Heterogeneous Effects in Jowei Chen's Voter Partisanship and the Effect of Distribution Spending on Political Participation

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Abstract

In "Voter Partisanship and the Effect of Distributive Spending on Political Participation", Jowei Chen examines the effect of receiving FEMA disaster relief on turnout for Florida voters and finds that being treated with FEMA aid after a hurricane encourages turnout among supporters of the incumbent's party but mitigates turnout among supporters of the opposing party. We extend Chen's analysis to examine heterogeneous effects, observing that voting behavior among male Democrats and African American Republicans who applied for FEMA Aid follows a different pattern than Chen's model predicts. In addition, we observe a null effect on turnout for non African American Democrats. We also take an alternative approach to correcting for selection bias; we restrict the sample of analysis to only those who applied for FEMA aid since this is the only group that can be treated, and estimate a treatment effect on a matched sample of applicants using the Coarsened Exact Matching technique. Our results using the matching technique are very comparable to the original

paper's.

Introduction

Do government benefits increase voter turnout for certain groups of citizens but not for other groups? Jowei Chen's 2013 article, "Voter Partisanship and the Effect of Distributive Spending on Political Participation," demonstrates the causal effect of receiving monetary FEMA aid on an individual's propensity to vote. Chen (2013) uses individual-level voting data for people registered to vote in Florida prior to the 2004 presidential election. The results show that aid received under a Republican administration increases turnout for Republican voters and decreases turnout for Democratic voters (Chen 2013, 206). The theory behind same-party turnout increase is straightforward and follows the intuition behind previous distribution literature: individuals respond to receiving distributive benefits by voting to "protect their future benefits" (Chen 2013, 201). However, the theory behind opposite-party turnout revises the traditional argument by claiming that a different partisan orientation will lead to a decrease in turnout. The mechanism behind this is as follows: an individual of the opposite party, after receiving distributive benefits, is less likely to desire the removal of the incumbent, and therefore, is less likely to turn out to vote (Chen 2013, 201).

Chen (2013)'s empirical demonstration of this theory leads to a natural question that extends his findings: if Democrats and Republicans exhibit different responses to distributive benefits based upon the incumbent party, do other "groups" of individuals demonstrate different political outcomes when receiving aid? We aim to answer this question by extending Chen (2013)'s findings to investigate the outcomes of individuals based upon race and gender.

First, we discuss the general literature on government aid distribution and voter behavior to provide a theoretical basis for the potentially differential treatment outcomes. Next, using

the logit model presented in Chen (2013), we find that different treatment effects do exist for groups divided by gender and race, with some results going against the theory presented in Chen (2013). Specifically, African American Republicans exhibit no significant treatment effect. In other words, African American Republicans are not more likely to turn out to vote as a result of receiving FEMA aid. We also show that for male Democrats, there exists no significant treatment effect. In addition, non African American Democrats exhibit a null treatment effect, though the average expected change in turnout does fit with Chen (2013)'s theory. These results point to an important theoretical gap in the distribution literature; that is, individuals divided by historically politically salient characteristics exhibit different responses to receiving government benefits. We then discuss Chen (2013)'s sample selection bias correction and make the case that, rather than generalize to all voters, we should restrict the sample to those individuals who applied for FEMA aid and match the data on observed covariates. With this redefined population of interest, we use Coarsened Exact Matching (CEM) to estimate the Feasible Sample Average Treatment on the Treated (FSATT). We find that the estimated FSATT closely mirrors the results in Model 6 of Table 1 of Chen (2013). We conclude with a discussion of this theoretical gap, as well as a discussion of important areas for future research.

Theoretical Basis for Hetergeneous Effects

A long tradition of scholarly literature has illustrated that non-means-tested government programs increase turnout among recipients. Agricultural subsides (Wolfinger and Rosenstone 1980), veterans' benefits (Mettler and Stonecash 2008), Social Security (Campbell 2005), and aggregate increased distribution levels across districts and states (Ansolabehere and Snyder 2006) all result in higher turnout rates among the beneficiaries of these aid programs. These studies, however, look at the total level of turnout among all citizens.

In fact, Ansolabehere and Snyder (2006) posit that distributive spending mobilizes both same-party and opposite-party voters, therefore suggesting politicians target areas that have high numbers of same-party voters to increase electoral prospects (565). Chen (2013) revises this finding by demonstrating that receiving non-means-tested government benefits actually decreases opposite-party turnout.

