BS_rep_FINAL

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2023-03-28

Data Wrangling

```
# Load Pew Data
pew <- read.dta13("ATP_W64.dta")
pew <- subset(pew,select=c(QKEY,COVID_COMFORT_a_W64,
                           COVID_COMFORT_b_W64,COVID_COMFORT_c_W64,
                           COVID_COMFORT_d_W64,COVID_COMFORT_e_W64,
                           COVID_RESTRICTION_a_W64,COVID_RESTRICTION_b_W64,
                           COVID_RESTRICTION_c_W64,COVID_RESTRICTION_d_W64,
                           COVID_RESTRICTION_e_W64,COVID_RESTRICTION_f_W64,
                           COVID_RESTRICTION_g_W64,F_IDEO,F_PARTY_FINAL,F_SEX,
                           F_AGECAT,F_EDUCCAT2,F_MARITAL,F_INCOME,F_CREGION,
                           F_RACETHN,WEIGHT_W64))
```

Code & Scale Ideological DV of interest (policy support)

```
covid_ideo_scales <- subset(pew,select=c(QKEY,COVID_RESTRICTION_a_W64,
                                         COVID_RESTRICTION_b_W64,
                                         COVID_RESTRICTION_c_W64,
                                         COVID_RESTRICTION_d_W64,
                                         COVID_RESTRICTION_e_W64,
                                         COVID_RESTRICTION_f_W64,
                                         COVID_RESTRICTION_g_W64,F_IDEO))
colnames(covid_ideo_scales) <- c("QKEY","restriction_intl_travel",
                                 "restriction_most_business",
                                 "restriction_large_gatherings",
                                 "restriction_sporting_events",
                                 "restriction_closing_k12",
                                 "restriction_carry_out_only",
                                 "restriction_postponing_primary","libcon")

for(i in 2:ncol(covid_ideo_scales)){
  covid_ideo_scales[,i] <- as.character(covid_ideo_scales[,i])
}
covid_ideo_scales[covid_ideo_scales == "Necessary"] <- 1
covid_ideo_scales[covid_ideo_scales == "Unnecessary"] <- 0

covid_ideo_scales$libcon <- ifelse(covid_ideo_scales$libcon %in% "Very conservative",1,
                           ifelse(covid_ideo_scales$libcon %in% "Conservative",2,
                           ifelse(covid_ideo_scales$libcon %in% "Moderate",3,
                           ifelse(covid_ideo_scales$libcon %in% "Liberal",4,
```

```
                            ifelse(covid_ideo_scales$libcon %in% "Liberal",4,
                            ifelse(covid_ideo_scales$libcon %in% "Very liberal",5,NA))))))


for(i in 2:ncol(covid_ideo_scales)){
  covid_ideo_scales[,i] <- as.numeric(covid_ideo_scales[,i])
}
covid_ideo_scales <- na.omit(covid_ideo_scales)
```

Factor Analysis (policy support)

```
library("FactoMineR")
library("factoextra")
```

```
## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
```

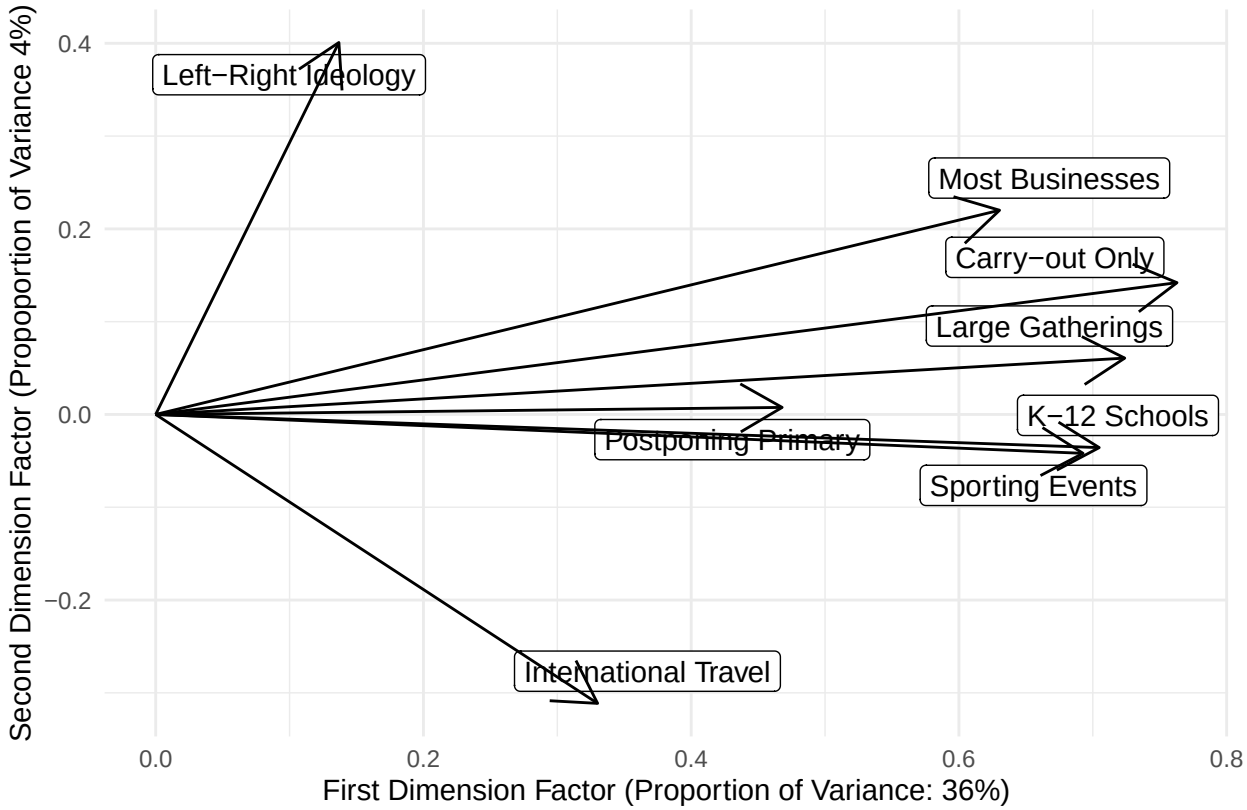
```
x <- covid_ideo_scales[,c(2:9)]
for(i in 1:8){
  x[,i] <- factor(x[,i])
}

factanal <- FAMD(x, graph = F,ncp=7,sup.var = NULL)
# fviz_screeplot(factanal)
# fviz_contrib(factanal, "var", axes = 1)
# fviz_contrib(factanal, "var", axes = 2)
# fviz_contrib(factanal, "var", axes = 3)
# fviz_famd_var(factanal, "var", repel = TRUE, col.var = "black")

factanal <- fa(covid_ideo_scales[,c(2:9)], nfactors=2, rotate="promax", fm="pa")
scores <- data.frame(factanal$scores)
#loadings(factanal)
loadings <- factanal$loadings
loadings <- data.frame(f1 = loadings[,1],f2=loadings[,2])

#plot(factanal$loadings,type="n") # set up plot
#text(factanal$loadings,labels=names(covid_ideo_scales)[2:9],cex=.7) # add variable names

library(ggrepel)

#alpha(covid_ideo_scales[,c(2:9)])

library(grid)
library(gridExtra)
```

```
##
## Attaching package: 'gridExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     combine
```

```
loadings$vars <- ifelse(rownames(loadings) %in% "restriction_intl_travel",
                        "International Travel",
                ifelse(rownames(loadings) %in% "restriction_most_business",
                               "Most Businesses",
```

```
                ifelse(rownames(loadings) %in% "restriction_large_gatherings",
                                    "Large Gatherings",
                ifelse(rownames(loadings) %in% "restriction_sporting_events",
                                       "Sporting Events",
                ifelse(rownames(loadings) %in% "restriction_closing_k12",
                                            "K-12 Schools",
                ifelse(rownames(loadings) %in% "restriction_carry_out_only",
                                                 "Carry-out Only",
                ifelse(rownames(loadings) %in% "restriction_postponing_primary",
                                                       "Postponing Primary",
                ifelse(rownames(loadings) %in% "libcon","Left-Right Ideology",NA)))))))

plot <- ggplot(loadings,aes(x = f1, y=f2,label=vars)) +
  theme_minimal() + geom_label_repel() +
  scale_x_continuous("First Dimension Factor (Proportion of Variance: 36%)") +
  scale_y_continuous("Second Dimension Factor (Propoportion of Variance 4%)") +
  geom_segment(aes(x = 0,y = 0,xend = f1,yend = f2),arrow=arrow())
grid.newpage()

footnote <- expression("Cronbach's Standardized"~alpha~"="~0.78)

g <- arrangeGrob(plot, bottom = textGrob(footnote, x = 0.025, hjust = 0,
                                         vjust= 0, y=0.75,
                                         gp = gpar(fontface = "italic",
                                                   fontsize = 9, col = "black")))
grid.draw(g)
```



