

Supplementary Information

Materials and Methods

Data

The study draws on two data sources from a public/private naturalization program in New York State. The first data source is the registration system. Immigrants interested in naturalization could register for the program on the web, by phone, or at a local Opportunity Center (OC) that contracted with the New York state government. The registration system was available in seven different languages, including English, Spanish, Chinese, Russian, Korean, Italian, and Haitian Creole. In order to register, immigrants had to be 18 years or older; reside in New York state; have a household income that falls at or below 300% of the Federal Poverty Guidelines; and be eligible for naturalization using an N-400 form. During the registration the participants provided information about their background characteristics and contact information as well as agreed to be contacted for follow-up surveys. The registration data provides information on household income, household size, age, gender, date of green card receipt, marital status, highest educational attainment, country of birth, and the language in which participants registered. The registration window was from July 13 to September 23, 2016. The vouchers and nudges were randomly assigned after the closing of the registration in the following week. Voucher winners were notified the week of October 3rd and the nudges were administered over the following months. Text SMS nudges occurred on November 15, 22, 29 and December 6; letters were mailed October 31; calls and emails to schedule appointments were made between December 2016 and February 2017.

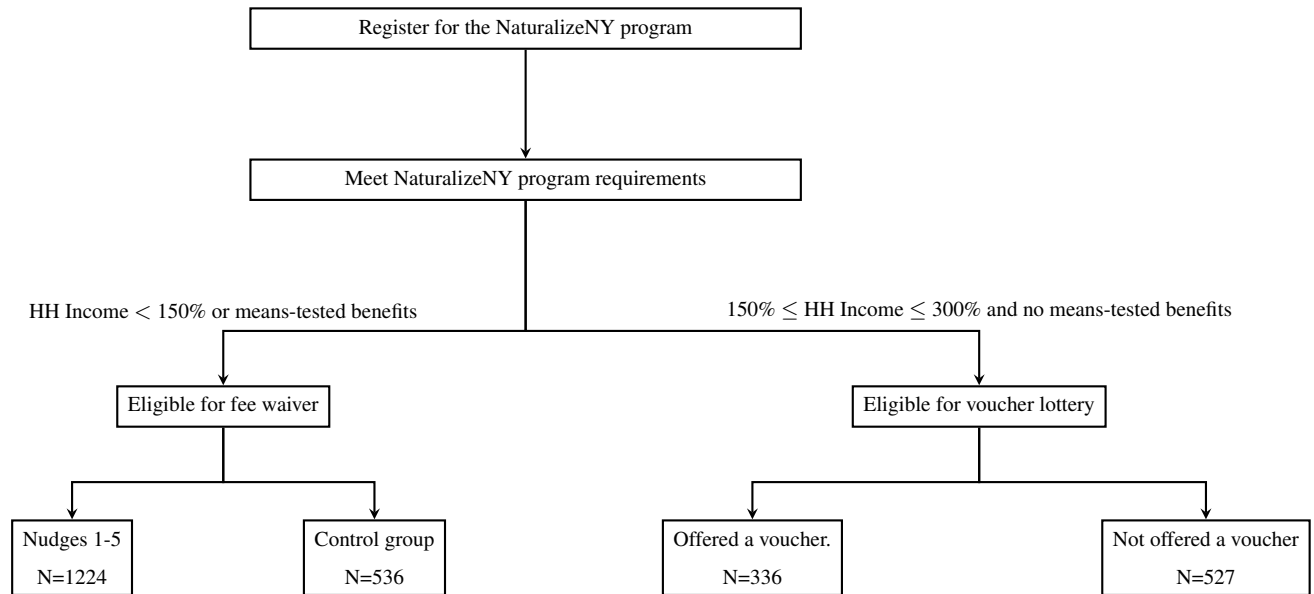
The key outcome of interest is whether participants submitted their application for naturalization. To measure this we draw on the second source of data, a follow-up survey that was administered during March-May 2017, about five to seven months after the treatment assignment. The check-in survey was conducted via SMS, email, and phone calls. The response rate for this survey was 79% (see below). Details for all measures used in the analysis are provided in a list below.

Experimental Design

A public/private naturalization program operating in New York State provided a unique opportunity to study the impact of different interventions to encourage naturalization. The program was organized by the New York State Office for New Americans (ONA) and aimed to promote naturalization among low-income, lawful permanent residents who are eligible to naturalize but may face barriers to doing so. The program provided information on the naturalization process as well as application assistance through ONA's state-wide network of OCs.

During the registration, two groups of eligible participants were identified.

Fig. S1: Study Design



- Participants who had a household income between 150% and 300% of the Federal Poverty Guidelines and did not receive means-tested benefits would face the cost of the naturalization application. These participants were entered into a lottery for a chance to receive a voucher that pays the fee for the naturalization application. We refer to this group as the voucher lottery group.
- Participants who had a household income below 150% of the Federal Poverty Guidelines or received means-tested benefits were informed by the registration system that they potentially qualify for a fee waiver from the federal government and encouraged to visit a local OC for free application assistance. We refer to this group as the fee waiver group.

During the first year of the NaturalizeNY program, two types of interventions were tested to better understand the barriers and facilitators of naturalization among the low-income immigrant population in New York. The interventions included a voucher to pay for the naturalization fee and behavioral nudges to increase naturalization rates. Figure S1 gives an overview of the study design.

Voucher Intervention

Immigrants in the voucher lottery group potentially face a financial hurdle to naturalization because they could not afford the \$680 application fee at the time. Participants in this group

were randomly assigned to one of two groups. Participants assigned to the treatment group received a voucher that paid for the \$680 application fee and were contacted by an OC in their area to schedule an appointment to process their application and voucher. The fee voucher was directly paid to the United States Citizenship and Immigration Services (USCIS) by the OC and could not be used for any other purpose than to pay the naturalization application fee. Participants assigned to the control group did not receive a fee voucher, but were still free to visit an OC to get free application assistance, and were informed of this during the registration. All participants were assigned to the closest OC based on their geo-coded street address provided during the registration.

For the random assignment of the voucher, the sample was restricted to 863 participants who lived in catchment areas of the 17 OCs, where there were more registrants than vouchers. These 17 OCs included all OCs in New York City as well as a few close-by areas. These 863 registrants were assigned to one of five randomization blocks based on the location of their closest OC. In each randomization block the vouchers were then assigned using complete randomization. We use inverse probability weights in the analysis to accommodate the fact that the treatment assignment probabilities vary by block.

Overall, of the 863 participants in the experiment, 282 participants initially won a voucher and were contacted by their OC. 56 of the participants initially assigned to the treatment group ended up not using the voucher because they could not be contacted, had already naturalized, turned out to be eligible for the fee waiver, or turned out to be ineligible for naturalization. Vouchers not used by the initial winners were then offered to 54 participants who were randomly drawn from those who had not won a voucher in the first lottery.⁶ Given that this second allocation was done randomly and only once, we can simply include those 54 participants in the treatment group. Alternatively, we can accommodate this initial non-compliance in the analysis stage using a standard local average treatment effect framework, and the results end up being virtually identical.

Nudge Intervention

Participants in the fee waiver group were told that they are potentially eligible for a federal fee waiver at the time they completed their registration, and they were also encouraged to contact OCs for assistance with their application at the end of the registration.⁷ Therefore, the application fee for naturalization is not a financial hurdle but they may face other hurdles. This

⁶Note that originally the protocol was to offer all 56 remaining vouchers but only 54 were offered because of application processing and budget constraints.

⁷All individuals received the following message if they were screened as likely eligible for the federal fee waiver: “Good news! Based on your responses it appears that you are likely eligible for a federal fee waiver to cover the cost of the naturalization application and therefore you do not need to participate in the fee voucher lottery. It appears you are likely eligible for the federal fee waiver because you receive means-tested benefits and/or your household income is below 150% of the Federal Poverty Guidelines. Please contact your local Office for New Americans Opportunity Center to find out how you can apply for the federal fee waiver and learn about the naturalization process.”

second experiment examines low-cost behavioral nudges that might encourage them to submit a naturalization application. Starting with 1,821 participants in this group, the sample was first restricted for the experiment to only include the 1,760 participants who were (1) living in New York City, (2) provided a cell phone number and email address, and (3) registered in English or Spanish. These restrictions were necessary due to resource constraints which made it impossible to administer the nudge calls in all languages. Note that this language restriction only affected a relatively small share of the participants in the nudge arm who registered in Korean ($N=9$), Russian ($N=17$), and Chinese ($N=82$). Participants in this restricted sample were then randomly assigned to one of six groups: five interventions from a menu of low-cost nudges that included letters, SMS messages, transportation vouchers (MetroCards), or phone calls to schedule in-person appointments with an immigrant service provider in New York City, or a control group that received no nudge. Nudges were administered after the program registration period ended.

The six nudge groups are described below:

1. A letter from the Office for New Americans reminding registrants of their potential fee waiver eligibility ($N = 399$; Figure S5 shows the letter).
2. A similar letter and a \$10 MetroCard to travel to an Opportunity Center ($N = 200$; see Figure S7).
3. A similar letter and four text SMS reminders ($N = 400$; see Figures S10 and S12).
4. A call from one of the OCs to schedule an appointment ($N = 200$).
5. A call from one of the OCs to schedule an appointment, with up to four appointment reminders from staff, email and letter contact attempts if phone failed, and a \$10 MetroCard conditional on attending appointment ($N = 25$).
6. A control group that received no nudge after program registration ($N = 536$).⁸

The randomization was a complete randomization without blocks.

Statistical Analysis

Because the study examines two distinct groups with separate randomizations and interventions, a separate analysis was performed on each study sample.

⁸Note that in the pre-analysis plan the numbers of observations for the letter, letter and SMS, and letter and MetroCard nudges were incorrectly reported as 400, 399, and 220, respectively.

