooklyn and Manhattan were the ones with the highest figures, with 16% in Sunset Park and 27% in Chinatown (Yi et al., 2022). These articles stated that the reason for the significant decline in business, even before any state and local governments issued shelter-in-place orders, was the public perception that the coronavirus1 causing COVID-19 originated in China due to food (sold in wet markets). This argument was also used to explain why Asian restaurants experienced vandalism during this time.

However, the notion that Asian cuisine is unclean and disease-bearing is rooted in a racist US history that spans hundreds of years. The expansion of the US economy in the 1800s brought many Chinese men to the US to seek work opportunities, which posed a threat to other non-Chinese workers, mostly white men, who were competing for such jobs. With growing tension and hostility, the Chinese Exclusion Act of 1882 legitimized the illegality and otherness of Chinese immigrants. During this time, many Chinese immigrants retreated into Chinatowns and opened Chinese restaurants. Because of their low prices and convenience, Chinese restaurants attracted a diverse clientele, and chefs began to make Chinese American food that catered to the white palette. At the same time, long-standing racism towards Chinese immigrants transformed into stereotypes of Chinese cuisine as unclean and unhealthy. While scholarship has largely focused on Chinese American cuisine, similar stereotypes have also affected the food of other Asian groups (Ku, 2014; Ku et al., 2013).

The study of Asian cuisine not only provides insight into its unique history, but also into our theoretical understanding of the assimilation of Asian Americans into the US mainstream. Many cuisines brought over by Asian Americans, such as Chinese and Filipinx immigrants, predate theories of immigration, such as straight line (Park and Burgess, 1921) and segmented assimilation (Portes and Zhou, 1993) theories. Straight line assimilation theory argues that as immigrants become more integrated into the US mainstream through education and occupation, they abandon their markers of ethnicity, such as language and culture (Park and Burgess, 1921; Zhou, 1999). Yet, other scholars have pinpointed the complexity of this process through the framework of segmented assimilation, stating that there are three possible adaptation patterns that occur among contemporary immigrants and their next generation: upward mobility into the white middle class, downward mobility into the underclass, or the preservation of immigrants’ values and solidarity through the establishments of ethnic capital (Portes and Zhou, 1993; Zhou, 1999). Studying how food and cuisine shape these trajectories...
has not been a focus of research using these frameworks and applying them can help us understand both how different types of cuisines are received by the white mainstream and the broader social standing of ethnic groups within US racial hierarchies.

Within the historical context and sociological analyses frame our investigation of the impacts of the COVID-19 pandemic on the economic livelihoods of Asian restaurants, there is one key actor that remains overlooked: the governmental health inspector. As individuals that enforce institutional policies regarding food safety, health inspectors play an important role in conveying to the public the level of compliance restaurants have with food safety regulations, and are particularly important in jurisdictions where restaurant grades must be prominently displayed for customers. Health inspectors are also official agents of the State, and any biases they manifest could result in systematic disadvantage against restaurants in ways that exacerbate existing inequalities. Moreover, these inequalities are structural ones given that representatives of the State are responsible for carrying out and enforcing laws.

This study seeks to understand how these potential biases shaped the livelihoods of Asian restaurants. Focusing on New York City, home to some of the largest enclaves of Asian restaurants in the US, we examine trends in health inspection scores before and after news of the pandemic became widespread in the US.

The COVID-19 pandemic and the restaurant industry

The COVID-19 pandemic devastated the economy and particularly the restaurant industry. From the authors’ own calculations using US Bureau of Labor Statistics data, the number of employees in the restaurant industry in April 2020 declined by 46.1% compared to April 2019 (see Appendix Table 1). This decline equates to a loss of approximately 5.1 million jobs in the restaurant industry (see Appendix Table 2). Additionally, the decline occurred primarily in April 2020, as the number of jobs in the restaurant industry during this time was approximately half of the number in the preceding month.

