IPV Perpetration according to race and employment status

An intersectional analysis using FFCWS data

|  |
| --- |
| Important |
| Analysis performed **without sampling weights** |

First, we load the data and the necessary packages:

# packages ----------------------------------------------------------------  
packages <- c("tidyverse", "here", "marginaleffects", "modelsummary")  
groundhog\_day <- "2024-01-11"  
  
# (install and) load package versions available on the specified day to try  
# to ensure reproducibility  
  
library(groundhog)  
  
groundhog::meta.groundhog(groundhog\_day)  
  
groundhog::groundhog.library(pkg = packages, date = groundhog\_day)  
  
  
dat <- readRDS(file = here::here("01\_data-processing", "data\_private", "data\_final\_imputed\_cases.RDS"))

# Regression Models

## Race -> IPV

Without considering employment, is race associated with different IPV rates?

We perform a linear regression, adjusting for all control variables.

mod\_race\_ipv <- glm(  
 formula = ipv\_prop ~ f\_race +   
 f\_age + f\_education + f\_alcohol + f\_drugs +  
 f\_children + f\_poverty + f\_incarceration +  
 f\_home + f\_depression,  
 data = dat,  
 family = "gaussian"  
)  
  
summary(mod\_race\_ipv)

Call:  
glm(formula = ipv\_prop ~ f\_race + f\_age + f\_education + f\_alcohol +   
 f\_drugs + f\_children + f\_poverty + f\_incarceration + f\_home +   
 f\_depression, family = "gaussian", data = dat)  
  
Coefficients:  
 Estimate Std. Error t value Pr(>|t|)  
(Intercept) 0.1096211 0.0199014 5.508 4.23e-08  
f\_raceBlack 0.0135357 0.0082520 1.640 0.10114  
f\_age -0.0004064 0.0006307 -0.644 0.51947  
f\_educationHS and above -0.0119226 0.0091795 -1.299 0.19419  
f\_alcohol<1 / month 0.0119663 0.0102747 1.165 0.24434  
f\_alcohol>1 / month 0.0316845 0.0093917 3.374 0.00076  
f\_drugs<1 / month 0.0190004 0.0160039 1.187 0.23532  
f\_drugs>1 / month -0.0099374 0.0156283 -0.636 0.52496  
f\_children 0.0008422 0.0033294 0.253 0.80033  
f\_poverty -0.0028262 0.0015800 -1.789 0.07386  
f\_incarcerationExperienced incarceration 0.0771704 0.0092396 8.352 < 2e-16  
f\_homeRented 0.0067634 0.0081527 0.830 0.40689  
f\_depression 0.0022891 0.0034521 0.663 0.50736  
   
(Intercept) \*\*\*  
f\_raceBlack   
f\_age   
f\_educationHS and above   
f\_alcohol<1 / month   
f\_alcohol>1 / month \*\*\*  
f\_drugs<1 / month   
f\_drugs>1 / month   
f\_children   
f\_poverty .   
f\_incarcerationExperienced incarceration \*\*\*  
f\_homeRented   
f\_depression   
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for gaussian family taken to be 0.02311809)  
  
 Null deviance: 39.695 on 1584 degrees of freedom  
Residual deviance: 36.342 on 1572 degrees of freedom  
AIC: -1457.9  
  
Number of Fisher Scoring iterations: 2

marginaleffects::avg\_predictions(mod\_race\_ipv, variables = "f\_race", vcov = "HC")

f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 White 0.127 <0.001 316.5 0.115 0.139  
 Black 0.140 <0.001 493.3 0.130 0.151  
  
Columns: f\_race, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_comparisons(mod\_race\_ipv, variables = "f\_race", vcov = "HC")

Term Contrast Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 f\_race Black - White 0.0135 0.00854 1.58 0.113 3.1 -0.00321 0.0303  
  
Columns: term, contrast, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

And now without covariates

mod\_race\_ipv\_nocov <- glm(  
 formula = ipv\_prop ~ f\_race,  
 data = dat,  
 family = "gaussian"  
)  
  
summary(mod\_race\_ipv\_nocov)

Call:  
glm(formula = ipv\_prop ~ f\_race, family = "gaussian", data = dat)  
  