Voucher Study

For the analysis of the fee voucher experiment we used the data from the voucher study sample and fitted the following regression:

$$y_i = \beta_0 + \beta_1 \text{VoucherOffered}_i + \delta X_i + \epsilon_i,$$

where y_i is the outcome of whether or not participant i reported having submitted the US citizenship application; VoucherOffered is a dummy variable for whether or not the participant was offered a voucher (either in the first lottery or the second randomization of the remaining vouchers); X is a vector of control variables; and ϵ is the error term. In this regression β_1 captures the intention-to-treat effect of offering the voucher. We present the estimates with and without covariates.

As an alternative specification we also use a standard local average treatment effect framework where we fit the following model:

$$y_i = \beta_0 + \beta_{1a} \text{VoucherOffered}_i + \delta X_i + \epsilon_i,$$

where the VoucherOffered is instrumented by a binary variable that is coded as 1 for participants who won a voucher in the initial lottery and 0 otherwise. Given that the second stage assignment of the remaining vouchers was conducted randomly, the effects of the voucher are similar regardless of whether we fit the simple OLS using the VoucherOffered treatment or fit the instrumental variable regression where VoucherOffered is instrumented by winning the initial lottery (i.e. β_1 and β_{1a} are similar). All regressions use robust standard errors and inverse probability weights to accommodate the fact that the treatment assignment probabilities varied by randomization block.

The covariate set includes age, gender, household income per person, years holding a green card, marital status (dummies for married and single), educational attainment (dummies for high school, some college, or BA or higher), language of registration (dummies for English and Spanish), country of origin (dummies for the three largest origins: Dominican Republic, Ecuador, and Colombia).

In order to deal with missing data we also replicate the analysis using multiple imputation.

Nudge Study

For the analysis for the nudge intervention in the fee waiver sample, we used a linear regression and estimated the following equation:

$$y_i = \beta_0 + \beta_1 \text{Nudge1}_i + \beta_2 \text{Nudge2}_i + \beta_3 \text{Nudge3}_i + \beta_4 \text{Nudge4}_i + \beta_5 \text{Nudge5}_i + \delta X_i + \epsilon_i,$$

where y_i is the outcome the outcome of whether or not participant i reported having submitted the US citizenship application; $\text{Nudge1} - \text{Nudge5}$ are dummy variables for whether or not the

participant was assigned a particular nudge (the reference category is the control group that received no nudge); X is the vector of control variables; and ϵ is the error term. β_1 to β_5 identify the intention-to-treat effects of the nudges; all regressions use robust standard errors.

In order to deal with missing data we also replicate the analysis using multiple imputation.

Measures

Below is a list of variables and measures used in the analysis.

- *Applied for Naturalization*: The question in the follow-up survey read “Did you submit your US citizenship application?” We coded responses as 1 if they answered “yes” and 0 if they answered “no”. A very small number of “unknown” responses were also coded as 0.
- *Educational attainment*: The registration system asked: “What is the highest degree or level of school that you have completed? Please select one option. If you are currently enrolled, please mark the previous grade or highest degree received.” There were nine answer options ranging from “No schooling completed” to “Graduate or professional degree or equivalent (for example: MA, MS, MBA, JD, MD, PhD)”. From these responses we created three binary variables that capture whether registrants have a highest educational attainment equal to *High School/GED degree*, *Some College*, or *BA degree or higher*.
- *Household Income per capita (1,000s)*: The variable was created using two questions from the registration systems: one for the participant’s household size and one for their household income. To determine a participant’s household size, the registration system asked:
“Next, we need to know how many family members who live in your home depend on your household’s income. Household members can include: a spouse, a dependent children under 21, dependent children between 21-24 if they are full time students and currently live in your household, or parents who rely on the household’s income and currently live in your household. Friends or other relatives are not considered household members for this program and should not be counted. Here are a few examples: Example 1: A woman living with her husband and two dependent children, ages 5 and 12, would report 4 household members. Example 2: A woman living with her dependent daughter, age 16, and her dependent retired father, age 75, would report 3 household members. Example 3: A man living with his son, age 37, and a friend would report 1 household member. (His son is not a dependent and friends are not considered household members.) Including you, how many family members who live in your home depend on your household’s income?”
To determine the household income, the registration system asked:
“Now, we need to know about your annual gross income (before taxes) for all household members you previously reported. Please include all sources of income such as wages,

earnings, child support, spousal support and unemployment benefits. If you filed or prepared a 2015 tax return, please report your household's gross annual income as stated on your return. On your 2015 return, please refer to: Line 4 if you filed a Form 1040EZ, Line 21 if you filed a Form 1040A, Line 37 if you filed Form 1040. If you did not prepare or file a 2015 tax return, please provide an estimate of your household's gross annual income based on current pay statements of all reported household members. Your information is confidential. Anyone winning the lottery will need to verify their household income in order to receive a naturalization fee voucher. What is the annual gross income (before taxes) for all household members you previously reported? Please enter whole numbers only and do not use any commas or decimals. For example, enter 25000 instead of 25,000 or 25.000."

The household income was divided by the reported household size and 1000 to create the variable used in the analysis.

- *Years on Green Card*: The registration system asked: "What is the 'Resident Since' date stated on your green card?" Participants were asked to enter the month, day, and year that appeared on their green card. The variable was constructed by subtracting the year entered by the participant from 2017.
- *Age*: The registration system asked: "What is your date of birth? Please report your date of birth as stated on your green card." Participants were asked to enter the day, month, and year that appeared on their green card. We constructed the variable by subtracting the birth year entered by the participant from 2016. Three outliers were top-coded at 88 years old.
- *Gender*: The registration system asked: "What is your gender?" The options were "Female" or "Male." We coded males as 0 and females as 1.
- *Country of Origin*: The registration system asked: "What country were you born in?" There were eight stated countries (Mexico, Dominican Republic, China, Guyana, Haiti, Korea, Ukraine, and Russia) and an option for Other that allowed a participant to type in any country that was not listed. We created three binary variables for the countries listed most frequently by the participants (*Dominican Republic*, *Ecuador*, and *Colombia*), with a 1 indicating that a participant listed that country as their country of origin and a 0 if they did not list that country as their country of origin.
- *Marital Status*: The registration system asked: "What is your marital status?" The options were: "Single," "Single, Living with Partner," "Married," "Separated," "Divorced," "Widowed," or "Marriage Annulled." We created a binary variable for *Married*, if a participant selected "Married" from the options and a binary variable for *Single* if a participant selected "Single" from the options.

- *Language*: The registration system allowed the participant to complete the required questions using seven possible languages: English, Spanish, Russian, Chinese, Korean, Haitian-Creole, and Italian. We created binary variables for two most common languages utilized during registration (*English* and *Spanish*).

Descriptive Statistics

Tables S1 and S2 display descriptive statistics for the voucher group and fee waiver group, respectively. Table S3 provides a more detailed breakdown of the origins of the registrants in both samples by listing the shares of the 15 largest origin groups.

Additional Results and Diagnostics

Balance Checks

Tables S4, S5, and S6 present covariate balance checks for the fee vouchers and the nudges. For the voucher group, in Table S4 we regress the treatment assignment on the full set of covariates, and the results suggest that when using an omnibus F-test we cannot reject the null that the coefficients on the covariates are jointly insignificant. This holds regardless of whether we define as treated only those participants who won the initial lottery (Models 1 and 2) or also those participants who won the voucher in the second lottery of the remaining vouchers (Models 3 and 4). Also, the results hold regardless of whether we look at the the full samples (Models 1 and 3) or only the samples of participants who responded to the survey (Models 2 and 4).

To examine balance in the nudge study we regress the treatment assignments on the covariates using a multinomial logit regression. When using an omnibus Chi-Square test we cannot reject the null that the regression coefficients on the covariates are jointly equal to zero. This holds regardless of whether we use the full sample (S5) or the sample of participants that responded to the survey (S6).

These balance checks support successful randomizations in both samples.

Response Rates Checks

Here we consider whether receiving the interventions affected the probability that someone would respond to the survey. For the voucher study sample in Table S7 in Models 1 and 2 we regress whether a participant responded to the survey on the indicator for whether participants won in the lotteries and were thus offered the voucher as well as the interactions of that treatment indicator and the covariates. In Models 3 and 4 we use instrumental variable regressions where the indicator for whether participants were offered the voucher is instrumented by an indicator for whether they won the initial lottery, and we also add the instrumented interactions. When using F-tests and Chi-Square tests we cannot reject the null that the coefficients on the treatment and the interactions of the covariates with the treatment are jointly insignificant.

For the fee voucher sample, in Table S8 we regress whether a participant responded to the survey on the nudge group assignment indicators. F-tests suggest that we cannot reject the null that the coefficients on the treatments are jointly insignificant.

Overall these checks suggest that there is no evidence for differential attrition.

Effect Estimates

The intention-to-treat effects for the voucher study are displayed in Table S9. In Model 1 we regress the applied for naturalization outcome on the treatment indicator for whether a participant was offered a voucher or not. Model 2 adds the full set of covariates. In Model 3 we instrument the treatment indicator for whether a participant was offered a voucher or not with a variable that is coded as 1 for participants who won a voucher in the initial lottery and 0 otherwise. Model 3 adds the full set of covariates. The results are very similar across all specifications, indicating that offering the voucher increases the rate of submitting the naturalization application by about 41 percentage points. Table S11 shows the effect estimates we get when replicating the model for various subgroups of the voucher group. The effect sizes are roughly similar across subgroups.

Table S12 shows the effects of receiving a voucher broken down by whether or not a participant would have been eligible for a partial fee waiver beginning on December 23, 2016. At the end of 2016, new regulations went into effect that would allow an applicant for naturalization whose incomes falls between 150% and 200% of the Federal Poverty Guidelines to request a partial fee waiver, so that their application fee would be \$405. At the same time, the cost of applying increased from \$675 to \$705 for those whose incomes is above 200% of the Federal Poverty Guidelines. We find no significant difference in the baseline application rate or the effect of the voucher between these two groups.