Employment data also suggests that Asian Americans were affected more than other groups. Data from the New York Bureau of Labor showed that in the 6-week period ending on 9 May 2020, unemployment claims filed by Asian Americans were 56 times higher than for the same period in 2019, which was also much higher than the growth in claims filed by white, Black, and Latinx individuals, which were 15, eleven, and 16 times higher, respectively (Klein, 2020). Moreover, a nation-wide report from the Pew Research Center (2020) found that the highest increase in unemployment was among Asian Americans, from 2.5% to 20.3% between February and May of 2020. News reports suggest that the effects of the pandemic were felt by Asian restaurants as early as January (Alcorn, 2020; Shen-Berro, 2020). For example, the owner of San Francisco’s famous Golden Gate Fortune Cookie Company when describing his business said “‘It’s dead. We have no people coming.’ He estimated that he had seen an 80% drop in foot traffic to his shop since the start of the outbreak” (Ho, 2020). One Washington Post article argued that “Asian-owned businesses are facing a crippling pileup of pressures during the coronavirus pandemic, advocates and researchers say — pressures that won’t all ease with the
country’s piecemeal reopening. They’ve been hurting longer, seeing their group’s un-
employment rate skyrocket faster and struggling like many minority-owned shops to
access government aid, often in industries with especially uncertain roads to recovery”
(Knowles and Bellware, 2020).

Decreased business was not the only form of hardship that Asian Americans in the
restaurant industry experienced. A number of Asian restaurants also reported being
defaced with racist graffiti and other forms of vandalism during the pandemic, such as
Douglas Kim’s Jeju Noodle Bar in New York City (Adams, 2020). One restaurant owner
described this dynamic from the perspective of Asian American customers: “It was
people’s fear of coming to Manhattan’s Chinatown...but also Asian families’ fears of
going out...of being punched, spat on or glared at because of her race or mask on the
subway (Knowles and Bellware, 2020).” This restaurant-specific discrimination was
undoubtedly linked to reports of spikes in complaints of anti-Asian harassment and
discrimination across the US and the globe (Gover et al., 2020; Phillips, 2020). Li and
Nicholson (2021) argued that the surge in anti-Asian discrimination reflected historic
notions of “Yellow Peril”, or the notion of East Asians as an ever-present threat against
whiteness. One initiative, Stop AAPI Hate, collected 1843 self-reported incidents of anti-
Asian discrimination from March 19 to 13 May 2020 (Turton, 2020).

History of anti-Asian racism and food

In order to understand contemporary anti-Asian sentiments, it is important to place these
events in the history of Anti-Asian discrimination. While not common in popular dis-
course of Asian restaurants and the COVID-19 pandemic, the roots of anti-Asian racism
and food date back to the late 1800s. Before 1882, the California Gold Rush brought the
first wave of Chinese immigrants to the US and by the latter half of the 19th Century as
many as 300,000 individuals were working in various sectors, such as agriculture, mining,
transportation, and manufacturing (Barbas, 2003; Godoy, 2016; Takaki, 1998). Many
non-Chinese, often white workers felt threatened by how new incoming Chinese laborers
worked for lower wages and anti-Chinese sentiment soon escalated into violence (Carter,
2018; Godoy, 2016). For example, in 1871, at least 18 Chinese immigrants were beat,
shot, and hung by a mob of mostly white Americans in Los Angeles – known as “the most
lethal example of racial violence ever recorded in the city” - yet, the white attackers were
tried and eventually released with very little penalty (Chung, 2014; Johnson, 2011; Lee,
2013). The US government not only did not provide relief and support, but in 1882,
President Chester A. Arthur signed the Chinese Exclusion Act, the very first law that
prohibited the entry of one specific ethnic group to the US and denied existing US
residents any pathway to citizenship (Godoy, 2016; Gyory, 1998; Kil, 2012; Lee, 2002).
The law also legitimized ways for others to persecute and force out Chinese immigrants
from the general labor market, which contributed to the formation of segregated ethnic
enclaves and labor niches (Barbas, 2003; Mendelson, 2016). By 1924, the Immigration
Act of 1924 denied all Chinese and other Asian immigrants the right to become natu-
ralized citizens and the ownership of land (Lee, 2002; Ngai, 1999). With such severe
limitations, Chinese immigrants had to establish new work opportunities for themselves.
Restaurant work within Chinatowns became one of the main job opportunities for Chinese immigrants (Chin, 2005; Shah, 2001; Siu and Tchen, 1988). These ethnic enclaves were some of the poorest and most segregated neighborhoods in large cities (Anderson, 1987; Lin, 1998; Yan and Santos, 2009). Chinese immigrants opened up new restaurants in Chinatowns where they adapted and learned to create dishes for non-Chinese patrons (Mendelson, 2016). Chinese restaurants became a symbol of “abundance” and “democracy” as eating fusion dishes such as “chop suey” and “chow mein” became not only a privilege to the wealthy, but one for the masses to be enjoyed on a regular basis (Barbas, 2003; Chen, 2014: p.3; Liu, 2015). Still, the phenomenon of inexpensive Chinese American food shaped anti-Chinese sentiments, which now stereotyped Chinese immigrants as subservient restaurant workers (Barbas, 2003).

