

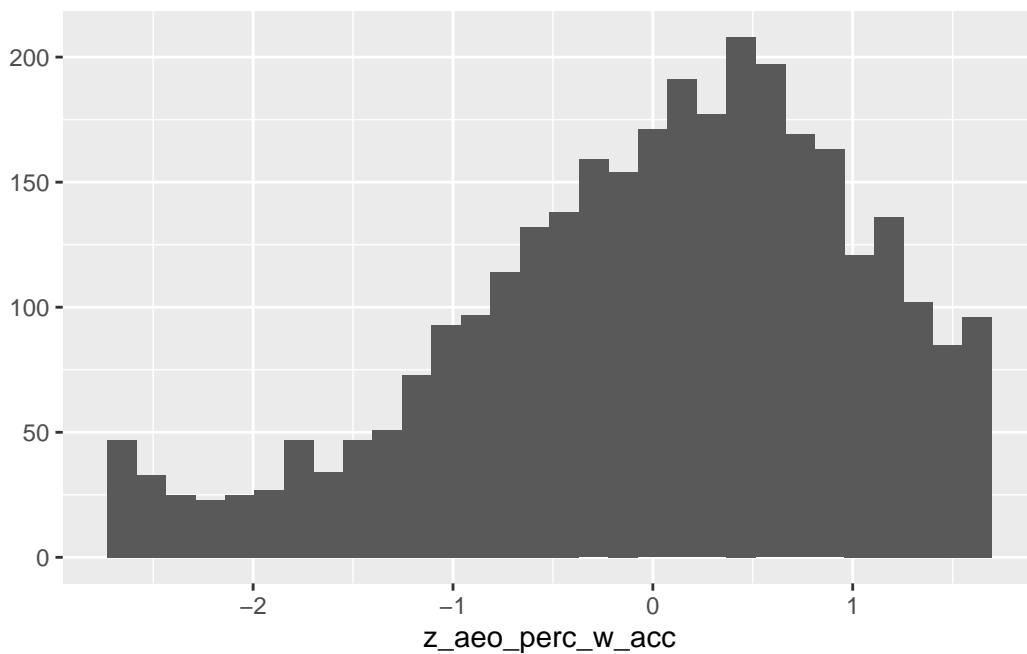
# Government Model

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Updated 11-9-23; Change made: removed *z\_uc\_percent* as an IV

DV Histogram (Access to Exercise Opportunities)

```
ggplot(data = Z_and_Final_Variables_10.28.22, mapping = aes(x = z_aeo_perc_w_acc)) +  
  geom_histogram() + labs(y = NULL)
```



```
options(scipen = 990) #turning off scientific notation for coefficients
```

## Government Model Groupings

### Outcome: Access to Exercise Opportunities

#### IVs: Demographics Only (9 variables)

```
z_aeo_just_demos <- lm(formula = z_aeo_perc_w_acc ~ z_ACS_PCT_BLACK +  
  z_ACS_PCT_HISPAN + z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB +  
  z_SVI_RPL_THEME3_MINO + z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL +  
  z_ACS_PCT_NON_CITIZEN + z_ACS_MEDIAN_AGE, data = Z_and_Final_Variables_10.28.22)  
summary(z_aeo_just_demos)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_ACS_PCT_BLACK + z_ACS_PCT_HISPAN +  
  z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB + z_SVI_RPL_THEME3_MINO +  
  z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL + z_ACS_PCT_NON_CITIZEN +  
  z_ACS_MEDIAN_AGE, data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.4116	-0.4552	0.1058	0.5560	2.4980

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.0009264	0.0153111	0.061	0.951759
z_ACS_PCT_BLACK	-0.1575983	0.0206763	-7.622	0.00000000000000329
z_ACS_PCT_HISPAN	-0.1318212	0.0276019	-4.776	0.0000018723684352
z_SVI_RPL_THEME1_SOCIECO	-0.4032064	0.0247732	-16.276	< 0.00000000000000002
z_SVI_RPL_THEME2_HH_DISB	-0.0539570	0.0210128	-2.568	0.010280
z_SVI_RPL_THEME3_MINO	0.1901056	0.0277886	6.841	0.00000000000094155
z_SVI_RPL_THEME4_HH_TRANS	0.2712781	0.0204611	13.258	< 0.00000000000000002
z_ACS_PCT_ENGL_NOT_WELL	-0.0074097	0.0437330	-0.169	0.865469
z_ACS_PCT_NON_CITIZEN	0.1482130	0.0395776	3.745	0.000184
z_ACS_MEDIAN_AGE	-0.0570775	0.0183681	-3.107	0.001904

(Intercept)

z_ACS_PCT_BLACK	***
z_ACS_PCT_HISPAN	***
z_SVI_RPL_THEME1_SOCIECO	***
z_SVI_RPL_THEME2_HH_DISB	*

```

z_SVI_RPL_THEME3_MINO      ***
z_SVI_RPL_THEME4_HH_TRANS ***
z_ACS_PCT_ENGL_NOT_WELL
z_ACS_PCT_NON_CITIZEN      ***
z_ACS_MEDIAN_AGE           **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8571 on 3124 degrees of freedom
(7 observations deleted due to missingness)
Multiple R-squared:  0.2676,    Adjusted R-squared:  0.2655
F-statistic: 126.8 on 9 and 3124 DF,  p-value: < 0.00000000000000022

```

## Confidence Intervals for Demographic IVs