Cronbach's Standardized $\alpha = 0.78$

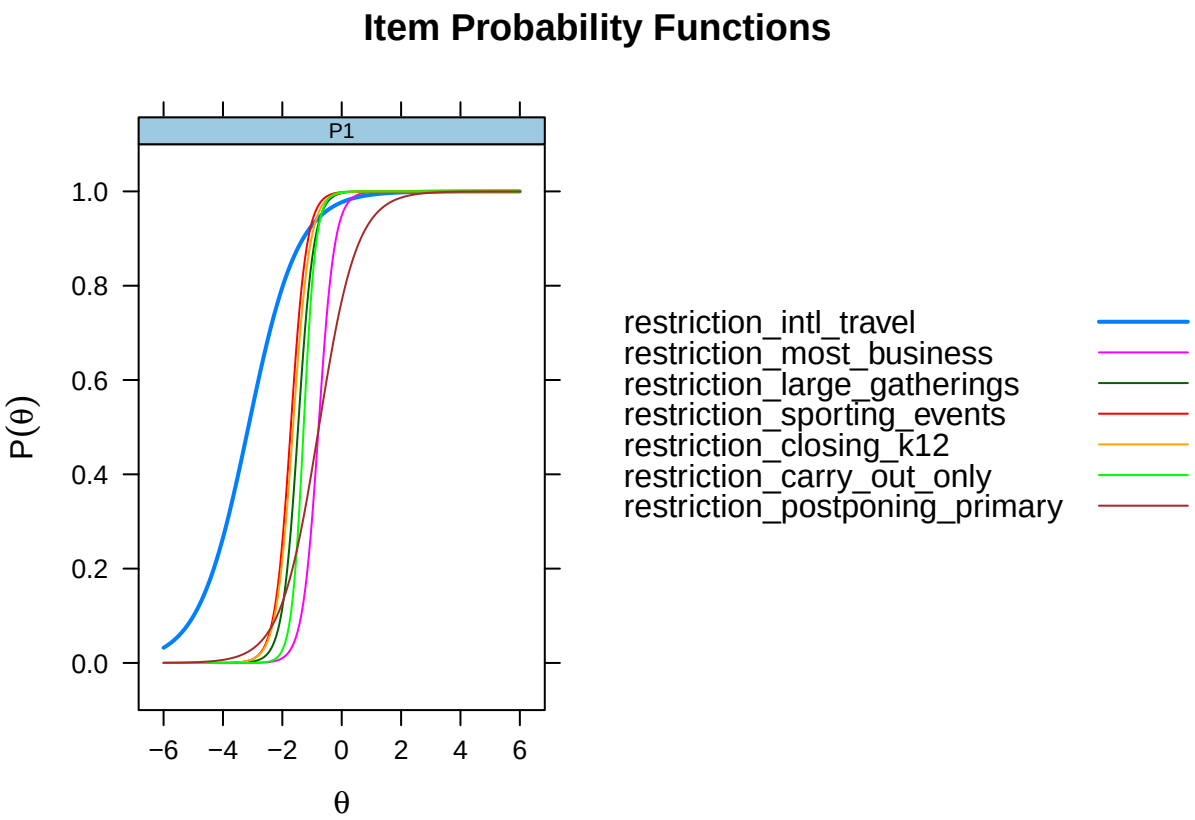
```
ggsave(file="factor_analysis_covid19_policies.png", g, width = 8, height = 5.43, units = "in")

covid_ideo_scales <- cbind(covid_ideo_scales,scores)
colnames(covid_ideo_scales)[10:11] <- c("covid_restriction_fa_dim1","covid_restriction_fa_dim2")
covid_ideo_scales$summated_restriction_scale <- rowSums(covid_ideo_scales[2:8],na.rm=T)
```

IRT

```
irt <- mirt(covid_ideo_scales[2:8], model = 1, itemtype = "graded", SE = T,
            verbose = T,removeEmptyRows = TRUE)
```

```
## Iteration: 1, Log-Lik: -24114.323, Max-Change: 1.49614Iteration: 2, Log-Lik: -21899.147, Max-Change:
##
## Calculating information matrix...
```

```
plt <- plot(irt, type = 'trace', facet_items=F) #store the object
print(plt) #plot the object
```




```
#str(plt) #find the data
pltdata <- data.frame(lapply(plt$panel.args, function(x) do.call(cbind, x))[[1]])

groups <- plot(irt, type = 'trace', facet_items=T)
groups$packet.sizes
```

```
## item
##        restriction_intl_travel      restriction_most_business
##                            200                            200
##   restriction_large_gatherings    restriction_sporting_events
```

```
##                             200                             200
##       restriction_closing_k12     restriction_carry_out_only
##                             200                             200
## restriction_postponing_primary
##                             200
```

```
pltdata$item <- rep(colnames(covid_ideo_scales)[2:8], each = 200)
pltdata$response <- groups$panel.args.common$groups

#plt$panel.args.common$groups

pltdata$item2 <- factor(pltdata$item,levels=c("restriction_carry_out_only",
                                              "restriction_closing_k12",
                                              "restriction_intl_travel",
                                              "restriction_large_gatherings",
                                              "restriction_most_business",
                                              "restriction_postponing_primary",
                                              "restriction_sporting_events"),
                        labels=c("Carry Out Only","Close K-12 Schools","
                                 Restrict Intl. Travel","Restrict Large Gatherings",
                                 "Restrict Most Businesses","Postpone Primary Elections",
                                 "Restrict Sporting Events"))

pltdata$item2 <- factor(pltdata$item2,levels=c("Restrict Intl. Travel",
                                               "Restrict Sporting Events",
                                               "Close K-12 Schools",
                                               "Restrict Large Gatherings",
                                               "Carry Out Only","Restrict Most Businesses",
                                               "Postpone Primary Elections"))

plot <- ggplot(pltdata, aes(x, y,linetype=item2,color=item2)) +
  geom_line() + scale_x_continuous(expression(theta)) +
  scale_y_continuous("Pr (Support)") + geom_hline(aes(yintercept = 0.5))  +
  theme_minimal() + labs(color="Policy",linetype="Policy") +
  theme(legend.position="bottom")
#+ scale_colour_grey(start = 0, end = .5) + ggtitle("Ordinal IRT Model Characteric Curves for Emphatic

#ggsave(file="covid19_restrictions_irt_curves_probs.png", plot, width = 8, height = 5.43, units = "in")
```