The perception of Chinese workers as cheap restaurant laborers and Chinatowns as poor and unclean soon formed a new racist rhetoric about Chinese food. As Chen (2014) stated in his book Chop Suey, USA: the Story of Chinese Food in America, “the lowly position of Chinese food in mainstream America’s restaurant-market hierarchy has mirrored the inferior status of China both as a culture and as a supplier of cheap labor in the economy” (p.3). Such anti-Chinese discrimination affected how white consumers saw other types of Asian cuisines as well. Many of these stereotypes formed the basis of racist propaganda, which claimed that Chinese restaurants used rats, cats, and dogs as their preferred meat (Liu, 2015). The media was ruthless in their writings and descriptions. In 1853, the Daily Alta California announced:

If there is one class of nasty foreigners. . . more ill-favored, unfortunate, and forlorn among us, than another, it certainly must be the Chinese…Rats, lizards, mud-terrapins, rank and indigestible shellfish, and such small deer, have been and continue to be, the food of the “no ways partickler” Celestial, where flour, beef, and bacon, and other fare suitable to the stomachs of “white folk” abound. It is not to be wondered at, therefore, that the habits of the Chinese in California should excite ineffable disgust, and turn the stomachs of the stoutest Anglo-Saxon (Liu 2015: p.29).

Alexander Young of the Daily Alta California stated the following in 1872:

“Superficial artists have insisted that the reason why the Chinese are attached to California, notwithstanding the ill-treatment to which they have been subjected there, is the abundance and superior quality of the rats of the golden gate.” (Liu, p.31)

Similar descriptions of Chinese immigrants and their cuisine also infiltrated the advertising world. “Rough on Rats,” a pest control product, had an advertisement that showcased “a Chinese man with his mouth open ready to eat a rodent…personified…the Chinese man being an effective rodent exterminator” (Liu 2015: p.40). The American Restaurant magazine stated in 1927 that “eating chop suey in a Chinese-run, rather than white-owned restaurants…is a definite way to contract a disease – if not commit ‘chop-suey-cide’” (Barbas, 2003: p.632). In its early formation, this rhetoric was largely propagated among only white Americans. Wong Chin Foo, a Chinese civil rights activist
in the late 1800s once answered during a public lecture that “I never knew that rats and puppies were good to eat until I was told by American people” (p.36). These stereotypes of Chinese food continue today: for example, in 2007, despite having no evidence, New York television station CW 11 broadcasted in their news that a Chinese restaurant in Brooklyn served mouse meat. While the restaurant passed their next health inspection, the owners received numerous threats and the television station never apologized (Liu, 2015).

More recently, rhetoric over the cleanliness and safety of Chinese and Asian American food has centered on the use of monosodium glutamate, or MSG. Unscientifically thought to cause “The Chinese Restaurant Syndrome” (Mosby, 2009), MSG, and more broadly Chinese and Asian American cuisine, has been blamed for a host of symptoms ranging from headache and fatigue to dry mouth. Despite decades of scientific studies that have found no statistical links between the consumption of MSG and these symptoms (Freeman, 2006), its use (or supposed use) still is associated with uncleanliness in the white consciousness (Huang, 2021; Yeung et al., 2020).

**Theoretical frameworks**

The history of Asian cuisine in the US also allows us to understand better the theoretical tools that focus on immigration. Common theories of immigration, particularly in sociology, stem from analysis of either southern, central, and eastern European immigrants at the turn of the 20th century (e.g. straight-line assimilation theory, Park and Burgess, 1921) or racially and ethnically diverse populations that arrived as a result of the Immigration Act of 1965 (e.g. Portes and Zhou, 1993). However, Asian cuisines in the US transcend these timelines, and they remain simultaneously one of the most popular foods while also bearing the marker of ‘ethnic’ difference. For example, one recent study of reviews of restaurants on Yelp, an online platform for business and product reviews, found that customers of Chinese restaurants evoked mentions of ethnicity more than any Mexican, Italian, and American restaurants (Boch et al., 2020). This dynamic shapes more than just the reception of food to the mainstream, but also the lives of Asian Americans themselves. For example, one ethnographic study of Chinese American restaurant owners found that opening Chinese restaurants helped solidify their ethnic identities (Liu and Lin, 2009). These identities were influenced by an acknowledgement of both past and current histories of Chinese American cuisines and were a form of resistance to a “wholesale assimilation” that was devoid of ethnic identities. Finally, understanding how policies beyond immigration laws shape assimilation trajectories is also vital, as scholars have long argued that policies that seemingly are “race-neutral” are enacted in ways that reinforce existing inequalities (Crenshaw, 1989).