The intention-to-treat effects for the nudge study are displayed in Table S10. In Model 1 we regress the applied for naturalization outcome on the treatment indicators for whether participants were assigned to the various nudge groups (the control group that received no additional nudge is the reference category). Model 2 adds the full set of covariates. Both models show that the nudges did not have a significant effect on whether those eligible for a fee waiver did or did not submit their naturalization applications. Tables S13 and S14 show the effect estimates we get when replicating the model for various subgroups of the voucher sample. There are no consistent differences across the subgroups. Note that for some subgroups the sample sizes get rather small, especially the mixed outreach group.

Multiple Imputation

Tables S15 and S16 and Figures S2 and S3 replicate the effect estimates using multiple imputation to address the missing response for the 163 participants in the voucher arm and the 396 participants in the fee waiver arm who did not reply to the follow-up survey. We use 10 multiple imputed datasets using chained equations with predictive mean matching based on five nearest

neighbors. The results are very similar to those without multiple imputation.

Tables for Supplementary Information

Table S1: Descriptive Statistics for Sample of Voucher Study (N=863)

	Mean	SD
Applied for Naturalization	0.53	0.50
Household Income Per Capita (1,000s)	19.18	6.85
Years on Green Card	13.21	9.42
Age	41.81	13.63
Female	0.55	0.50
Origin:		
Dominican Republic	0.28	0.45
Ecuador	0.10	0.30
Colombia	0.07	0.25
Marital Status:		
Married	0.45	0.50
Single	0.33	0.47
Highest Education:		
High School/GED degree	0.25	0.43
Some College	0.24	0.43
BA degree or higher	0.30	0.46
Language for Registration:		
English	0.63	0.48
Spanish	0.34	0.47
Treatment Received:		
Voucher Offered (Initial Lottery)	0.33	0.47
Voucher Offered	0.39	0.49

Note: Sample consists of legal permanent residents who registered for the naturalization program and have a household income between 150 and 300 percent of the Federal Poverty Guidelines and receive no means-tested benefits.

Table S2: Descriptive Statistics for Sample of Nudge Study (N=1,760)

	Mean	SD
Applied for Naturalization	0.40	0.49
Household Income Per Capita (1,000s)	7.53	5.79
Years on Green Card	13.53	9.73
Age	38.83	14.83
Female	0.65	0.48
Origin:		
Dominican Republic	0.41	0.49
Ecuador	0.09	0.29
Colombia	0.06	0.23
Marital Status:		
Married	0.36	0.48
Single	0.43	0.50
Highest Education:		
High School/GED degree	0.30	0.46
Some College	0.22	0.42
BA degree or higher	0.22	0.41
Language for Registration:		
English	0.59	0.49
Spanish	0.41	0.49
Treatment Received:		
Control	0.30	0.46
Letter	0.23	0.42
SMS and Letter	0.23	0.42
Metro Card and Letter	0.11	0.32
Calls and Appointment	0.11	0.32
Mixed-outreach Strategy	0.01	0.12

Note: Sample consists of legal permanent residents who registered for the naturalization program and are potentially eligible for the federal fee waiver since their household income is below 150 percent of the Federal Poverty Guidelines or they receive means-tested benefits.

Table S3: Descriptive Statistics for Origin Groups

	Voucher Study		Nudge Study	
	Mean	SD	Mean	SD
Origin:				
Dominican Republic	0.279	0.449	0.415	0.493
Ecuador	0.100	0.300	0.094	0.292
Colombia	0.068	0.253	0.057	0.232
Jamaica	0.052	0.222	0.032	0.177
China	0.043	0.203	0.042	0.201
Mexico	0.028	0.165	0.027	0.163
Guyana	0.024	0.154	0.025	0.156
Haiti	0.021	0.143	0.024	0.154
Honduras	0.020	0.139	0.024	0.154
Peru	0.032	0.177	0.018	0.134
Trinidad and Tobago	0.017	0.131	0.019	0.136
El Salvador	0.029	0.168	0.013	0.111
Panama	0.016	0.126	0.013	0.111
Guatemala	0.020	0.139	0.009	0.092
Russia	0.014	0.117	0.011	0.103
N	N=863		1,760	

Note: Sample consists of legal permanent residents who registered for the naturalization program.

Table S4: Balance Checks for Voucher Study

	Voucher Offer (Initial Lottery)		Voucher Offer (Both Lotteries)	
	(1)	(2)	(3)	(4)
HH Income P. Cap (1,000s)	0.001 (0.003)	0.002 (0.003)	0.000 (0.003)	0.001 (0.003)
Years on Green Card	-0.000 (0.002)	0.000 (0.003)	0.000 (0.002)	0.001 (0.002)
Age	0.003 (0.002)	0.003 (0.002)	0.003 (0.002)	0.002 (0.002)
Female	-0.041 (0.039)	-0.013 (0.043)	-0.035 (0.037)	-0.014 (0.041)
Dominican Republic	-0.044 (0.050)	-0.048 (0.056)	-0.081 (0.048)	-0.085 (0.054)
Ecuador	-0.077 (0.067)	-0.073 (0.081)	-0.021 (0.064)	-0.029 (0.077)
Colombia	-0.099 (0.078)	-0.122 (0.089)	-0.078 (0.076)	-0.077 (0.086)
Married	0.019 (0.051)	0.070 (0.057)	0.013 (0.049)	0.058 (0.055)
Single	0.075 (0.057)	0.086 (0.064)	0.067 (0.055)	0.072 (0.061)
High School/GED degree	-0.040 (0.058)	-0.036 (0.063)	-0.026 (0.055)	-0.034 (0.061)
Some College	-0.005 (0.060)	-0.010 (0.066)	-0.012 (0.057)	-0.013 (0.063)
BA degree or higher	0.051 (0.058)	0.017 (0.065)	0.056 (0.055)	0.027 (0.061)
English	-0.114 (0.103)	-0.110 (0.104)	-0.100 (0.096)	-0.099 (0.096)
Spanish	-0.094 (0.109)	-0.126 (0.112)	-0.098 (0.102)	-0.136 (0.105)
Constant	0.468 (0.158)	0.426 (0.167)	0.540 (0.148)	0.530 (0.157)
Observations	863	700	863	700
Adjusted R^2	0.002	0.000	0.003	0.002
F-value	1.004	0.932	1.068	1.020
P-value	0.447	0.523	0.383	0.431

Note: Regression coefficients shown with robust standard errors in parentheses. F-values and P-values in the bottom rows are from omnibus F tests against the null that all slope coefficients are jointly equal to zero. Models 1 and 3 refer to the samples of all participants; models 2 and 4 to the samples of participants who responded to the follow-up survey.

Table S5: Balance Checks for Nudge Study (All Participants)

	Treatment Groups:				
	Letter	Letter+SMS	Letter+Metro	Calls Appt	Multi Calls Appt
HH Income P. Cap (1,000s)	-0.016 (0.011)	-0.003 (0.012)	-0.003 (0.015)	-0.001 (0.015)	0.023 (0.032)
Years on Green Card	0.003 (0.009)	0.005 (0.008)	0.008 (0.009)	0.004 (0.010)	-0.006 (0.021)
Age	-0.005 (0.006)	-0.002 (0.006)	0.003 (0.007)	0.002 (0.007)	0.004 (0.014)
Female	0.035 (0.142)	-0.156 (0.139)	0.143 (0.180)	-0.101 (0.174)	0.316 (0.449)
Dominican Republic	0.077 (0.162)	0.161 (0.164)	0.043 (0.195)	0.001 (0.201)	-0.174 (0.567)
Ecuador	0.386 (0.249)	0.314 (0.250)	-0.167 (0.328)	0.115 (0.321)	-0.906 (1.126)
Colombia	-0.090 (0.313)	0.099 (0.303)	-0.562 (0.438)	0.345 (0.337)	-0.677 (1.185)
Married	-0.078 (0.188)	-0.117 (0.191)	-0.072 (0.230)	0.102 (0.235)	-0.019 (0.523)
Single	-0.267 (0.195)	-0.143 (0.194)	-0.268 (0.244)	-0.212 (0.251)	-0.498 (0.592)
High School/GED degree	0.036 (0.186)	0.196 (0.187)	0.151 (0.233)	0.021 (0.229)	0.415 (0.508)
Some College	-0.039 (0.196)	-0.055 (0.206)	0.124 (0.253)	-0.088 (0.253)	-0.298 (0.687)
BA degree or higher	0.239 (0.210)	0.462 (0.208)	0.167 (0.268)	0.341 (0.257)	0.068 (0.567)
English	-0.023 (0.158)	-0.154 (0.161)	0.045 (0.198)	-0.061 (0.196)	0.045 (0.605)
Constant	0.005 (0.388)	-0.230 (0.383)	-1.254 (0.486)	-1.066 (0.451)	-3.305 (1.169)
Observations	1759				
Pseudo R^2	0.007				
Chi-Square	40.45				
P-value	0.993				

Note: Multinomial logit regression coefficients shown with robust standard errors in parentheses. The reference category is participants in the control group that received no additional nudge. Chi-Square and P-value in the bottom rows are from an omnibus Chi-Square test against the null that all slope coefficients are jointly equal to zero. This model is based on the sample of all participants.