```
confint(z_aeo_just_demos)
```

	2.5 %	97.5 %
(Intercept)	-0.02909447	0.03094720
z_ACS_PCT_BLACK	-0.19813876	-0.11705784
z_ACS_PCT_HISPAN	-0.18594096	-0.07770146
z_SVI_RPL_THEME1_SOCIECO	-0.45177985	-0.35463286
z_SVI_RPL_THEME2_HH_DISB	-0.09515738	-0.01275668
z_SVI_RPL_THEME3_MINO	0.13561977	0.24459144
z_SVI_RPL_THEME4_HH_TRANS	0.23115957	0.31139660
z_ACS_PCT_ENGL_NOT_WELL	-0.09315805	0.07833862
z_ACS_PCT_NON_CITIZEN	0.07061234	0.22581370
z_ACS_MEDIAN_AGE	-0.09309223	-0.02106269

## VIF for Demographic IVs

```
vif(z_aeo_just_demos)
```

z_ACS_PCT_BLACK	z_ACS_PCT_HISPAN	z_SVI_RPL_THEME1_SOCIECO
1.825872	3.234385	2.616529
z_SVI_RPL_THEME2_HH_DISB	z_SVI_RPL_THEME3_MINO	z_SVI_RPL_THEME4_HH_TRANS
1.881629	3.294866	1.784910
z_ACS_PCT_ENGL_NOT_WELL	z_ACS_PCT_NON_CITIZEN	z_ACS_MEDIAN_AGE
8.170962	6.692005	1.434752

## Outcome: Access to Exercise Opportunities

### IVs: Food & Housing Only (14 variables)

```
z_aeo_just_foodhouse <- lm(formula = z_aeo_perc_w_acc ~ z_food_afford +
  z_fd_enviro_indx + z_fi_percent + z_ACS_PCT_FOOD_STAMP +
  z_childelig_lunch_perc + z_shp_percent + z_shcb_percent +
  z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD + z_ACS_PCT_RENT_COST_30PCT +
  z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH + z_ACS_PCT_OWNER_HH_CHILD +
  z_ACS_MEDIAN_HOME_VALUE, data = Z_and_Final_Variables_10.28.22)
summary(z_aeo_just_foodhouse)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_food_afford + z_fd_enviro_indx +
  z_fi_percent + z_ACS_PCT_FOOD_STAMP + z_childelig_lunch_perc +
  z_shp_percent + z_shcb_percent + z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD +
  z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
  z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE, data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-2.7239	-0.4281	0.0732	0.4704	3.2343

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.009889	0.014811	0.668	0.5044
z_food_afford	-0.158113	0.023467	-6.738	0.00000000001949 ***
z_fd_enviro_indx	0.178150	0.025642	6.948	0.00000000000461 ***
z_fi_percent	-0.012613	0.030099	-0.419	0.6752
z_ACS_PCT_FOOD_STAMP	0.143023	0.028570	5.006	0.00000059039281 ***
z_childelig_lunch_perc	-0.024963	0.026431	-0.944	0.3450
z_shp_percent	0.180585	0.027231	6.632	0.000000000003978 ***
z_shcb_percent	-0.059366	0.029680	-2.000	0.0456 *
z_ACS_PCT_NO_VEH	-0.022827	0.021007	-1.087	0.2773
z_ACS_PCT_RENTER_HH_CHILD	-0.121917	0.017814	-6.844	0.000000000000944 ***
z_ACS_PCT_RENT_COST_30PCT	0.085369	0.021227	4.022	0.00005931803594 ***
z_ACS_PCT_MOBILE_HOME	-0.268691	0.020331	-13.216	< 0.0000000000000002 ***
z_ACS_PCT_OWNED_HH	-0.180357	0.021050	-8.568	< 0.0000000000000002 ***
z_ACS_PCT_OWNER_HH_CHILD	0.037126	0.017481	2.124	0.0338 *
z_ACS_MEDIAN_HOME_VALUE	0.165154	0.022630	7.298	0.000000000000038 ***

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.7708 on 2771 degrees of freedom

(355 observations deleted due to missingness)

Multiple R-squared: 0.4188, Adjusted R-squared: 0.4159

F-statistic: 142.6 on 14 and 2771 DF, p-value: < 0.000000000000000022

## Confidence Intervals for Food & Housing IVs

```
confint(z_aeo_just_foodhouse)
```

	2.5 %	97.5 %
(Intercept)	-0.019153258	0.038930481
z_food_afford	-0.204126710	-0.112098921
z_fd_enviro_indx	0.127870925	0.228428668
z_fi_percent	-0.071632147	0.046406323
z_ACS_PCT_FOOD_STAMP	0.087002100	0.199043345
z_childelig_lunch_perc	-0.076790358	0.026864420
z_shp_percent	0.127189720	0.233980128
z_shcb_percent	-0.117563510	-0.001168741
z_ACS_PCT_NO_VEH	-0.064017698	0.018364657
z_ACS_PCT_RENTER_HH_CHILD	-0.156846181	-0.086987747
z_ACS_PCT_RENT_COST_30PCT	0.043746559	0.126990947
z_ACS_PCT_MOBILE_HOME	-0.308555631	-0.228826030
z_ACS_PCT_OWNED_HH	-0.221632490	-0.139081275
z_ACS_PCT_OWNER_HH_CHILD	0.002849079	0.071402754
z_ACS_MEDIAN_HOME_VALUE	0.120779788	0.209528216