**Research question**

Given their recent economic devastation, history of discrimination, and potential to further our theoretical understanding of immigrant assimilation, Asian restaurants, and how they have fared during the COVID-19 pandemic, are important subjects of investigation. Moreover, it is vital to understand the role that institutions, such as health
inspection, play in shaping the outcomes of these restaurants. We ask the following research question: did patterns of health inspection citations of Asian restaurants, compared to other restaurants, in New York City change when news of the COVID-19 pandemic became widespread in the US?

Data

To answer our research question, we use data from NYC Open data, which is provided by the New York City Department of Health and Mental Hygiene (DOHMH). The dataset contained violation citations from every inspection conducted up to 3 years prior to the most recent inspection for restaurants in active status on the date the data is accessed. When an inspection results in more than one violation, values for associated fields are repeated for each additional violation record. Each establishment is identified by a unique record ID.

It is important to note that we only included restaurants that had active status in February of 2020 in order to analyze the period between December 2019 and February 2020. We chose the cutoff of December 2019 to mark the month before public attention to the COVID-19 pandemic started in the US. Using Google Trends to examine google searches in the US on terms such as “Coronavirus”, we saw that searches for these words grew rapidly during the week of January 19–25, 2020. We chose the latter cutoff of February 2020 to take into consideration that a number of restaurants closed during and after March 2020. Therefore, the period of December 2019 to February 2020 represents the months after the news of COVID-19 began and restaurants were still open.

The data we used in this study is at the restaurant type/cuisine level. The first step of our analysis was to create a dataset aggregating the citation information by type of cuisine. For each cuisine, we calculate the average citations and number of records (the number of times a restaurant was graded). We then reshaped the data so that each cuisine was a row and each column represented monthly information covering the period between January 2017 and February 2020. We also calculated cumulative citations, which represent the average of the monthly citations up to the corresponding month. For example, the cumulative rating for October 2019 was the average of ratings from January 2017 to October 2019. We decided to use the cumulative ratings as the outcome for our synthetic control analysis (described below) as it was a better measure of sustained increase or decrease in the ratings of certain cuisines than the raw monthly averages, which we explain further in the results section. Focusing on when news of the COVID-19 outbreak started to rise in the US, we analyzed potential changes in the cumulative ratings of restaurants.

To create the synthetic control group, we included as covariates the (1) cumulative citations, as they speak to a sustained increase or decrease in citations, (2) monthly ratings, as they indicate whether restaurants had a month with a particularly high number of citations, which helps us factor in for the seasonality that can arise in citations and (3) number of records, or how many times in a month a restaurant was cited. We modeled the synthetic controls using data from January 2017 until (and including) December 2019 and then predicted values for January and February 2020. We did this using a causal framework: the pre-treatment condition (before January 2020) is not contaminated by our
“treatment” or shock, which in this case is when news of COVID-19 began in the US. Our donor pool for the synthetic control group included American, Caribbean, Latin, Italian, and Mexican restaurants. Please see Appendix Table 3 for descriptive statistics of variables used for the synthetic controls. We only included these cuisines as they were the ones with sufficient citation information during the period analyzed.5

Analytic strategy

To determine whether there was an effect of the news of the COVID-19 pandemic on food inspector citations of Asian restaurants, we used a comparative case study approach: we compared citations for restaurants of Asian cuisine, which we argue were particularly affected by COVID-19 news, to the citations of comparison or control groups.6 One of the main concerns when using a comparative case study approach is how to select correctly a control group. One approach given our data and research question is to use the difference in differences (DID) method, which relies on the parallel trends assumption. For this study, this assumption requires us to find a comparison group that has a similar trend in citations to Asian restaurants before January 2020. If this comparison cuisine existed, we could implement a difference in differences (DID) approach to evaluate and compare the average change over time for Asian restaurants and the control cuisine. To find a potential comparison group of this type, we visually analyzed the citations’ trends and did not find any cuisine for which we could make the parallel trend assumption. For this reason, we used the synthetic control method developed by Abadie and Gardeazabal (2003).

