Evaluating the Effects of a Finger-Imaging Requirement for SNAP Eligibility on Food Stamp Participation and Food Security

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Abstract:

The Supplemental Nutrition Assistance Program (SNAP), previously known as the Food Stamp Program, provides a crucial resource for impoverished households in increasing purchasing power and food security. Fraud presents a large cost concern to the program, and the federal government mandates that the states must maintain a system that prevents duplicate or ineligible participants from receiving benefits. To satisfy this requirement, four states (Arizona, California, New York, and Texas) required applicants to submit to a finger-imaging requirement to receive benefits at different times in the last two decades. However, a large opposition to finger-imaging appeared, claiming it decreased SNAP participation by increasing the costs in time, money, stigma, and inconvenience of applying for benefits, and every state save Arizona repealed the requirement. I exploit the variation in timing by state with a difference in difference framework to examine the impact of this eligibility requirement on SNAP participation and food insecurity. I find the requirement decreases SNAP participation by 1.3 and 1.5 percentage points for individuals at or below 200% and 130% of the poverty threshold, respectively, and the effect intensifies for whites (non-Hispanic), children, and single mothers. Food insecurity increases for white mothers below 185% of the poverty line and white children of all incomes and below 185% of the poverty line. However, a finger-imaging requirement improves SNAP participation and food security for Hispanics and has no effect for blacks (non-Hispanic), suggesting that the increased costs associated with finger-imaging are equaled or exceeded by the benefit of reducing discrimination from SNAP officers by confirming one's legal US residence and freedom from felony drug convictions.

I. Introduction

At the end of the last century, the Supplemental Nutrition Assistance Program (SNAP), formerly known as the Food Stamp Program, trended toward a system of requiring program applicants to submit to finger-imaging in order to receive benefits. The practice started in Los Angeles County in 1991, and news of reduced fraud and costs evidenced by decreased enrollment encouraged other states to adopt the practice. Opponents of biometric identification argued that enrollment dropped due to the increased cost and inconvenience of application and recertification with finger-imaging rather than from fewer fraudulent enrollees, increasing the rate of eligible nonparticipation. The ethical concern of the association between finger-imaging and criminal treatment reinforced the backlash, and the fingerprinting requirement for SNAP started disappearing as quickly as it arrived, with Arizona as the only remaining state with the requirement.

Food stamps are an effective and efficient tool in alleviating poverty and food insecurity, making the eligible nonparticipation due to increased costs of application and recertification a significant problem. In 2013 alone, food stamps elevated 4.9 million people above the poverty threshold, 2.2 million of whom were children (Trisi 2013). A USDA study found the prevalence of very low food security in SNAP eligible households declined with an increase in SNAP benefits from 2008 to 2009 despite an expected increase in food insecure households due to decreased income and employment from the recession (Rosenbaum 2013). As a result of better nutrition, food stamp participation improves the health of its recipients, evidenced by an improvement in birth outcomes as measured by mean birth weight and incidence of low birth weight with the Food Stamp

Program rollout from 1965 to 1971 (Almond et al. 2008). This paper examines the effect of a finger-imaging requirement on SNAP enrollment and food insecurity.

In order to answer this question, I exploit the variation in the timing by year and the location by state of the requirement. At different points over the last twenty years, four states (Arizona, California, New York, and Texas) required food stamp applicants to be fingerprinted to receive benefits. The timing of when the requirement started and ended differs across each state. I exploit this variation with a difference in difference framework to examine the impact of these eligibility requirements. In particular, I use panels of repeated cross sections and add state and year fixed-effects into the model. This allows me to control for differences in the permanent differences across states that are common over time that may alter take-up (such as underlying food prices or the ease with which people can enroll within a state) and enrollment trends over time that are common to all states (such as the Great Recession).

I find that finger-imaging SNAP applicants reduces enrollment by 0.9 percentage points for adults and 1.6 percentage points for children with a gross household income at or below 130% of the federal poverty threshold, which I use as an approximation for food stamp eligibility. I also find differences in the effect by race and ethnicity, with whites experiencing the biggest enrollment loss, and by age and gender, with SNAP participation for children and single mothers decreasing more than other adults with the policy. In addition, a finger-imaging requirement increases the likelihood of white children and mothers below 185% of the poverty threshold being food insecure, defined by the USDA as the "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways," by 6 and 4.9 percentage points, respectively.

However, the opposite trend is found with the Hispanic population. Hispanic adults and children under 200% of the poverty threshold respond to a finger-imaging requirement by increasing SNAP participation by 1.2 and 1.1 percentage points, and Hispanic children under 185% of the poverty line respond with a 2.5 percentage point reduction in food insecurity. In addition, no significant correlation exists between a finger-imaging requirement and SNAP participation or food insecurity for black individuals. I suggest that a finger-imaging requirement provides eligible Hispanics and blacks a chance to prevent discrimination from SNAP officers based upon race or ethnicity by providing further evidence of legal US residence and a criminal record free of any felony drug convictions, both of which are required to receive SNAP benefits. In addition, I assert that the increased SNAP enrollment and decreased food insecurity for Hispanics can be attributed in part to a sharp increase in the amount of naturalizations and number of Hispanic citizens exactly when states instituted the policy. With finger-imaging resulting in increased SNAP participation and food security for Hispanics and no change for blacks, the anti-discriminatory benefits of finger-imaging and rise in the number of SNAP eligible Hispanics balanced the increased costs of enrollment and recertification from finger-imaging for blacks and exceeded them for Hispanics.

II. Background

Food stamps are an essential part of impoverished families' income, often providing the resources to meet their basic needs. In order to be eligible for SNAP, individual or household gross income must be at or below 130% of the federal poverty threshold (Aussenberg 2014). US citizenship is also required, though exceptions exist for immigrants with legal US residence of 5 years or longer, immigrants receiving disability-assistance, and children under 18. SNAP is a federally funded program, with states covering only a small portion of administrative costs (Ben-Shalom et al. 2011).

According to a study by the Food Research and Action Committee, SNAP is the most effective program in lifting families above one half of the poverty threshold, and one of the most effective in lifting families completely out of poverty (Maryns 2008). When paired with the Earned Income Tax Credit, SNAP participation allows a minimum wage worker's family to reach an income level above the poverty threshold (CBPP 2015). In addition, food stamps can increase the purchasing power of a family of four supported by a full-time, year-round minimum wage worker by 36 percent (Rosenbaum et al. 2005). Comparing new SNAP enrollees to households receiving benefits for six months, SNAP decreased food insecurity by 9 and 10 percentage points for all households and households with children, respectively (Mabli et al. 2013). Food stamps are also efficient, as the CBO found increases in SNAP benefits as one of the two most cost-effective of all tax and spending options examined in boosting jobs and growth in a struggling economy, generating $1.70 in economic activity for each dollar increase in SNAP benefits (Rosenbaum 2013).