## VIF for Food & Housing IVs

```
vif(z_aeo_just_foodhouse)
```

z_food_afford	z_fd_enviro_indx	z_fi_percent
2.570074	3.111423	4.287987
z_ACS_PCT_FOOD_STAMP	z_childelig_lunch_perc	z_shp_percent
3.754121	2.619590	3.414855
z_shcb_percent	z_ACS_PCT_NO_VEH	z_ACS_PCT_RENTER_HH_CHILD

	4.185768	1.910118	1.498304
z_ACS_PCT_RENT_COST_30PCT		z_ACS_PCT_MOBILE_HOME	z_ACS_PCT_OWNED_HH
	2.107373	1.967663	2.050265
z_ACS_PCT_OWNER_HH_CHILD		z_ACS_MEDIAN_HOME_VALUE	
	1.457420	2.345365	

## Outcome: Access to Exercise Opportunities

### IVs: Education (3 variables)

```
z_aeo_just_ed <- lm(formula = z_aeo_perc_w_acc ~ z_hsg_rate +
  z_sc_percent + z_ms_average, data = Z_and_Final_Variables_10.28.22)
summary(z_aeo_just_ed)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_hsg_rate + z_sc_percent + z_ms_average,
    data = Z_and_Final_Variables_10.28.22)
```

Residuals:

	Min	1Q	Median	3Q	Max
	-3.07770	-0.48716	0.09847	0.56034	2.64444

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.02608	0.01755	1.486	0.1375
z_hsg_rate	-0.14232	0.01918	-7.420	0.0000000000000163 ***
z_sc_percent	0.46617	0.01876	24.850	< 0.0000000000000002 ***
z_ms_average	0.03702	0.01821	2.033	0.0421 *

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8431 on 2323 degrees of freedom

(814 observations deleted due to missingness)

Multiple R-squared: 0.2377, Adjusted R-squared: 0.2367

F-statistic: 241.5 on 3 and 2323 DF, p-value: < 0.00000000000000022

## Confidence Intervals for Education IVs

```
confint(z_aeo_just_ed)
```

	2.5 %	97.5 %
(Intercept)	-0.008338814	0.06048903
z_hsg_rate	-0.179928288	-0.10470569
z_sc_percent	0.429387250	0.50296091
z_ms_average	0.001318939	0.07272418

## VIF for Education IVs

```
vif(z_aeo_just_ed)
```

z_hsg_rate	z_sc_percent	z_ms_average
1.022551	1.083295	1.098559

## Outcome: Access to Exercise Opportunities

### IVs: Technology (3 variables)

```
z_aeo_just_tech <- lm(formula = z_aeo_perc_w_acc ~ z_ACS_PCT_BROADBAND +  
  z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE, data = Z_and_Final_Variables_10.28.22)  
summary(z_aeo_just_tech)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_ACS_PCT_BROADBAND + z_ACS_PCT_NO_PC +  
  z_ACS_PCT_SMARTPHONE, data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.1461	-0.4706	0.1025	0.5333	3.1263

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-0.00005288	0.01506257	-0.004	0.997199

```

z_ACS_PCT_BROADBAND    0.35874824    0.04258707    8.424 < 0.00000000000000002 ***
z_ACS_PCT_NO_PC        -0.14308669    0.03904557   -3.665          0.000252 ***
z_ACS_PCT_SMARTPHONE   -0.07604987    0.01895769   -4.012          0.0000617 ***
---

```

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8434 on 3131 degrees of freedom

(6 observations deleted due to missingness)

Multiple R-squared: 0.2894, Adjusted R-squared: 0.2887

F-statistic: 425.1 on 3 and 3131 DF, p-value: < 0.000000000000000022

## Confidence Intervals for Technology IVs

```
confint(z_aeo_just_tech)
```

	2.5 %	97.5 %
(Intercept)	-0.0295864	0.02948064
z_ACS_PCT_BROADBAND	0.2752468	0.44224964
z_ACS_PCT_NO_PC	-0.2196442	-0.06652918
z_ACS_PCT_SMARTPHONE	-0.1132206	-0.03887912

## VIF for Technology IVs

```
vif(z_aeo_just_tech)
```

z_ACS_PCT_BROADBAND	z_ACS_PCT_NO_PC	z_ACS_PCT_SMARTPHONE
7.996637	6.719928	1.568602

## Outcome: Access to Exercise Opportunities

### IVs: HWCC (7 variables)