The synthetic control method is a statistical tool that combines matching (in a similar way as propensity scores techniques do) and DID approaches by creating a weighted combination from a pool of controls, called the synthetic control, which is then compared to the treatment group. This method has several benefits: it can account for the effects of other confounders that change over time as long as the covariates are not related to the intervention; it uses the data available to create a better control group (i.e. one that most resembles the treatment group before intervention); and it is data driven, meaning that the researcher does not select the control group, as the synthetic control is obtained from the data structure and covariates used in the model (Abadie and Gardeazabal, 2003).

In mathematical terms, let us assume we have $J+1$ different cuisines. Without loss of generality, we assume that the first one is Asian cuisine with a total of $J$ possible controls. Let $Y_{it}^N$ be the outcomes that would be observed for cuisine $i$ at time $t$ in absence of COVID-19 news and let $Y_{it}^I$ be the outcome for cuisine $i$ at time $t$ with the news of COVID-19. Let $T_0$ be the first month when the COVID-19 news started to surface, so for $1 \leq t \leq T_0$ we have that $Y_{it}^N = Y_{it}^I$. We are interested in estimating the following equation for $t > T_0$

$$\alpha_{it} = Y_{it}^N - Y_{it}^I$$

(1)

Since one of our assumptions is that only Asian cuisine restaurants were affected by the COVID-19 news (we further discuss this assumption in our discussion section) then equation (1) becomes
And because the second term of equation (2) is observed, then we are only interested in estimating $Y_N^{it}$. Suppose that we can express $Y_N^{it}$ with a factor model so that Equation 3 becomes

$$Y_N^{it} = \delta_t + \theta_t Z_i + \lambda_t \mu_i + \varepsilon_{it}$$

Where $\delta_t$ is an unknown common parameter, $Z_i$ is a $(r \times 1)$ vector of observed covariates not related to the spread of COVID-19 news, $\theta_t$ is a $(1 \times r)$ vector of unknown parameters, $\lambda_t$ is a $(1 \times F)$ vector of unobserved common factors, $\mu_i$ is an $(F \times 1)$ vector of unknown factor loadings and $\varepsilon_{it}$ are the error terms for each cuisine.

The particular vectors of weights $W = (w_2, \ldots, w_{J+1})'$ such that each $w_j \geq 0$ and $\sum w_j = 1$ represent a different solution for a potential synthetic control, which is a weighted average of cuisines. If there exists a vector $W^* = (w_2^*, \ldots, w_{J+1}^*)'$ such that Equation 4 becomes

$$\sum_{j=2}^{J+1} w_j^* Y_{jt1} = Y_{t11}, \ldots, \sum_{j=2}^{J+1} w_j^* Y_{j10} = Y_{110} \text{ and } \sum_{j=2}^{J+1} w_j^* Z_j = Z_1$$

Then we can use such vector of weights $W^*$ to estimate our synthetic control group as the weighted average of the other cuisines and we can proceed to estimate equation (2).
Results

To address our research question we first analyzed, descriptively, restaurant ratings by cuisine. From Figure 1, we see that some cuisines had decreases in the number of citations from December 2019 to January 2020, while other cuisines, such as Asian, Caribbean, and Italian, showed consistent increases in citations until February of 2020.

It is also clear from Figure 1 that monthly citations vary greatly within cuisines, which makes it difficult to examine whether the number of citations after December 2019 changed due to systematic biases held by potential inspector bias or random noise. For example, in December 2019, Asian restaurants had an average citation count of 11.5, while in January 2020 the citation count was 11.8. Moreover, Asian restaurants had lower citation numbers in that 6-month period; therefore, it is unclear whether the increase seen in later months is simply due to the comparison with December. Given our interest in whether citation numbers in the months after December 2019 were substantially different from prior months, we calculate the citations’ cumulative average, which we present in Figure 2. The cumulative average helps address spikes in certain months that may affect the distribution in a way that precludes meaningful analysis by providing information on sustained increases or decreases in the number of citations. When investigating this alternative measure descriptively, we see from Figure 2 that there is still an increase starting in December of 2019 that is more pronounced for Asian restaurants vis-à-vis other restaurants.

To examine in a more robust manner whether January 2020 and February 2020 citations were significantly different from earlier ratings, we used the technique of synthetic
control. As mentioned in the methods section, the synthetic control approach relies on predicting a counterfactual or control group for the treatment group as a function of the other cuisines’ covariates (cumulative citations, monthly citations, and records) before intervention (December 2019). The first step of our analysis was to create a synthetic control for Asian cuisine. The second step was a robustness check of our estimates to investigate whether other non-Asian cuisines also showed systematic increases in the number of citations after December 2019.

