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How the Voter's Choice Act Changed Turnout in California

Technical Appendix

CONTENTS

Appendix A. Figures and Model Results

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with research support from Jennifer Paluch

Supported with funding from the Evelyn and Walter Haas, Jr. Fund

Appendix A. Figures and Model Results

FIGURE A1

VCA counties overcomply with staffed locations

VCA COUNTIES: STAFFED LOCATIONS

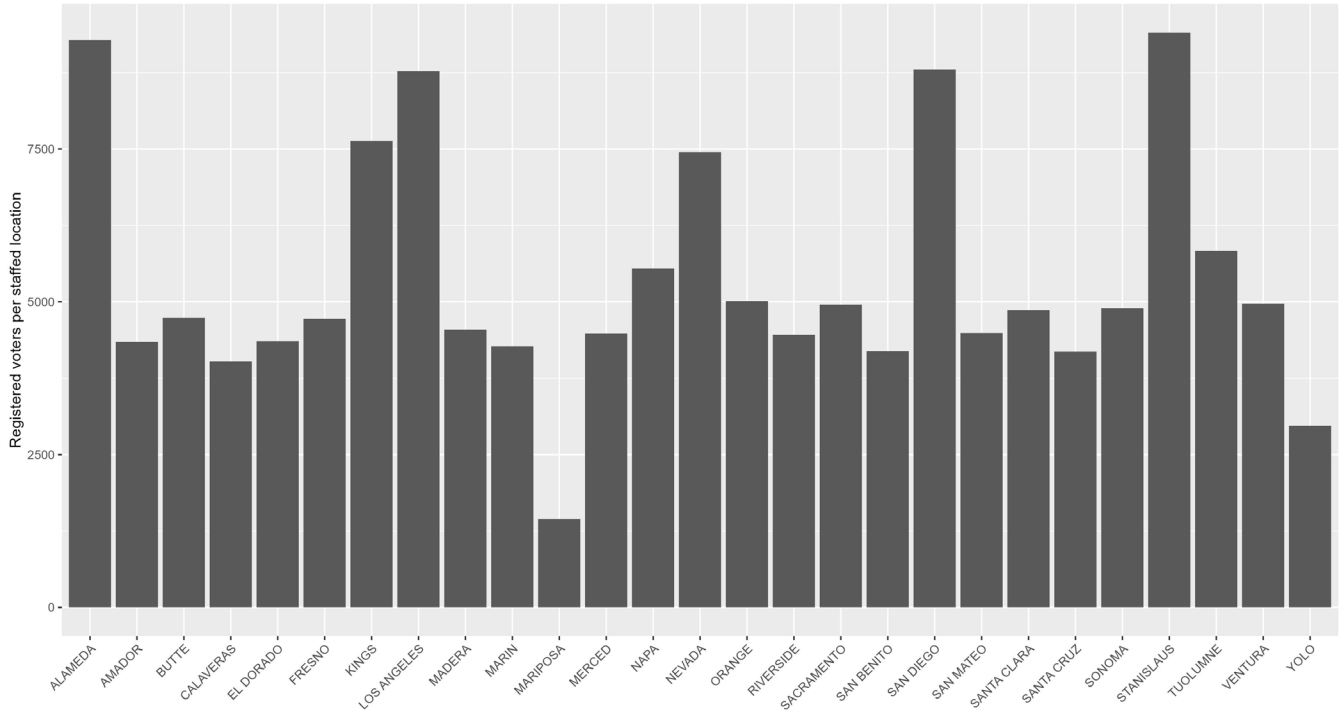


FIGURE A2

VCA counties also overcomply with unstaffed drop boxes

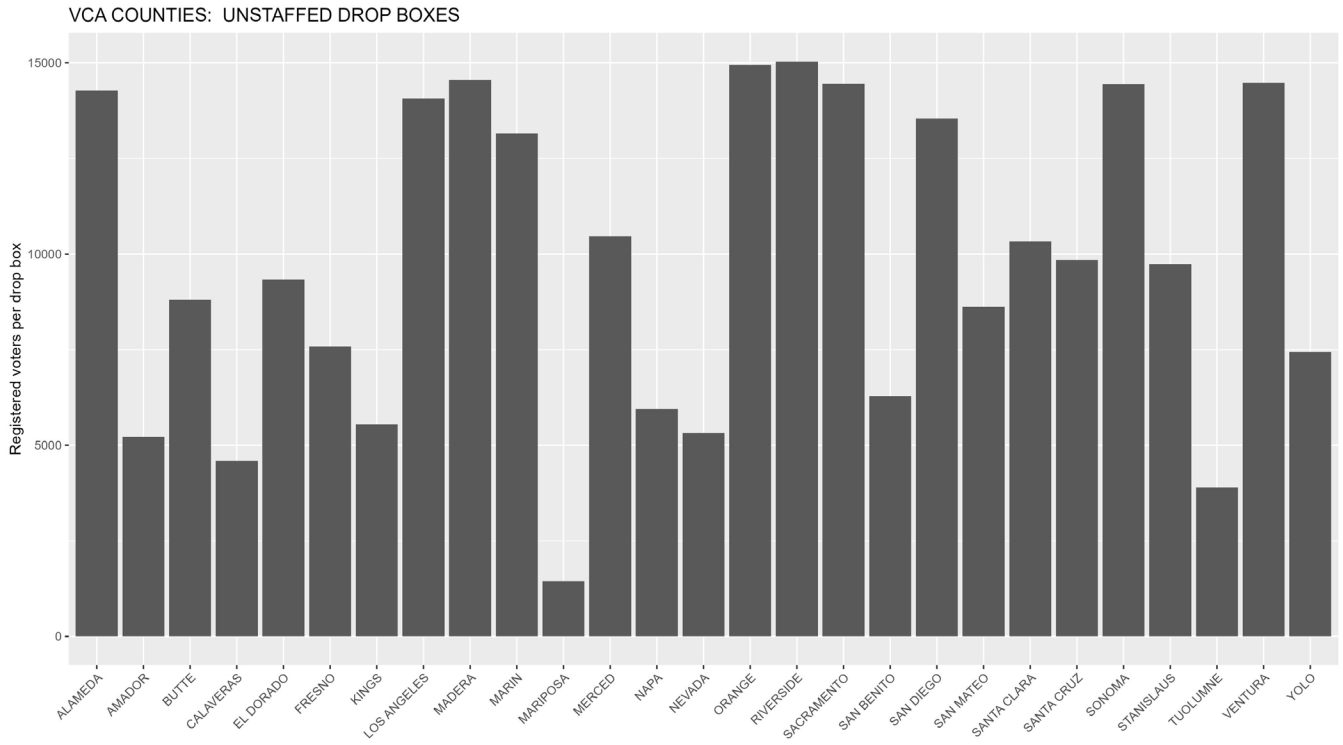
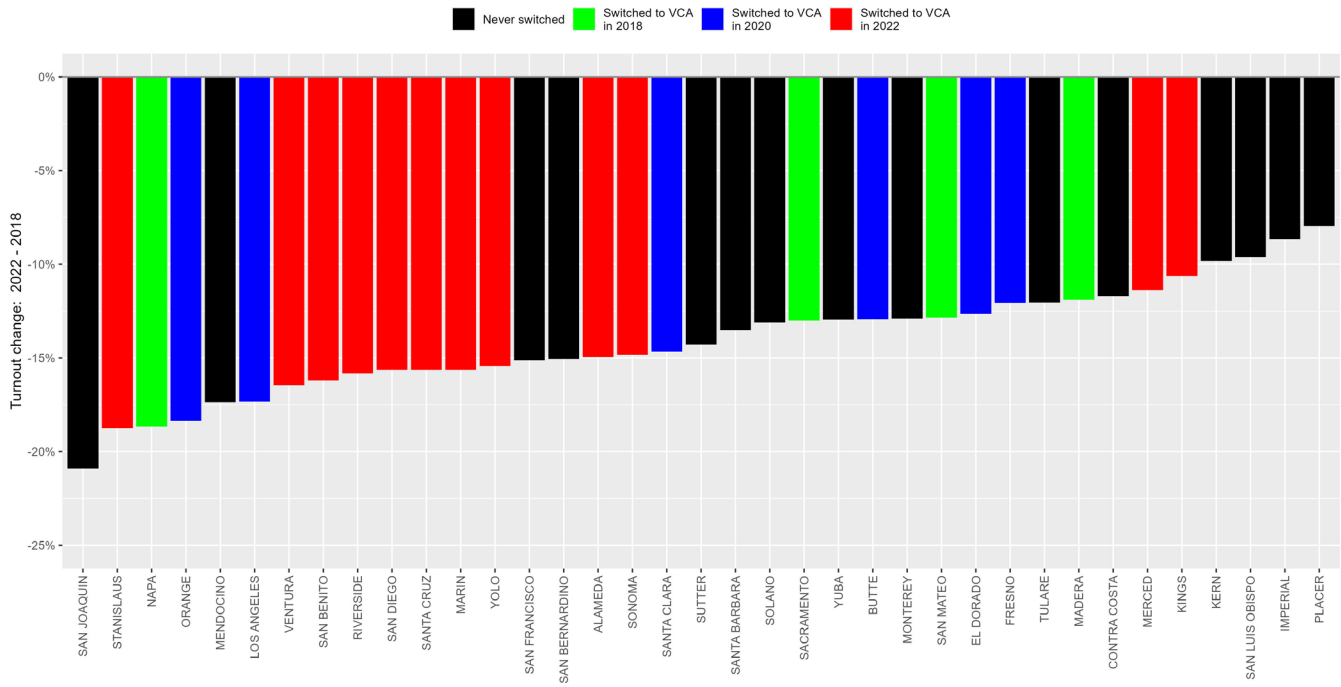