```

z_aeo_just_HWCC <- lm(formula = z_aeo_perc_w_acc ~ z_pphd_avgnum +
  z_pmhd_avgnum + z_lbw_percent_lbw + z_pi_phy_inact + z_cip_perc +
  z_csph_perc + z_ACS_PCT_CHILD_DISAB, data = Z_and_Final_Variables_10.28.22)
summary(z_aeo_just_HWCC)

```



Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_pphd_avgnum + z_pmhd_avgnum +  
    z_lbwt_percent_lbwt + z_pi_phy_inact + z_cip_perc + z_csph_perc +  
    z_ACS_PCT_CHILD_DISAB, data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.0287	-0.4542	0.0993	0.5463	3.2040

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.033768	0.015084	2.239	0.025245 *
z_pphd_avgnum	-0.188441	0.049731	-3.789	0.000154 ***
z_pmhd_avgnum	0.156031	0.044518	3.505	0.000463 ***
z_lbwt_percent_lbwt	-0.014634	0.020134	-0.727	0.467393
z_pi_phy_inact	-0.299119	0.018122	-16.505	< 0.0000000000000002 ***
z_cip_perc	-0.322107	0.029260	-11.008	< 0.0000000000000002 ***
z_csph_perc	0.224539	0.022430	10.011	< 0.0000000000000002 ***
z_ACS_PCT_CHILD_DISAB	-0.008469	0.016758	-0.505	0.613326

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8292 on 3024 degrees of freedom

(109 observations deleted due to missingness)

Multiple R-squared: 0.2618, Adjusted R-squared: 0.2601

F-statistic: 153.2 on 7 and 3024 DF, p-value: < 0.00000000000000022

## Confidence Intervals for HWCC IVs

```
confint(z_aeo_just_HWCC)
```

	2.5 %	97.5 %
(Intercept)	0.004193255	0.06334368
z_pphd_avgnum	-0.285951216	-0.09093000
z_pmhd_avgnum	0.068742880	0.24331846
z_lbwt_percent_lbwt	-0.054112119	0.02484425
z_pi_phy_inact	-0.334652152	-0.26358522
z_cip_perc	-0.379479145	-0.26473518
z_csph_perc	0.180559793	0.26851756
z_ACS_PCT_CHILD_DISAB	-0.041327484	0.02438903

## VIF for HWCC IVs

```
vif(z_aeo_just_HWCC)
```

z_pphd_avgnum	z_pmhd_avgnum	z_lbw_percent_lbw
10.774927	8.539125	1.785515
z_pi_phy_inact	z_cip_perc	z_csph_perc
1.468884	3.796455	2.123869
z_ACS_PCT_CHILD_DISAB		
1.165504		

## Outcome: Access to Exercise Opportunities

### IVs: Health A (7 variables)

```
z_aeo_just_healthA <- lm(formula = z_aeo_perc_w_acc ~ z_phys_per_cap +  
  z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc + z_opcp_rate +  
  z_TeenBirths, data = Z_and_Final_Variables_10.28.22)  
summary(z_aeo_just_healthA)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_phys_per_cap + z_mhp_per_cap +  
  z_dents_per_cap + z_uninsur_perc + z_opcp_rate + z_TeenBirths,  
  data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-4.1100	-0.4469	0.0910	0.5208	2.7363

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-0.001402	0.014904	-0.094	0.925
z_phys_per_cap	0.189354	0.021317	8.883	<0.0000000000000002 ***
z_mhp_per_cap	0.011533	0.019498	0.591	0.554
z_dents_per_cap	0.322230	0.020514	15.708	<0.0000000000000002 ***
z_uninsur_perc	-0.132767	0.015506	-8.562	<0.0000000000000002 ***
z_opcp_rate	-0.005169	0.017417	-0.297	0.767
z_TeenBirths	0.135897	0.015665	8.675	<0.0000000000000002 ***

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8173 on 3002 degrees of freedom

(132 observations deleted due to missingness)

Multiple R-squared: 0.3337, Adjusted R-squared: 0.3324

F-statistic: 250.6 on 6 and 3002 DF, p-value: < 0.000000000000000022

## Confidence Intervals for Health A IVs

```
confint(z_aeo_just_healthA)
```

	2.5 %	97.5 %
(Intercept)	-0.03062573	0.02782171
z_phys_per_cap	0.14755634	0.23115116
z_mhp_per_cap	-0.02669847	0.04976481
z_dents_per_cap	0.28200721	0.36245291
z_uninsur_perc	-0.16317019	-0.10236398
z_opcp_rate	-0.03931971	0.02898143
z_TeenBirths	0.10518123	0.16661249

## VIF for Health A IVs

```
vif(z_aeo_just_healthA)
```

z_phys_per_cap	z_mhp_per_cap	z_dents_per_cap	z_uninsur_perc	z_opcp_rate
2.014311	1.677533	1.901175	1.092618	1.343027
z_TeenBirths				
1.148399				

## Outcome: Access to Exercise Opportunities

### IVs: Health B (5 variables)

```
z_aeo_just_healthB <- lm(formula = z_aeo_perc_w_acc ~ z_phs_rate +  
  z_ms_perc_ann + z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC,  
  data = Z_and_Final_Variables_10.28.22)  
summary(z_aeo_just_healthB)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_phs_rate + z_ms_perc_ann +  
  z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC, data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.0361	-0.5071	0.1211	0.6290	2.7206

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.02023	0.01632	1.240	0.2150
z_phs_rate	-0.22077	0.01707	-12.933	< 0.0000000000000002 ***
z_ms_perc_ann	0.14752	0.01727	8.541	< 0.0000000000000002 ***
z_AMFAR_AMATFAC	0.19320	0.01627	11.873	< 0.0000000000000002 ***
z_MP_PERCPEN	0.08252	0.01689	4.887	0.00000108 ***
z_AHRF_RURAL_H_CLINIC	-0.03141	0.01634	-1.922	0.0547 .

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8978 on 3024 degrees of freedom

(111 observations deleted due to missingness)

Multiple R-squared: 0.1509, Adjusted R-squared: 0.1495

F-statistic: 107.5 on 5 and 3024 DF, p-value: < 0.00000000000000022

### Confidence Intervals for Health B IVs