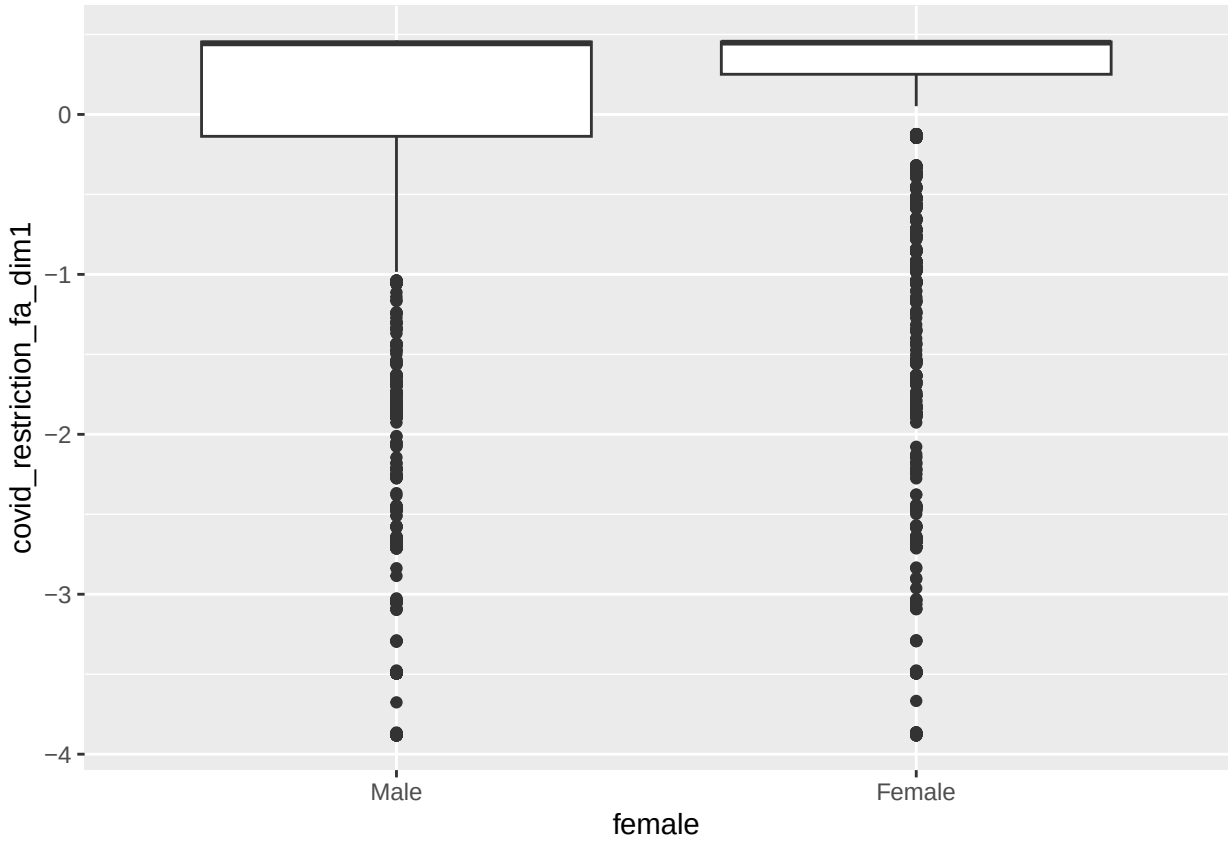
Scores

```
covid_ideo_scales$covid_restriction_fa_dim2 <- fscores(irt, full.scores = TRUE,
                                                       full.scores.SE = F)
colnames(covid_ideo_scales)[11] <- "covid_restriction_irt"

pew <- merge(pew,covid_ideo_scales,by=c("QKEY"),all=T)
pew$covid_restriction_fa_dim1 <- pew$covid_restriction_fa_dim1-mean(pew$covid_restriction_fa_dim1,na.rm=
```

Covariates

```
pew$female <- as.character(pew$F_SEX)
pew$female <- factor(pew$female,levels=c("Male","Female"))
```

```
ggplot(na.omit(pew),aes(x=female,y=covid_restriction_fa_dim1)) + geom_boxplot()
```




```
pew$pid3 <- as.character(pew$F_PARTY_FINAL)
pew$pid3 <- factor(pew$pid3,levels=c("Republican","Independent","Democrat"))

pew$weight <- as.numeric(pew$WEIGHT_W64)

pew$age_linear <- as.numeric(factor(pew$F_AGECAT))
pew$age_linear[pew$age_linear %in% 5] <- NA # Get rid of refused

pew$educ_linear <- as.numeric(factor(pew$F_EDUCCAT2))
pew$educ_linear[pew$educ_linear %in% 7] <- NA # Get rid of refused

pew$marital_status <- ifelse(pew$F_MARITAL %in% "Married",1,0)
pew$marital_status[pew$F_MARITAL %in% "Refused"] <- NA # Get rid of refused

pew$income_linear <- as.numeric(factor(pew$F_INCOME))
pew$income_linear[pew$income_linear %in% 10] <- NA # Get rid of refused

pew$region_factor <- pew$F_CREGION
pew$white_respondent <- ifelse(pew$F_RACETHN %in% "White non-Hispanic",1,0)
pew$white_respondent[pew$F_RACETHN %in% "Refused"] <- NA # Get rid of refused

hold <- read.dta13("ATP_W42.dta")
hold <- hold[,c("QKEY", "F_RACECMB")]

pew <- merge(pew,hold,by=c("QKEY"),all=T)
```

