Mini Project 2: Obama to Trump

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Introduction:

Through this report, the analysts are trying to determine the extent to which attitudes towards immigration explain the switching of votes of 2012 Obama supporters who became 2016 Trump supporters. In this analysis, we have studied how the demographics of individuals interacts with their attitudes towards immigration in order to explain their shift in the choice of political leaders.

Data:

For this study, we have used the 2016 Cooperative Congressional Election Study dataset which contains responses from around 64,600 adults. The dataset consists of 563 variables, but we have mainly focused our attention on the following variables –

- Gender – Coded as Male or Female depending on the sex of the individual
- Education level – Coded as an ordered categorical variable according to the level of education of the surveyed individual
- Race – Coded as White, Black, Hispanic and "Others" depending on the race of the surveyed individual. "Others" include Asians, Mixed, Native American and Middle Eastern
- Party Identification variable – Coded as an ordered categorical variable ranging from Strong Democrat to Strong Republican
- An immigration attitude variable – This variable was created by adding the scores, surveyed individuals received on four questions predicting their attitude towards immigration

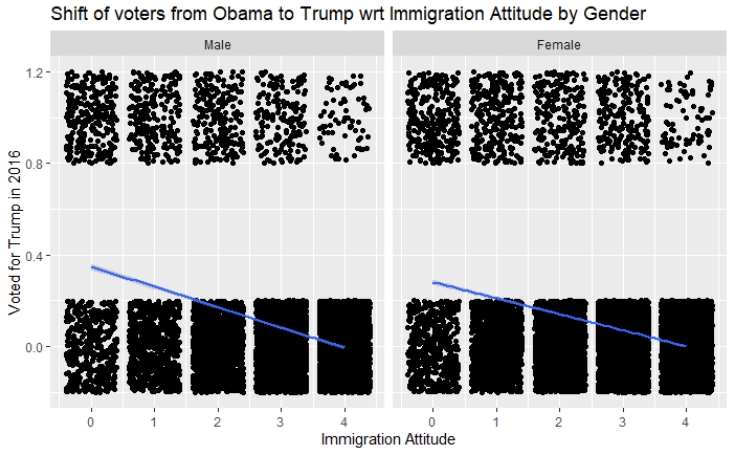
In order to carry out our analysis, we have considered only the individuals who responded to the post-election survey. Next, we took a subset of individuals who voted for Obama in 2012 and studied if they voted for Trump in 2016 or not by creating a binary variable for the same. The subset so obtained consisted of 23,395 individuals 2,121 of who said that they voted for Trump in 2016.

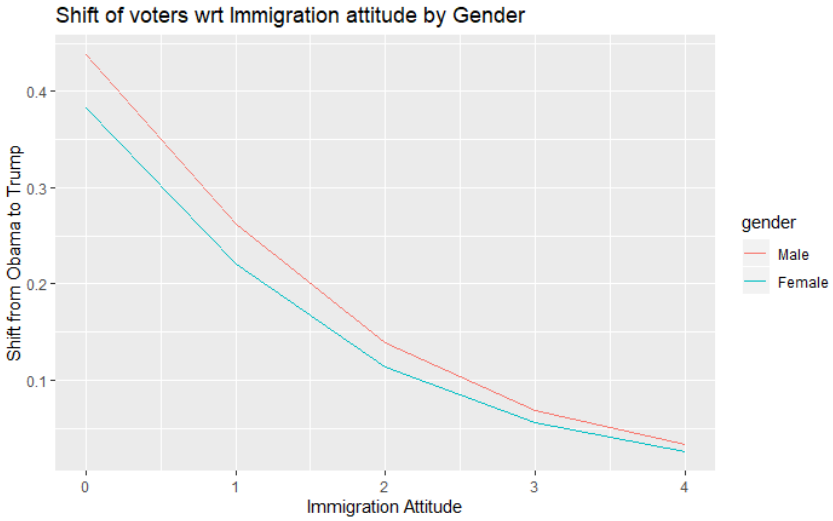
Interpretation:

In order to answer our research question, we analyzed demographic data viz. gender, race, party and education along with immigration attitude against the dummy variable that the individual voted for Trump in 2016 after choosing Obama in 2012 (coded as 0 if individual did not vote for Trump in 2016 and as 1 if individual voted for Trump in 2016). We also analyzed the effect of the interaction between each of these demographic variable and immigration attitude on the predicted variable (votes for Trump). Our theory is that the interaction of immigration attitude with demographic variables can have a significant effect on how people chose their leader in the 2016 elections.

Question 2

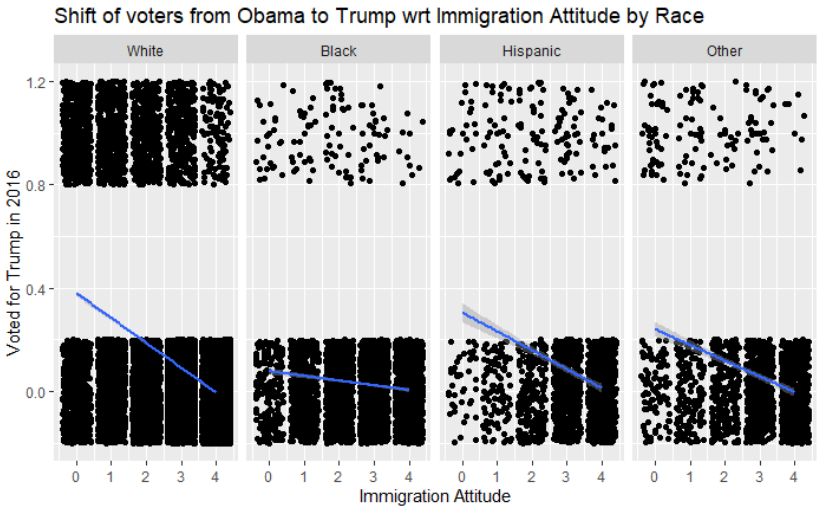
- **Relationship between Gender, Immigration Attitude and switching from Obama to Trump**