```
confint(z_aeo_just_healthB)
```

	2.5 %	97.5 %
(Intercept)	-0.01175744	0.0522222191
z_phs_rate	-0.25424598	-0.1873013325
z_ms_perc_ann	0.11365613	0.1813900061
z_AMFAR_AMATFAC	0.16129656	0.2251118336
z_MP_PERCPEN	0.04941105	0.1156329860
z_AHRF_RURAL_H_CLINIC	-0.06345071	0.0006339338

## VIF for Health B IVs

```
vif(z_aeo_just_healthB)
```

z_phs_rate	z_ms_perc_ann	z_AMFAR_AMATFAC
1.086643	1.082685	1.030124
z_MP_PERCPEN	z_AHRF_RURAL_H_CLINIC	
1.073504	1.026653	

## Outcome: Access to Exercise Opportunities

### IVs: Business (4 variables)

```
z_aeo_just_bus <- lm(formula = z_aeo_perc_w_acc ~ z_unemp_perc +
  z_ACS_GINI_INDEX + z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR,
  data = Z_and_Final_Variables_10.28.22)
summary(z_aeo_just_bus)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_unemp_perc + z_ACS_GINI_INDEX +
  z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR, data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.4053	-0.5016	0.1231	0.6190	2.3430

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.001558	0.015977	0.098	0.92234

z_unemp_perc	0.055460	0.018627	2.977	0.00293	**
z_ACS_GINI_INDEX	0.097526	0.017721	5.503	0.0000000402841	***
z_ACS_MEDIAN_HH_INCOME	0.475558	0.018510	25.692	< 0.0000000000000002	***
z_ACS_PCT_WORK_NO_CAR	0.122092	0.018445	6.619	0.0000000000424	***

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8941 on 3128 degrees of freedom

(8 observations deleted due to missingness)

Multiple R-squared: 0.2013, Adjusted R-squared: 0.2003

F-statistic: 197.1 on 4 and 3128 DF, p-value: < 0.00000000000000022

## Confidence Intervals for Business IVs

```
confint(z_aeo_just_bus)
```

	2.5 %	97.5 %
(Intercept)	-0.02976839	0.03288388
z_unemp_perc	0.01893845	0.09198231
z_ACS_GINI_INDEX	0.06277913	0.13227246
z_ACS_MEDIAN_HH_INCOME	0.43926486	0.51185157
z_ACS_PCT_WORK_NO_CAR	0.08592532	0.15825771

## VIF for Business IVs

```
vif(z_aeo_just_bus)
```

z_unemp_perc	z_ACS_GINI_INDEX	z_ACS_MEDIAN_HH_INCOME
1.279680	1.224683	1.342457
z_ACS_PCT_WORK_NO_CAR		
1.094151		

## Outcome: Access to Exercise Opportunities

### IVs: Government (4 variables; removed AEO)

```
z_aeo_just_gov <- lm(formula = z_aeo_perc_w_acc ~ z_soc_assoc_num +  
  z_dwv_presence + z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL,  
  data = Z_and_Final_Variables_10.28.22)  
summary(z_aeo_just_gov)
```

Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_soc_assoc_num + z_dwv_presence +  
  z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL, data = Z_and_Final_Variables_10.28.22)
```

Residuals:

Min	1Q	Median	3Q	Max
-6.9391	-0.5332	0.1478	0.6587	1.8610

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-0.01714	0.01667	-1.028	0.30391
z_soc_assoc_num	0.32408	0.01717	18.876	< 0.0000000000000002 ***
z_dwv_presence	0.07181	0.01687	4.257	0.0000214 ***
z_ACS_PCT_HH_PUB_ASSIST	0.04022	0.01722	2.335	0.01961 *
z_AHRF_TXC_SITE_NO_CNTRL	0.05357	0.01712	3.129	0.00177 **

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9266 on 3086 degrees of freedom

(50 observations deleted due to missingness)

Multiple R-squared: 0.1328, Adjusted R-squared: 0.1317

F-statistic: 118.2 on 4 and 3086 DF, p-value: < 0.00000000000000022

### Confidence Intervals for Government IVs

```
confint(z_aeo_just_gov)
```

	2.5 %	97.5 %
(Intercept)	-0.049824274	0.01554358

z_soc_assoc_num	0.290414558	0.35774060
z_dwv_presence	0.038732485	0.10488416
z_ACS_PCT_HH_PUB_ASSIST	0.006446064	0.07398680
z_AHRF_TXC_SITE_NO_CNTRL	0.020002243	0.08714361

## VIF for Government IVs