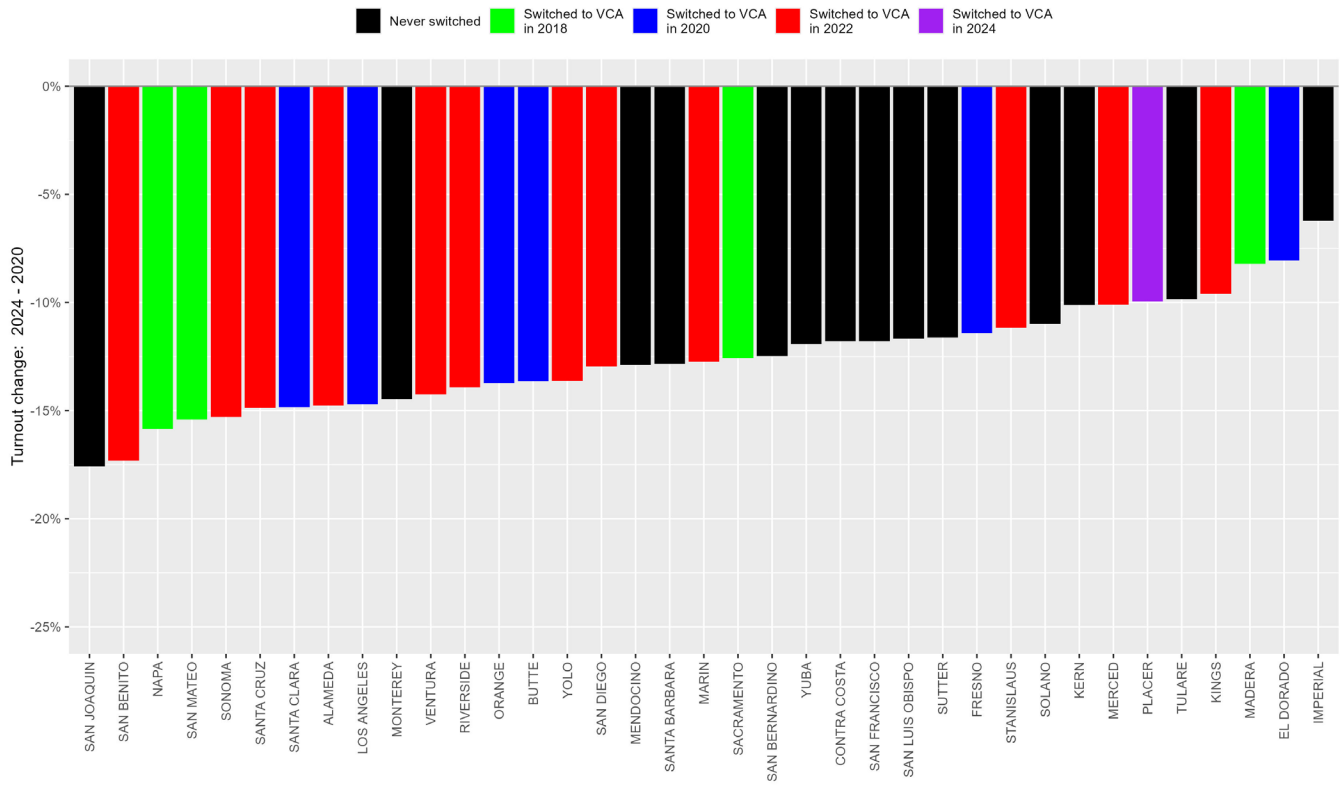
FIGURE A3

Turnout among Latinos, by county

2018-2022



2020-2024



NOTE: Counties where our sample of 100,000 cases led to fewer than 200 Latino registrants have been omitted from the plot.