Table S6: Balance Checks for Nudge Study (Responders to follow-up survey)

	Treatment Groups:				
	Letter	Letter+SMS	Letter+Metro	Calls Appt	Multi Calls Appt
HH Income P. Cap (1,000s)	-0.011 (0.013)	-0.004 (0.014)	-0.012 (0.018)	0.002 (0.017)	0.006 (0.044)
Years on Green Card	-0.004 (0.010)	0.002 (0.010)	0.008 (0.011)	0.000 (0.011)	-0.004 (0.020)
Age	-0.007 (0.007)	-0.002 (0.007)	-0.003 (0.009)	0.001 (0.007)	0.005 (0.019)
Female	0.114 (0.162)	-0.153 (0.161)	0.075 (0.201)	-0.109 (0.196)	0.161 (0.521)
Dominican Republic	-0.052 (0.183)	0.118 (0.187)	0.024 (0.220)	0.125 (0.230)	0.478 (0.700)
Ecuador	0.430 (0.286)	0.493 (0.289)	0.093 (0.357)	0.401 (0.365)	-0.039 (1.216)
Colombia	-0.152 (0.343)	0.079 (0.342)	-0.941 (0.556)	0.560 (0.368)	0.060 (1.305)
Married	-0.028 (0.209)	-0.234 (0.217)	-0.074 (0.258)	0.234 (0.270)	-0.560 (0.585)
Single	-0.407 (0.217)	-0.279 (0.218)	-0.364 (0.273)	-0.088 (0.292)	-0.998 (0.652)
High School/GED degree	-0.071 (0.211)	0.356 (0.220)	0.172 (0.277)	-0.043 (0.263)	-0.211 (0.600)
Some College	-0.075 (0.219)	-0.032 (0.245)	0.320 (0.289)	-0.110 (0.286)	-0.944 (0.908)
BA degree or higher	0.111 (0.237)	0.693 (0.242)	0.388 (0.306)	0.265 (0.297)	0.012 (0.592)
English	-0.015 (0.181)	-0.234 (0.185)	-0.050 (0.230)	0.025 (0.225)	0.142 (0.695)
Constant	0.216 (0.427)	-0.220 (0.435)	-0.931 (0.570)	-1.216 (0.514)	-3.017 (1.429)
Observations	1363				
Pseudo R^2	0.012				
Chi-Square	57.74				
P-value	0.727				

Note: Multinomial logit regression coefficients shown with robust standard errors in parentheses. The reference category are participants in the control group that received no additional nudge. Chi-Square and P-value in the bottom rows are from an omnibus Chi-Square test against the null that all slope coefficients are jointly equal to zero. This model is based on the samples of all participants who responded to the follow-up survey.

Table S7: Survey Response Checks for Voucher Group

	Responded to Survey			
	(1)	(2)	(3)	(4)
Voucher Offered	0.040 (0.027)	0.014 (0.212)	0.044 (0.031)	-0.156 (0.237)
HH Income P. Cap (1,000s)		-0.003 (0.003)		-0.005 (0.003)
Years on Green Card		-0.001 (0.002)		-0.001 (0.002)
Age		0.000 (0.002)		-0.000 (0.002)
Female		0.044 (0.036)		0.027 (0.039)
Dominican Republic		-0.056 (0.045)		-0.057 (0.048)
Ecuador		-0.154 (0.072)		-0.184 (0.090)
Colombia		-0.071 (0.079)		-0.022 (0.081)
Married		-0.094 (0.046)		-0.105 (0.051)
Single		-0.015 (0.048)		-0.016 (0.053)
High School/GED degree		0.036 (0.053)		0.010 (0.060)
Some College		0.017 (0.058)		0.013 (0.059)
BA degree or higher		0.053 (0.057)		0.063 (0.061)
English		-0.025 (0.115)		-0.062 (0.116)
Spanish		0.054 (0.122)		0.024 (0.123)
Voucher × HH Income P. Cap (1,000s)		0.005 (0.004)		0.009 (0.005)
Voucher × Years on Green Card		0.000 (0.003)		0.001 (0.004)
Voucher × Age		-0.002 (0.002)		-0.001 (0.003)
Voucher × Female		0.049 (0.055)		0.078 (0.061)
Voucher × Dominican Republic		-0.020 (0.073)		-0.017 (0.080)
Voucher × Ecuador		-0.018 (0.115)		0.036 (0.151)
Voucher × Colombia		-0.012 (0.126)		-0.104 (0.149)
Voucher × Married		0.140 (0.076)		0.157 (0.088)
Voucher × Single		0.003 (0.086)		0.007 (0.100)
Voucher × High School/GED degree		-0.040 (0.084)		0.008 (0.096)
Voucher × Some College		-0.029 (0.087)		-0.019 (0.094)
Voucher × BA degree or higher		-0.087 (0.083)		-0.100 (0.094)
Voucher × English		-0.007 (0.127)		0.043 (0.136)
Voucher × Spanish		-0.153 (0.143)		-0.112 (0.153)
Constant	0.802 (0.018)	0.893 (0.156)	0.800 (0.019)	1.005 (0.163)
Covariates	No	Yes	No	Yes
Observations	863	863	863	863
Adjusted R ²	0.002	0.023	0.002	0.019
F-value	2.206	1.240		
Chi-Square			2.039	19.020
P-value	0.138	0.235	0.153	0.213

Note: Regression coefficients shown with robust standard errors in parentheses. Models 1 and 2 regress whether a participant responded to the survey on the indicator for whether participants won in the lotteries and were thus offered the voucher plus all interactions of this indicator with the covariates. Models 3 and 4 are instrumental variable regressions where the indicator for whether participants were offered the voucher is instrumented by an indicator for whether they won the initial lottery. For Model 4 the interactions between the covariates and the treatment are also instrumented by the interactions between the winning in the initial lottery and the covariates. The F-test for Model 3 tests the null that the coefficients on the treatment and the coefficients on the interactions of the covariates with the treatment are jointly equal to zero. The Chi-Square test for Model 4 is also a joint significance test against the null that the coefficients on the treatment and the interactions of the covariates with the treatment are jointly equal to zero.

Table S8: Survey Response Checks for Fee Waiver Group

	Responded to Survey	
	(1)	(2)
Letter	-0.006 (0.027)	-0.011 (0.027)
SMS and Letter	-0.050 (0.028)	-0.056 (0.028)
Metro Card and Letter	-0.008 (0.034)	-0.008 (0.034)
Calls and Appointment	-0.023 (0.035)	-0.027 (0.035)
Mixed-outreach Strategy	-0.113 (0.095)	-0.114 (0.096)
HH Income P. Cap (1,000s)		0.001 (0.002)
Years on Green Card		-0.001 (0.001)
Age		-0.001 (0.001)
Female		0.013 (0.021)
Dominican Republic		-0.007 (0.024)
Ecuador		0.027 (0.037)
Colombia		0.031 (0.043)
Married		-0.030 (0.027)
Single		-0.065 (0.028)
High School/GED degree		0.032 (0.029)
Some College		0.073 (0.030)
BA degree or higher		0.085 (0.032)
English		-0.056 (0.024)
Constant	0.793 (0.018)	0.873 (0.058)
Covariates	No	Yes
Observations	1760	1759
Adjusted R ²	0.000	0.009
F-value	0.949	1.077
P-value	0.448	0.371

Note: Regression coefficients shown with robust standard errors in parentheses. Model 1 regresses whether a participant responded to the survey on the nudge group assignment indicators (the control group that received no additional nudge is the reference category). Model 2 adds covariates. The F-test is against the null that the regression coefficients on the nudge group assignment indicators are jointly equal to null.

Table S9: Intention-to-treat Effect Estimates for Voucher Study

	Applied for Naturalization			
	(1)	(2)	(3)	(4)
Voucher Offered	0.417 (0.036)	0.411 (0.036)	0.413 (0.041)	0.410 (0.040)
HH Income P. Cap (1,000s)		-0.003 (0.003)		-0.003 (0.003)
Years on Green Card		-0.004 (0.002)		-0.004 (0.002)
Age		0.000 (0.002)		0.000 (0.002)
Female		-0.039 (0.037)		-0.039 (0.036)
Dominican Republic		0.086 (0.048)		0.086 (0.047)
Ecuador		0.089 (0.072)		0.089 (0.071)
Colombia		0.025 (0.075)		0.025 (0.074)
Married		-0.054 (0.049)		-0.054 (0.049)
Single		-0.042 (0.055)		-0.042 (0.054)
High School/GED degree		0.027 (0.058)		0.027 (0.058)
Some College		0.042 (0.061)		0.042 (0.060)
BA degree or higher		0.067 (0.058)		0.067 (0.058)
English		-0.026 (0.106)		-0.026 (0.104)
Spanish		-0.234 (0.114)		-0.234 (0.112)
Constant	0.361 (0.024)	0.549 (0.162)	0.363 (0.026)	0.549 (0.159)
Covariates	No	Yes	No	Yes
Observations	700	700	700	700

Note: Regression coefficients shown with robust standard errors in parentheses. Models 1 and 2 regress the outcome on the indicator for whether participants won in the lotteries and were thus offered the voucher. Models 3 and 4 are instrumental variable regressions where the indicator for whether participants were offered the voucher is instrumented by an indicator for whether they won the initial lottery.

Table S10: Intention-to-treat Effect Estimates for Nudge Study

	Applied for Naturalization	
	(1)	(2)
Letter	-0.036 (0.037)	-0.037 (0.037)
SMS and Letter	-0.060 (0.037)	-0.051 (0.037)
Metro Card and Letter	-0.061 (0.045)	-0.059 (0.046)
Calls and Appointment	-0.002 (0.047)	-0.000 (0.046)
Mixed-outreach Strategy	0.099 (0.124)	0.107 (0.130)
HH Income P. Cap (1,000s)		0.001 (0.002)
Years on Green Card		-0.004 (0.002)
Age		0.001 (0.001)
Female		0.038 (0.028)
Dominican Republic		-0.059 (0.032)
Ecuador		-0.052 (0.049)
Colombia		0.041 (0.061)
Married		-0.021 (0.037)
Single		-0.040 (0.038)
High School/GED degree		-0.005 (0.036)
Some College		0.028 (0.040)
BA degree or higher		0.002 (0.041)
English		0.103 (0.032)
Constant	0.431 (0.024)	0.413 (0.077)
Covariates	No	Yes
Observations	1364	1363

Note: Regression coefficients shown with robust standard errors in parentheses. Models 1 and 2 regress the outcome on indicators for whether participants were assigned to the various nudge groups (the control group that received no additional nudge is the reference category).