```
vif(z_aeo_just_gov)
```

z_soc_assoc_num	z_dwv_presence	z_ACS_PCT_HH_PUB_ASSIST
1.073226	1.023884	1.009635
z_AHRF_TXC_SITE_NO_CNTRL		
1.060408		

## Full Government Model

### Outcome: Access to Exercise Opportunities

#### IVs: 56

```
z_aeo_levels_12345678 <- lm(formula = z_aeo_perc_w_acc ~ z_ACS_PCT_BLACK +
  z_ACS_PCT_HISPAN + z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB +
  z_SVI_RPL_THEME3_MINO + z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL +
  z_ACS_PCT_NON_CITIZEN + z_ACS_MEDIAN_AGE + z_food_afford +
  z_fd_enviro_indx + z_fi_percent + z_ACS_PCT_FOOD_STAMP +
  z_childelig_lunch_perc + z_shp_percent + z_shcb_percent +
  z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD + z_ACS_PCT_RENT_COST_30PCT +
  z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH + z_ACS_PCT_OWNER_HH_CHILD +
  z_ACS_MEDIAN_HOME_VALUE + z_hsg_rate + z_sc_percent + z_ms_average +
  z_ACS_PCT_BROADBAND + z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE +
  z_pphd_avgnum + z_pmhd_avgnum + z_lbw_percent_lbw + z_pi_phy_inact +
  z_cip_perc + z_csph_perc + z_ACS_PCT_CHILD_DISAB + z_phys_per_cap +
  z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc + z_opcp_rate +
  z_TeenBirths + z_phs_rate + z_ms_perc_ann + z_AMFAR_AMATFAC +
  z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC + z_unemp_perc + z_ACS_GINI_INDEX +
  z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR + z_soc_assoc_num +
  z_dwv_presence + z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL,
  data = Z_and_Final_Variables_10.28.22)
summary(z_aeo_levels_12345678)
```



Call:

```
lm(formula = z_aeo_perc_w_acc ~ z_ACS_PCT_BLACK + z_ACS_PCT_HISPAN +
    z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB + z_SVI_RPL_THEME3_MINO +
    z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL + z_ACS_PCT_NON_CITIZEN +
    z_ACS_MEDIAN_AGE + z_food_afford + z_fd_enviro_indx + z_fi_percent +
    z_ACS_PCT_FOOD_STAMP + z_childelig_lunch_perc + z_shp_percent +
    z_shcb_percent + z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD +
    z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
    z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE + z_hsg_rate +
    z_sc_percent + z_ms_average + z_ACS_PCT_BROADBAND + z_ACS_PCT_NO_PC +
    z_ACS_PCT_SMARTPHONE + z_pphd_avgnum + z_pmhd_avgnum + z_lbw_percent_lbw +
    z_pi_phy_inact + z_cip_perc + z_csph_perc + z_ACS_PCT_CHILD_DISAB +
    z_phys_per_cap + z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc +
    z_opcp_rate + z_TeenBirths + z_phs_rate + z_ms_perc_ann +
    z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC +
    z_unemp_perc + z_ACS_GINI_INDEX + z_ACS_MEDIAN_HH_INCOME +
    z_ACS_PCT_WORK_NO_CAR + z_soc_assoc_num + z_dwv_presence +
    z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL, data = Z_and_Final_Variables_10.28.2
```

Residuals:

	Min	1Q	Median	3Q	Max
	-2.75103	-0.36641	0.04116	0.40723	2.39558

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.064071	0.016846	3.803	0.000147 ***
z_ACS_PCT_BLACK	-0.201274	0.035025	-5.747	0.0000000104758 ***
z_ACS_PCT_HISPAN	0.017561	0.035892	0.489	0.624700
z_SVI_RPL_THEME1_SOCIECO	-0.046801	0.048739	-0.960	0.337052
z_SVI_RPL_THEME2_HH_DISB	-0.046766	0.027063	-1.728	0.084131 .
z_SVI_RPL_THEME3_MINO	0.051357	0.032940	1.559	0.119123
z_SVI_RPL_THEME4_HH_TRANS	0.066753	0.026010	2.566	0.010346 *
z_ACS_PCT_ENGL_NOT_WELL	0.097208	0.051471	1.889	0.059090 .
z_ACS_PCT_NON_CITIZEN	0.058087	0.047043	1.235	0.217057
z_ACS_MEDIAN_AGE	0.068470	0.037815	1.811	0.070340 .
z_food_afford	-0.039191	0.030316	-1.293	0.196245
z_fd_enviro_indx	0.145559	0.034073	4.272	0.0000202632268 ***
z_fi_percent	0.050345	0.047863	1.052	0.292992
z_ACS_PCT_FOOD_STAMP	0.118664	0.041128	2.885	0.003952 **
z_childelig_lunch_perc	-0.036188	0.033738	-1.073	0.283557
z_shp_percent	-0.063595	0.040074	-1.587	0.112684
z_shcb_percent	0.040276	0.038069	1.058	0.290186

z_ACS_PCT_NO_VEH	0.015971	0.058225	0.274	0.783886	
z_ACS_PCT_RENTER_HH_CHILD	-0.081323	0.023047	-3.529	0.000427	***
z_ACS_PCT_RENT_COST_30PCT	0.052770	0.024894	2.120	0.034143	*
z_ACS_PCT_MOBILE_HOME	-0.171435	0.025621	-6.691	0.0000000000285	***
z_ACS_PCT_OWNED_HH	-0.122103	0.033594	-3.635	0.000285	***
z_ACS_PCT_OWNER_HH_CHILD	0.004068	0.033563	0.121	0.903548	
z_ACS_MEDIAN_HOME_VALUE	-0.027038	0.041658	-0.649	0.516382	
z_hsg_rate	-0.097178	0.019840	-4.898	0.0000010442129	***
z_sc_percent	0.052562	0.029861	1.760	0.078524	.
z_ms_average	0.037058	0.034431	1.076	0.281917	
z_ACS_PCT_BROADBAND	0.039382	0.046420	0.848	0.396319	
z_ACS_PCT_NO_PC	-0.147438	0.046824	-3.149	0.001663	**
z_ACS_PCT_SMARTPHONE	-0.097910	0.024592	-3.981	0.0000709017615	***
z_pphd_avgnum	-0.163681	0.058364	-2.804	0.005087	**
z_pmhd_avgnum	0.169375	0.051464	3.291	0.001015	**
z_lbw_percent_lbw	0.119226	0.026865	4.438	0.0000095658300	***
z_pi_phy_inact	-0.010102	0.022320	-0.453	0.650881	
z_cip_perc	0.029038	0.045465	0.639	0.523104	
z_csph_perc	0.069956	0.031874	2.195	0.028295	*
z_ACS_PCT_CHILD_DISAB	-0.016869	0.018069	-0.934	0.350631	
z_phys_per_cap	0.091874	0.026529	3.463	0.000545	***
z_mhp_per_cap	-0.046458	0.023275	-1.996	0.046060	*
z_dents_per_cap	0.096967	0.026439	3.668	0.000251	***
z_uninsur_perc	-0.023640	0.028910	-0.818	0.413621	
z_opcp_rate	0.018494	0.020751	0.891	0.372917	
z_TeenBirths	-0.092799	0.053156	-1.746	0.081000	.
z_phs_rate	-0.038969	0.019135	-2.037	0.041822	*
z_ms_perc_ann	-0.018693	0.022192	-0.842	0.399704	
z_AMFAR_AMATFAC	0.006183	0.022722	0.272	0.785561	
z_MP_PERCPEN	0.010411	0.017842	0.584	0.559600	
z_AHRF_RURAL_H_CLINIC	-0.006504	0.015599	-0.417	0.676764	
z_unemp_perc	0.083236	0.026267	3.169	0.001553	**
z_ACS_GINI_INDEX	-0.054258	0.023680	-2.291	0.022049	*
z_ACS_MEDIAN_HH_INCOME	-0.002259	0.055721	-0.041	0.967669	
z_ACS_PCT_WORK_NO_CAR	-0.050275	0.048789	-1.030	0.302916	
z_soc_assoc_num	0.121263	0.059793	2.028	0.042685	*
z_dwv_presence	-0.006482	0.016218	-0.400	0.689461	
z_ACS_PCT_HH_PUB_ASSIST	-0.037021	0.021391	-1.731	0.083668	.
z_AHRF_TXC_SITE_NO_CNTRL	0.020969	0.016656	1.259	0.208206	

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6751 on 2044 degrees of freedom

(1041 observations deleted due to missingness)  
Multiple R-squared: 0.5129, Adjusted R-squared: 0.4998  
F-statistic: 39.14 on 55 and 2044 DF, p-value: < 0.000000000000000022

## Confidence Intervals for Full Government Model IVs