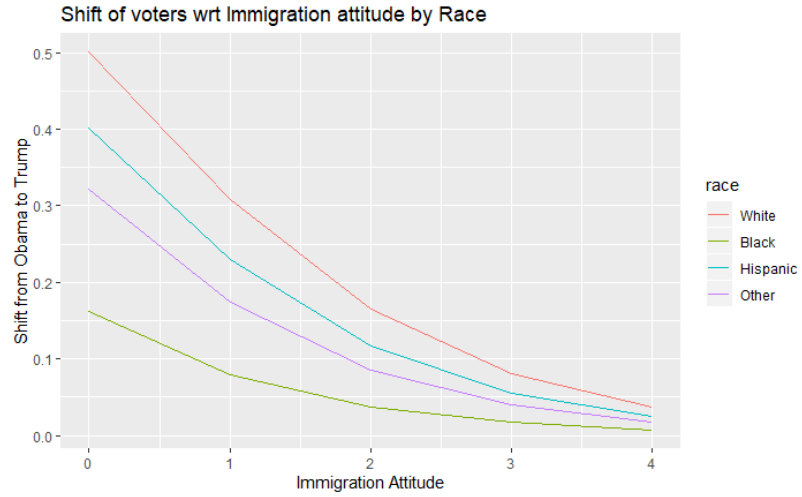


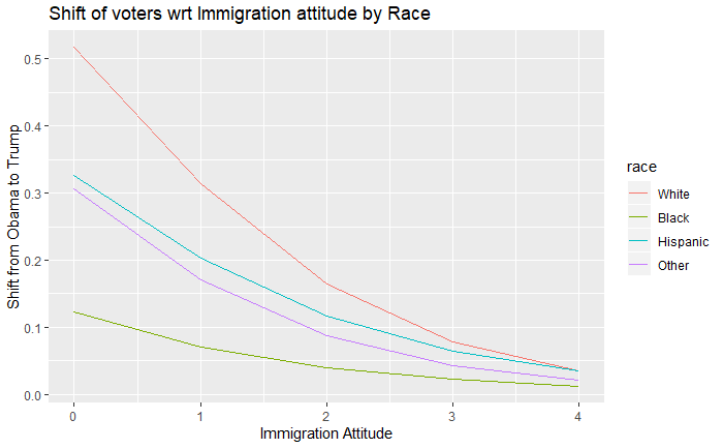


We observe that as individuals become more immigration pro, the probability of them voting for Trump in 2016 decreases and becomes less than 0.1. In general, females are less likely to switch to Trump after Obama than males. For this model, we see that adding an interaction between gender and immigration attitude doesn't add any value to the model and therefore we prefer the simple model over the model with an interaction term. We noticed that both the models had the same AIC value (as these are very large datasets), therefore we used anova to check if interaction term adds any value to the model. Unfortunately, it does not and therefore we choose the simple model in this case.

- **Relationship between Race, Immigration Attitude and switching from Obama to Trump**