Table S11: Intention-to-treat Effect Estimates for Voucher Study by Subsample

Applied for Naturalization													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Voucher Offered	0.388 (0.055)	0.439 (0.047)	0.429 (0.046)	0.397 (0.055)	0.358 (0.044)	0.511 (0.064)	0.460 (0.049)	0.375 (0.052)	0.424 (0.048)	0.420 (0.052)	0.466 (0.069)	0.323 (0.131)	0.449 (0.149)
Constant	0.389 (0.037)	0.341 (0.031)	0.393 (0.033)	0.325 (0.034)	0.449 (0.031)	0.195 (0.033)	0.348 (0.034)	0.374 (0.034)	0.402 (0.033)	0.313 (0.034)	0.333 (0.042)	0.405 (0.082)	0.291 (0.093)
Observations	299	401	384	316	448	230	350	350	362	338	190	58	46
Subsample	Male	Female	College	High School	English	Spanish	Low income	High income	Younger	Older	Dominican Republic	Ecuador	Colombia

Note: Regression coefficients shown with robust standard errors in parentheses. Model 1 is the subsample of respondents that are males. Model 2 is the subsample of respondents that are females. Model 3 is the subsample of respondents that received at least some college education. Model 4 is the subsample of respondents that received a high school education or less. Model 5 is the subsample of respondents that registered for the program using an English-language version of the registration. Model 6 is the subsample of respondents that registered for the program using a Spanish-language version of the registration. Model 7 is the subsample of respondents that are at or below the median household income of \$18,051. Model 8 is the subsample of respondents that are above the median household income of \$18,051. Model 9 is the subsample of respondents that are at or below the median age of 40. Model 10 is the subsample of respondents that are above the median age of 40. Model 11 is the subsample of respondents that are from the Dominican Republic. Model 12 is the subsample of respondents that are from Ecuador. Model 13 is the subsample of respondents that are from Colombia.

Table S12: Effect Considering Eligibility for a Partial Fee Waiver in December 2016

	Applied for Naturalization			
	(1)	(2)	(3)	(4)
Voucher Offered	0.421 (0.055)	0.414 (0.057)	0.414 (0.047)	0.406 (0.047)
HH Income P. Cap (1,000s)		-0.001 (0.007)		-0.006 (0.004)
Years on Green Card		-0.001 (0.003)		-0.006 (0.003)
Age		-0.001 (0.002)		0.001 (0.002)
Female		-0.006 (0.058)		-0.053 (0.047)
Dominican Republic		0.092 (0.078)		0.073 (0.060)
Ecuador		0.039 (0.099)		0.136 (0.105)
Colombia		-0.021 (0.132)		0.050 (0.092)
Married		-0.120 (0.068)		-0.014 (0.075)
Single		-0.148 (0.079)		0.055 (0.078)
High School/GED degree		0.099 (0.082)		-0.043 (0.079)
Some College		0.034 (0.095)		0.004 (0.074)
BA degree or higher		0.135 (0.089)		-0.006 (0.072)
English		0.147 (0.211)		-0.129 (0.075)
Spanish		-0.051 (0.218)		-0.333 (0.096)
Constant	0.341 (0.035)	0.345 (0.260)	0.377 (0.032)	0.714 (0.192)
Eligible for a Partial Fee Waiver	Yes	Yes	No	No
Covariates	No	Yes	No	Yes
Observations	301	301	399	399

Note: Regression coefficients shown with robust standard errors in parentheses. Models 1 and 2 show the effect of receiving a voucher for participants that would have been eligible for a partial fee waiver beginning on December 23, 2016. Models 3 and 4 show the effect of receiving a voucher for participants that were not eligible for a partial fee waiver beginning on December 23, 2016.

Table S13: Intention-to-treat Effect Estimates for Nudge Study by Subsample

	Applied for Naturalization										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Letter	-0.098 (0.064)	-0.006 (0.045)	-0.114 (0.054)	0.030 (0.050)	-0.056 (0.049)	-0.002 (0.055)	-0.034 (0.052)	-0.038 (0.052)	-0.155 (0.050)	0.100 (0.054)	-0.025 (0.056)
SMS and Letter	-0.072 (0.063)	-0.052 (0.046)	-0.074 (0.056)	-0.051 (0.049)	-0.056 (0.050)	-0.048 (0.054)	-0.010 (0.054)	-0.107 (0.051)	-0.074 (0.052)	-0.048 (0.051)	-0.065 (0.055)
Metro Card and Letter	-0.252 (0.070)	0.031 (0.057)	-0.064 (0.067)	-0.068 (0.061)	-0.115 (0.060)	0.017 (0.070)	-0.072 (0.062)	-0.046 (0.068)	-0.146 (0.064)	0.027 (0.065)	0.004 (0.069)
Calls and Appointment	-0.045 (0.077)	0.022 (0.059)	-0.022 (0.070)	0.013 (0.063)	0.033 (0.062)	-0.039 (0.068)	0.059 (0.066)	-0.064 (0.065)	-0.097 (0.066)	0.097 (0.066)	0.040 (0.072)
Mixed-outreach Strategy*	0.152 (0.224)	0.079 (0.148)	0.013 (0.208)	0.161 (0.154)	0.071 (0.169)	0.147 (0.181)	0.134 (0.170)	0.060 (0.181)	0.071 (0.191)	0.143 (0.162)	0.192 (0.170)
Constant	0.448 (0.042)	0.421 (0.030)	0.487 (0.036)	0.385 (0.032)	0.484 (0.032)	0.353 (0.037)	0.421 (0.034)	0.440 (0.034)	0.500 (0.034)	0.357 (0.033)	0.364 (0.036)
Observations	467	896	629	735	779	585	684	680	710	654	563
Subsample	Male	Female	College	High School	English	Spanish	Low income	High income	Younger	Older	Dominican Republic

Note: Regression coefficients shown with robust standard errors in parentheses. Model 1 is the subsample of respondents that are males. Model 2 is the subsample of respondents that are females. Model 3 is the subsample of respondents that received at least some college education. Model 4 is the subsample of respondents that received a high school education or less. Model 5 is the subsample of respondents that registered for the program using an English-language version of the registration. Model 6 is the subsample of respondents that registered for the program using a Spanish-language version of the registration. Model 7 is the subsample of respondents that are at or below the median household income of \$6,500. Model 8 is the subsample of respondents that are above the median household income of \$6,500. Model 9 is the subsample of respondents that are at or below the median age of 36. Model 10 is the subsample of respondents that are above the median age of 36. Model 11 is the subsample of respondents that are from the Dominican Republic.* Estimate based on small sample size given the small size of the mixed-outreach group.

Table S14: Intention-to-treat Effect Estimates for Nudge Study by Subsample

	Applied for Naturalization							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Letter	0.002 (0.063)	-0.005 (0.083)	-0.077 (0.054)	-0.052 (0.057)	-0.035 (0.061)	-0.044 (0.062)	0.028 (0.066)	-0.087 (0.064)
SMS and Letter	-0.030 (0.059)	-0.079 (0.094)	-0.080 (0.056)	-0.053 (0.056)	-0.115 (0.062)	-0.127 (0.065)	-0.067 (0.064)	-0.014 (0.063)
Metro Card and Letter	-0.067 (0.074)	-0.141 (0.098)	-0.016 (0.072)	-0.062 (0.070)	-0.111 (0.075)	0.018 (0.078)	-0.017 (0.078)	-0.210 (0.079)
Calls and Appointment	-0.034 (0.077)	0.149 (0.104)	-0.049 (0.070)	-0.044 (0.072)	0.023 (0.075)	0.080 (0.080)	-0.003 (0.079)	-0.088 (0.084)
Mixed-outreach Strategy*	0.177 (0.224)	-0.194 (0.226)	0.194 (0.176)	0.363 (0.183)	-0.105 (0.198)	0.033 (0.172)	0.386 (0.185)	-0.132 (0.277)
Constant	0.423 (0.039)	0.444 (0.056)	0.431 (0.037)	0.437 (0.035)	0.438 (0.041)	0.411 (0.041)	0.414 (0.043)	0.466 (0.042)
Observations	504	257	603	576	501	454	455	455
Subsample	HH Size: 1	HH Size: 2	HH Size: >=3	Single	Married	Low Distance	Medium Distance	High Distance

Note: Regression coefficients shown with robust standard errors in parentheses. Models 1, 2, 3 are for the subsamples of respondents that have a household size of one, two, or three or more, respectively. Model 4 and 5 are for the subsamples of respondents that are single or married, respectively. Models 6, 7, and 8 are for the subsamples of respondents that live within a low, medium, or high distance to the closest Opportunity Center (distance groups were created based on equal-sized bins; the median distances by group are 1km, 2.6km, and 5.7km). * Estimate based on small sample size given the small size of the mixed-outreach group.