Coefficients:  
 Estimate Std. Error t value Pr(>|t|)   
(Intercept) 0.116667 0.005871 19.872 < 2e-16 \*\*\*  
f\_raceBlack 0.032274 0.007947 4.061 5.13e-05 \*\*\*  
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for gaussian family taken to be 0.02481733)  
  
 Null deviance: 39.695 on 1584 degrees of freedom  
Residual deviance: 39.286 on 1583 degrees of freedom  
AIC: -1356.5  
  
Number of Fisher Scoring iterations: 2

marginaleffects::avg\_predictions(mod\_race\_ipv\_nocov, variables = "f\_race", vcov = "HC")

f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 White 0.117 <0.001 300.9 0.105 0.128  
 Black 0.149 <0.001 544.3 0.138 0.160  
  
Columns: f\_race, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_comparisons(mod\_race\_ipv\_nocov, variables = "f\_race", vcov = "HC")

Term Contrast Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 f\_race Black - White 0.0323 0.00793 4.07 <0.001 14.4 0.0167 0.0478  
  
Columns: term, contrast, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

## Race + Employment -> IPV

When using race and employment, are they, respectively, predictive of IPV?

We perform a linear regression, adjusting for all control variables.

mod\_race\_employment\_ipv <- glm(  
 formula = ipv\_prop ~ f\_race + f\_employment +  
 f\_age + f\_education + f\_alcohol + f\_drugs +  
 f\_children + f\_poverty + f\_incarceration +  
 f\_home + f\_depression,  
 data = dat,  
 family = "gaussian"  
)  
  
summary(mod\_race\_employment\_ipv)

Call:  
glm(formula = ipv\_prop ~ f\_race + f\_employment + f\_age + f\_education +   
 f\_alcohol + f\_drugs + f\_children + f\_poverty + f\_incarceration +   
 f\_home + f\_depression, family = "gaussian", data = dat)  
  
Coefficients:  
 Estimate Std. Error t value Pr(>|t|)  
(Intercept) 0.1054959 0.0216023 4.884 1.15e-06  
f\_raceBlack 0.0140707 0.0083254 1.690 0.09121  
f\_employmentEmployed 0.0053409 0.0108632 0.492 0.62304  
f\_age -0.0004117 0.0006310 -0.653 0.51415  
f\_educationHS and above -0.0124599 0.0092465 -1.348 0.17800  
f\_alcohol<1 / month 0.0117137 0.0102900 1.138 0.25514  
f\_alcohol>1 / month 0.0313567 0.0094176 3.330 0.00089  
f\_drugs<1 / month 0.0189916 0.0160078 1.186 0.23565  
f\_drugs>1 / month -0.0096869 0.0156403 -0.619 0.53577  
f\_children 0.0009133 0.0033333 0.274 0.78412  
f\_poverty -0.0028841 0.0015848 -1.820 0.06898  
f\_incarcerationExperienced incarceration 0.0779373 0.0093725 8.316 < 2e-16  
f\_homeRented 0.0066037 0.0081612 0.809 0.41854  
f\_depression 0.0024094 0.0034616 0.696 0.48651  
   
(Intercept) \*\*\*  
f\_raceBlack .   
f\_employmentEmployed   
f\_age   
f\_educationHS and above   
f\_alcohol<1 / month   
f\_alcohol>1 / month \*\*\*  
f\_drugs<1 / month   
f\_drugs>1 / month   
f\_children   
f\_poverty .   
f\_incarcerationExperienced incarceration \*\*\*  
f\_homeRented   
f\_depression   
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for gaussian family taken to be 0.02312925)  
  
 Null deviance: 39.695 on 1584 degrees of freedom  
Residual deviance: 36.336 on 1571 degrees of freedom  
AIC: -1456.2  
  
Number of Fisher Scoring iterations: 2

marginaleffects::avg\_predictions(mod\_race\_employment\_ipv, variables = "f\_race", vcov = "HC")

f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 White 0.127 <0.001 314.9 0.115 0.139  
 Black 0.141 <0.001 488.1 0.130 0.151  
  