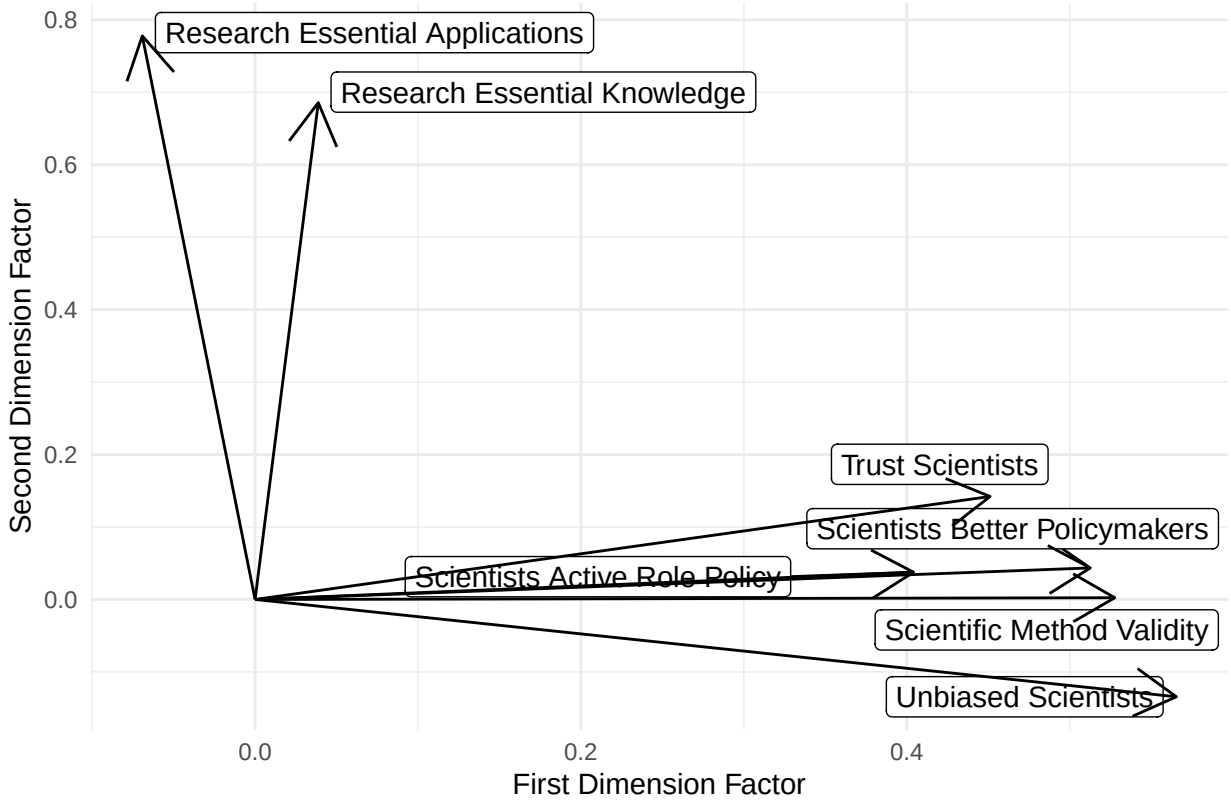
```
pew$race3 <- ifelse(pew$F_RACETHN %in% "White non-Hispanic","white",
                    ifelse(pew$F_RACETHN %in% "Black non-Hispanic","black",
                           ifelse(pew$F_RACETHN %in% "Hispanic","hispanic",NA)))
pew$race3 <- ifelse(is.na(pew$race3) & pew$F_RACECMB %in% "Asian or Asian-American",
                    "asian",pew$race3)

pew$race3 <- factor(pew$race3,levels=c("white","black","hispanic","asian"))
```

Trust

```
trust <- read.dta13("ATP_W42.dta")
trust <- subset(trust,select=c("QKEY","CONFa_W42","CONFb_W42","CONFd_F1_W42",
                               "CONFd_F2_W42", "POLICY1_W42","POLICY2_W42",
                               "POLICY3_W42","SCM2_W42","SCM3_W42","SCM4a_W42",
                               "SCM4b_W42"))

colnames(trust) <- c("QKEY","trust_elected_officials","trust_media",
                     "trust_medial_scientists","trust_scientists",
                     "scientists_active_role_policy","scientists_pivotal_policy",
                     "scientists_better_policy","scientific_method",
                     "scientists_judgement_facts","research_essential_immediate_applications",
                     "research_essential_advance_knowledge")

trust[trust == "Refused"] <- NA

# for(i in 2:ncol(trust)){
#   print(table(trust[,i]))
#   print(levels(trust[,i]))
# }
for(i in 2:ncol(trust)){
  trust[,i] <- as.character(trust[,i])
  #print(table(trust[,i]))
}
trust[trust == "Essential"] <- 4
trust[trust == "Important, but not essential"] <- 3
trust[trust == "Not too important"] <- 2
trust[trust == "Not important at all"] <- 1

trust[trust == "A great deal of confidence"] <- 4
trust[trust == "A fair amount of confidence"] <- 3
trust[trust == "Not too much confidence"] <- 2
trust[trust == "No confidence at all"] <- 1

trust[trust == "Scientists should take an active role in public policy debates about scientific issues"]
trust[trust == "Scientists should focus on establishing sound scientific facts and stay out of public po

trust[trust == "Public opinion should NOT play an important role to guide policy decisions about scienti
trust[trust == "Public opinion should play an important role to guide policy decisions about scientific

trust[trust == "Usually BETTER at making good policy decisions about scientific issues than other peopl
trust[trust == "NEITHER BETTER NOR WORSE at making good policy decisions about scientific issues than o
trust[trust == "Usually WORSE at making good policy decisions about scientific issues than other people
```

```r
trust[trust == "The scientific method generally produces accurate conclusions"] <- 2
trust[trust == "The scientific method can be used to produce any conclusion the researcher wants"] <- 1

trust[trust == "Scientists make judgments based solely on the facts"] <- 2
trust[trust == "Scientists' judgments are just as likely to be biased as other people's"] <- 1

trust$trust_scientists <- ifelse(is.na(trust$trust_medial_scientists),
                                 trust$trust_scientists,
                                 ifelse(is.na(trust$trust_scientists),
                                        trust$trust_medial_scientists,NA))

trust$trust_medial_scientists <- NULL
trust$scientists_pivotal_policy <- NULL

for(i in 2:ncol(trust)){
  trust[,i] <- as.numeric(trust[,i])
  #print(table(trust[,i]))
}

factanal <- fa(trust[,c(4:10)], nfactors=2, rotate="promax", fm="pa")
scores <- data.frame(factanal$scores)
#loadings(factanal)
loadings <- factanal$loadings
loadings <- data.frame(f1 = loadings[,1],f2=loadings[,2])

# plot(factanal$loadings,type="n") # set up plot
# text(factanal$loadings,labels=names(trust)[4:10],cex=.7) # add variable names

library(ggrepel)

# alpha(trust[,c(4:8)])
# skewness(loadings$f1, na.rm=T)
# kurtosis(loadings$f1, na.rm=T)

# alpha(trust[,c(9:10)])
# skewness(loadings$f2, na.rm=T)
# kurtosis(loadings$f2, na.rm=T)

loadings$vars <- ifelse(rownames(loadings) %in% "trust_scientists",
                        "Trust Scientists",
                 ifelse(rownames(loadings) %in% "scientists_active_role_policy",
                        "Scientists Active Role Policy",
                 ifelse(rownames(loadings) %in% "scientists_pivotal_policy",
                        "PO Guiding Policy Science",
                 ifelse(rownames(loadings) %in% "scientists_better_policy",
                        "Scientists Better Policymakers",
                 ifelse(rownames(loadings) %in% "scientific_method",
                        "Scientific Method Validity",
                 ifelse(rownames(loadings) %in% "scientists_judgement_facts",
                        "Unbiased Scientists",
                 ifelse(rownames(loadings) %in% "research_essential_immediate_applications",
                        "Research Essential Applications",
                 ifelse(rownames(loadings) %in% "research_essential_advance_knowledge",
```

```
                          "Research Essential Knowledge",NA)))))))))

plot <- ggplot(loadings,aes(x = f1, y=f2,label=vars)) +
  theme_minimal() + geom_label_repel() + scale_x_continuous("First Dimension Factor") +
  scale_y_continuous("Second Dimension Factor") +
  geom_segment(aes(x = 0,y = 0,xend = f1,yend = f2),arrow=arrow())
# (Proportion of Variance F1: 18%) (Propoportion of F2 Variance 16%)"

grid.newpage()

footnote <- expression("Cronbach's Standardized"~alpha~"="~0.66)

g <- arrangeGrob(plot, bottom = textGrob(footnote, x = 0.025, hjust = 0,
                                         vjust= 0, y=0.75,
                                         gp = gpar(fontface = "italic",
                                                   fontsize = 9, col = "black")))
grid.draw(g)
```