Missing from these empirical studies, however, is an examination of the relationship between race and gender, and the receipt of government aid. While the statistical analyses of these works control for important covariates, including race and gender, past research illustrates the unique relationship between these attributes and political behavior and participation. For instance, high black political empowerment plays an important role in facilitating black political participation by contributing to an increased level of trust in government (Bobo and Gilliam 1990). African American political participation is also shown to be a function of available community resources, specifically in regards to political and church organizations (Tate 1991). In addition, Logan et al. (2012) demonstrate that traditionally analyzed differences, such as proportion of immigrants in an eligible voting group, socioeconomic status, and education do not account for disparate rates in political participation between racial groups; rather, the authors suggest that future work look at often ignored factors, including race and ethnicity. Further research demonstrates the limitations of theoretical models when applied widely to different racial groups (Leighley and Vedlitz 1999).

Gender, too, has been shown to affect political behavior. Research illustrates that women are less likely to engage in "egocentric" economic voting but more likely to engage in "sociotropic" economic voting. These differences appear to be attributed to gender, rather than socioeconomic status, indicating the existence of unique political behaviors of men and women (Welch and Hibbing 1992). Further, literature shows that differences in political attitudes, and the salience of these attitudes, between men and women contribute to differences in voting behavior and political preferences (Kaufmann and Petrocik 1999). Differences in

engagement between genders are shown to affect political behavior and participation generally. Specifically, women, in aggregate, are less politically informed and involved than men (Verba et al. 1997).

This literature serves to illustrate the potential unobserved differences between men and women, and African Americans and non African Americans, that shape political participation and voting behavior. Specifically, this research indicates that race and gender have important effects on an individual's relationship with government, implying that men and women, and those of different racial backgrounds, may respond differently to certain political stimuli. Chen (2013) cites the vast political behavior literature and recognizes the variant responses to government benefits between individuals of the incumbent government party and those of the opposite party (200). Using a similar platform, we contend that the literature detailing the unique political behavior based on gender and race provide ample basis for extending Chen (2013)'s analysis through an examination of these particular groups.

Heterogeneous Effects

Description of Modeling Approach and Simulations

The methods we employ to estimate the treatment coefficient for individuals divided by race and gender strongly resemble those methods used by Chen (2013) to estimate the treatment coefficient for Republicans and Democrats. We use the formal model presented in Chen (2013) , as well as the logit models used to estimate the treatment coefficients in Table 1 (Chen 2013, 206). The changes we make begin with subsetting the data to estimate the different treatment effects on men, women, African Americans, and non African Americans. This, however, does alter the logit equation. By subsetting the data along these covariates, we essentially interact these binary variables with every other covariate in the equation. While this makes it difficult to compare treatment effects across groups (due to the change

in the interaction between covariates in the logit equation), we can still compare the treatment effects on these groups to the theory present in Chen (2013).

In addition to running the given logit functions from Chen (2013), we simulate the treatment coefficients using ZELIG (Imai, King and Lau 2006) to estimate the uncertainty in these coefficients. We use Models 1 and 2 from Table 1 in Chen (2013) to estimate a naive treatment effect on the different groups of individuals. These groups include male, female, African American, and non African American. Through this, we are able to show whether or not the coefficient for the treatment variable "FEMA Aid Awarded" remains significant for specified groups, and therefore whether or not the theory in Chen (2013) applies to all groups of citizens, or just to some.

Results

Table 1 shows the effect of receiving FEMA aid on the turnout for the 2004 presidential

Table 1: Overall Treatment Effect on Individuals

	Republican	Democrat
Mean	1.1%	-0.6%
Standard Deviation	± 0.2%	± 0.2%
95% Confidence Interval	[0.7%, 1.5%]	[-1.1%, 0.2%]

election for all individuals who applied for aid prior to the election. Turnout increased by 1.1% on average for Republicans who received FEMA aid. This effect is statistically significant. Conversely, turnout decreased by 0.6% on average for Democrats who received FEMA aid. This also represents a significant result. The above results coincide with the theory in Chen (2013): incumbent-party turnout increases when receiving aid, while opposite-party turnout decreases.

However, this theory does not hold for all groups of citizens. The results below show that there is a null effect on the treatment assignment (receiving FEMA aid) for some groups. In other words, receiving FEMA aid does not affect the voting behavior of these groups. For

other groups, however, there exists a strongly significant treatment effect.