Columns: f\_race, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_predictions(mod\_race\_employment\_ipv, variables = c("f\_race", "f\_employment"), vcov = "HC")

f\_employment f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 Employed White 0.128 <0.001 297.3 0.1151 0.140  
 Employed Black 0.142 <0.001 406.3 0.1298 0.153  
 Unemployed White 0.122 <0.001 85.1 0.0996 0.145  
 Unemployed Black 0.136 <0.001 129.0 0.1160 0.157  
  
Columns: f\_race, f\_employment, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_comparisons(mod\_race\_employment\_ipv, variables = "f\_race", vcov = "HC")

Term Contrast Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 f\_race Black - White 0.0141 0.0086 1.64 0.102 3.3 -0.00278 0.0309  
  
Columns: term, contrast, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

marginaleffects::avg\_predictions(mod\_race\_employment\_ipv, variables = "f\_employment", vcov = "HC")

f\_employment Estimate Pr(>|z|) S 2.5 % 97.5 %  
 Employed 0.135 <0.001 679.5 0.127 0.144  
 Unemployed 0.130 <0.001 125.3 0.110 0.149  
  
Columns: f\_employment, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_comparisons(mod\_race\_employment\_ipv, variables = "f\_employment", vcov = "HC")

Term Contrast Estimate Std. Error z Pr(>|z|) S  
 f\_employment Employed - Unemployed 0.00534 0.0115 0.466 0.641 0.6  
 2.5 % 97.5 %  
 -0.0171 0.0278  
  
Columns: term, contrast, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

And now without covariates

mod\_race\_employment\_ipv\_nocov <- glm(  
 formula = ipv\_prop ~ f\_race + f\_employment,  
 data = dat,  
 family = "gaussian"  
)  
  
summary(mod\_race\_employment\_ipv\_nocov)

Call:  
glm(formula = ipv\_prop ~ f\_race + f\_employment, family = "gaussian",   
 data = dat)  
  
Coefficients:  
 Estimate Std. Error t value Pr(>|t|)   
(Intercept) 0.136883 0.011414 11.993 < 2e-16 \*\*\*  
f\_raceBlack 0.028604 0.008136 3.516 0.000451 \*\*\*  
f\_employmentEmployed -0.022055 0.010682 -2.065 0.039112 \*   
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for gaussian family taken to be 0.02476628)  
  
 Null deviance: 39.695 on 1584 degrees of freedom  
Residual deviance: 39.180 on 1582 degrees of freedom  
AIC: -1358.7  
  
Number of Fisher Scoring iterations: 2

marginaleffects::avg\_predictions(mod\_race\_employment\_ipv\_nocov, variables = "f\_race", vcov = "HC")

f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 White 0.119 <0.001 299.5 0.107 0.130  
 Black 0.147 <0.001 527.5 0.137 0.158  
  
Columns: f\_race, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_predictions(mod\_race\_employment\_ipv\_nocov, variables = c("f\_race", "f\_employment"), vcov = "HC")

f\_employment f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 Employed White 0.115 <0.001 287.4 0.103 0.126  
 Employed Black 0.143 <0.001 415.7 0.132 0.155  
 Unemployed White 0.137 <0.001 98.2 0.113 0.160  
 Unemployed Black 0.165 <0.001 191.5 0.145 0.186  
  
Columns: f\_race, f\_employment, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_comparisons(mod\_race\_employment\_ipv\_nocov, variables = "f\_race", vcov = "HC")

Term Contrast Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 f\_race Black - White 0.0286 0.00812 3.52 <0.001 11.2 0.0127 0.0445  
  
Columns: term, contrast, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

marginaleffects::avg\_predictions(mod\_race\_employment\_ipv\_nocov, variables = "f\_employment", vcov = "HC")

f\_employment Estimate Pr(>|z|) S 2.5 % 97.5 %  
 Employed 0.130 <0.001 663.0 0.122 0.139  
 Unemployed 0.152 <0.001 162.0 0.132 0.173  
  
Columns: f\_employment, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_comparisons(mod\_race\_employment\_ipv\_nocov, variables = "f\_employment", vcov = "HC")

Term Contrast Estimate Std. Error z Pr(>|z|) S  
 f\_employment Employed - Unemployed -0.0221 0.0113 -1.96 0.0504 4.3  
 2.5 % 97.5 %  
 -0.0441 3.59e-05  
  
Columns: term, contrast, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

## Race \* Employment -> IPV

When allowing race and employment to interact, how do they predict IPV?