Figure 3 shows the results of our synthetic control for Asian restaurants. We can see that the synthetic control for Asian restaurants closely mirrors the actual trend for Asian restaurants until December 2019 (shown by a vertical red dotted line), which shows that the model estimated a robust synthetic control for the number of citations received by Asian restaurants. However, after December 2019, a gap emerges between the synthetic control and actual citation count and widens throughout January and February 2020. This pattern shows that the number of citations for Asian restaurants were higher than predicted.
in January and February 2020, which is when news of coronavirus started in the US. As mentioned earlier, we smoothed the actual monthly scores as the raw data reflects too much variation (e.g. has too much noise). As a robustness check, we calculated a 3-month moving average of the scores and analyzed the synthetic control for this trend. The results hold in this case are shown in Appendix Figure 1.

To confirm that a gap was only observed for Asian restaurants, we compared the synthetic controls and actual numbers of citations for other cuisines, which is commonly referred to as a placebo test. Figure 4 shows the synthetic controls and actual citation numbers for Italian, Mexican, Latin, and Asian cuisines. From Figure 4, we can see that patterns for other cuisines do not resemble the one for Asian cuisines. The synthetic control for Italian cuisine is parallel with the observed line from across December 2019 to February 2020, while the citations for Mexican and Latin restaurants are lower than their synthetic predictions.
To illustrate the gaps between synthetic controls and actual citation numbers for the other cuisines, we turn to Figure 5. Here, we see that only Asian restaurants had more citations in January and February 2020 than predicted. Lines that are close to zero prior to December of 2019 indicate synthetic controls that mirrored closely the actual citation numbers. We were able to find robust synthetic controls for many cuisines, but were unable to calculate robust controls for Caribbean and American cuisines. Yet for Caribbean and American cuisines, the gap between actual and synthetic does not change before and after December 2019. In terms of the extent of the gaps for each cuisine and their corresponding synthetic control, Asian cuisine had an increase of 0.66% in citations in February of 2020. For Latin, Italian and Mexican restaurants, the percentages were of −0.29%, −0.73% and −0.69%, respectively. These negative values show that the synthetic control predicted fewer citations for all cuisines, except Asian cuisines.

**Figure 5.** Gaps in number of citations for Asian, American, Caribbean, Italian, Latin, and Mexican cuisines (Actual - Synthetic control). Note: Our donor pool for the synthetic controls included American, Caribbean, Latin, Italian and Mexican restaurants since they were the only ones with sufficient citation information during the period of time analyzed.
Discussion

The premise of this study was to examine whether Asian restaurants received more citations after news of the coronavirus causing COVID-19 spread in the US, which would suggest biases on the part of health inspectors. Our findings show that in January and February 2020, Asian restaurants - and no other types of restaurants - received more citations than would have been otherwise predicted. Many discussions of anti-Asian racism and food in the US, both contemporary and those that reach back hundreds of years, have constructed Asian cuisine as foreign, unclean, and disease-bearing. A symphony of voices, from politicians and business owners to everyday individuals, contribute to these stereotypes. However, there is less evidence that discrimination against Asian food establishments is codified in structures and institutions. In other words, there is no mention of the origins of food in health code laws. This is similar to how many laws in the US do not include language of race/ethnicity or identity. However, scholars have argued that a law or policy is racist if the enactment of it produces racial/ethnic inequalities. For example, Crenshaw’s (1989) work on intersectionality focused on the racial, gender, and class consequences of various laws. Here, the results of this study suggest how health inspectors who subscribe to these stereotypes may perpetuate and exacerbate racism against Asian food establishments. By giving biased citations, health inspectors likely deter customers; however, for Asian restaurants, the effects may be multiplicative, as clientele are likely primed to think that such establishments are already unclean.

It is also worthwhile to imagine how biases may have manifested during health inspections after news of the coronavirus causing COVID-19 began in the US. Descriptions in documents describing the health inspection process detail significant interactions between restaurant employees (referred to as “operators”) and health inspectors (New York City Department of Health and Mental Hygiene, 2020). For example, at the end of the inspection, health inspectors are required to “review the results of the sanitary inspection with the operator, explain violations and suggest ways to correct them and improve food safety (New York City Department of Health and Mental Hygiene, 2016).” They also provide “answers to reasonable questions about the inspection and instructions for viewing results...in non-English languages” with the aid of language assistance programs (New York City Department of Health and Mental Hygiene, 2014). Often these conversations involve food service operators explaining how certain violations may be, in fact, in compliance with regulations. These exchanges are particularly important for restaurants that serve food that may be unfamiliar to the health inspector despite their rigorous training. It may be the case that news of the outbreak shaped these interactions; health inspectors may have asked for less explanation of violations from operators of Asian restaurants and spent less time investigating potential violations before giving citations.