Despite the program's efficiency in alleviating poverty and food insecurity, one in every three eligible persons does not receive benefits, reducing SNAP's effectiveness (Ratcliffe et al. 2008). Although this occurs in part from misperception over one's eligibility, the largest contributor to eligible nonparticipation is the high costs in time, money, stigma, and inconvenience of applying for benefits. Bartlett and Burnstein (2004) found the costs of application and participation as a reason for not seeking benefits for 61 percent of eligible nonparticipants. In 2000, 10% of households reported being food insecure, but the risk increased to 45% for SNAP eligible nonparticipants. Finger-imaging increases the cost of obtaining food stamps, evidenced in a study where it was found to decrease the likelihood that an eligible household will complete an application by 23 percent (Bartlett et al. 2004). Furthermore, finger-imaging was one of only five factors that negatively impacted food stamp participation.

Finger-imaging deters participation in SNAP through a variety of avenues. First, many consider it an unjust treatment of poor people, as finger-imaging is associated with criminals and can be considered degrading, leaving some to choose to not participate due to pride or a perceived ethical dilemma. Second, it increases the cost and inconvenience of receiving benefits, as it may require an additional trip to a separate facility to complete, increasing the costs of transportation, childcare, and/or lost wages. Every adult in the household must be fingerprinted until benefits can be received, often requiring multiple trips due to a lack of information or schedule conflicts. Last, finger-imaging increases fears of interagency sharing in applicants, specifically for those attempting to commit fraud and receive excess benefits and undocumented immigrants (who cannot legally obtain food stamps) fearful of information sharing with the INS. Although deterring fraud is the intended effect of finger-imaging, its unintended costs may also prevent many SNAP eligible individuals from receiving benefits.

Fraud presents a large problem to SNAP due to the high costs of providing excessive benefits. The largest portion of fraud comes from individuals using duplicate identities to obtain excessive benefits (Sticha 2009). With a duplicate identity, an individual applies for and receives benefits from multiple programs he or she is ineligible for or eligible for but with a smaller benefit. For example, being a recipient of Temporary Assistance to Needy Families (TANF) benefits automatically reduces one's benefit amount from SNAP, so applying under separate identification would give an individual full benefits from both programs. An applicant can also use a duplicate identity to receive benefits from the same program twice. With a false birth certificate, an individual obtains secondary identification from issuing agencies and can acquire multiple cases of assistance simultaneously.

In order to prevent fraud, the Food Stamp Act [7 CFR 272.4(f)(1)] requires each state to establish a system that prevents no applicant from receiving monthly benefits "more than once a month, in more than one jurisdiction, or in more than one household within the State." In order to comply, states have integrated fraud reduction systems into their application process, and individuals must provide basic documentation including names and social security numbers as a minimum and other measures of identification as states deem appropriate. These include the Eligibility Verification System (IEVS), which mandates matching case records with six external databases, and the Electronic Benefit Transfer (EBT), which replaces paper coupons and creates an electronic record of each transaction (Sticha 2009). For the purposes of this paper, the fraud reducing measure of interest is biometric identification technology, which identifies people based on physical characteristics, such as hand shape, voice patterns, and, most notably for SNAP, fingerprints. Under the Food Stamp Act, biometric identification fulfills the States' requirement in stopping the excessive procurement of benefits. In fact, fingerprinting is especially useful in eliminating duplicate applicants, as an applicant's fingerprint can be analyzed against a database with beneficiaries of SNAP and other welfare programs to ensure he or she is not receiving benefits under separate identification. However, finger-imaging is limited in reducing across-state duplicate participation, as the fingerprinting trend for other welfare programs closely followed that of SNAP by time and state, although certain exceptions exist (Connecticut, Illinois, and Massachusetts had finger-imaging requirements for other welfare programs without requiring the same for SNAP applicants) (Sticha & Ford 1999).

Previous work shows considerable ambiguity in the effect of biometric testing on enrollment and fraud. Sticha et al. (1999) found that finger imaging systems detects approximately 1 duplicate application for every 5000 cases, with statewide and interstate systems increasing the detection rate (1999). Using the most controlled estimate of refusal by existing enrollees, the authors found the finger-imaging requirement reduces participation by 1.3% (Ernst & Young 1995). Bartlett et al. (2004) found that a finger-imaging requirement reduced the likelihood of a completed application by 23 percentage points, which was more than any other measured factor. However, in an accompanying survey, only 1 percent of applicants who did not complete the application process mentioned it as a reason. There is currently no research linking food insecurity to a finger-imaging requirement for SNAP.

In this study, I attempt to fill a gap in the literature by analyzing individual-level panel data that covers every year finger-imaging has been used as a fraud-reduction measure in SNAP (1991-2014).This allows any estimate of finger-imaging's effect on SNAP participation to not include a reduction in the number of duplicate applicants, as using individual-level data rather than participation data from SNAP directly avoids counting individual participants twice. This isolates the effect to applicants deterred by the increased cost and inconvenience of application and recertification. In addition, by examining the effect of finger-imaging on food insecurity, this study shows how reduced SNAP participation translates into increased difficulties for the poor. Finally, this study separates how finger-imaging impacts SNAP participation and food insecurity by race, income level, age, and marital status, illuminating how the policy disproportionately hurts whites, children, and single mothers but also provides a defense against SNAP officer discrimination for blacks and Hispanics.

III. Data and Empirical Model

The data used to analyze the impact of a finger-imaging requirement on SNAP enrollment comes from the IPUMS-CPS database. IPUMS-CPS is a database containing 50 years (1962-2011) of the Current Population Survey (CPS), which is a monthly household survey conducted by the US Census Bureau and the Bureau of Labor Statistics. Initially designed to measure unemployment after the great depression, the survey expanded to include “a battery of labor force and demographic questions”, with supplemental inquiries on specific topics added for particular months over time. One of these supplemental surveys is the March Annual Demographic File and Income Supplement, or the March CPS, which has become a crucial resource for social scientists and policymakers. For example, the March CPS is the source of annual data on national poverty rates and the fraction uninsured. The IPUMS version of the CPS provides a useful continuity to the March CPS data by “harmonizing” variables across time, greatly improving the feasibility of cross time comparisons. This study also incorporates the December CPS Food Security Supplement, which adds additional questions to the survey on individuals' food security and expenditures and use of food and nutrition assistance programs.

In this study, I use panels of repeated cross sections from the March CPS for the years 1991 through 2014 to determine the impact of multiple variables on food stamp participation. The sample is limited to individuals with households at or below 200% of the poverty threshold. In addition, I use panels of repeated cross sections from the December CPS Food Security Supplement for the years 1998 through 2010 to estimate the impact of a finger-imaging requirement on the food insecurity of individuals and households. Both surveys use individual-level observations, with approximately 60,000 observations per year in the March CPS and 100,000 for the December CPS. Summary Statistics for the March and December CPS are listed in Table 1.

A major limitation of the data is that the survey instrument does not identify whether respondents are undocumented immigrants. In selecting a sample of likely SNAP enrollees, I use low income families that will necessarily include many undocumented workers and hence, people categorically ineligible for benefits. A second limitation is the lack of county level data in the December CPS, meaning all food insecurity regressions are limited to state-wide finger-imaging requirements. Finally, the December CPS is without many of the variables included in the more complete March CPS, meaning the controls in the food insecurity regressions are less comprehensive than those in the SNAP participation regressions.