We perform a weighted logistic regression, adjusting for all control variables.

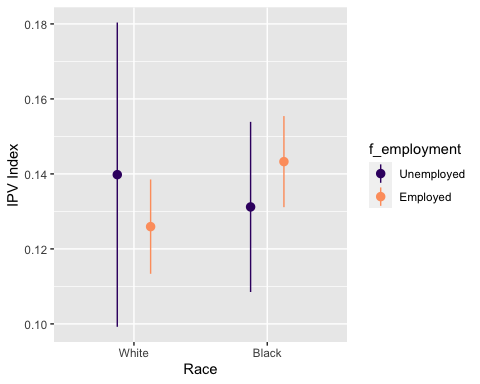
mod\_race\_employment\_interaction\_ipv <- glm(  
 formula = ipv\_prop ~ f\_race \* f\_employment +  
 f\_age + f\_education + f\_alcohol + f\_drugs +  
 f\_children + f\_poverty + f\_incarceration +  
 f\_home + f\_depression,  
 data = dat,  
 family = "gaussian"  
)  
  
summary(mod\_race\_employment\_interaction\_ipv)

Call:  
glm(formula = ipv\_prop ~ f\_race \* f\_employment + f\_age + f\_education +   
 f\_alcohol + f\_drugs + f\_children + f\_poverty + f\_incarceration +   
 f\_home + f\_depression, family = "gaussian", data = dat)  
  
Coefficients:  
 Estimate Std. Error t value Pr(>|t|)  
(Intercept) 0.1235945 0.0272633 4.533 6.25e-06  
f\_raceBlack -0.0086056 0.0224423 -0.383 0.70143  
f\_employmentEmployed -0.0138599 0.0207221 -0.669 0.50369  
f\_age -0.0004266 0.0006311 -0.676 0.49917  
f\_educationHS and above -0.0130754 0.0092632 -1.412 0.15828  
f\_alcohol<1 / month 0.0116353 0.0102896 1.131 0.25832  
f\_alcohol>1 / month 0.0313851 0.0094171 3.333 0.00088  
f\_drugs<1 / month 0.0189413 0.0160069 1.183 0.23686  
f\_drugs>1 / month -0.0092594 0.0156444 -0.592 0.55402  
f\_children 0.0008762 0.0033333 0.263 0.79270  
f\_poverty -0.0027972 0.0015867 -1.763 0.07811  
f\_incarcerationExperienced incarceration 0.0782260 0.0093757 8.343 < 2e-16  
f\_homeRented 0.0065657 0.0081608 0.805 0.42120  
f\_depression 0.0024753 0.0034619 0.715 0.47471  
f\_raceBlack:f\_employmentEmployed 0.0259421 0.0238426 1.088 0.27674  
   
(Intercept) \*\*\*  
f\_raceBlack   
f\_employmentEmployed   
f\_age   
f\_educationHS and above   
f\_alcohol<1 / month   
f\_alcohol>1 / month \*\*\*  
f\_drugs<1 / month   
f\_drugs>1 / month   
f\_children   
f\_poverty .   
f\_incarcerationExperienced incarceration \*\*\*  
f\_homeRented   
f\_depression   
f\_raceBlack:f\_employmentEmployed   
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for gaussian family taken to be 0.02312654)  
  
 Null deviance: 39.695 on 1584 degrees of freedom  
Residual deviance: 36.309 on 1570 degrees of freedom  
AIC: -1455.4  
  
Number of Fisher Scoring iterations: 2

marginaleffects::avg\_predictions(  
 mod\_race\_employment\_interaction\_ipv,   
 variables = c("f\_race", "f\_employment"), vcov = "HC"  
)

f\_employment f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 Employed White 0.126 <0.001 282.5 0.1134 0.139  
 Employed Black 0.143 <0.001 390.4 0.1311 0.155  
 Unemployed White 0.140 <0.001 36.0 0.0992 0.180  
 Unemployed Black 0.131 <0.001 96.5 0.1085 0.154  
  