Cronbach's Standardized $\alpha = 0.66$

```
#ggsave(file="factor_analysis_scientific_trust.png", g, width = 8, height = 5.43, units = "in")

trust <- cbind(trust,scores)
colnames(trust)[11:12] <- c("trust_scientists_fa_dim1","trust_scientists_fa_dim2")

pew <- merge(pew,trust,by=c("QKEY"),all=T)

x <- subset(pew,select=c(pid3,trust_scientists_fa_dim1,trust_scientists_fa_dim2))
x <- na.omit(x)
```

```
x$pid <- ifelse(x$pid3 %in% "Democrat","D",
                ifelse(x$pid3 %in% "Republican","R",
                       ifelse(x$pid3 %in% "Independent","I",NA)))

plot <- ggplot(x,aes(x=trust_scientists_fa_dim1,
                     y=trust_scientists_fa_dim2,label=pid,color=pid)) +
  geom_text(alpha=0.2) + scale_color_manual("",values=c("blue","purple","red"))

x1 <- x
x1$pid3 <- "Full Sample"
x <- rbind(x,x1)
x$pid3 <- factor(x$pid3,levels=c("Republican","Independent","Democrat","Full Sample"),
                 labels=c("Republican Partisans","Independent Partisans",
                          "Democratic Partisans","Full Sample"))

print(summary(aov(trust_scientists_fa_dim1 ~ pid3, data = x)))
```

```
##               Df Sum Sq Mean Sq F value Pr(>F)
## pid3           3    216   72.14   116.4 <2e-16 ***
## Residuals   5810   3599    0.62
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

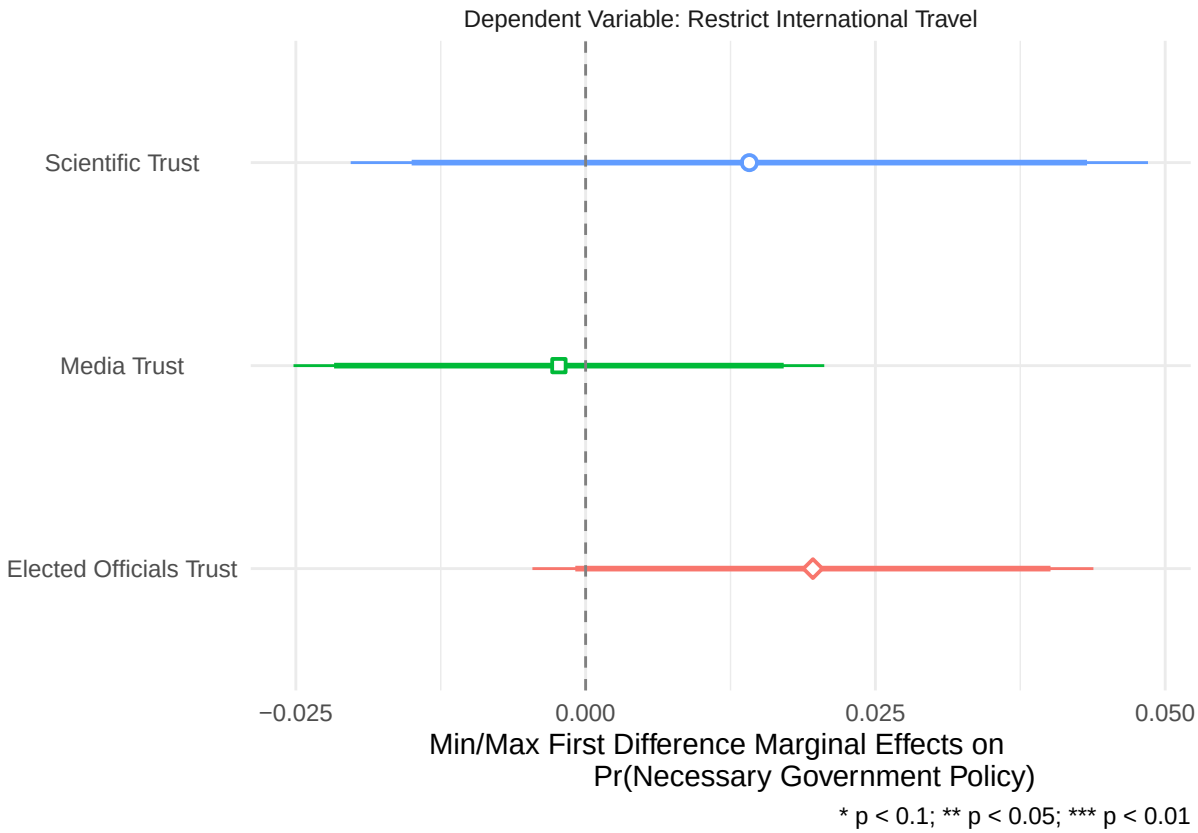
```
plot <- ggplot(x, aes(x=pid3,y=trust_scientists_fa_dim1, group=pid3,fill=pid3)) +
  geom_boxplot(alpha=0.2) + theme_minimal() +
  scale_y_continuous("Latent Scientific Trust") +
  scale_x_discrete("") + scale_fill_manual("",values=c("red","purple","blue","black")) +
  theme(legend.position = "none")
#ggsave(file="scientific_trust_boxplots_by_party.png", plot, width = 8, height = 5.43, units = "in")
```

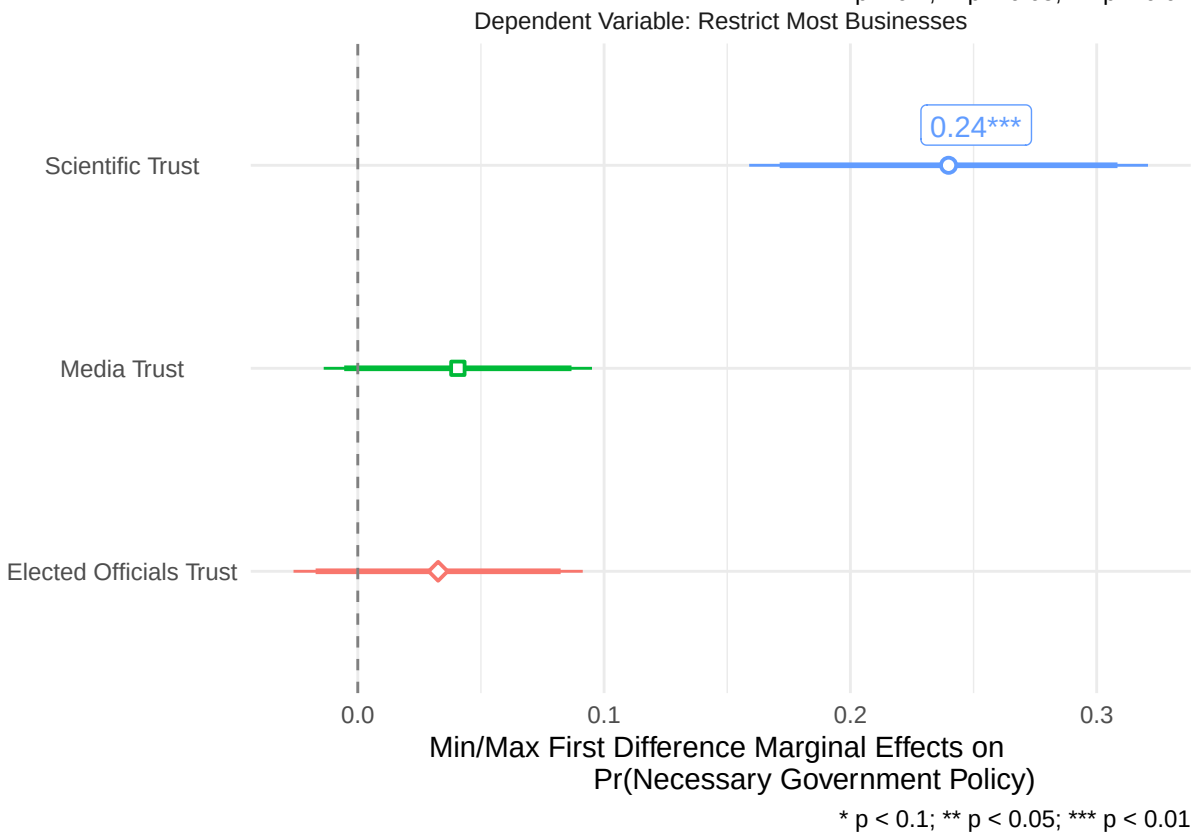
Data Analysis: COVID Policy ~ Scientific Trust: Baseline Effects

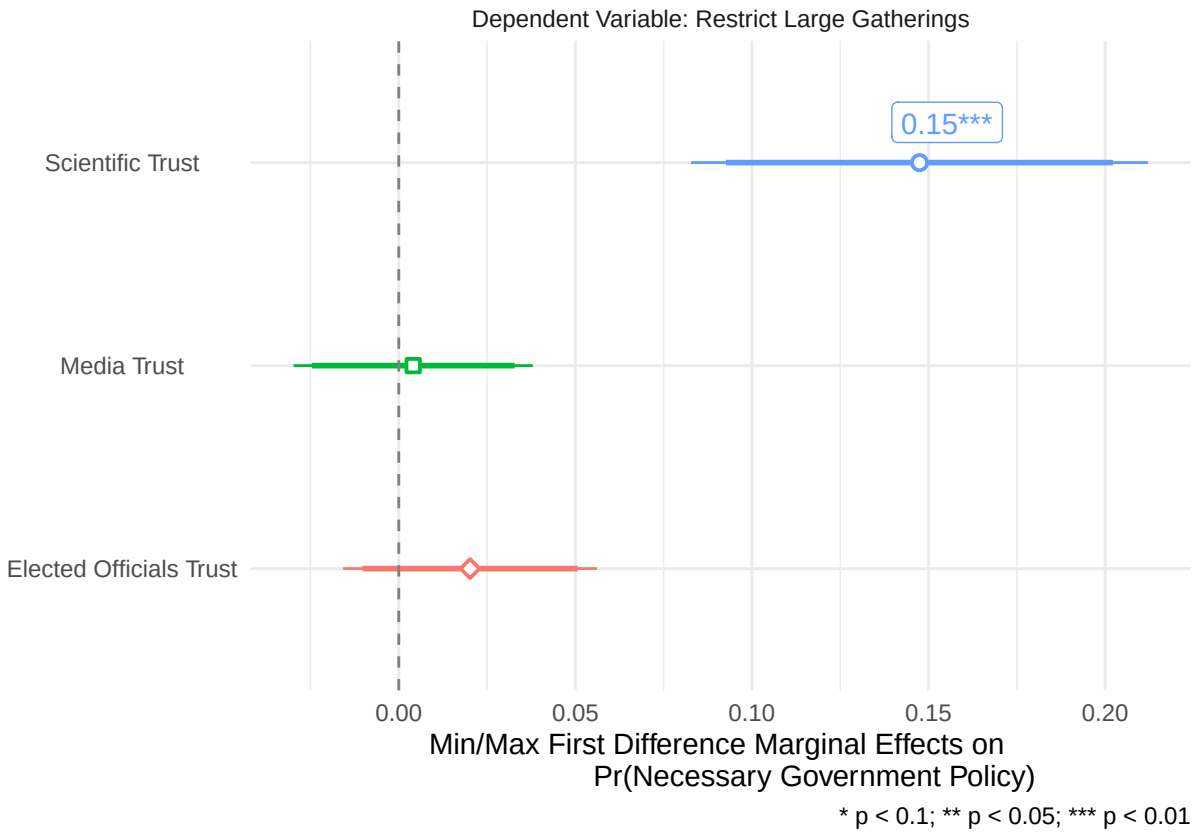
Baseline Trust Effects

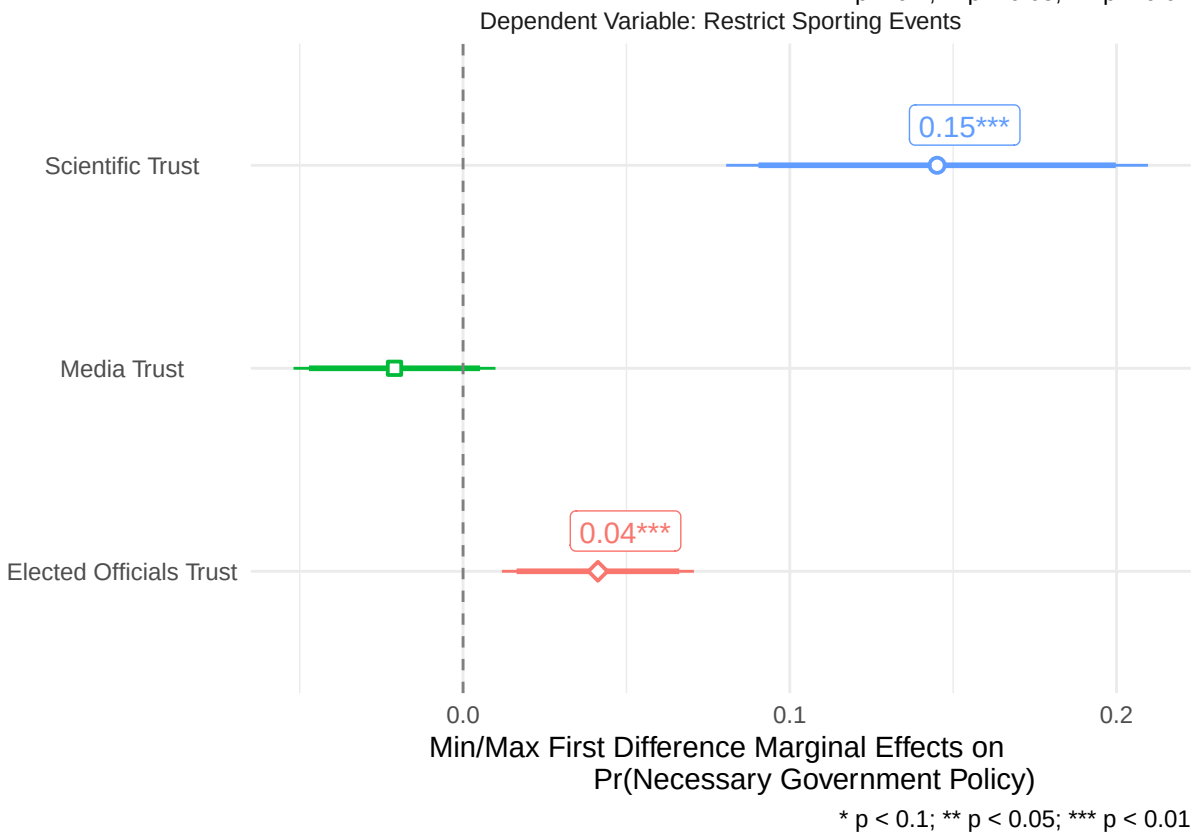
```
baseline_trust_effects <- list()
for(i in which(colnames(pew) == "restriction_intl_travel"):
    which(colnames(pew) == "restriction_postponing_primary")){
  summary(model <- glm(pew[,i] ~ trust_scientists_fa_dim1 +
                         trust_media + trust_elected_officials + female +
                         pid3 + libcon + age_linear + educ_linear +
                         income_linear + race3 + region_factor,
                       data=pew, weights=weight, family = binomial(link = "logit")))
  mes <- summary(margins(model,
                         variables=c("trust_scientists_fa_dim1","trust_media",
                                     "trust_elected_officials"),
                         type="response", change="minmax"))
  mes$model <- colnames(pew)[i]
  mes$category <- "Full Sample Baseline"
  baseline_trust_effects[[i]] <- mes
}
baseline_trust_effects <- ldply(baseline_trust_effects,data.frame)