Our findings shed light on how the current discrimination against Asian restaurants in the US fits into broader discourses of the history of Asian American cuisine and frameworks of immigrant assimilation. Unpacking the theoretical roots of stereotypes of Asian food, and its intersections with other stereotypes of Asian Americans, can reveal
how Asian cuisine is both stigmatized as a longstanding ‘other’ and appropriated into the mainstream. The notion that Asian Americans are “forever foreign” aligns well with notions of Asian cuisine as being distinct from ‘American’ cuisine. Yet the trope of Asian Americans as Model Minorities, who excel in science and math, and are obedient and servile, is seemingly antithetical to stereotypes of Asian food. It may be the case that the longstanding stereotype of Asian cuisine as disease-baring simply supersedes notions of the Model Minority, or that both can coexist in the imagination of the racist mainstream.

Our study also revealed the potential consequences of biases against Asian cuisine as unclean and unsafe; however, this is not the only type of racism that affects this type of cuisine. Much attention has been paid to how Asian cuisines in the US have been appropriated by mainly white chefs. This appropriation not only asserts power over and ownership of Asian cuisines, but also creates the idea that white appropriators can ‘elevate’ Asian food. This sentiment was found in an advertisement in 1927 from a white-owned Chinese restaurant that boasted that “the dishes are not made by a Chinaman, which only means that the food is cleaner” (Barbas, 2003: p.678). A similar sentiment was echoed in April 2019, when a journalist for the New York Times wrote about a white-owned Chinese restaurant called Lucky Lee’s in New York City (Otterman, 2019). The purpose for opening the restaurant was that “...she [the owner] wanted to open up a Chinese restaurant where her and her food-sensitive clients could eat – where the lo-mein wouldn’t make people feel ‘bloated and icky’ the next day, or one where the food wasn’t ‘too oily’ or salty.” Notably, the cuisine was also touted as being MSG-free. Such discrimination and appropriation extend to other Asian cuisines as well (Consul, 2016). For example, in 2016, the renowned American food magazine Bon Appétit not only posted a video that showed a young white chef teaching the proper way of eating Vietnamese pho, which the magazine deemed as “the new ramen,” but also published another white chef’s modified recipe of the Filipinx dessert Halo-Halo. The appropriation of Asian cuisines by the white mainstream also complicates notions of assimilation. Many assimilation theories measure the level of group integration with markers of social distance. However, it is not sufficient to describe Asian cuisines appropriated by the white mainstream as a sign of integration: Asian cuisine is both ‘exotic’ and enticing while simultaneously in need of refining by the white mainstream.

We framed our study using theories of discrimination and assimilation, but our findings are not fully described by any one framework. The biased health inspection grades reflect in some ways the centuries of discrimination against Asian cuisines. This construction stands seemingly opposed to the notion of “cultural advantage” that is evoked to explain high Asian American achievement, which is also used to uphold historic notions of anti-Blackness. Even the appropriation of Asian cuisine reflects aspects of both of these theories: whiteness desires Asian cuisine but also advertises its version as “cleaner” and better. It is notable that the direct messaging of an “improvement” on Asian cuisine is often absent in other forms of cultural appropriation in which cultural products are wholly stolen and resold for profit. Instead, appropriated Asian cuisine is explicitly advertised using stereotypes and is still marketed as Asian cuisine. This dynamic complicates assimilation frameworks that describe different pathways of mobility and the preservation (or lack there of) of ethnic capital. The marginalization of Asian cuisine cements its
position in the periphery, yet the desire for whiteness to appropriate it while evoking the same racist stereotypes, reflects a process that is more complicated than direct assimilation.

This study has limitations. Comparative case studies are widely used in the social sciences but one of their main limitations is the researcher’s own bias when selecting a proper comparison group. In this study, we try to address this issue by using a synthetic control method that relies on the data structure for the selection of a proper comparison group. But synthetic control methods have limitations linked to the availability of data. First, the selection of the synthetic Asian cuisine group is dependent on the available pretreatment covariates, which in our case is limited. Second, the pool of donors is limited by cuisines that have complete information during the period of the analysis. We try to isolate the potential effect of the news of COVID-19 on health inspectors racial bias, but we recognize that our estimates of consistent increases in citations may also be due to other factors associated with the pandemic for which we had no information. However, given our placebo tests’ results, we argue that these factors, whatever they may be, were uniquely detrimental to Asian restaurants.