TABLE A1

Effect of VCA on continuing voters: 2018-2022

	All	Black	Latino	Asian	White/Other
VCA County	-0.014 (0.001)	-0.001 (0.004)	-0.030 (0.002)	-0.002 (0.003)	-0.003 (0.001)
Mean-deviated: voters	X	X	X	X	X
Mean-deviated: years	X	X	X	X	X
N	1822476	90426	524802	201276	1005972
RMSE	0.343	0.347	0.369	0.362	0.321

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. Standard errors are clustered at the individual voter.

TABLE A2

Effect of VCA on continuing voters: 2020-2024

	All	Black	Latino	Asian	White/Other
VCA County	0.009 (0.001)	-0.008 (0.003)	0.004 (0.001)	-0.002 (0.002)	0.004 (0.001)
Mean-deviated: voters	X	X	X	X	X
Mean-deviated: years	X	X	X	X	X
N	1957532	96280	577456	245180	1038616
RMSE	0.296	0.315	0.339	0.317	0.261

SOURCES: Political Data, Inc. (2020 voter file); California Secretary of State (2024 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2020 and 2024 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. Standard errors are clustered at the individual voter.

TABLE A3

Effect of VCA on new young voters (18-19): 2018-2022

	(1)	(2) Main effects	(2) Black interactions	(2) Latino interactions	(2) Asian interactions
(Intercept)	0.517 (0.003)	0.604 (0.003)	-0.174 (0.003)	-0.155 (0.002)	-0.136 (0.002)
VCA County	-0.017 (0.002)	0.010 (0.003)	-0.006 (0.005)	-0.058 (0.002)	-0.007 (0.004)
Year = 2022	-0.178 (0.002)	-0.174 (0.002)	--	--	--
County fixed effects	X	X			
N	870675	870155			
RMSE	0.473	0.466			

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. Data consist of voters ages 18 and 19.

TABLE A4

Effect of VCA on new young voters (18-19): 2020-2024

	(1)	(2) Main effects	(2) Black interactions	(2) Latino interactions	(2) Asian interactions
(Intercept)	0.761 (0.002)	0.823 (0.002)	-0.134 (0.003)	-0.126 (0.002)	-0.043 (0.002)
VCA County	0.017 (0.002)	0.029 (0.002)	-0.016 (0.004)	-0.016 (0.002)	-0.040 (0.003)
Year = 2024	-0.138 (0.001)	-0.140 (0.001)	--	--	--
County fixed effects	X	X			
N	1222246	1181273			
RMSE	0.461	0.456			

SOURCES: Political Data, Inc. (2020 voter file); California Secretary of State (2024 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. Data consist of voters ages 18 and 19.

TABLE A5

Effect of VCA and distance on continuing voters: 2018-2022

	All	Black	Latino	Asian	White/Other
VCA County	-0.010 (0.001)	-0.004 (0.005)	-0.024 (0.002)	0.005 (0.004)	0.000 (0.001)
Distance to voting	-0.054 (0.003)	-0.014 (0.015)	-0.067 (0.007)	-0.052 (0.011)	-0.038 (0.004)
Distance to voting > median	0.054 (0.004)	0.012 (0.016)	0.065 (0.007)	0.060 (0.013)	0.037 (0.004)
VCA X Distance	0.059 (0.006)	-0.071 (0.022)	0.050 (0.010)	-0.001 (0.018)	0.032 (0.008)
VCA X Distance > median	-0.050 (0.006)	0.076 (0.024)	-0.040 (0.011)	-0.013 (0.020)	-0.029 (0.008)
Mean-deviated: voters	X	X	X	X	X
Mean-deviated: years	X	X	X	X	X
N	1821979	90424	524795	201274	1005486
RMSE	0.343	0.347	0.369	0.362	0.321

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. Standard errors are clustered at the county level. Distance to in-person voting is centered around the sample median. The term for distance greater than the median is identical to the main distance term for values above the median, and zero for values below the median. Its coefficient can be added to the main term to identify the slope for values above the median. Because the median is roughly half a mile, the coefficients can be divided by two to get a sense of their total effect.

TABLE A6

Effect of VCA on continuing voters in 2022 VCA counties: 2018-2022

	All	Black	Latino	Asian	White/Other
2022 VCA County	-0.009 (0.001)	-0.008 (0.005)	-0.022 (0.002)	-0.011 (0.004)	-0.005 (0.001)
Mean-deviated: voters	X	X	X	X	X
Mean-deviated: years	X	X	X	X	X
N	978135	40808	249746	82310	605271
RMSE	0.336	0.351	0.365	0.362	0.317

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. Standard errors are clustered at the individual level.