baseline_trust_effects$pid3 <- "Full Baseline Sample"
```

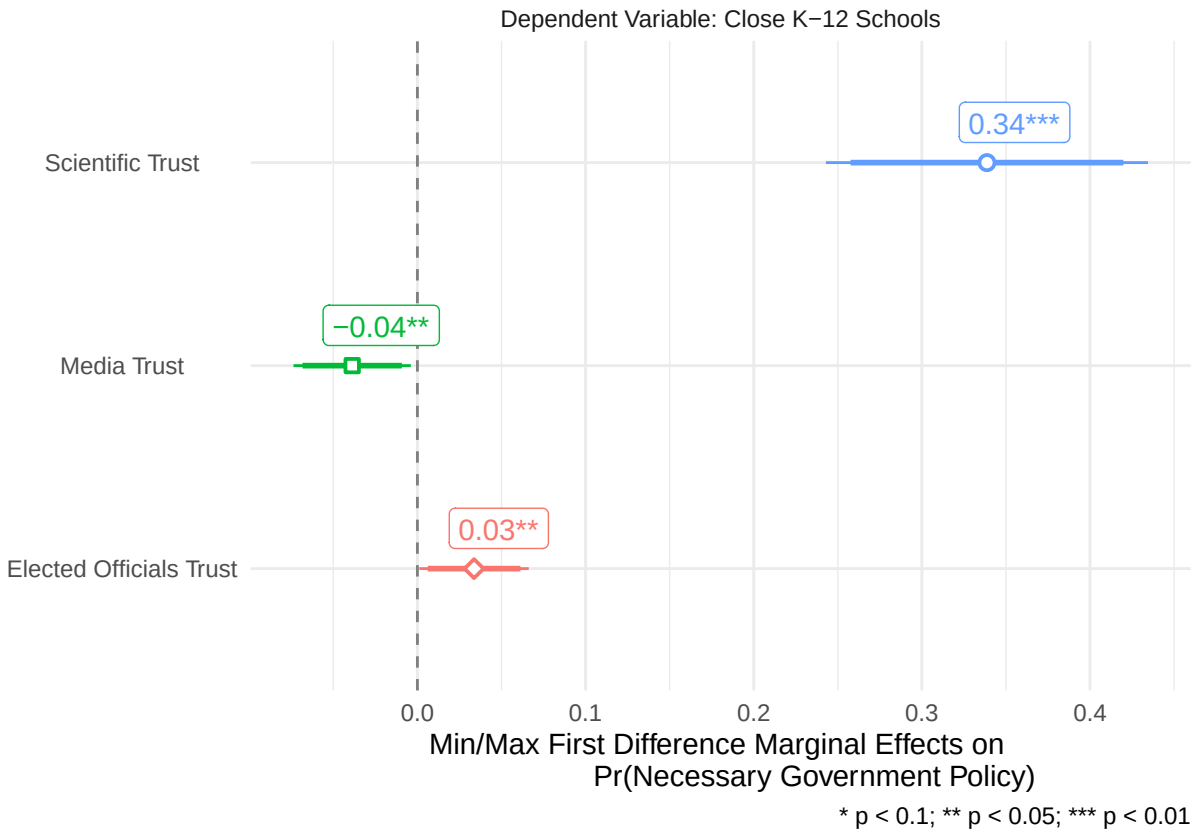
```r
baseline_trust_effects$category <- NULL