Using variables on demographic information and food stamp participation, I measure the impact of fingerprinting on SNAP participation while including state and year fixed effects to control for differences in SNAP participation by location and time. In addition, I control for a variety of demographic variables, such as income as a percentage of the poverty threshold, age, age^2, race, and education. Furthermore, while continuing to control for state and year fixed-effects, I regress food insecurity against the presence of fingerprinting requirement and the set of demographic controls.

The model exploits the variation in the timing and location of the fingerprinting requirement with a difference in difference framework to examine its effect on SNAP participation and food insecurity. Table 2 shows the start and end dates of the finger-imaging requirement for SNAP beneficiaries, starting with Los Angeles County in 1991. Although Arizona, Texas, California, and New York all had statewide finger-imaging requirements from 2000 to 2007, Arizona is the only remaining state with the requirement.

$$SNAP_{ist} = \alpha + Finger_{st}\beta_1 + X_{ist}\beta_2 + \mu_s + \tau_t + v_{ist}$$

I use the above model in determining the impact of a fingerprinting requirement and demographic characteristics on food stamp participation. $SNAP_{ist}$ represents whether individual *i* in state *s* in year *t* is a food stamp recipient. $Finger_{ist}$ determines the presence of a food stamp requirement in year *t* in state *s*. Demographic variables and household characteristics are represented in X_{ist}. These characteristics include race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic), age, age^2, education, gender, income as percentage of the poverty threshold, number of own children in the household, and number of own children under 5 in the household. When looking specifically at children,

X_{ist} incorporates the mother's age, education, and marital status. In addition, μ_s represents the state-level fixed effects, τ_t represents the year fixed effects, and v_{ist} represents the random error term. The basic requirement for SNAP enrollment is a gross household income at or below 130% of the federal poverty threshold, and I restrict the sample to households with a gross household income of 130% or below the poverty level in certain regressions to determine the impact of finger-imaging on the SNAP eligible population.

$$FoodInsecurity_{ist} = \alpha + Finger_{st}\beta_1 + X_{ist}\beta_2 + \mu_s + \tau_t + v_{ist}$$

The second model determines how a finger-imaging requirement and demographic characteristics impacts the food security of an individual. $FoodInsecurity_{ist}$ is a dummy variable with a value of 1 indicating a household is classified as low or very low food security, meaning households "reduced the quality, variety, and desirability of their diets" and, for households with very low food security, experienced a significant disruption in the "quality of food intake and normal eating patterns". Again, demographic and household characteristics are represented in the vector X_{ist}, including family income, education, race, age, age^2, gender, and number of own children in the household. Analysis restricted to mothers includes number of children under 5 and marital status. Analysis restricted to children includes the mother's age, education, and marital status.

IV. Results

A. Food Stamp Participation

Table 3 displays OLS estimates of the food stamp participation regression with state and year effects. It shows that a finger-imaging requirement reduces SNAP participation by 1.3 percentage points for individuals below 200% of the poverty threshold and 1.5 percentage points for individuals below 130% of the poverty threshold. When separate models are estimated by race and ethnicity, only whites (non-Hispanic) show decreased food stamp participation with a finger-imaging requirement, with enrollment drops of 1.6 and 1.8 percentage points when below 200% and 130% of the poverty threshold, respectively. Finger-imaging had no statistically significant effect on blacks' (non-Hispanic) food stamp participation and a statistically significant positive effect on Hispanics' SNAP participation below 200% of the poverty threshold.

Table 4 isolates the effect of finger-imaging on SNAP participation to individuals aged 18 and older. A finger-imaging requirement decreases food stamp participation by 0.8 and 0.9 percentage points for adults below 200% and 130% of the poverty threshold, respectively. A finger-imaging requirement remains statistically significant in decreasing white individuals' and increasing Hispanic individuals below 200% of the poverty threshold's SNAP participation. Across all samples, increases in income and education and decreases in the number of own children in the household statistically significantly decrease food stamp participation.

Table 5 isolates the effect of finger-imaging on SNAP participation to children under the aged 18 and younger. The impact of finger-imaging on SNAP participation is amplified for children, with statistically significant decreases in participation of 1.5 and 1.6 percentage points from finger-imaging for children below 200% and 130% of the poverty threshold, respectively. White children experience an even greater effect, with a 2.4 percentage point decrease for children under 200% of the poverty threshold and a 2.9 percentage point decrease for children under 130% of the poverty threshold in SNAP participation. The only other subsample where finger-imaging statistically significantly affects SNAP participation is with Hispanic children under 200% of the poverty threshold, where it increases SNAP participation by 1.1 percentage points.

Table 6 estimates SNAP participation for children with single mothers. Finger-imaging remains a statistically significant predictor of lower SNAP participation for all children and white children with single mothers under 200% and 130% of the poverty threshold, with a finger-imaging requirement lowering participation by 1.3 and 1.5 percentage points for all children with single mothers below 200% and 130% of the poverty threshold and 2.6 and 2.2 percentage points for white children with single mothers below 200% and 130% of the poverty threshold. Finger-imaging increases SNAP participation for Hispanic children with single mothers below 200% and 130% of the poverty threshold by 3 and 2.7 percentage points, respectively.

Table 7 estimates this effect for single mothers, with participation decreasing by 4.9 percentage points for single mothers ages 18 to 25 and by 2.7 percentage points for single mothers ages 26 to 40. There is no statistically significant effect of finger-imaging on SNAP participation within each race subsample.

B. Food Insecurity

Table 8 estimates the effect of a finger-imaging requirement for SNAP on food insecurity in adults, and finds no statistically significant relationship for adults of all incomes and those below 185% of the poverty threshold. Only Hispanic adults under 185% of the poverty threshold had statistically significant results, with a finger-imaging requirement decreasing the expectation of being food insecure by 1.7 percentage points. Other results include increased food insecurity with being female and increasing the number of own children in the household and decreased food insecurity with increasing family income and education for all groups.

Table 9 estimates food insecurity for mothers. A finger-imaging requirement increases food insecurity by 4.9 percentage points for white mothers. Family income and education correlate negatively and being a single mother and increased numbers of own children in the household correlate positively with food insecurity across all samples. For white mothers of all incomes and below 185% of the poverty threshold and all mothers below 185% of the poverty threshold, increasing the number of children under 5 in the household, while holding the total number of own children in the household constant, decreases food insecurity by 0.5, 1.7, and 2.5 percentage points, respectively. Being a single mother is a statistically significant indicator of increased food insecurity for all in the sample.

Table 10 examines food insecurity for children. A finger-imaging requirement for food stamp participation increases food insecurity in white children of all incomes and below 185% of the poverty threshold by 1.5 and 6 percentage points, respectively. However, the same requirement decreases food insecurity for Hispanic children of all incomes and below 185% of the poverty threshold by 1.5 and 2.5 percentage points. For all children under 185% of the poverty threshold, food insecurity increases in age and if the child has a single mother and decreases in family income, mother's age (except for black children), and mother's education.