Table S15: Intention-to-treat Effect Estimates for Voucher Study (Multiple Imputation)

	Applied for Naturalization			
	(1)	(2)	(3)	(4)
Voucher Offered	0.410 (0.036)	0.407 (0.035)	0.406 (0.041)	0.407 (0.040)
HH Income P. Cap (1,000s)		-0.003 (0.003)		-0.003 (0.003)
Years on Green Card		-0.003 (0.002)		-0.003 (0.002)
Age		0.000 (0.002)		0.000 (0.002)
Female		-0.026 (0.037)		-0.026 (0.037)
Dominican Republic		0.069 (0.046)		0.069 (0.046)
Ecuador		0.100 (0.066)		0.100 (0.065)
Colombia		0.032 (0.083)		0.032 (0.083)
Married		-0.046 (0.049)		-0.046 (0.049)
Single		-0.035 (0.054)		-0.035 (0.054)
High School/GED degree		0.038 (0.054)		0.038 (0.053)
Some College		0.054 (0.057)		0.054 (0.057)
BA degree or higher		0.069 (0.055)		0.069 (0.055)
English		-0.027 (0.101)		-0.027 (0.100)
Spanish		-0.230 (0.110)		-0.230 (0.109)
Constant	0.368 (0.022)	0.520 (0.152)	0.370 (0.024)	0.520 (0.150)
Covariates	No	Yes	No	Yes
Observations	863	863	863	863

Note: Regression coefficients shown with robust standard errors in parentheses. Models 1 and 2 regress the outcome on the indicator for whether participants won in the lotteries and were thus offered the voucher. Models 3 and 4 are instrumental variable regressions where the indicator for whether participants were offered the voucher is instrumented by an indicator for whether they won the initial lottery. All analyses are based on multiple imputation using 10 imputed datasets. See text for details.

Table S16: Intention-to-treat Effect Estimates for Nudge Study (Multiple Imputation)

	Applied for Naturalization	
	(1)	(2)
Letter	-0.044 (0.040)	-0.041 (0.040)
SMS and Letter	-0.060 (0.037)	-0.051 (0.036)
Metro Card and Letter	-0.065 (0.044)	-0.064 (0.045)
Calls and Appointment	-0.006 (0.044)	-0.003 (0.044)
Mixed-outreach Strategy	0.087 (0.117)	0.080 (0.120)
Household Income Per Capita (1,000s)		0.001 (0.002)
Years on Green Card		-0.004 (0.002)
Age		0.000 (0.001)
Female		0.037 (0.032)
Dominican Republic		-0.056 (0.031)
Ecuador		-0.053 (0.049)
Colombia		0.019 (0.056)
Married		-0.019 (0.037)
Single		-0.040 (0.038)
High School/GED degree		-0.018 (0.036)
Some College		0.018 (0.040)
BA degree or higher		-0.009 (0.044)
English		0.104 (0.031)
Constant	0.433 (0.023)	0.427 (0.081)
Covariates	No	Yes
Observations	1760	1760

Note: Regression coefficients shown with robust standard errors in parentheses. Models 1 and 2 regress the outcome on indicators for whether participants were assigned to the various nudge groups (the control group that received no additional nudge is the reference category). All analyses are based on multiple imputation using 10 imputed datasets. See text for details.

Figures for Supplementary Information

Fig. S2: Effects of Voucher on Naturalization Application Rates (Multiple Imputation). Upper panel shows the average application rates with robust 95% confidence intervals in the groups of registrants who were offered and not offered the fee voucher to pay for their citizenship application. The lower panel shows the intention-to-treat effects with robust 95% confidence intervals for the overall sample in the voucher study and various subgroups defined based on background covariates. The results are similar to the analysis done without multiple imputation.

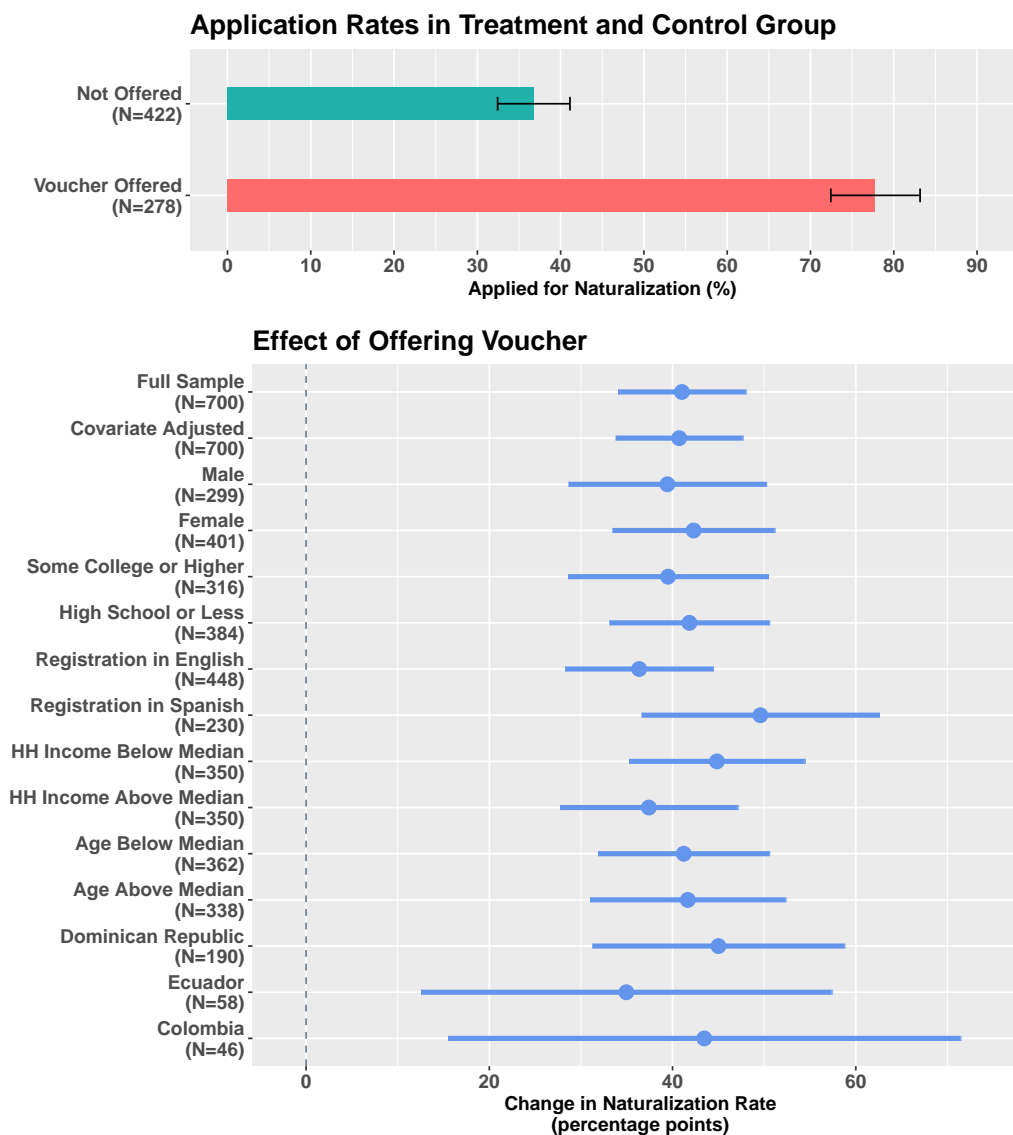
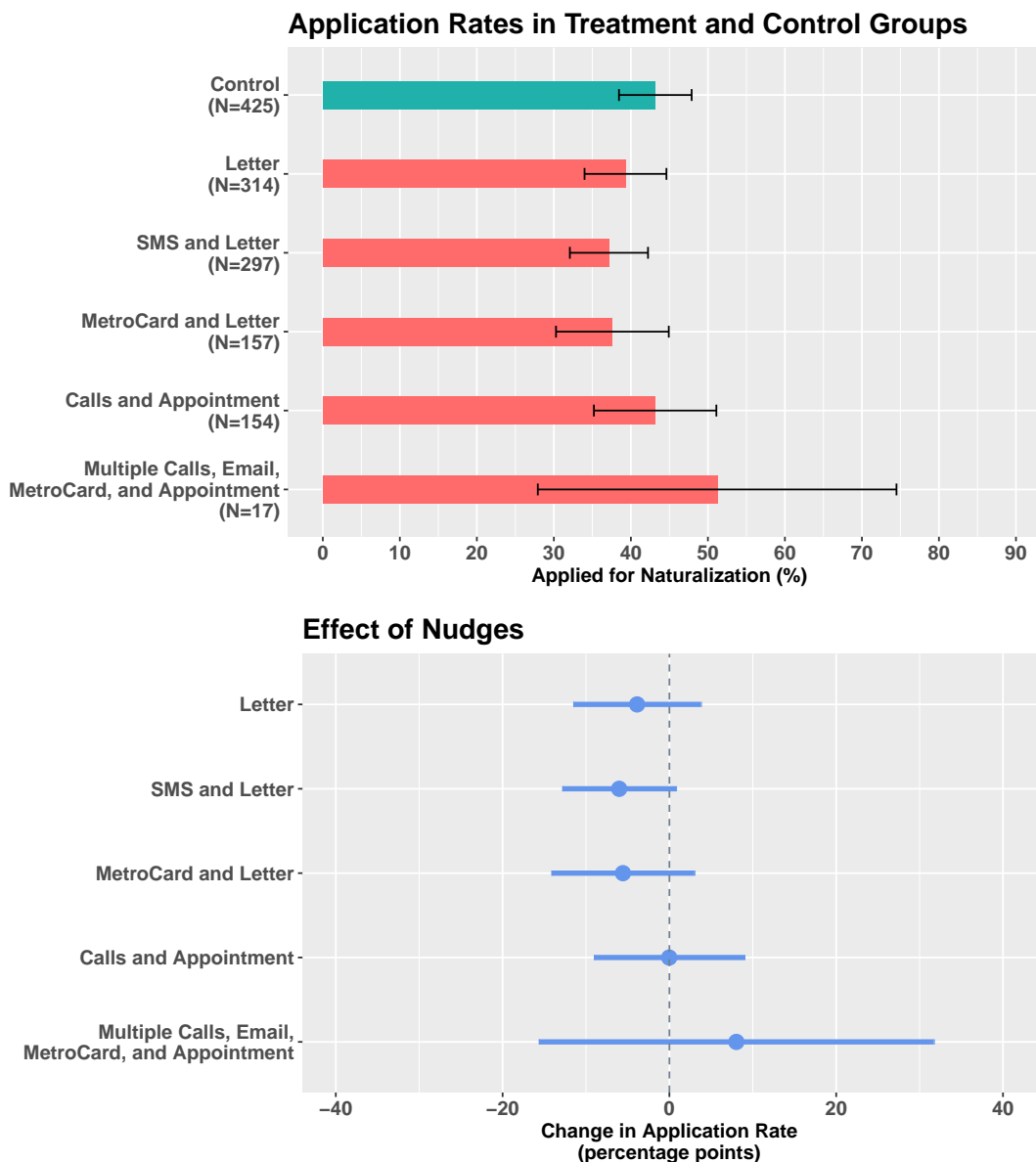


Fig. S3: **Effects of Nudges on Naturalization Application Rates (Multiple Imputation).** Upper panel shows the average application rates with robust 95% confidence intervals in the groups of registrants who received one of the five nudges reminding them for their fee waiver eligibility and encouraging them to apply for naturalization and the control group that received no nudge. The lower panel shows the intention-to-treat effects with robust 95% confidence intervals for the overall sample in the nudge study. The results are similar to the analysis done without multiple imputation.