effects <- baseline_trust_effects
effects$ylo90 <- (effects$AME - (qt(.95, 100) * effects$SE))
effects$yhi90 <- (effects$AME + (qt(.95, 100) * effects$SE))
effects$model2 <- ifelse(effects$model %in% "restriction_carry_out_only",
                         "Dependent Variable: Restaurants Carry Out Only",
                  ifelse(effects$model %in% "restriction_closing_k12",
                         "Dependent Variable: Close K-12 Schools",
                  ifelse(effects$model %in% "restriction_intl_travel",
                         "Dependent Variable: Restrict International Travel",
                  ifelse(effects$model %in% "restriction_large_gatherings",
                         "Dependent Variable: Restrict Large Gatherings",
                  ifelse(effects$model %in% "restriction_most_business",
                         "Dependent Variable: Restrict Most Businesses",
                  ifelse(effects$model %in% "restriction_postponing_primary",
                         "Dependent Variable: Postpone Primary Elections",
                  ifelse(effects$model %in% "restriction_sporting_events",
                         "Dependent Variable: Restrict Sporting Events",NA)))))))

effects$factor <- ifelse(effects$factor %in% "trust_elected_officials","Elected Officials Trust",
                  ifelse(effects$factor %in% "trust_media","Media Trust",
                  ifelse(effects$factor %in% "trust_scientists_fa_dim1","Scientific Trust",NA)))

effects$label <- ifelse(effects$p < 0.01,paste(round(effects$AME,2),"***",sep=""),
                  ifelse(effects$p < 0.05,paste(round(effects$AME,2),"**",sep=""),
                  ifelse(effects$p < 0.10,paste(round(effects$AME,2),"*",sep=""),NA)))