V. Discussion

The primary finding of this study - the 1.3 percentage point decrease in SNAP participation with a finger-imaging requirement for all individuals at or below 200% of the federal poverty threshold - is exactly in line with Ernst & Young's (1995) initial estimation. When separate models are estimated by race and ethnicity, I find that the negative impact of finger-imaging on SNAP participation is present only for white individuals. I find that a finger-imaging requirement for SNAP statistically significantly decreases SNAP participation for white adults and children and increases food insecurity for white mothers below 185% of the poverty threshold and white children while no significant relationship between finger-imaging and the two measures of SNAP exists for black individuals. These results suggest that finger-imaging does significantly increase the costs of enrollment and recertification and disproportionately hurts white applicants' SNAP participation and food security.

The most peculiar finding of the study is the theme of increasing SNAP participation and decreasing food insecurity with a finger-imaging requirement for Hispanics, which contradicts the intuitive impact of such a measure. Not only would Hispanics incur the same increased costs and inconvenience of application and recertification and the possible humiliation from the association between finger-imaging and criminals as whites, but Hispanics account for 81% of the undocumented immigrants in the US, meaning that if a significant amount of undocumented immigrants are receiving benefits, fears over interagency sharing, specifically with the INS, should disproportionately decrease SNAP participation for Hispanic by decreasing fraud (Passel and Cohn 2009). However, IPUMS-CPS does not include information to determine if an individual is an undocumented immigrant, so the extent of this effect is unknown. In addition, a finger-imaging requirement did not affect SNAP participation and food insecurity for black individuals.

One possible explanation for the positive impact of finger-imaging on SNAP participation and food security for Hispanics is that the inclusion of a finger-imaging requirement allows Hispanic applicants to prove their status as legal US residents. Wozniak (2014) argued that drug testing provides non-using blacks an opportunity to prove their drug-free status to employers, and found that both employment and wages for low-skilled black men increased with pro-testing legislation. If SNAP officers discriminate against Hispanics based on the large population of undocumented Hispanic immigrants, especially in Arizona, Texas, and California, finger-imaging allows eligible Hispanics to prove their citizenship status and reduce the threat of being ethnically discriminated against, resulting in increased SNAP enrollment and decreased food insecurity, despite other costs increasing due to finger-imaging.

In addition, finger-imaging could also benefit both blacks and Hispanics in a similar fashion by allowing them to prove that they have never had a felony drug conviction. In 1996, congress passed the Personal Responsibility and Work Opportunity Reconciliation Act, which includes a ban on felony drug convicts from receiving benefits through SNAP. In the same way drug testing helped blacks prove their status as non-users in Wozniak's (2014) study, Hispanics and blacks benefit from the effect of finger-imaging on reducing discrimination by SNAP officers based upon the high proportion of blacks and Hispanics serving jail time for drug charges relative to whites (Carson 2013).

Another possible explanation of the unexpected result for Hispanics is an increase in the number of naturalizations of illegal or legal immigrant Hispanics in the states of interest coinciding with the implementation of statewide finger-imaging systems. In 2013, 35% of the Hispanic population in the United States was immigrants (Zong and Batalova 2015). The naturalization rate doubled from 1995 to 2005 for eligible Mexican immigrants, who account for the largest foreign-born population in the US, rose markedly from 2000 to 2002 for Central American immigrants, and rose 80% from 1995 to 2005 for Caribbean immigrants (Passel 2007). Figure 1 shows sharp increases in the number of persons naturalized in the four states with fingerprinting requirement in 1996, 1999, and 2000, years that approximately coincide with the statewide fingerprinting implementation for all four states. The 1999-2000 jump coincides with a jump in the number of Hispanic citizens in fingerprinting states, as shown in figure 2 with the number of Hispanic citizens increasing by 8.3% from 1999 to 2000 while no other years show an increase above 3.6%. Considering all four states that ever used finger-imaging in SNAP are among the top ten by Hispanics as a percent of the state population according to the 2010 census, finger-imaging implementation for SNAP could be explained as an attempt to hinder enrollment growth in the face of a rapid increase in the number of SNAP eligible applicants. US citizenship is a prerequisite in most cases for SNAP eligibility, and these results suggest that the increases in SNAP enrollment and decreases in food insecurity for Hispanics may be due to a sharp increase in the amount of SNAP eligible Hispanics at the same time as states implemented finger-imaging as a requirement for SNAP, rather than Hispanics responding to the policy by increasing SNAP participation.

VI. Conclusion

In sum, I find a finger-imaging requirement significantly reduces SNAP participation for all individuals at or below 200% and 130% of the poverty threshold by 1.3 and 1.5 percentage points, respectively. This effect increases for whites (non-Hispanic), children, and single mothers. Finger-imaging increases food insecurity for white mothers below 185% of the poverty threshold and white children of all incomes and below 185% of the poverty threshold. However, Hispanics respond in the opposite manner to a finger-imaging requirement for SNAP enrollment by increasing SNAP participation and decreasing food insecurity. Although initially counterintuitive, the results are likely a result of a) the ability of a finger-imaging requirement to strengthen SNAP applications by Hispanics against discrimination from SNAP officers by affirming legal US residence and freedom from any felony drug convictions and b) the timing of a sharp increase in the number of US naturalization coinciding with the integration of a finger-imaging requirement for food stamps. Since no significant relationship exists between finger-imaging for SNAP and black (non-Hispanic) SNAP participation and food insecurity, the capability of finger-imaging to remove doubt about eligibility based upon one's criminal record also likely improves SNAP participation and food security for blacks, effectively negating the increased costs to enrollment and recertification due to finger-imaging.

The takeaways from this study should be twofold. First, finger-imaging does significantly increase the costs of application and recertification, as evidenced by the decreases in SNAP participation and food security for whites, who likely experience very little effect from reduced discrimination. Second, finger-imaging provides a measure against discrimination from SNAP officers based upon race or ethnicity, evidenced by the lack of an effect for blacks and the positive effect for Hispanics from finger-imaging on SNAP participation and food security. Even if one assumes that a finger-imaging requirement does not reduce fraud through duplicate participation, finger-imaging for SNAP is not an unambiguously hurtful requirement for SNAP applicants, as the increased costs are balanced for blacks and exceeded for Hispanics by the benefit of proving further evidence of one's US residence or lack of a criminal history. A possible solution to the problem is to maintain finger-imaging as part of the SNAP application process, but as an optional step designated as a way to strengthen one's application rather than a requirement. Potential problems include the cost of such a system and choosing to forgo finger-imaging being seen as an admission of ineligibility by SNAP officers, and a more thorough examination of these costs versus the benefits of optional finger-imaging would be needed to fully explore if such a system should be instituted.