Samples of Nudges for the Very Low-Income Fee Waiver Group

Fig. S4: **Letter-Only Encouragement (English)**. This letter was sent to 399 very low-income registrants. The English-language version of the letter was sent to 233 registrants.

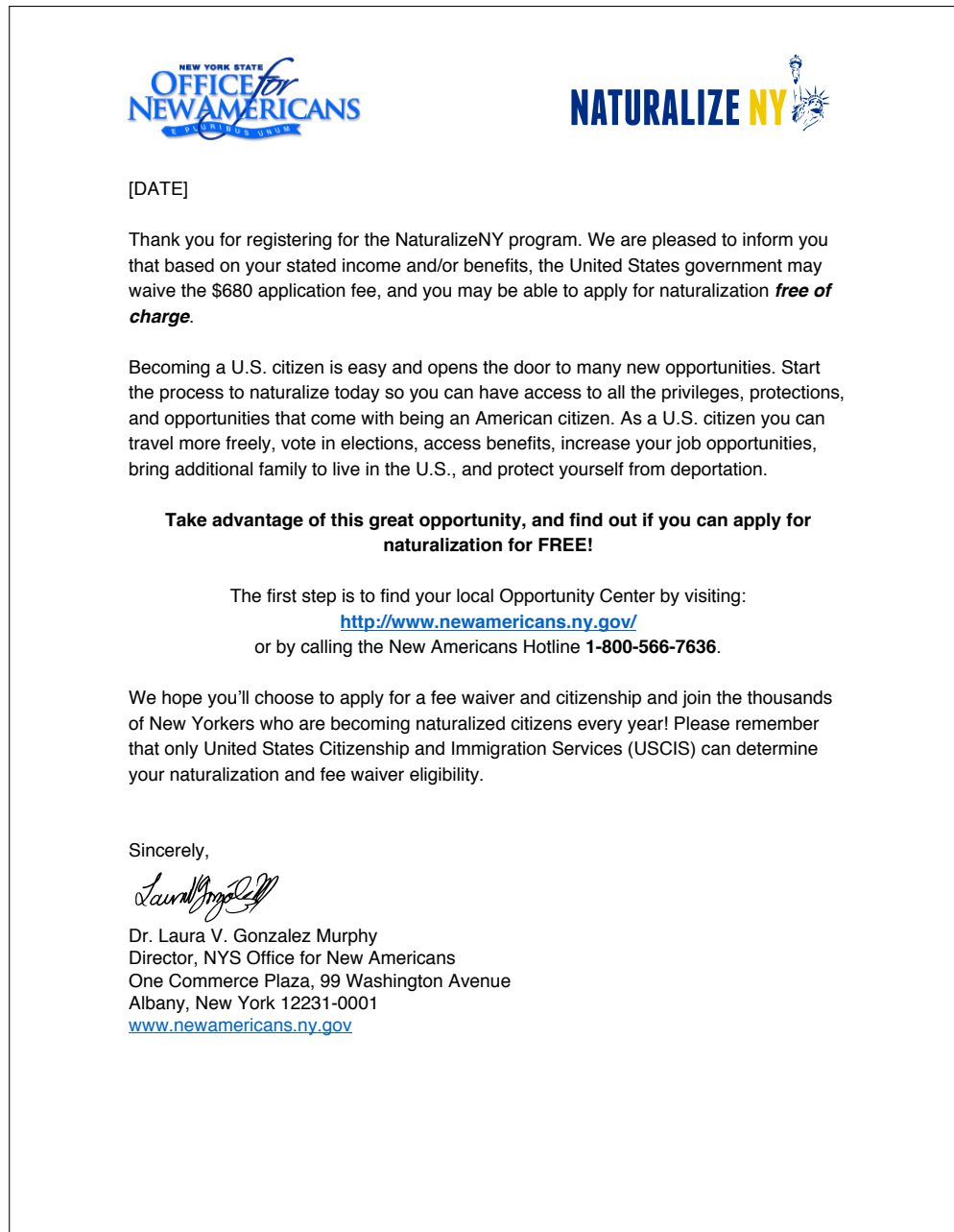


Fig. S5: **Letter-Only Encouragement (Spanish)**. This letter was sent to 399 very low-income registrants. The Spanish-language version of the letter was sent to 166 registrants.



Fig. S6: **Letter and MetroCard Encouragement (English)**. This letter was sent to 200 very low-income registrants. A MetroCard worth \$10 was included with the letter. The English-language version of the letter was sent to 121 registrants.

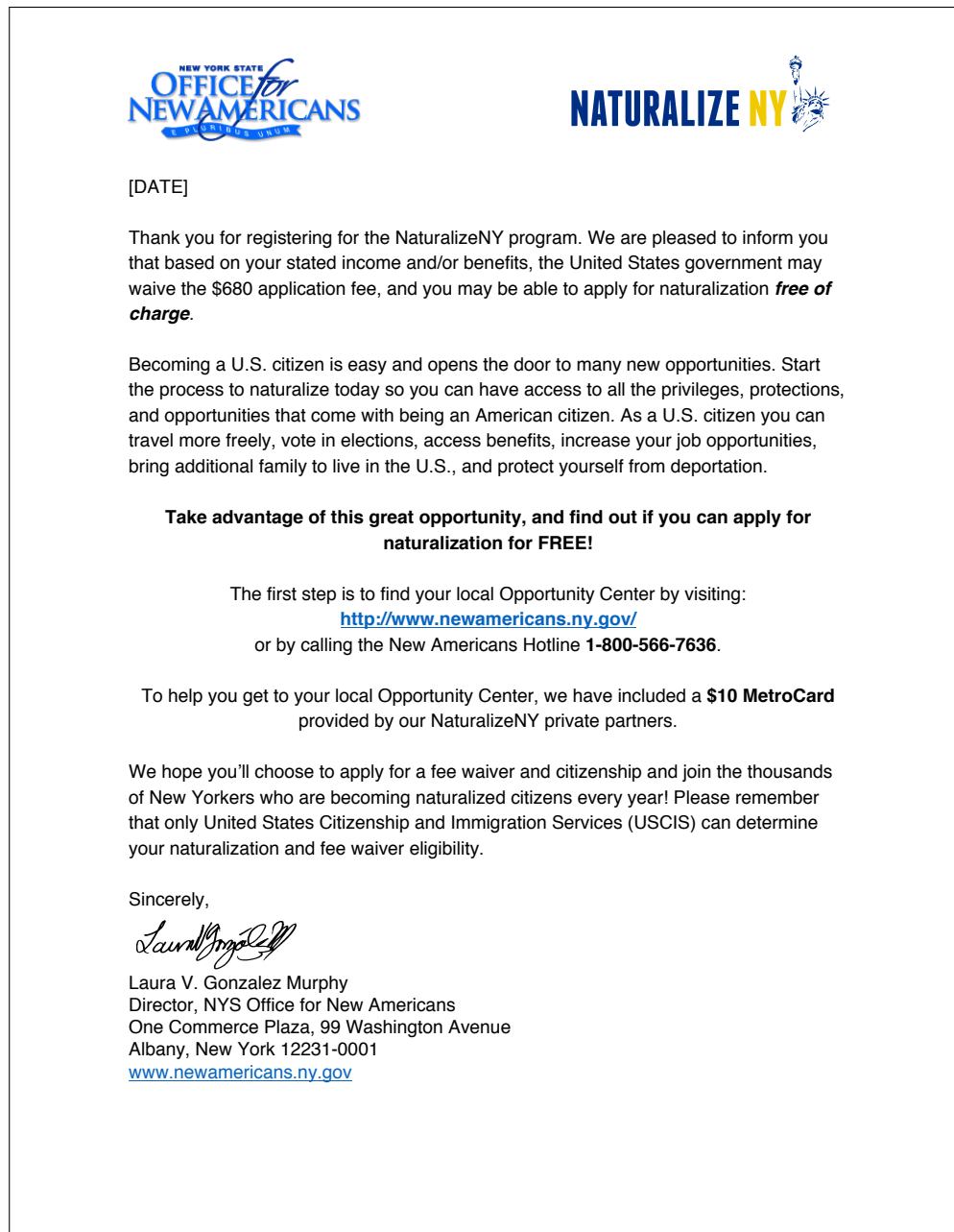


Fig. S7: **Letter and MetroCard Encouragement (Spanish)**. This letter was sent to 200 very low-income registrants. A MetroCard worth \$10 was included with the letter. The Spanish-language version of the letter was sent to 79 registrants.



Fig. S8: **Letter and SMS Encouragement (English)**. This letter was sent to 400 very low-income registrants. After the letter, they were also sent 4 SMS messages about naturalization. The English-language version of the letter was sent to 224 registrants.