Columns: f\_race, f\_employment, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_predictions(  
 mod\_race\_employment\_interaction\_ipv,   
 variables = c("f\_race", "f\_employment"), vcov = "HC"  
) |>   
 dplyr::mutate(  
 across(.cols = -dplyr::starts\_with("f\_"), .fns = as.numeric)  
 ) |>   
 ggplot(aes(x = f\_race, y = estimate, ymin = conf.low, ymax = conf.high, color = f\_employment)) +  
 geom\_pointrange(position = position\_dodge(width = .5)) +  
 xlab("Race") +  
 ylab("IPV Index") +  
 scale\_color\_viridis\_d(option = "magma", begin = .2, end = .8)



marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv,   
 variables = "f\_race",   
 by = "f\_employment", vcov = "HC"  
)

Term Contrast f\_employment Estimate Std. Error z  
 f\_race mean(Black) - mean(White) Unemployed -0.00861 0.02393 -0.36  
 f\_race mean(Black) - mean(White) Employed 0.01734 0.00898 1.93  
 Pr(>|z|) S 2.5 % 97.5 %  
 0.7192 0.5 -0.055516 0.0383  
 0.0536 4.2 -0.000271 0.0349  
  
Columns: term, contrast, f\_employment, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high, predicted\_lo, predicted\_hi, predicted   
Type: response

# (BE - WE) - (BU - WU)  
marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv,  
 variables = "f\_race",   
 by = "f\_employment",  
 hypothesis = "pairwise", vcov = "HC"  
)

Term Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 Unemployed - Employed -0.0259 0.025 -1.04 0.299 1.7 -0.0749 0.0231  
  
Columns: term, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv,   
 variables = "f\_employment",   
 by = "f\_race", vcov = "HC"  
)

Term Contrast f\_race Estimate Std. Error  
 f\_employment mean(Employed) - mean(Unemployed) White -0.0139 0.0216  
 f\_employment mean(Employed) - mean(Unemployed) Black 0.0121 0.0133  
 z Pr(>|z|) S 2.5 % 97.5 %  
 -0.641 0.521 0.9 -0.0562 0.0285  
 0.909 0.363 1.5 -0.0140 0.0381  
  
Columns: term, contrast, f\_race, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high, predicted\_lo, predicted\_hi, predicted   
Type: response

# (WE - WU) - (BE - BU) (simply the other comparison multiplied by -1)  
marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv,  
 variables = "f\_employment", by = "f\_race",  
 hypothesis = "pairwise", vcov = "HC"  
)

Term Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 White - Black -0.0259 0.025 -1.04 0.299 1.7 -0.0749 0.0231  
  
Columns: term, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

And now without covariates

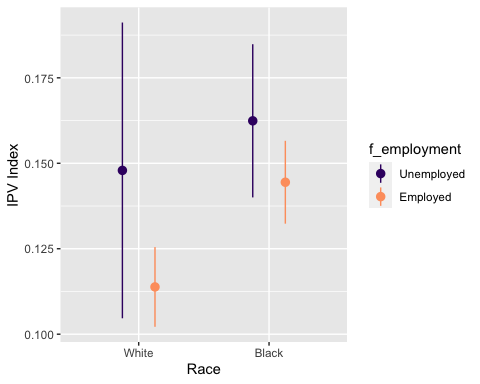
mod\_race\_employment\_interaction\_ipv\_nocov <- glm(  
 formula = ipv\_prop ~ f\_race \* f\_employment,  
 data = dat,  
 family = "gaussian"  
)  
  
summary(mod\_race\_employment\_interaction\_ipv\_nocov)

Call:  
glm(formula = ipv\_prop ~ f\_race \* f\_employment, family = "gaussian",   
 data = dat)  
  
Coefficients:  
 Estimate Std. Error t value Pr(>|t|)   
(Intercept) 0.14792 0.02032 7.279 5.27e-13 \*\*\*  
f\_raceBlack 0.01451 0.02297 0.632 0.528   
f\_employmentEmployed -0.03409 0.02122 -1.606 0.108   
f\_raceBlack:f\_employmentEmployed 0.01612 0.02456 0.656 0.512   
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for gaussian family taken to be 0.02477519)  
  