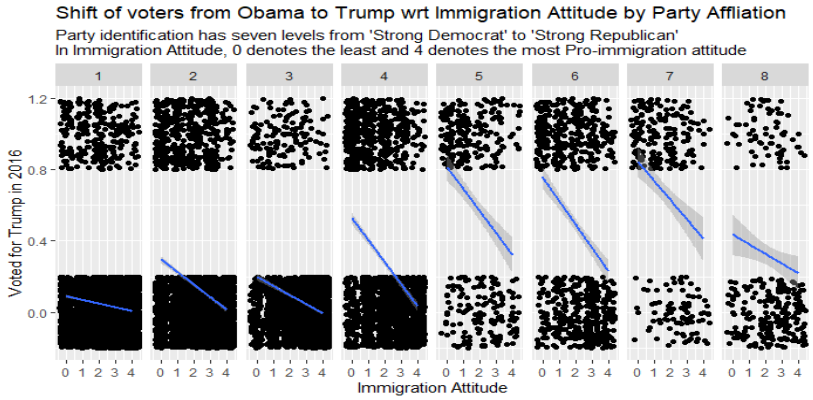


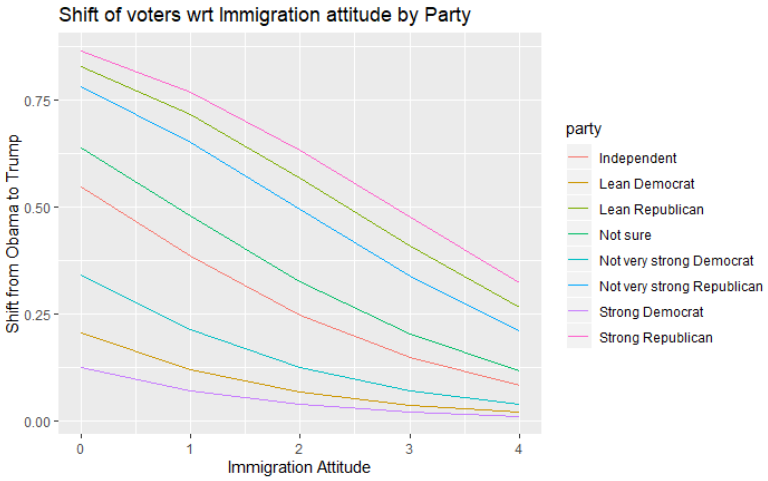


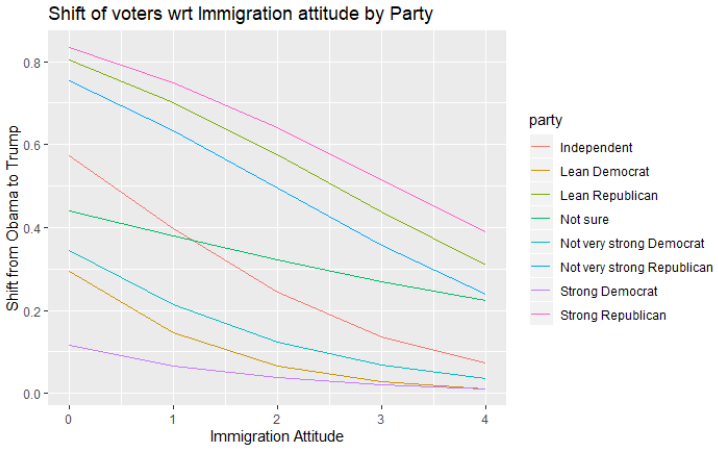
As we can see from the first plot, the rate of switching from Obama to Trump varies differently with change in immigration pro attitude for different races. For example – the curve for white people shows a steep slope whereas for Black it is flat. This means as white people become more immigration pro, their probability of switching to Trump from Obama decreases rapidly whereas for Black people the probability of shifting from Obama to Trump is not much influenced by their immigration pro attitude.

The second plot represents a model without an interaction between race and immigration attitude whereas the third plot represents a model with interaction between race and immigration attitude. By using AIC and anova we find that the interaction term adds value to our model and therefore we choose the model with an interaction term. We find that in general as an individual becomes pro-immigration, the probability of them voting for Trump in 2016 decreases. However, we notice that White individuals who are pro-immigration show a steep decrease in probability as their attitude towards immigration improves. Therefore, we can say that the impact of attitude on switching from Obama to Trump varies by race is maximum for White people and minimum for Black people.

- **Relationship between Party, Immigration Attitude and switching from Obama to Trump**