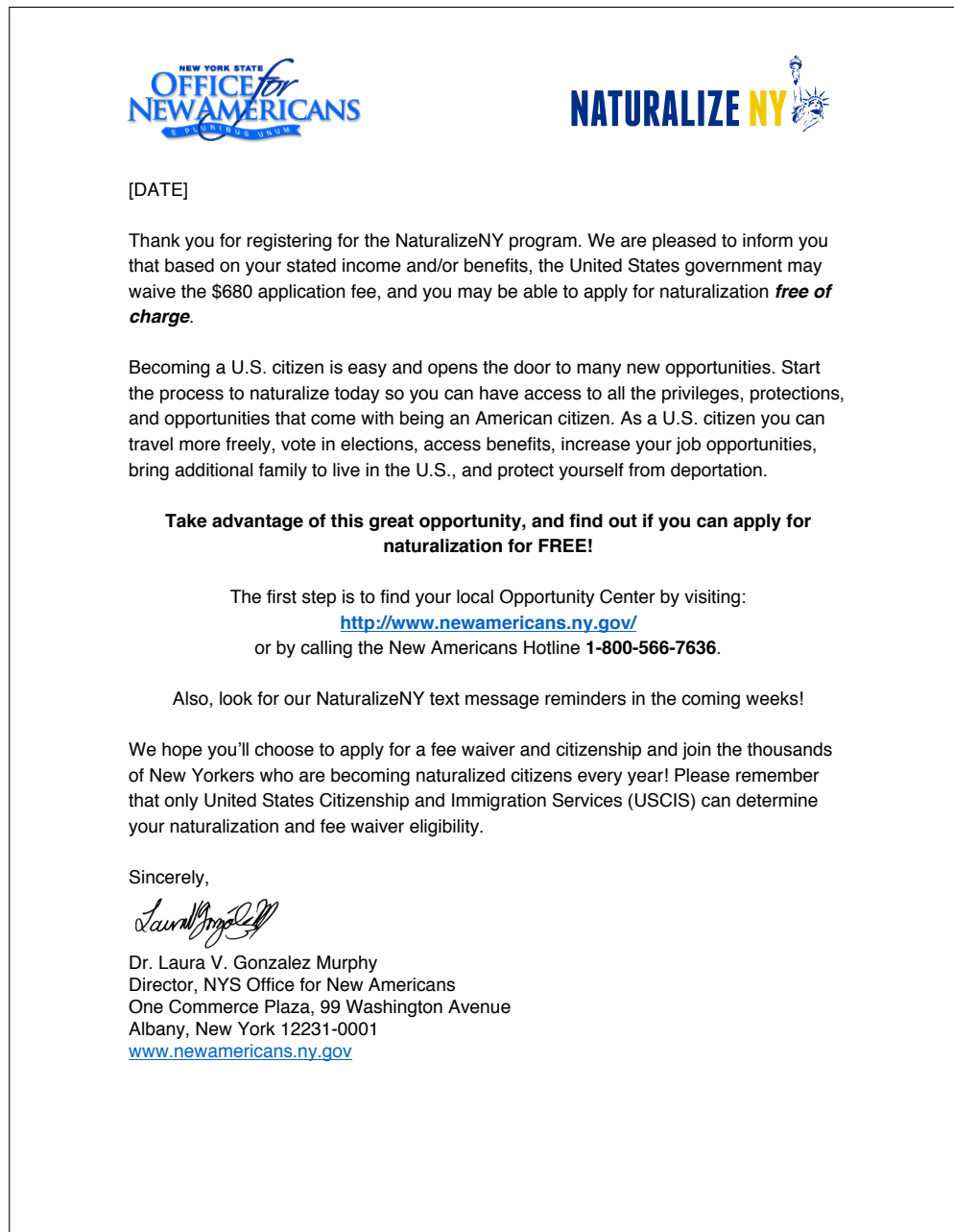


Fig. S9: **Letter and SMS Encouragement (Spanish)**. This letter was sent to 400 very low-income registrants. After the letter, they were also sent 4 SMS messages about naturalization. The Spanish-language version of the letter was sent to 176 registrants.

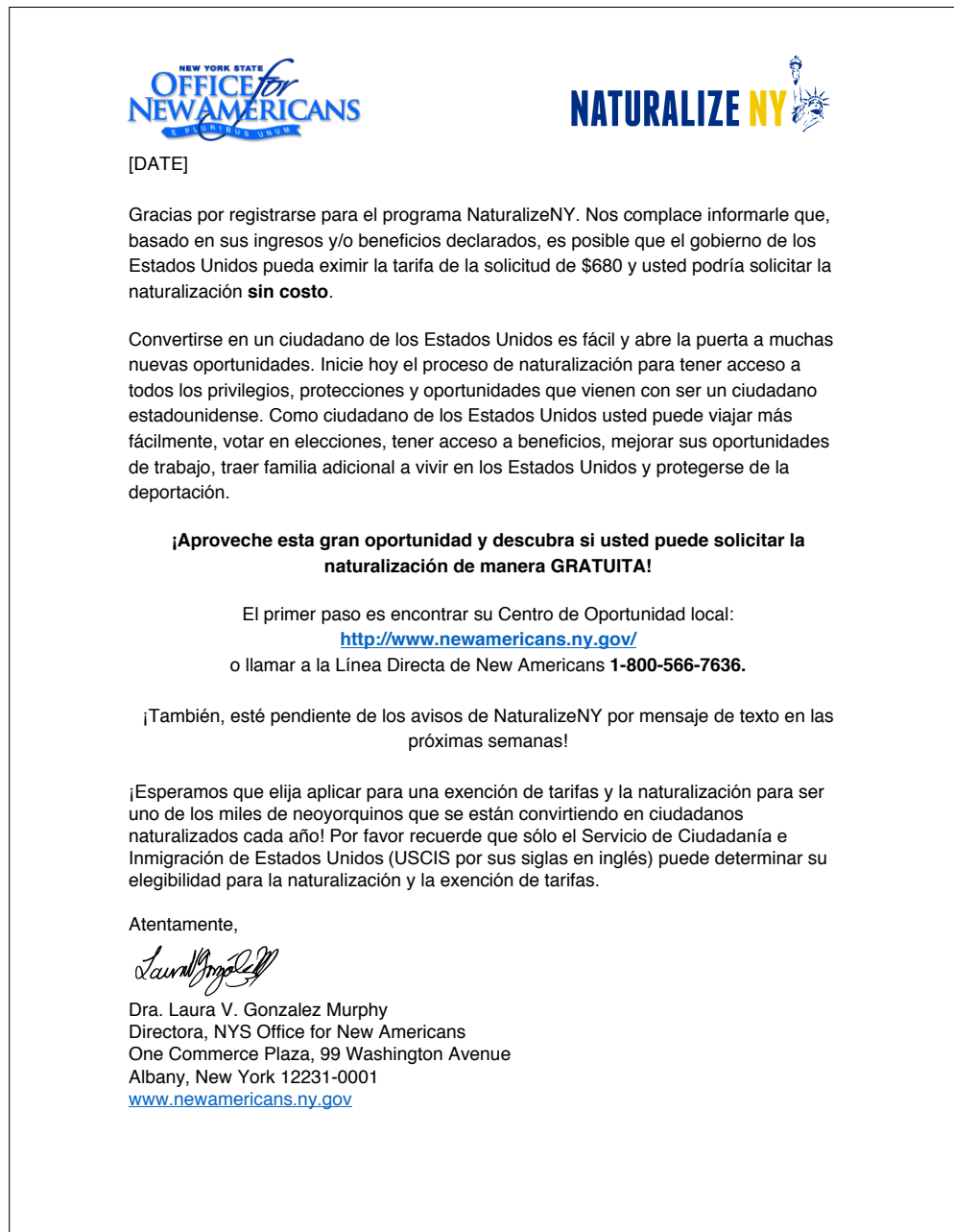


Fig. S10: **Mixed-Outreach Strategy.** This letter was sent to 7 of the 25 very low-income registrants who were part of the mixed-outreach nudge. Similar language was also used in emails to these registrants. The emails and letters were sent to the registrants in the group who had not responded to phone calls to schedule appointments from the immigrant service provider.



Fig. S11: **SMS Encouragement (English)**. SMS messages were sent to 400 registrants. One SMS reminder was sent per week for a period of four weeks. Registrants who opted out of the SMS messages did not receive any subsequent SMS messages. The English-language versions of the SMS messages were sent to 224 registrants.

1. Applying for citizenship is easier than you think. Visit newamericans.ny.gov to learn more. Text STOP to cancel reminders
2. Citizenship can bring you new job opportunities. Visit newamericans.ny.gov to learn more. Text STOP to cancel reminders
3. Citizenship gives you the right to vote. Visit newamericans.ny.gov to find out more about how to apply. Text STOP to cancel reminders
4. Citizenship protects you from deportation. Visit newamericans.ny.gov to find out more. Text STOP to cancel reminders

Fig. S12: **SMS Encouragement (Spanish)**. SMS messages were sent to 400 registrants. One SMS reminder was sent per week for a period of four weeks. Registrants who opted out of the SMS messages did not receive any subsequent SMS messages. The Spanish-language versions of the SMS messages were sent to 176 registrants.

1. Solicitar la ciudadanía es mas facil de lo que piensa. Visite newamericans.ny.gov para aprender mas. Envie ALTO para cancelar los recordatorios
2. La ciudadanía puede traer nuevas oportunidades de empleo para usted. Visite newamericans.ny.gov para aprender mas. Envie ALTO para cancelar los recordatorios
3. La ciudadanía le da el derecho de votar. Visite newamericans.ny.gov para aprender mas. Envie ALTO para cancelar los recordatorios
4. La ciudadanía le protege de la deportacion. Visite newamericans.ny.gov para aprender mas. Envie ALTO para cancelar los recordatorios