Possible future research on the subject should include exploring other fraud and discrimination reduction measures to discover if any are successful without increasing the costs of application and recertification. Using the same econometric method employed in this study, decreases in overall SNAP participation could indicate if a measure increases costs to SNAP participation and difference in SNAP participation by race could indicate if a measure has any anti-discriminatory benefit. Comparing the results with data on the frequency of fraud detection would verify if any measures possess the fraud and discrimination reducing capabilities of a finger-imaging requirement without the accompanying increased costs to participation. In addition, finding more extensive controls for SNAP eligibility that include citizenship status would likely yield more substantial results by removing the effect of the coinciding timing of the increase in naturalized Hispanics with the implementation of the finger-imaging requirement, and reveal the extent to which the surge in naturalization affected the results of this study. Removing the effect of changes in the number of SNAP eligible individuals would more accurately measure the increase in costs from a finger-imaging requirement against its benefit of reducing discrimination by confirming one's US residence and criminal record. Furthermore, examining individual applications to SNAP offices with and without finger-imaging requirements and determining if there is a systematic difference in acceptance based upon a finger-imaging requirement for completed applications (to remove any effect from the increased costs of application) of whites versus blacks or Hispanics would further clarify the extent of discrimination in the SNAP application process and the capability of finger-imaging to lessen such discrimination. Additionally, using a more extensive measure of food insecurity could yield more statistically significant results, as being on food stamps may not completely solve issues of food security, but likely reduces the severity of the food insecurity substantially.

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Table 1: Sample Characteristics

Variable	Full Sample	Finger-imaging Required
March Current Population Survey (CPS) [1991-2014]		
Observations (person/year)	58,484	8,764
% Finger-Imaging Requirement	15.0%	100%
Average Age	31.50	29.82
% White (Non-Hispanic)	50.2%	24.6%
% Black (Non-Hispanic)	16.3%	10.7%
% Hispanic	25.9%	57.2%
% Other Race	7.5%	7.4%
% Female	55.1%	54.1%
Average Number of Children in Own Household	0.60	0.67
Average Number of Children Under 5 in Own Household	0.15	0.15
Average Income as a Percentage of the Poverty Threshold	110.60	107.89
December Current Population Survey (CPS) Food Security Supplement [1998-2010]		
Observations (person/year)	115,044	15,591
% Finger-Imaging Requirement	13.5%	100%
% Food Insecure	12.6%	14.5%
Average Age	37.0	35.2
% White (Non-Hispanic)	72.6%	52.1%
% Black (Non-Hispanic)	9.4%	8.2%
% Hispanic	11.3%	30.7%
% Other race	6.7%	9.0%
% Female	51.6%	51.7%
Average Number of Children in Own Household	0.54	0.59
Average Number of Children Under 5 in Own Household	0.11	0.12

Notes to Table 1. Sample from the March CPS is restricted to individuals at or below 200 percent of the poverty threshold. Finger-imaging required restricts sample to time and state when finger-imaging was required for SNAP participation.

Table 2: Timing of the Finger-Imaging Requirement for SNAP Eligibility by State and County

State & County	Start	End
Arizona		
ALL	July-98	Still in effect
California		
ALL	August-00	January-12
Los Angeles	April-91	
Almeda	February-93	
Contra Costa	January-95	
San Francisco	January-95	
Orange	January-96	
San Diego	January-96	
San Bernadino	January-96	
New York		
ALL	January-96	May-07
New York City		January-12
Texas		
ALL	August-99	August-11
Bexar	October-96	
Guadalupe	October-96	

Table 3: OLS Estimates of SNAP Participation

	Below 200% of the Poverty Line				Below 130% of the Poverty Line			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging requirement	-0.013*	-0.016*	0.0020	0.01*	-0.015*	-0.018*	0.0030	0.0031
	(0.0014)	(0.0022)	(0.0046)	(0.0025)	(0.0020)	(0.0034)	(0.0059)	(0.0035)
Income as percentage of the poverty line	-0.002*	-0.002*	-0.003*	-0.002*	-0.001*	-0.001*	-0.002*	-0.002*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Education	-0.002*	-0.002*	-0.002*	-0.001*	-0.002*	-0.003*	-0.002*	-0.001*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Black (non-Hispanic)	0.129*				0.151*			
	(0.0016)				(0.0023)			
White (non-Hispanic)	-0.018*				-0.021*			
	(0.0015)				(0.0022)			
Hispanic	0.015*				0.012*			
	(0.0016)				(0.0023)			
Age	0.002*	0.004*	0.002*	-0.003*	0.003*	0.006*	0.002*	-0.003*
	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0002)
Age^2	0*	0*	0*	0*	0*	0*	0*	0*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female	0.032*	0.024*	0.06*	0.03*	0.05*	0.041*	0.081*	0.044*
	(0.0007)	(0.0009)	(0.0019)	(0.0014)	(0.0010)	(0.0015)	(0.0024)	(0.0019)
Adj R-squared	0.1665	0.1339	0.1863	0.1441	0.1214	0.1045	0.1219	0.0973
N	1403599	705084	229258	363783	822434	371224	156230	230149

TABLE 3. Notes to Table 3. Standard errors are in parenthesis. Data are from the March CPS, and include individuals from the years 1991-2014. Each regression includes year and state fixed effects.

***Significant at *p* <0.01**

****Significant at *p* <0.05**

*****Significant at *p* <0.1**

Table 4: OLS Estimates of SNAP Participation for Adults (age≥18)

	Below 200% of the Poverty Line				Below 130% of the Poverty Line			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging requirement	-0.008* (0.0017)	-0.01* (0.0024)	0.0069 (0.0057)	0.012* (0.0032)	-0.009* (0.0025)	-0.009** (0.0039)	0.0097 (0.0075)	0.0058 (0.0045)
Income as percentage of the poverty line	-0.002* (0.0000)	-0.001* (0.0000)	-0.002* (0.0000)	-0.002* (0.0000)	-0.001* (0.0000)	0* (0.0000)	-0.001* (0.0000)	-0.001* (0.0000)
Education	-0.002* (0.0000)	-0.002* (0.0000)	-0.003* (0.0001)	0* (0.0000)	-0.002* (0.0000)	-0.003* (0.0000)	-0.003* (0.0001)	0* (0.0000)
Black (non-Hispanic)	0.126* (0.0020)				0.151* (0.0029)			
White (non-Hispanic)	-0.0018 (0.0018)				0.0000 (0.0026)			
Hispanic	0.006* (0.0019)				0.0013 (0.0029)			
Age	0.001* (0.0001)	0.003* (0.0001)	-0.001* (0.0004)	-0.005* (0.0003)	0.002* (0.0002)	0.007* (0.0002)	-0.0002 (0.0005)	-0.007* (0.0004)
Age^2	0.000* (0.0000)	0.000* (0.0000)	0.000* (0.0000)	0.000* (0.0000)	0.000* (0.0000)	0.000* (0.0000)	0.000* (0.0000)	0.000* (0.0000)
Female	0.04* (0.0008)	0.03* (0.0010)	0.076* (0.0025)	0.04* (0.0018)	0.06* (0.0013)	0.046* (0.0017)	0.101* (0.0033)	0.058* (0.0026)
Number of own children in household	0.041* (0.0003)	0.04* (0.0005)	0.048* (0.0010)	0.038* (0.0007)	0.058* (0.0005)	0.064* (0.0008)	0.059* (0.0012)	0.054* (0.0009)
Adj R-squared	0.1401	0.1241	0.1571	0.1189	0.1196	0.1176	0.1222	0.0951
N	896809	481959	139713	209193	503148	248208	90418	125074

TABLE 4. Notes to Table 4. Standard errors are in parenthesis. Data are from the March CPS, and include individuals from the years 1991-2014. Each regression includes year and state fixed effects.