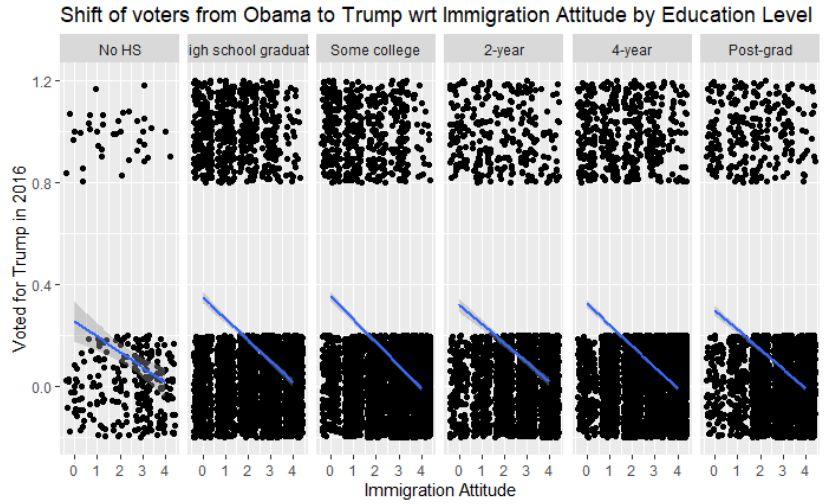


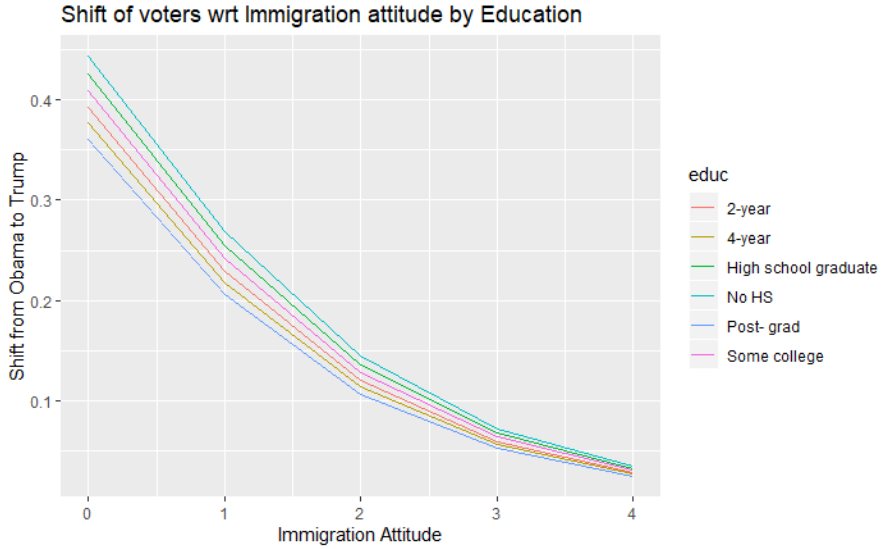


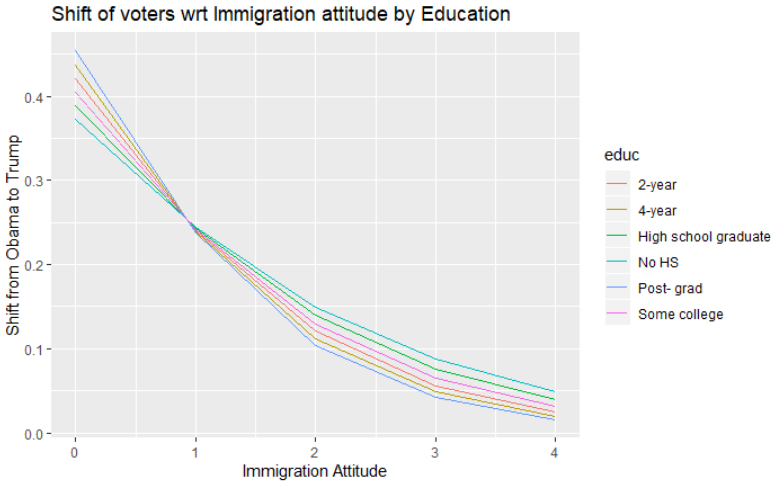


On using AIC and anova we find that in this case, adding an interaction term does add value to our model. Therefore, we would prefer a model with an interaction term.
The first plot shows that as partisanship changes from Democratic through Independent to Republican, the change in decrease in probability with increase in immigration attitude decreases but at different rates i.e. with increase in pro-immigration attitude Democrats show less change in probability of switching to Trump than Independents and Republicans.
The second graph shows our model prediction without interaction and the third graph shows our model prediction with an interaction term. We notice that by adding the interaction term the people who declared their partisanship as "not sure", the probability of them voting for Trump decreases with their attitude becoming more immigration pro. We also notice that the curves for Lean Democrat and Strong Democrat combine as immigration attitude score increases to around 4. Overall, immigration attitude scores have less effect on Democrats and more effect on Republicans with Independents being somewhere in the middle.

- **Relationship between Education, Immigration Attitude and switching from Obama to Trump**







On using AIC and anova we find that in this case, adding an interaction term does add value to the model. Therefore, we would prefer a model with an interaction term.
The first plot shows that probability of switching from Obama to Trump for people of different education level. It is clear that the line for people at level 1 education is flatter than all other lines. The second plot shows the interaction of education with immigration attitude. As we can see from the plot, at low levels of pro-immigration attitude, education plays a key role in determining if individuals switched from Obama to Trump. However, we see that at a high level of pro-immigration attitude, the probability of switching is higher for a person with lower education than by a person with a higher level of education. Therefore, we can say that at low level of pro-immigration attitude, higher education influences the probability of switching from Obama to Trump while at low education level, higher value on pro-immigration attitude influences probability of switching from Obama to Trump.