 Null deviance: 39.695 on 1584 degrees of freedom  
Residual deviance: 39.170 on 1581 degrees of freedom  
AIC: -1357.2  
  
Number of Fisher Scoring iterations: 2

marginaleffects::avg\_predictions(  
 mod\_race\_employment\_interaction\_ipv\_nocov,   
 variables = c("f\_race", "f\_employment"), vcov = "HC"  
)

f\_employment f\_race Estimate Pr(>|z|) S 2.5 % 97.5 %  
 Employed White 0.114 <0.001 268.6 0.102 0.125  
 Employed Black 0.144 <0.001 398.5 0.132 0.157  
 Unemployed White 0.148 <0.001 35.5 0.105 0.191  
 Unemployed Black 0.162 <0.001 149.8 0.140 0.185  
  
Columns: f\_race, f\_employment, estimate, p.value, s.value, conf.low, conf.high   
Type: invlink(link)

marginaleffects::avg\_predictions(  
 mod\_race\_employment\_interaction\_ipv\_nocov,   
 variables = c("f\_race", "f\_employment"), vcov = "HC"  
) |>   
 dplyr::mutate(  
 across(.cols = -dplyr::starts\_with("f\_"), .fns = as.numeric)  
 ) |>   
 ggplot(aes(x = f\_race, y = estimate, ymin = conf.low, ymax = conf.high, color = f\_employment)) +  
 geom\_pointrange(position = position\_dodge(width = .5)) +  
 xlab("Race") +  
 ylab("IPV Index") +  
 scale\_color\_viridis\_d(option = "magma", begin = .2, end = .8)



marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv\_nocov,   
 variables = "f\_race",   
 by = "f\_employment", vcov = "HC"  
)

Term Contrast f\_employment Estimate Std. Error z  
 f\_race mean(Black) - mean(White) Unemployed 0.0145 0.02486 0.584  
 f\_race mean(Black) - mean(White) Employed 0.0306 0.00858 3.569  
 Pr(>|z|) S 2.5 % 97.5 %  
 0.56 0.8 -0.0342 0.0632  
 <0.001 11.4 0.0138 0.0474  
  
Columns: term, contrast, f\_employment, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high, predicted\_lo, predicted\_hi, predicted   
Type: response

# (BE - WE) - (BU - WU)  
marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv\_nocov,  
 variables = "f\_race",   
 by = "f\_employment",  
 hypothesis = "pairwise", vcov = "HC"  
)

Term Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 Unemployed - Employed -0.0161 0.0263 -0.613 0.54 0.9 -0.0677 0.0354  
  
Columns: term, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv\_nocov,   
 variables = "f\_employment",   
 by = "f\_race", vcov = "HC"  
)

Term Contrast f\_race Estimate Std. Error  
 f\_employment mean(Employed) - mean(Unemployed) White -0.0341 0.0229  
 f\_employment mean(Employed) - mean(Unemployed) Black -0.0180 0.0130  
 z Pr(>|z|) S 2.5 % 97.5 %  
 -1.49 0.136 2.9 -0.0789 0.0107  
 -1.38 0.167 2.6 -0.0434 0.0075  
  
Columns: term, contrast, f\_race, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high, predicted\_lo, predicted\_hi, predicted   
Type: response

# (WE - WU) - (BE - BU) (simply the other comparison multiplied by -1)  
marginaleffects::avg\_comparisons(  
 mod\_race\_employment\_interaction\_ipv\_nocov,  
 variables = "f\_employment", by = "f\_race",  
 hypothesis = "pairwise", vcov = "HC"  
)

Term Estimate Std. Error z Pr(>|z|) S 2.5 % 97.5 %  
 White - Black -0.0161 0.0263 -0.613 0.54 0.9 -0.0677 0.0354  
  
Columns: term, estimate, std.error, statistic, p.value, s.value, conf.low, conf.high   
Type: response