```
confint(z_aeo_levels_12345678)
```

	2.5 %	97.5 %
(Intercept)	0.031033368	0.0971086153
z_ACS_PCT_BLACK	-0.269963464	-0.1325855089
z_ACS_PCT_HISPAN	-0.052827780	0.0879499570
z_SVI_RPL_THEME1_SOCIECO	-0.142384086	0.0487825506
z_SVI_RPL_THEME2_HH_DISB	-0.099840023	0.0063078091
z_SVI_RPL_THEME3_MINO	-0.013242080	0.1159568770
z_SVI_RPL_THEME4_HH_TRANS	0.015743487	0.1177619639
z_ACS_PCT_ENGL_NOT_WELL	-0.003733988	0.1981500635
z_ACS_PCT_NON_CITIZEN	-0.034169822	0.1503448017
z_ACS_MEDIAN_AGE	-0.005689750	0.1426304461
z_food_afford	-0.098644553	0.0202626255
z_fd_enviro_indx	0.078737532	0.2123799345
z_fi_percent	-0.043520770	0.1442106939
z_ACS_PCT_FOOD_STAMP	0.038006529	0.1993209379
z_childelig_lunch_perc	-0.102351940	0.0299751509
z_shp_percent	-0.142185197	0.0149957444
z_shcb_percent	-0.034381323	0.1149339823
z_ACS_PCT_NO_VEH	-0.098215683	0.1301572352
z_ACS_PCT_RENTER_HH_CHILD	-0.126521843	-0.0361242786
z_ACS_PCT_RENT_COST_30PCT	0.003950046	0.1015893216
z_ACS_PCT_MOBILE_HOME	-0.221681470	-0.1211893403
z_ACS_PCT_OWNED_HH	-0.187985920	-0.0562202176
z_ACS_PCT_OWNER_HH_CHILD	-0.061753005	0.0698883407
z_ACS_MEDIAN_HOME_VALUE	-0.108733231	0.0546579535
z_hsg_rate	-0.136087731	-0.0582687001
z_sc_percent	-0.005999881	0.1111231691
z_ms_average	-0.030465231	0.1045820189
z_ACS_PCT_BROADBAND	-0.051652795	0.1304170080
z_ACS_PCT_NO_PC	-0.239266091	-0.0556095355
z_ACS_PCT_SMARTPHONE	-0.146137827	-0.0496825325
z_pphd_avgnum	-0.278139576	-0.0492224134
z_pmhd_avgnum	0.068446511	0.2703026412

z_lbw_percent_lbw	0.066540128	0.1719122693
z_pi_phy_inact	-0.053874315	0.0336700472
z_cip_perc	-0.060125517	0.1182008561
z_csph_perc	0.007446106	0.1324653040
z_ACS_PCT_CHILD_DISAB	-0.052303386	0.0185663531
z_phys_per_cap	0.039846404	0.1439008576
z_mhp_per_cap	-0.092103267	-0.0008129848
z_dents_per_cap	0.045115843	0.1488180297
z_uninsur_perc	-0.080335380	0.0330560152
z_opcp_rate	-0.022201523	0.0591885980
z_TeenBirths	-0.197045013	0.0114471999
z_phs_rate	-0.076493896	-0.0014435674
z_ms_perc_ann	-0.062213376	0.0248280912
z_AMFAR_AMATFAC	-0.038378171	0.0507443312
z_MP_PERCPEN	-0.024578565	0.0454009187
z_AHRF_RURAL_H_CLINIC	-0.037094634	0.0240871451
z_unemp_perc	0.031723157	0.1347496538
z_ACS_GINI_INDEX	-0.100697059	-0.0078180553
z_ACS_MEDIAN_HH_INCOME	-0.111534589	0.1070170157
z_ACS_PCT_WORK_NO_CAR	-0.145955828	0.0454059905
z_soc_assoc_num	0.004001611	0.2385250658
z_dwv_presence	-0.038288061	0.0253248548
z_ACS_PCT_HH_PUB_ASSIST	-0.078971851	0.0049305770
z_AHRF_TXC_SITE_NO_CNTRL	-0.011696137	0.0536332488

## VIF for Full Government Model IVs

```
vif(z_aeo_levels_12345678)
```

z_ACS_PCT_BLACK	z_ACS_PCT_HISPAN	z_SVI_RPL_THEME1_SOCIECO
6.603908	5.898935	10.968020
z_SVI_RPL_THEME2_HH_DISB	z_SVI_RPL_THEME3_MINO	z_SVI_RPL_THEME4_HH_TRANS
3.263732	4.693295	2.949215
z_ACS_PCT_ENGL_NOT_WELL	z_ACS_PCT_NON_CITIZEN	z_ACS_MEDIAN_AGE
11.377382	9.130467	5.880073
z_food_afford	z_fd_enviro_indx	z_fi_percent
4.054088	4.504558	10.621094
z_ACS_PCT_FOOD_STAMP	z_childelig_lunch_perc	z_shp_percent
6.963554	4.022290	4.642026
z_shcb_percent	z_ACS_PCT_NO_VEH	z_ACS_PCT_RENTER_HH_CHILD
5.438549	6.811779	2.243489

z_ACS_PCT_RENT_COST_30PCT	z_ACS_PCT_MOBILE_HOME	z_ACS_PCT_OWNED_HH
2.259950	3.167187	4.362379
z_ACS_PCT_OWNER_HH_CHILD	z_ACS_MEDIAN_HOME_VALUE	z_hsg_rate
4.702871	5.463600	1.537136
z_sc_percent	z_ms_average	z_ACS_PCT_BROADBAND
3.819041	1.826764	10.055906
z_ACS_PCT_NO_PC	z_ACS_PCT_SMARTPHONE	z_pphd_avgnum
10.177966	2.827563	15.646511
z_pmhd_avgnum	z_lbwt_percent_lbwt	z_pi_phy_inact
11.991018	3.405499	2.334530
z_cip_perc	z_csph_perc	z_ACS_PCT_CHILD_DISAB
9.978337	4.505821	1.375975
z_phys_per_cap	z_mhp_per_cap	z_dents_per_cap
2.665311	2.038877	2.546423
z_uninsur_perc	z_opcp_rate	z_TeenBirths
4.024421	1.769909	14.444688
z_phs_rate	z_ms_perc_ann	z_AMFAR_AMATFAC
1.638934	2.159835	1.848425
z_MP_PERCPEN	z_AHRF_RURAL_H_CLINIC	z_unemp_perc
1.382898	1.198424	2.525295
z_ACS_GINI_INDEX	z_ACS_MEDIAN_HH_INCOME	z_ACS_PCT_WORK_NO_CAR
2.484909	12.753907	3.155566
z_soc_assoc_num	z_dwt_presence	z_ACS_PCT_HH_PUB_ASSIST
15.943557	1.181486	1.497731
z_AHRF_TXC_SITE_NO_CNTRL		
1.068450		