***Significant at *p* <0.01**

****Significant at *p* <0.05**

*****Significant at *p* <0.1**

Table 5: OLS Estimates of SNAP Participation for Children (age≤18)

	Below 200% of the Poverty Line				Below 130% of the Poverty Line			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging requirement	-0.015*	-0.024*	-0.0020	0.011*	-0.016*	-0.029*	-0.0069	0.0068
	(0.0025)	(0.0045)	(0.0077)	(0.0040)	(0.0034)	(0.0070)	(0.0094)	(0.0053)
Income as percentage of the poverty line	-0.003*	-0.003*	-0.003*	-0.003*	-0.002*	-0.002*	-0.003*	-0.003*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Black (non-Hispanic)	0.084*				0.092*			
	(0.0029)				(0.0040)			
White (non-Hispanic)	-0.039*				-0.046*			
	(0.0027)				(0.0038)			
Hispanic	-0.042*				-0.052*			
	(0.0028)				(0.0039)			
Age	0.004*	0.004*	0.005*	0.004*	0.007*	0.009*	0.008*	0.007*
	(0.0004)	(0.0006)	(0.0011)	(0.0008)	(0.0006)	(0.0010)	(0.0013)	(0.0010)
Age^2	0*	0*	0*	0*	0*	0*	0*	0*
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Female	0.0016	-0.0029	0.005***	0.005**	0.0025	-0.005***	0.007***	0.007**
	(0.0012)	(0.0018)	(0.0031)	(0.0022)	(0.0017)	(0.0029)	(0.0037)	(0.0030)
Mother's Age	-0.006*	-0.006*	-0.006*	-0.003*	-0.006*	-0.007*	-0.006*	-0.003*
	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0003)	(0.0002)
Mother's Education	-0.002*	-0.003*	-0.003*	0*	-0.002*	-0.004*	-0.003*	0*
	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Single Mother?	0.117*	0.094*	0.098*	0.142*	0.147*	0.121*	0.124*	0.163*
	(0.0014)	(0.0020)	(0.0034)	(0.0027)	(0.0019)	(0.0030)	(0.0042)	(0.0034)
Adj R-squared	0.2418	0.2134	0.261	0.2097	0.1405	0.1115	0.141	0.1412
N	458014	202614	78387	142503	282960	282960	57210	95909

TABLE 5. Notes to Table 5. Standard errors are in parenthesis. Data are from the March CPS, and include individuals from the years 1991-2014. Each regression includes year and state fixed effects.

***Significant at *p*<0.01**

****Significant at *p*<0.05**

*****Significant at *p*<0.1**

Table 6: OLS Estimates of SNAP participation for Children (age≤18) with a Single Mother

	Below 200% of the Poverty Line				Below 130% of the Poverty Line			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging requirement	-0.013*	-0.026*	-0.0009	0.03*	-0.015*	-0.022**	-0.0075	0.027*
	(0.0045)	(0.0085)	(0.0096)	(0.0077)	(0.0053)	(0.0109)	(0.0108)	(0.0087)
Income as percentage of the poverty line	-0.003*	-0.003*	-0.004*	-0.003*	-0.002*	-0.002*	-0.003*	-0.002*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Black (non-Hispanic)	0.078*				0.084*			
	(0.0051)				(0.0061)			
White (non-Hispanic)	-0.064*				-0.074*			
	(0.0050)				(0.0060)			
Hispanic	-0.021*				-0.025*			
	(0.0053)				(0.0063)			
Age	0.008*	0.006*	0.007*	0.012*	0.011*	0.01*	0.011*	0.015*
	(0.0008)	(0.0013)	(0.0014)	(0.0016)	(0.0009)	(0.0016)	(0.0015)	(0.0018)
Age^2	0*	0*	0*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*
	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Female	-0.0021	-0.009**	0.0018	-0.0012	-0.0028	-0.012*	0.0026	-0.0033
	(0.0021)	(0.0034)	(0.0038)	(0.0043)	(0.0025)	(0.0044)	(0.0043)	(0.0049)
Mother's Age	-0.005*	-0.004*	-0.006*	-0.004*	-0.006*	-0.004*	-0.007*	-0.004*
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0002)	(0.0003)	(0.0003)	(0.0004)
Mother's Education	-0.002*	-0.004*	-0.002*	-0.001*	-0.002*	-0.004*	-0.003*	-0.001*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Adj R-squared	0.2139	0.1955	0.2322	0.1743	0.107	0.0957	0.1137	0.0938
N	174440	67563	50493	44344	133405	47370	40723	36197

TABLE 6. Notes to Table 6. Standard errors are in parenthesis. Data are from the March CPS, and include individuals from the years 1991-2014. Each regression includes year and state fixed effects.

***Significant at *p* <0.01**

****Significant at *p* <0.05**

*****Significant at *p* <0.1**

Table 7: OLS Estimates of SNAP Participation for Single Mothers

	Ages 18-25				Ages 26-40			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging Requirement	-0.049*	-0.0317	-0.0406	-0.0090	-0.027*	-0.0222	-0.0248	0.0213
	(0.0168)	(0.0298)	(0.0350)	(0.0298)	(0.0085)	(0.0147)	(0.0184)	(0.0154)
Income as percentage of the poverty line	-0.003*	-0.002*	-0.003*	-0.002*	-0.003*	-0.003*	-0.004*	-0.003*
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Education	-0.003*	-0.004*	-0.004*	-0.0004	-0.002*	-0.003*	-0.003*	-0.001*
	(0.0003)	(0.0004)	(0.0005)	(0.0005)	(0.0001)	(0.0002)	(0.0003)	(0.0002)
Black (non-Hispanic)	0.149*				0.122*			
	(0.0210)				(0.0108)			
White (non-Hispanic)	-0.0221				-0.0036			
	(0.0206)				(0.0105)			
Hispanic	-0.0249				0.0128			
	(0.0222)				(0.0112)			
Age	0.124*	0.0391	0.23*	0.173***	0.0074	0.0085	-0.0123	0.032***
	(0.0436)	(0.0671)	(0.0775)	(0.0973)	(0.0081)	(0.0120)	(0.0152)	(0.0172)
Age^2	-0.003*	-0.0006	-0.005*	-0.0036	0***	-0.0002	0.0001	-0.001**
	(0.0010)	(0.0015)	(0.0017)	(0.0022)	(0.0001)	(0.0002)	(0.0002)	(0.0003)
Adj R-squared	0.151	0.131	0.1503	0.1382	0.2049	0.187	0.2389	0.1676
N	14668	6541	4314	3060	51108	23051	13727	11652

TABLE 7. Notes to Table 7. Standard errors are in parenthesis. Data are from the March CPS, and include individuals from the years 1991-2014. Each regression includes year and state fixed effects. Sample is restricted to single mothers with gross household income at or below 200% of the poverty threshold.