Table 2: Treatment Effect on Males

	Republican	Democrat
Mean	1.5%	0.4%
Standard Deviation	± 0.3%	± 0.4%
95% Confidence Interval	[0.9%, 2.1%]	[-0.4%, 1.2%]

Table 2 shows the simulated results for the data including only men. Here, we find that the coefficient for "FEMA Application Approved" is not significant for male Democrats; thus, male Democrats who receive FEMA aid are not significantly deterred from voting. In fact, the expected turnout rate for male Democrats is positive (0.4%), rather than negative as Chen (2013) predicts. Conversely, male Republicans exhibit a strongly significant treatment effect, as Chen (2013) predicts. Male Republicans have an average expected increase in turnout rate of 1.5%.

Table 3: Treatment Effect on Females

	Republican	Democrat
Mean	0.8%	-1.1%
Standard Deviation	± 0.3%	± 0.3%
95% Confidence Interval	[0.3%, 1.4%]	[-1.7%, -0.5%]

Table 3 shows the simulated results for the data including only females. The treatment effect for both female Republicans and Democrats is significant and corroborates the theory in Chen (2013); that is, female Republicans are more likely to vote after receiving FEMA aid by an average of 0.8%, and female Democrats are less likely to vote by an average of 1.1%.

Table 4: Treatment Effect on African Americans

	Republican	Democrat
Mean	-3.4%	-1.7%
Standard Deviation	± 2.3%	± 0.5%
95% Confidence Interval	[-8.0%, 1.1%]	[-2.7%, -0.8%]

Table 4 shows the simulated results for the data including only African Americans. As illustrated above, the coefficient on "FEMA Application Approved" is not significant for African American Republicans, though it is significant for African American Democrats. On average, turnout for African American Democrats who receive FEMA aid is expected to have an average decrease of 1.7%. Interestingly, turnout for African American Republicans who received aid is also expected to decrease on average, though, again, this result is not significant.

Table 5: Treatment Effect on Non-African Americans

	Republican	Democrat
Mean	1.2%	-0.2%
Standard Deviation	± 0.2%	± 0.3%
95% Confidence Interval	[0.8%, 1.6%]	[-0.7%, 0.3%]

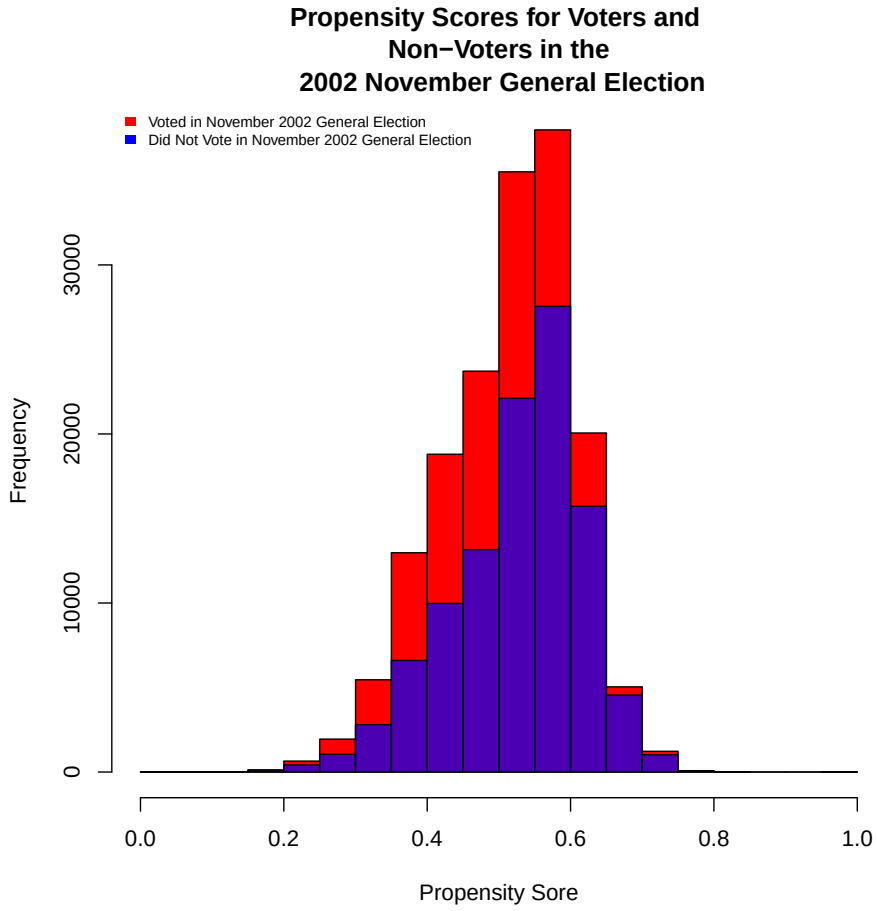
Table 5 shows the simulated results for the data including only non-African Americans. After receiving FEMA aid, non African American Democrats exhibit no treatment effect, though the expected change in turnout is negative, as Chen (2013) predicts. However, African American Republicans have an expected average vote increase of 1.2%.