Question 3

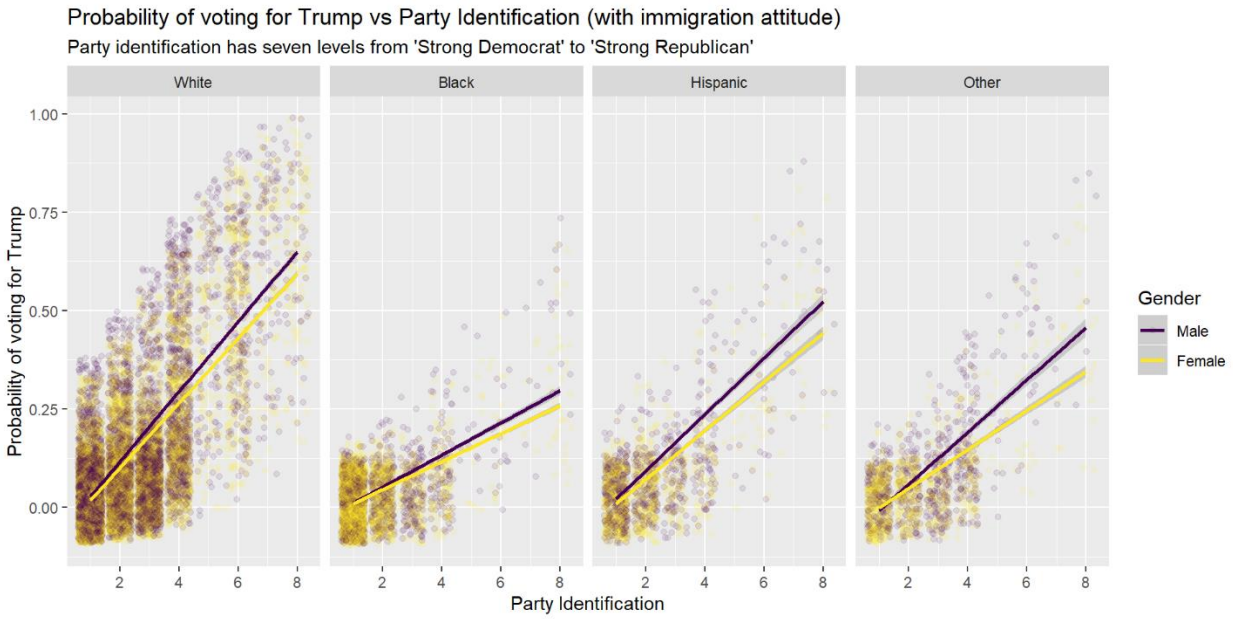
From the results from question 2, we have decided to use interaction with immigration attitude for the following demographic variables – race, party and education.

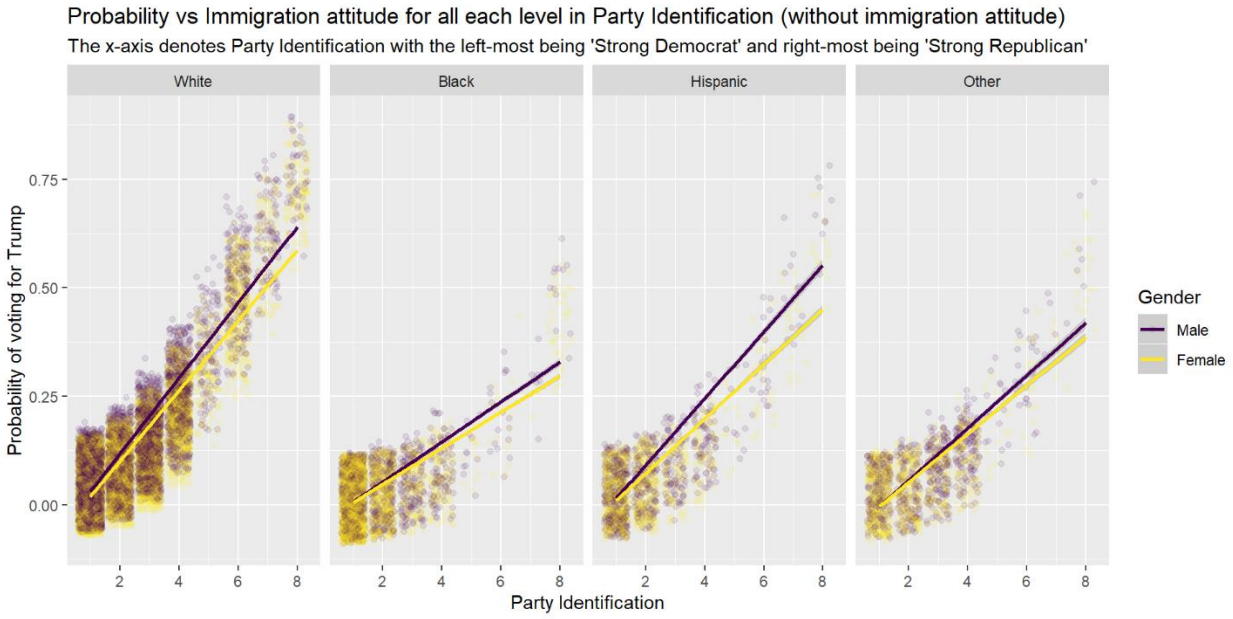
Comparing the two models:

We created two models, one with immigration attitude (and interactions) and one without. To evaluate the models, we compared the AICs. The AICs of models with and without immigration attitude were 10596 and 12014 respectively. We know smaller AICs denote better model quality. This tells us that the model with immigration attitude is performing much better than the one without immigration attitude.

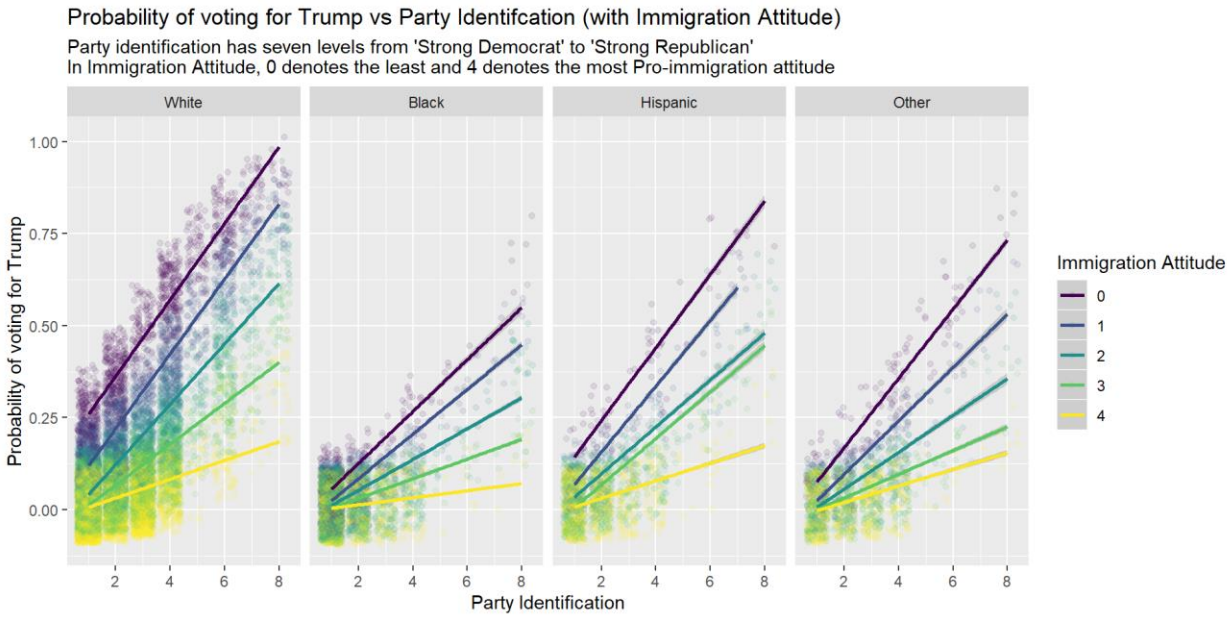
To corroborate our observation, we used ANOVA to analyze whether the model without immigration (simple model) was better than the model with immigration and interactions (complex model). The P-value for this test was (2.2e-16). We can therefore reject the null hypothesis and say the model with immigration attitude and interactions is better than the model without immigration attitude.