***Significant at $p<0.01$**

****Significant at $p<0.05$**

*****Significant at $p<0.1$**

Table 8: OLS Estimates of Food Insecurity

	All Incomes				Below 185% of the Poverty Line			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging requirement	-0.0008 (0.0019)	0.0011 (0.0020)	0.0027 (0.0085)	-0.0015 (0.0064)	-0.0025 (0.0050)	0.0091 (0.0068)	0.0163 (0.0165)	-0.017*** (0.0104)
Family Income	-0.001* (0.0000)	-0.001* (0.0000)	-0.001* (0.0000)	-0.001* (0.0000)	-0.023* (0.0003)	-0.024* (0.0004)	-0.024* (0.0009)	-0.024* (0.0008)
Education	-0.002* (0.0000)	-0.002* (0.0000)	-0.003* (0.0001)	-0.002* (0.0000)	-0.002* (0.0000)	-0.002* (0.0000)	-0.002* (0.0001)	-0.001* (0.0001)
Black (non-Hispanic)	0.087* (0.0016)				0.09* (0.0040)			
White (non-Hispanic)	-0.018* (0.0013)				0.008** (0.0036)			
Hispanic	0.048* (0.0016)				0.036* (0.0039)			
Age	0.0000 (0.0001)	0* (0.0001)	0.0007 (0.0004)	-0.002* (0.0005)	0.008* (0.0003)	0.01* (0.0003)	0.006* (0.0008)	0.004* (0.0007)
Age^2	0* (0.0000)	0* (0.0000)	0* (0.0000)	0** (0.0000)	0* (0.0000)	0* (0.0000)	0* (0.0000)	0* (0.0000)
Female	0.014* (0.0003)	0.01* (0.0003)	0.021* (0.0012)	0.021* (0.0011)	0.021* (0.0007)	0.025* (0.0010)	0.019* (0.0021)	0.02* (0.0017)
Number of own children in household	0.014* (0.0003)	0.01* (0.0003)	0.021* (0.0012)	0.021* (0.0011)	0.021* (0.0007)	0.025* (0.0010)	0.019* (0.0021)	0.02* (0.0017)
Adj R-squared	0.0787	0.0483	0.0634	0.0592	0.0806	0.0854	0.0585	0.0602
N	982560	743052	84821	93167	268437	167186	35659	46960

TABLE 8. Notes to Table 8. Standard errors are in parenthesis. Data are from the December CPS Food Security Supplement, and include individuals from the years 1998-2010. Each regression includes year and state fixed effects. Food Insecurity is a dummy variable with 1 defined as an individual having low or very-low food security.

***Significant at *p* <0.01**

****Significant at *p* <0.05**

*****Significant at *p* <0.1**

Table 9: OLS Estimates of Food Insecurity for Mothers

	All Incomes				Below 185% of Poverty Line			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging requirement	-0.0060	0.0098	-0.0064	-0.0186	-0.0076	0.049**	-0.0524	-0.0213
	(0.0051)	(0.0061)	(0.0207)	(0.0137)	(0.0117)	(0.0194)	(0.0342)	(0.0202)
Family Income	-0.001*	-0.001*	-0.001*	-0.001*	-0.026*	-0.028*	-0.023*	-0.027*
	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0008)	(0.0011)	(0.0020)	(0.0016)
Education	-0.002*	-0.002*	-0.003*	-0.002*	-0.001*	-0.002*	-0.001*	-0.001*
	(0.0000)	(0.0000)	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0004)	(0.0002)
Age	-0.002*	-0.004*	0.004***	-0.0018	0.007*	0.007*	0.012*	0.006**
	(0.0007)	(0.0007)	(0.0023)	(0.0019)	(0.0014)	(0.0020)	(0.0036)	(0.0029)
Age^2	0.0000	0***	0**	0.0000	0*	0*	0**	0***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
White (non-Hispanic)	-0.018*				0.024*			
	(0.0035)				(0.0090)			
Black (non-Hispanic)	0.06*				0.048*			
	(0.0042)				(0.0099)			
Hispanic	0.039*				0.032*			
	(0.0040)				(0.0094)			
Single Mom?	0.144*	0.151*	0.143*	0.113*	0.061*	0.079*	0.041*	0.027*
	(0.0020)	(0.0022)	(0.0071)	(0.0062)	(0.0046)	(0.0061)	(0.0128)	(0.0097)
Number of own children in household	0.025*	0.02*	0.029*	0.03*	0.023*	0.025*	0.018*	0.025*
	(0.0009)	(0.0010)	(0.0033)	(0.0028)	(0.0020)	(0.0028)	(0.0049)	(0.0040)
Number of own children under 5 in household	-0.0025	-0.005*	-0.0012	0.0024	-0.017*	-0.025*	-0.0106	-0.0044
	(0.0015)	(0.0016)	(0.0060)	(0.0048)	(0.0033)	(0.0044)	(0.0087)	(0.0068)
Adj R-squared	0.12	0.1014	0.0887	0.0765	0.0698	0.0739	0.0635	0.0671
N	170727	119159	16778	23026	53644	28556	8367	12919

TABLE 9. Notes to Table 9. Standard errors are in parenthesis. Data are from the December CPS Food Security Supplement, and include individuals from the years 1998-2010. Each regression includes year and state fixed effects. Food Insecurity is a dummy variable with 1 defined as an individual having low or very-low food security.

***Significant at p<0.01**

****Significant at p<0.05**

*****Significant at p<0.1**

Table 10: OLS Estimates of Food Insecurity for Children (age<18)

	All Incomes				Below 185% of Poverty Line			
	All	**White**	**Black**	**Hispanic**	**All**	**White**	**Black**	**Hispanic**
Finger-imaging Requirement	0.0006	0.015*	0.0168	-0.015***	0.0037	0.06*	0.0212	-0.025**
	(0.0032)	(0.0039)	(0.0129)	(0.0083)	(0.0070)	(0.0116)	(0.0206)	(0.0119)
Family Income	-0.001*	-0.001*	-0.001*	-0.001*	-0.024*	-0.025*	-0.023*	-0.026*
	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0004)	(0.0006)	(0.0011)	(0.0009)
Age	0.002*	0.002*	0.003*	0.0004	0.005*	0.007*	0.005*	0.002*
	(0.0002)	(0.0002)	(0.0006)	(0.0005)	(0.0003)	(0.0005)	(0.0009)	(0.0007)
Age^2	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
White (non-Hispanic)	-0.03*				0.0013			
	(0.0022)				(0.0051)			
Black (non-Hispanic)	0.065*				0.052*			
	(0.0026)				(0.0056)			
Hispanic	0.037*				0.025*			
	(0.0025)				(0.0053)			
Single Mom?	0.151*	0.163*	0.144*	0.126*	0.061*	0.084*	0.052*	0.034*
	(0.0015)	(0.0017)	(0.0045)	(0.0042)	(0.0029)	(0.0040)	(0.0074)	(0.0060)
Mother's Age	-0.003*	-0.003*	-0.001*	-0.002*	-0.001*	-0.002*	0.0004	0.001**
	(0.0001)	(0.0001)	(0.0003)	(0.0003)	(0.0002)	(0.0003)	(0.0005)	(0.0004)
Mother's Education	-0.002*	-0.002*	-0.003*	-0.002*	-0.001*	-0.002*	-0.001*	-0.001*
	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)
Adj R-squared	0.1176	0.0908	0.0936	0.0714	0.0725	0.076	0.0663	0.0664
N	403388	267153	43251	60777	143110	70553	23581	36813