TABLE A7

Effect of VCA on continuing voters in 2020 VCA counties: 2018-2022

	All	Black	Latino	Asian	White/Other
2020 VCA County	-0.018 (0.001)	0.003 (0.004)	-0.034 (0.002)	0.003 (0.003)	-0.002 (0.001)
Mean-deviated: voters	X	X	X	(X)	(X)
Mean-deviated: years	X	X	X	X	X
N	1295485	70512	393568	156217	675188
RMSE	0.344	0.344	0.368	0.361	0.321

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. Standard errors are clustered at the individual level.

TABLE A8

Effect of VCA on continuing voters in 2024 VCA counties: 2020-2024

	All	Black	Latino	Asian	White/Other
2024 VCA County	0.024 (0.002)	-0.004 (0.013)	0.016 (0.005)	-0.007 (0.007)	0.012 (0.002)
Mean-deviated: voters	X	X	X	X	X
Mean-deviated: years	X	X	X	X	X
N	1433590	76147	434799	195156	727488
RMSE	0.298	0.313	0.337	0.317	0.262

SOURCES: Political Data, Inc. (2020 voter file); California Secretary of State (2024 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2020 and 2024 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. Standard errors are clustered at the county level.

TABLE A9

Effect of VCA on continuing voters in 2022 VCA counties: 2020-2024

	All	Black	Latino	Asian	White/Other
2022 VCA County	0.008 (0.001)	-0.008 (0.003)	0.003 (0.001)	-0.003 (0.002)	0.003 (0.001)
Mean-deviated: voters	X	X	X	X	X
Mean-deviated: years	X	X	X	X	X
N	1924689	96024	575140	243632	1009893
RMSE	0.297	0.315	0.339	0.318	0.261

SOURCES: Political Data, Inc. (2020 voter file); California Secretary of State (2024 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2020 and 2024 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. Standard errors are clustered at the county level.

TABLE A10

Effect of VCA and distance on continuing voters by language preference: 2018-2022

	Latino: Foreign Language	Latino: English	Asian: Foreign Language	Asian: English
VCA County	-0.039 (0.006)	-0.028 (0.002)	0.001 (0.009)	-0.003 (0.003)
Mean-deviated: voters	X	X	X	X
Mean-deviated: years	X	X	X	X
N	52450	472352	26746	174530
RMSE	0.384	0.367	0.368	0.361

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A11

Effect of VCA and distance on continuing voters by language preference: 2020-2024

	Latino: Foreign Language	Latino: English	Asian: Foreign Language	Asian: English
VCA County	0.000 (0.005)	0.003 (0.002)	-0.021 (0.007)	-0.001 (0.002)
Mean-deviated: voters	X	X	X	X
Mean-deviated: years	X	X	X	X
N	58850	492302	31996	206766
RMSE	0.345	0.335	0.336	0.312

SOURCES: Political Data, Inc. (2020 voter file); California Secretary of State (2024 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2020 and 2024 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A12

Effect of VCA and distance on new young voters (18-19): 2018-2022

	(1)	(2) Main effects	(2) Black interactions	(2) Latino interactions	(2) Asian interactions
(Intercept)	0.526 (0.003)	0.605 (0.003)	-0.168 (0.005)	-0.156 (0.002)	-0.136 (0.004)
VCA County	-0.028 (0.003)	0.009 (0.003)	-0.020 (0.007)	-0.059 (0.003)	-0.019 (0.005)
Distance to voting	0.055 (0.006)	0.008 (0.009)	0.044 (0.025)	-0.012 (0.012)	0.004 (0.019)
Distance to voting > median	-0.051 (0.006)	-0.006 (0.009)	-0.039 (0.027)	0.008 (0.013)	0.007 (0.023)
VCA X Distance	-0.011 (0.010)	-0.009 (0.019)	-0.079 (0.047)	0.028 (0.023)	-0.160 (0.036)
VCA X Distance > median	0.025 (0.011)	0.008 (0.020)	0.097 (0.051)	-0.012 (0.024)	0.164 (0.040)
Year = 2022	-0.178 (0.002)	-0.175 (0.002)	--	--	--
County fixed effects	X	X			
N	870536	870016			
RMSE	0.473	0.466			

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. Data consist of voters ages 18 and 19. The main distance to voting coefficient is the slope of distance for distances below the median (about a half a mile), while the second distance to voting coefficient is the change in the interval 1 coefficient for distances over the median. The distance to voting variable is centered around its overall median so that the main VCA effect reflects the effect at the median distance.