Effect of including/excluding Immigration attitude on demographic groups:

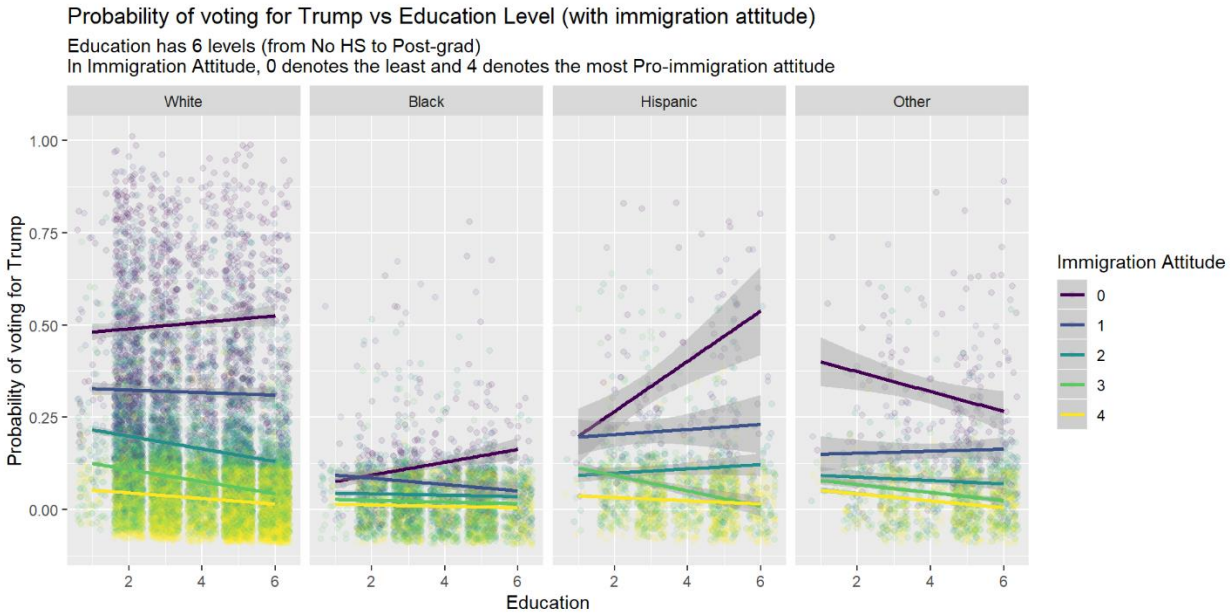




As we can see, when we exclude Immigration attitude, the probabilities aren't so evenly distributed with Party Identification. The coefficient of immigration attitude was approximately -0.44 which suggests that it had a negative effect on the probability. Even in each Party Identification group, people with pro-immigration sentiments have a lower probability of voting for Trump.



In all the graphs the “White” population had a significantly higher probability of voting for Trump in 2016 compared to other races. There weren’t a lot of Non-white people who are ‘Strong Republican’ so it’s hard to comment about it. But the regression line suggests that as the Party identification increases, the probability to vote for Trump also increases (irrespective of the Race).



We can also say that gender doesn’t have a strong effect on the probability of voting for Trump. Combined with Party identification, people with the most Pro-Immigration attitude seem to have a lower probability of voting for Trump while people who have least Pro-immigration attitude seem to have a higher probability. Education, in general, doesn’t affect the probability of voting. There seems to be no significant pattern here.