TABLE 10. Notes to Table 10. Standard errors are in parenthesis. Data are from the December CPS Food Security Supplement, and include individuals from the years 1998-2010. Each regression includes year and state fixed effects. Food Insecurity is a dummy variable with 1 defined as an individual having low or very-low food security.

***Significant at *p* <0.01**

****Significant at *p* <0.05**

*****Significant at *p* <0.1**

Figure 1:Total Hispanic Population and Number of Naturalizations in US by year, 1990-2010

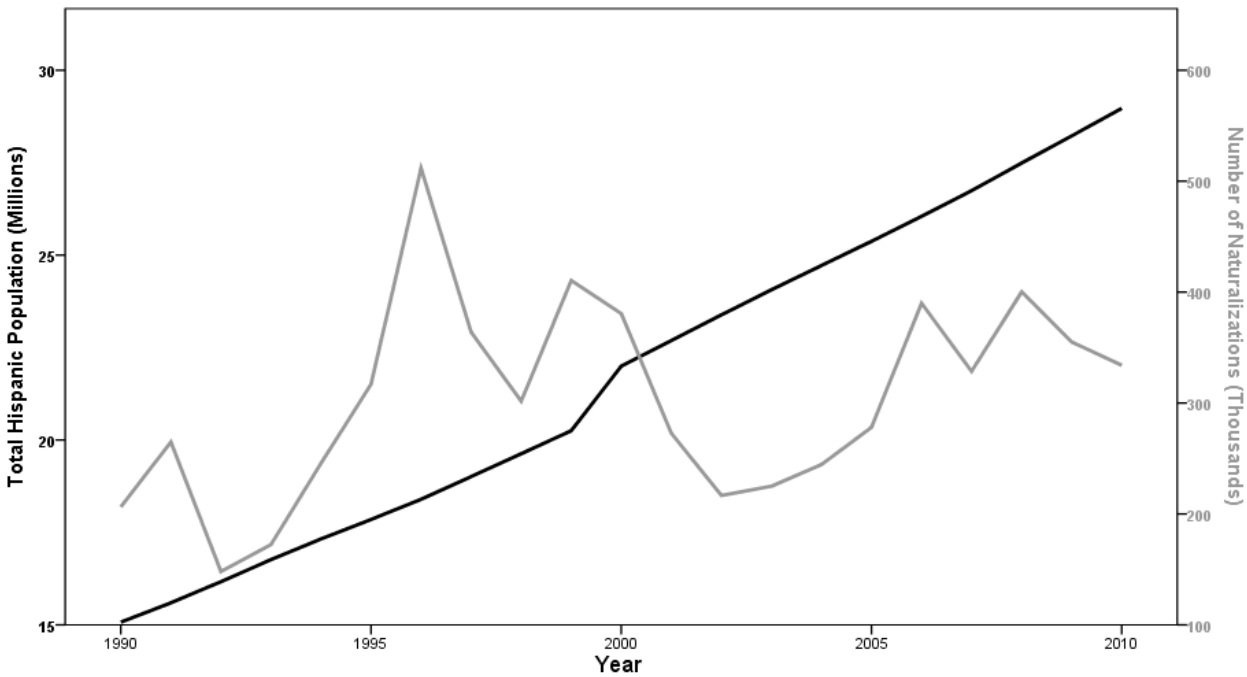

Figure 1. Notes to Figure 1. Data for Total Hispanic Population and Number of Naturalizations from the Pew Research Center.

Figure 2: Annual Change in Hispanic Population and Number of Naturalizations in US by year, 1991-2010

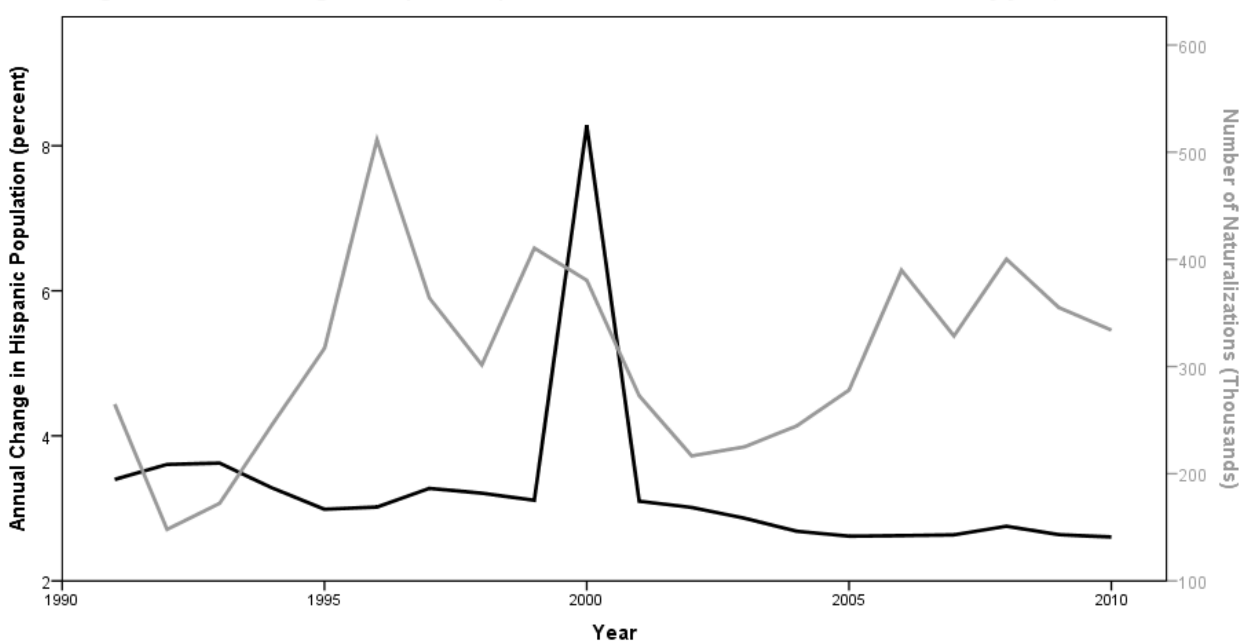

Figure 2. Notes to Figure 2. Data for Annual Change in Hispanic Population and Number of Naturalizations from the Pew Research Center