# Models side by side

modelsummary::modelsummary(  
 models = list(  
 "IPV on race" = mod\_race\_ipv,  
 "IPV on race and employment" = mod\_race\_employment\_ipv,  
 "IPV on race by employment" = mod\_race\_employment\_interaction\_ipv  
 ),  
 estimate = "estimate",  
 stars = TRUE,  
 statistic = c("conf.int", "p.value"),  
 vcov = sandwich::vcovHC  
)

|  | IPV on race | IPV on race and employment | IPV on race by employment |
| --- | --- | --- | --- |
| (Intercept) | 0.110\*\*\* | 0.105\*\*\* | 0.124\*\*\* |
|  | [0.071, 0.148] | [0.064, 0.147] | [0.071, 0.177] |
|  | (<0.001) | (<0.001) | (<0.001) |
| f\_raceBlack | 0.014 | 0.014 | -0.009 |
|  | [-0.003, 0.030] | [-0.003, 0.031] | [-0.056, 0.038] |
|  | (0.113) | (0.102) | (0.719) |
| f\_age | 0.000 | 0.000 | 0.000 |
|  | [-0.002, 0.001] | [-0.002, 0.001] | [-0.002, 0.001] |
|  | (0.499) | (0.494) | (0.479) |
| f\_educationHS and above | -0.012 | -0.012 | -0.013 |
|  | [-0.031, 0.007] | [-0.032, 0.007] | [-0.033, 0.006] |
|  | (0.223) | (0.210) | (0.187) |
| f\_alcohol<1 / month | 0.012 | 0.012 | 0.012 |
|  | [-0.007, 0.031] | [-0.007, 0.030] | [-0.007, 0.030] |
|  | (0.211) | (0.221) | (0.224) |
| f\_alcohol>1 / month | 0.032\*\*\* | 0.031\*\*\* | 0.031\*\*\* |
|  | [0.013, 0.050] | [0.013, 0.050] | [0.013, 0.050] |
|  | (<0.001) | (<0.001) | (<0.001) |
| f\_drugs<1 / month | 0.019 | 0.019 | 0.019 |
|  | [-0.019, 0.057] | [-0.019, 0.057] | [-0.019, 0.057] |
|  | (0.326) | (0.328) | (0.330) |
| f\_drugs>1 / month | -0.010 | -0.010 | -0.009 |
|  | [-0.041, 0.022] | [-0.041, 0.022] | [-0.041, 0.022] |
|  | (0.536) | (0.546) | (0.564) |
| f\_children | 0.001 | 0.001 | 0.001 |
|  | [-0.006, 0.007] | [-0.006, 0.007] | [-0.006, 0.007] |
|  | (0.799) | (0.781) | (0.790) |
| f\_poverty | -0.003+ | -0.003+ | -0.003+ |
|  | [-0.006, 0.000] | [-0.006, 0.000] | [-0.006, 0.000] |
|  | (0.056) | (0.051) | (0.059) |
| f\_incarcerationExperienced incarceration | 0.077\*\*\* | 0.078\*\*\* | 0.078\*\*\* |
|  | [0.055, 0.099] | [0.056, 0.100] | [0.056, 0.100] |
|  | (<0.001) | (<0.001) | (<0.001) |
| f\_homeRented | 0.007 | 0.007 | 0.007 |
|  | [-0.009, 0.023] | [-0.009, 0.022] | [-0.009, 0.022] |
|  | (0.400) | (0.412) | (0.415) |
| f\_depression | 0.002 | 0.002 | 0.002 |
|  | [-0.005, 0.009] | [-0.005, 0.009] | [-0.005, 0.010] |
|  | (0.521) | (0.501) | (0.490) |
| f\_employmentEmployed |  | 0.005 | -0.014 |
|  |  | [-0.017, 0.028] | [-0.056, 0.029] |
|  |  | (0.641) | (0.521) |
| f\_raceBlack × f\_employmentEmployed |  |  | 0.026 |
|  |  |  | [-0.023, 0.075] |
|  |  |  | (0.300) |
| Num.Obs. | 1585 | 1585 | 1585 |
| R2 | 0.084 | 0.085 | 0.085 |
| AIC | -1457.9 | -1456.2 | -1455.4 |
| BIC | -1382.8 | -1375.7 | -1369.5 |
| Log.Lik. | 742.967 | 743.089 | 743.687 |
| RMSE | 0.15 | 0.15 | 0.15 |
| Std.Errors | Custom | Custom | Custom |
| + p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001 | | | |