Despite these limitations, the results of this study suggest that anti-Asian sentiments can further racial inequalities that arise from biased enforcement of institutional rules. Future directions of research should further investigate the extent to which Asian restaurants have been devastated by the COVID-19 pandemic. In terms of addressing these inequalities, in order to ensure that Asian restaurant owners have access to “knowledgeable, fair and impartial inspectors who enforce agency rules uniformly” (New York City Department of Health and Mental Hygiene, 2014), it is imperative that health inspectors engage in conversations of racial stereotypes and food. An inspection of public-facing documents found no mention of any type of training that is required of health inspectors (New York City Department of Health and Mental Hygiene, 2014, 2016, 2020). Moving forward, health inspectors should be trained to address their own potential biases, particularly in a context as diverse as New York City. Researchers should also partner with public agencies to continue to utilize data to inform practice.

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Notes
1. We distinguish in this manuscript between the coronavirus that causes COVID-19 and the COVID-19 disease as our analyses focused on a time when the term COVID-19 was not yet used.
2. Data pulled from https://www.google.com/url?q=https://data.cityofnewyork.us/Health/Restaurant-Grades/gra9-xbjk&sa=D&ust=1595883211144000&usg=AFQjCNGvu-KtuWNuxdhdQFas64upZNgx4w
3. https://trends.google.com/trends/explore?geo=US&q=coronavirus
4. To illustrate the configuration of the final dataset, we give the example of Mexican cuisine: one row represents Mexican restaurants where the first three columns are the ratings, the number of records, and the cumulative ratings for January 2017, the next three values are the ratings, the number of records and the cumulative ratings of February 2017 and so on until February of 2020.
5. As a robustness check we ran the same analysis for a shortened period of time (starting in January 2019 rather than 2017) to include more cuisines, with a total pool of 16 different cuisines. The results were in the same direction as the ones presented here.
6. As stereotypes of Asian cuisine encompass a number of cuisines with origins in Asia, we consider as Asian any restaurant that is classified as Chinese, Japanese, Asian, Thai, Vietnamese or Korean. We do not include Indian restaurants as we argue, and literature has shown, that stereotypes of Chinese cuisines are often more similar with those of other East and Southeast Asian cuisines than South Asian cuisines. Depending on the number of restaurants on each cuisine, we create a weighted average for scores of our constructed Asian restaurants group. Results for this constructed category of cuisine mirrored those calculated for each individual cuisine.
7. For both American and Caribbean cuisines no conclusions can be drawn regarding their synthetic controls since it assigned a weight of 1 to Italian and Latin cuisines respectively, meaning that their comparison groups are not a weighted average of other cuisines but rather only one cuisine that resembles them the most.

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**Appendix Table 1. Year over year percent change in restaurant employment.**

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| Year       | Percent Change |
|------------|----------------|
| 2017       | -10.2%         |
| 2018       | -1.1%          |
| 2019       | -0.8%          |
| 2020       | -0.6%          |
```

Source: US Bureau of Labor Statistics 2020.
Appendix Table 2. Number of jobs in restaurant industry.

Source: US Bureau of Labor Statistics 2020.

Appendix Table 3. Descriptive statistics of variables used for the synthetic controls.

| Cuisine   | Scores | Records | Number of restaurants |
|-----------|--------|---------|-----------------------|
|           | Mean   | Max     | SD        | Mean   | Max     | SD     | Mean   | Max     | SD     |
| American  | 10.32  | 11.92   | 0.77      | 2.52   | 2.82    | 0.14   | 4,894  | 4,894   | -      |
| Asian     | 11.28  | 13.41   | 0.88      | 2.50   | 2.87    | 0.14   | 3,847  | 3,847   | -      |
| Caribbean | 12.16  | 15.25   | 1.59      | 2.71   | 3.30    | 0.26   | 605    | 605     | -      |
| Italian   | 10.87  | 13.47   | 0.92      | 2.44   | 2.84    | 0.16   | 888    | 888     | -      |
| Latin     | 11.88  | 14.19   | 1.26      | 2.56   | 2.91    | 0.21   | 764    | 764     | -      |
| Mexican   | 11.26  | 13.37   | 1.07      | 2.65   | 2.94    | 0.16   | 795    | 795     | -      |

Appendix Figure 1. Actual vs. synthetic control citations for Asian cuisine using a 3-month moving average.