Discussion of Selection Bias Correction and Matching

Chen (2013) acknowledges that unobserved characteristics like civic-mindedness have the potential to affect both an individual's propensity to apply for FEMA aid if she is eligible and her observed turnout in the 2002 and 2004 general elections. These unobserved characteristics, he argues, introduce the challenge of selection bias in the sense that individuals will select into the pool of FEMA applicants for reasons that also affect their observed outcomes. The presence of this selection problem implies that individuals who apply for FEMA aid are fundamentally different from those who don't. To test and correct for selection bias, Chen appends a large sample of registered Florida voters who *did not* apply for FEMA aid before

the November 2004 general election and employs a two stage Heckman censored probit.

While it's unquestionably important to consider the potential impact of unobserved covariates that may influence individuals in the sample to self select into the pool, we argue there are several reasons to prefer an approach which restricts the population of interest exclusively to applicants for FEMA aid, and matches Chen's sample of applicants based on observed covariates. Note that the treatment variable in this framework is a binary indicator for whether or not an individual received aid from FEMA. FEMA determines whether or not to "treat" an individual with disaster relief by sending an inspector to examine the extent of damage to her property and assess the urgency of her need for aid. Since the treatment assignment is completely internal to FEMA, it becomes difficult to imagine how unobserved characteristics which may lead to selection bias affect an individual's probability of getting assigned to active treatment. Indeed, there is little evidence that FEMA granted aid awards with unequal probabilities to individuals who voted in the November 2002 general election and those who didn't. To illustrate this visually, we calculated propensity scores for individual applicants in Chen's sample by regressing the treatment variable on individual age and its squared term, maximum wind speed in miles per hour and its squared term, a dummy variable for registered Republicans, a dummy variable for males, a dummy variable for African American, dummy variables for the individual's county of residence, median household income in an individual's block group and the median home value in the individual's block group. Figure 1 below depicts very similar distributions of propensity scores for voters and non-voters in the 2002 November general elections, suggesting that having voted and applied for aid as a result of some unobserved covariate does not affect FEMA's willingness to grant aid.

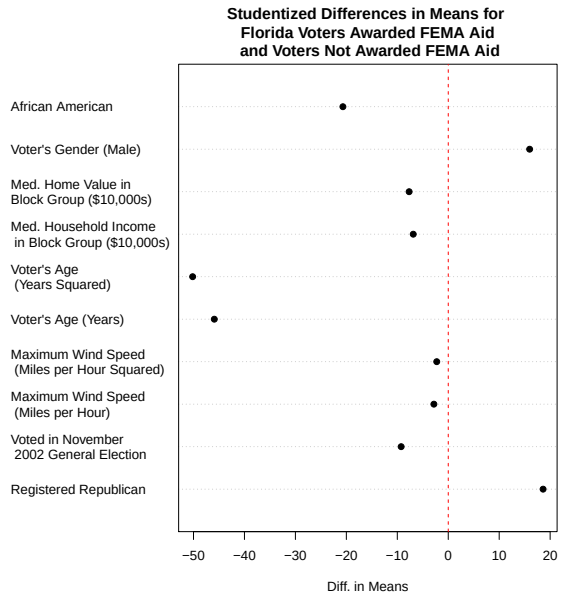


Additionally, FEMA engages only applicants to its Individuals and Households Program (IHP), which means that only applicants have a non-zero probability of being assigned to active treatment. The relevant control group in this case, then, is those individuals who applied for FEMA aid but were not granted any by the agency. Since there are no feasible circumstances under which applicants and non-applicants would be compared in an evaluation of the effect of active treatment, and assignment to active treatment remains unaffected by unobserved characteristics that make those groups distinct, we restrict the sample to applicants and apply a Coarsened Exact Matching (CEM)(Iacus, King and Porro 2011) technique to reduce imbalance and estimate the Feasible Sample Average Treatment on the Treated (FSATT).