TABLE A13

Effect of VCA on continuing voters by voting method in 2016: 2018-2022

	Vote method in 2016		
	Didn't vote	Voted by mail	Voted in person
VCA County	-0.013 (0.002)	0.000 (0.001)	-0.032 (0.002)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	483582	741852	557912
RMSE	0.343	0.319	0.365

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. The distance to voting variable is centered around its overall median so that the main VCA effect reflects the effect at the median distance.

TABLE A14

Effect of VCA on continuing voters by voting method in 2018: 2020-2024

	Vote method in 2018		
	Didn't vote	Voted by mail	Voted in person
VCA County	0.004 (0.001)	0.006 (0.001)	0.015 (0.001)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	809290	721794	368862
RMSE	0.361	0.219	0.249

SOURCES: Political Data, Inc. (2020 voter file); California Secretary of State (2024 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in both the 2020 and 2024 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity. The distance to voting variable is centered around its overall median so that the main VCA effect reflects the effect at the median distance.

TABLE A15

Effect of VCA on continuing voters by voting method in 2016: 2018-2022 Asian Americans

	Vote method in 2016		
	Didn't vote	Voted by mail	Voted in person
VCA County	-0.005 (0.005)	-0.002 (0.004)	-0.011 (0.007)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	68598	83920	44570
RMSE	0.350	0.354	0.387

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A16

Effect of VCA and distance on continuing voters by voting method in 2016: 2018-2022 Blacks

	Vote method in 2016		
	Didn't vote	Voted by mail	Voted in person
VCA County	0.004 (0.006)	0.006 (0.007)	0.004 (0.008)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	32314	25424	30934
RMSE	0.309	0.343	0.378

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A17

Effect of VCA and distance on continuing voters by voting method in 2016: 2018-2022 Latinos

	Vote method in 2016		
	Didn't vote	Voted by mail	Voted in person
VCA County	-0.024 (0.003)	-0.003 (0.003)	-0.047 (0.003)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	176132	148500	181978
RMSE	0.329	0.369	0.396

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A18

Effect of VCA and distance on continuing voters by voting method in 2016: 2018-2022 Whites

	Vote method in 2016		
	Didn't vote	Voted by mail	Voted in person
VCA County	-0.008 (0.003)	0.003 (0.001)	-0.011 (0.002)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	206538	484008	300430
RMSE	0.357	0.291	0.334

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A19

Effect of VCA and distance on continuing voters by voting method in 2018: 2020-2024 Asian Americans

	Vote method in 2018		
	Didn't vote	Voted by mail	Voted in person
VCA County	-0.003 (0.003)	-0.002 (0.003)	0.002 (0.005)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	124120	85286	29356
RMSE	0.365	0.244	0.257

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A20

Effect of VCA and distance on continuing voters by voting method in 2018: 2020-2024 Blacks

	Vote method in 2018		
	Didn't vote	Voted by mail	Voted in person
VCA County	-0.018 (0.006)	0.000 (0.005)	-0.005 (0.007)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	46720	25518	21386
RMSE	0.357	0.247	0.272

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A21

Effect of VCA and distance on continuing voters by voting method in 2018: 2020-2024 Latinos

	Vote method in 2018		
	Didn't vote	Voted by mail	Voted in person
VCA County	-0.002 (0.002)	0.003 (0.002)	0.012 (0.003)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	299936	137272	113950
RMSE	0.374	0.273	0.299

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.

TABLE A22

Effect of VCA and distance on continuing voters by voting method in 2018: 2020-2024 Whites

	Vote method in 2018		
	Didn't vote	Voted by mail	Voted in person
VCA County	0.002 (0.002)	0.003 (0.001)	0.004 (0.001)
Mean-deviated: voters	X	X	X
Mean-deviated: years	X	X	X
N	338514	473718	204170
RMSE	0.347	0.192	0.210

SOURCES: Political Data, Inc. (2018 voter file); California Secretary of State (2022 voter file). Race and ethnicity are imputed at the block level using the WRU package for R, version 1.0.1.

NOTES: Standard errors in parentheses. The data consist of voters who were registered somewhere in the state in the both the 2018 and 2022 general elections. The data are mean-deviated by individual voter and year, thus modeling the change within individuals in vote propensity.



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