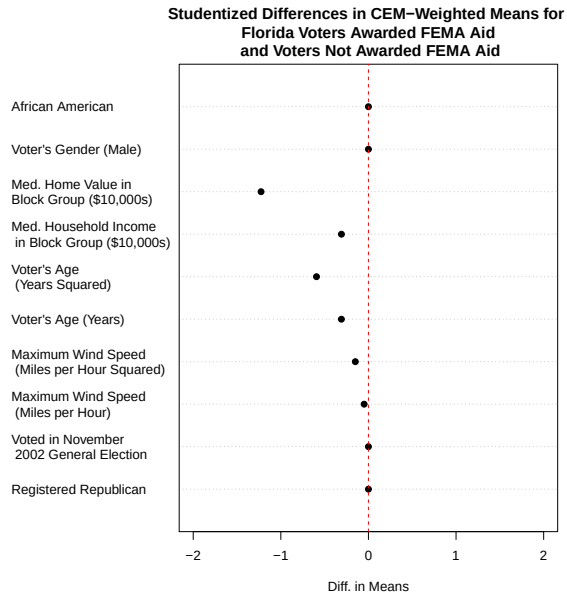
Table 6 below summarizes the observations kept and pruned from the sample used to estimate the FSATT for FEMA aid. Removing unmatched observations leaves a sample of 251,205 individuals. Figures 2 and 3 below demonstrate the substantial imbalance across covariates that was present in the unmatched data, and the corresponding improvement in balanced means by covariate generated with the CEM algorithm.

Table 6: Observations Matched

	No Aid Awarded (Control)	Aid Awarded (Treatment)	Total
Observations in Original Data	129,336	139,416	268,752
Matched Observations	120,491	130,714	251,205
Unmatched Observations	8,845	8,702	17,547



(a) Figure 2: Imbalance Prior Matching



(b) Figure 3: Matched Data

The CEM matching results below map very closely to Model 6 in the original paper; coefficients are reported in the appendix. Simulating from those results would produce estimates very similar to the quantities reported in our discussion of heterogeneous effects above, though this would be a natural extension of this research.

Discussion

Our results demonstrate the heterogeneous treatment effect of receiving FEMA aid for different groups of citizens separated by race and gender. In certain cases, a treatment effect does not exist at all, meaning that receiving FEMA aid does not affect an individual's propensity to vote. These cases include male Democrats, African American Republicans, and non African American Democrats. In other cases, including male Republicans, female Democrats and Republicans, African American Democrats, and non African American Republicans, receiving FEMA aid does appear to have a substantial affect on an individual's voting behavior. These effects corroborate the theory present in Chen (2013). However, the differences in treatment effects between groups lead to natural questions: 1) What are the mechanisms behind the decision to vote for each group? 2) How can the theory in Chen (2013) be complicated to include heterogeneous treatment effects on different groups of voters?

Literature on the political behavior of individuals of a specific race or gender helps illuminate the potential mechanisms behind these variant treatment effects. Prior research points to the different relationships certain genders and races have with government; for example, Kaufmann and Petrocik (1999) demonstrates that men and women attribute more salience to their political attitudes, which then affects their behavior, and Logan et al. (2007) shows that traditionally considered variables, such as socioeconomic status, do not really explain the different political behaviors of racial groups. These findings imply that unobserved covariates may play an important role in individual responses to receiving government aid. Unobserved covariates could include perception of government intentions, past interactions with bureaucrats, and political engagement through community organizations, among many other potentially influential factors. Indeed, one can imagine that certain interactions with government officials, such as the police, could lead to a different voting outcome in African

Americans than in non-African Americans. Similarly, differential levels of trust in government between men and women could facilitate gendered political responses to government distributive benefits.

Discussion of unobserved covariates' potential effects facilitates ideas on how Chen (2013)'s theory can be complicated to include these variant treatment outcomes. Chen (2013) contributes to the distribution literature by recognizing and empirically proving the divergent outcomes on voting between incumbent-party voters and opposition-party voters (215); yet, the paper neglects the potential for different effects between voters of a certain gender or race. Of course, this analysis was beyond the scope of Chen (2013), but recognizing where the treatment effect holds, and where it does not, provides an important level of analysis in understanding individual responses to distribution. Thus, models of the effects of government aid on voting behavior should take into account differences between racial groups and gender, as well as differences between the incumbent-party and opposition-party.

Conclusion

This paper makes an important substantive contribution in the illustration of variant treatment effects across different races and genders. By extending Chen (2013), we are able to find that individuals divided by race and gender have different outcomes when receiving FEMA aid. We use past literature to demonstrate the potential for unobserved covariates to influence different political behaviors between different gender and racial groups. We then use the basic logit model presented in Table 1 of Chen (2013) to simulate the treatment outcomes on eight different groups: male Republicans, male Democrats, female Republicans, female Democrats, African American Republicans, African American Democrats, non-African American Republicans, and non-African American Democrats. We find that there is no treatment effect for male Democrats, African-American Republicans, and non African

American Democrats, though Chen (2013)'s theory does hold for all other groups. These disparate outcomes imply that the Chen (2013) model should be extended to consider different groups of citizens and their specific relationships with government. In addition, we argue that the population of interest should be redefined to only those individuals who applied for FEMA aid. Using CEM to determine the treatment effect on this redefined population, we find that the effect of receiving aid on turnout is very similar to the effect illustrated in Model 6 of Table 1 in Chen (2013).

Our findings spur ideas for a potentially rich research agenda. First, the results in Chen (2013) should be replicated in states outside of Florida, as well as for elections other than the 2004 election. Replication across states and time would provide important external validity to Chen (2013)'s theory, especially since the theory complicates the findings of the well-established distribution literature. Further, future works on distribution should replicate our results and engage with previous literature on the specific political behaviors of individuals of a particular race or gender. This type of research would help to more definitively determine whether an overall treatment effect that changes political behavior applies to all citizens or just to some. Finding consistent divergence in the effect of receiving distributive benefits on turnout across election years and states would contribute both to the distribution literature and to the general literature on political behavior.

Appendix

Table 7: Imbalance and CEM Weighted Controls

Covariate	$\bar{X}_T$	$\bar{X}_C$	$\bar{X}_T$ - $\bar{X}_C$	t	p-value	CEM-Weighted $\bar{X}_C$	$\bar{X}_T$ - $\bar{X}_{C,CEM}$	t_{CEM}	p-value$_{CEM}$
Registered Republican	0.487	0.451	0.036	18.616	0.000	0.488	0.000	0.000	1.000
Voted in November 2002 General Election	0.600	0.618	-0.018	-9.244	0.000	0.607	0.000	0.000	1.000
Maximum Wind Speed (Miles per Hour)	73.770	73.979	-0.209	-2.820	0.005	73.932	-0.007	-0.049	0.961
Maximum Wind Speed (Miles per Hour Squared)	5,813.824	5,839.592	-25.768	-2.259	0.024	5,823.312	-2.422	-0.1497	0.881
Voter's Age (Years)	49.312	52.181	-2.869	-45.916	0.000	49.216	-0.030	-0.308	0.758
Voter's Age (Years Squared)	2,669.708	3,006.862	-337.154	-50.168	0.000	2,651.431	-4.278	-0.593	0.553
Med. Home Value in Block Group ($10,000s)	10.355	10.513	-0.159	-7.679	0.000	10.087	-0.032	-1.226	0.220
Med. Household Income in Block Group ($10,000s)	4.134	4.174	-0.039	-6.869	0.000	4.093	-0.003	-0.308	0.758
Voter's Gender (Male)	0.454	0.424	0.031	15.975	0.000	0.451	0.000	0.000	1.000
African American	0.145	0.174	-0.029	-20.676	0.000	0.138	0.000	0.000	1.000

Table 8: FSATT Estimate Summary

	Estimate	Std. Error	t value	p-value
(Intercept)	-1.59	0.15	-10.71	0.00
Voted in November 2002 General Election	2.33	0.01	194.78	0.00
FEMA Application Approved	-0.03	0.01	-1.94	0.05
FEMA Application Approved x Registered Republican	0.12	0.02	5.38	0.00
Registered Republican	0.09	0.02	5.71	0.00
Maximum Wind Speed (Miles per Hour)	-0.00	0.00	-1.03	0.30
Maximum Wind Speed (Miles per Hour Squared)	0.00	0.00	1.03	0.30
Voter's Age (Years)	0.07	0.00	37.76	0.00
Voter's Age (Years Squared)	-0.00	0.00	-37.46	0.00
Med. Home Value in Block Group ($10,000s)	0.02	0.00	8.68	0.00
Voter's Gender (Male)	-0.25	0.01	-22.71	0.00
African American	0.03	0.02	1.44	0.15
Med. Household Income in Block Group ($10,000s)	0.07	0.01	10.47	0.00

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