for(i in unique(effects$model)){
  x <- subset(effects,effects$model %in% i)
  plot <- ggplot(x,aes(x=factor,y=AME,factor=factor,group=factor,color=factor,
                       shape=factor,label=label,fill=factor)) +
    facet_wrap(~model2) + coord_flip() +
    geom_linerange(aes(x= factor, ymin = ylo90, ymax = yhi90),
                   position = position_dodge(width=0.75), lwd  = 1) +
    geom_pointrange(aes(x= factor, ymin = lower, ymax = upper), lwd = 1/2,
                    position = position_dodge(width=0.75),fill="white") +
    theme_minimal() + scale_x_discrete("") +
    scale_y_continuous("Min/Max First Difference Marginal Effects on
                       Pr(Necessary Government Policy)") +
    geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
    labs(color="Trust Effects",shape="Trust Effects") +
    theme(legend.position = "none") +
    theme(axis.text.x = element_text(hjust = 0.5),
          axis.text.y = element_text(hjust = 0.5)) +
    geom_label(vjust=-0.5,hjust=0.25,fill="white") +
    labs(caption="* p < 0.1; ** p < 0.05; *** p < 0.01") +
    scale_shape_manual("",values=c(23,22,21))
  print(plot)
  #ggsave(file=paste(i,"_model",".png",sep=""), plot, width = 8, height = 5.43, units = "in")
}
```


Dependent Variable: Restrict International Travel
Scientific Trust
Media Trust
Elected Officials Trust
−0.025
0.000
0.025
0.050
Min/Max First Difference Marginal Effects on
Pr(Necessary Government Policy)
* p < 0.1; ** p < 0.05; *** p < 0.01

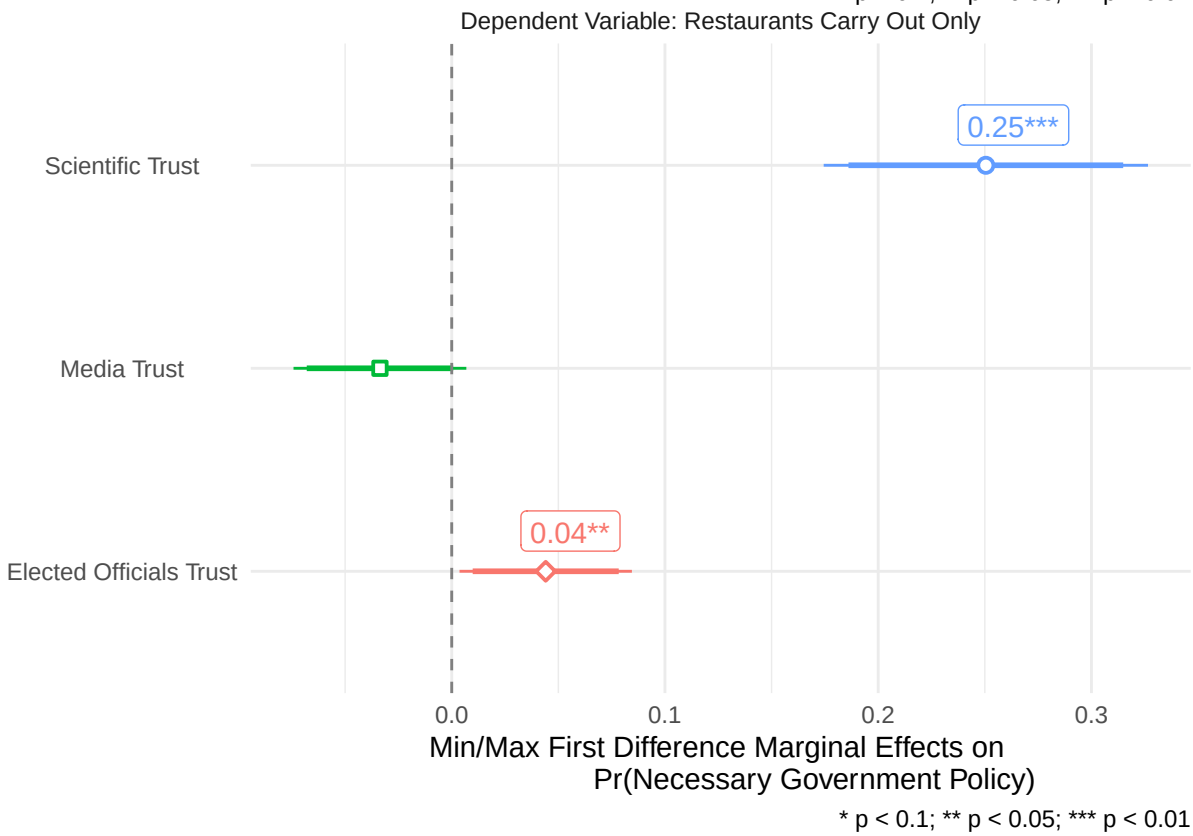

Dependent Variable: Restrict Most Businesses
0.24***
Scientific Trust
Media Trust
Elected Officials Trust
0.0
0.1
0.2
0.3
Min/Max First Difference Marginal Effects on
Pr(Necessary Government Policy)
* p < 0.1; ** p < 0.05; *** p < 0.01


Dependent Variable: Restrict Large Gatherings
Scientific Trust
Media Trust
Elected Officials Trust
0.15***
0.00
0.05
0.10
0.15
0.20
Min/Max First Difference Marginal Effects on
Pr(Necessary Government Policy)
* p < 0.1; ** p < 0.05; *** p < 0.01

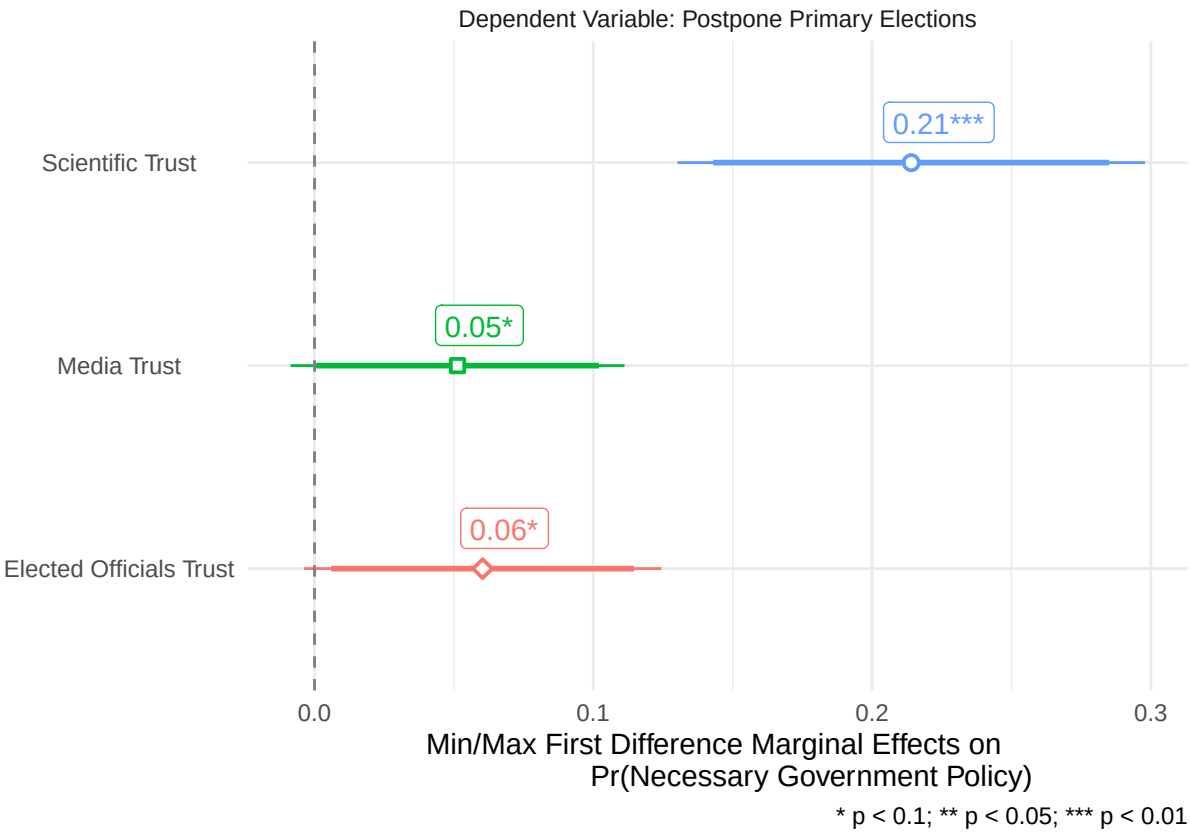

Dependent Variable: Restrict Sporting Events
Scientific Trust
Media Trust
Elected Officials Trust
0.15***
0.04***
0.0
0.1
0.2
Min/Max First Difference Marginal Effects on
Pr(Necessary Government Policy)
* p < 0.1; ** p < 0.05; *** p < 0.01



* p < 0.1; ** p < 0.05; *** p < 0.01



* p < 0.1; ** p < 0.05; *** p < 0.01

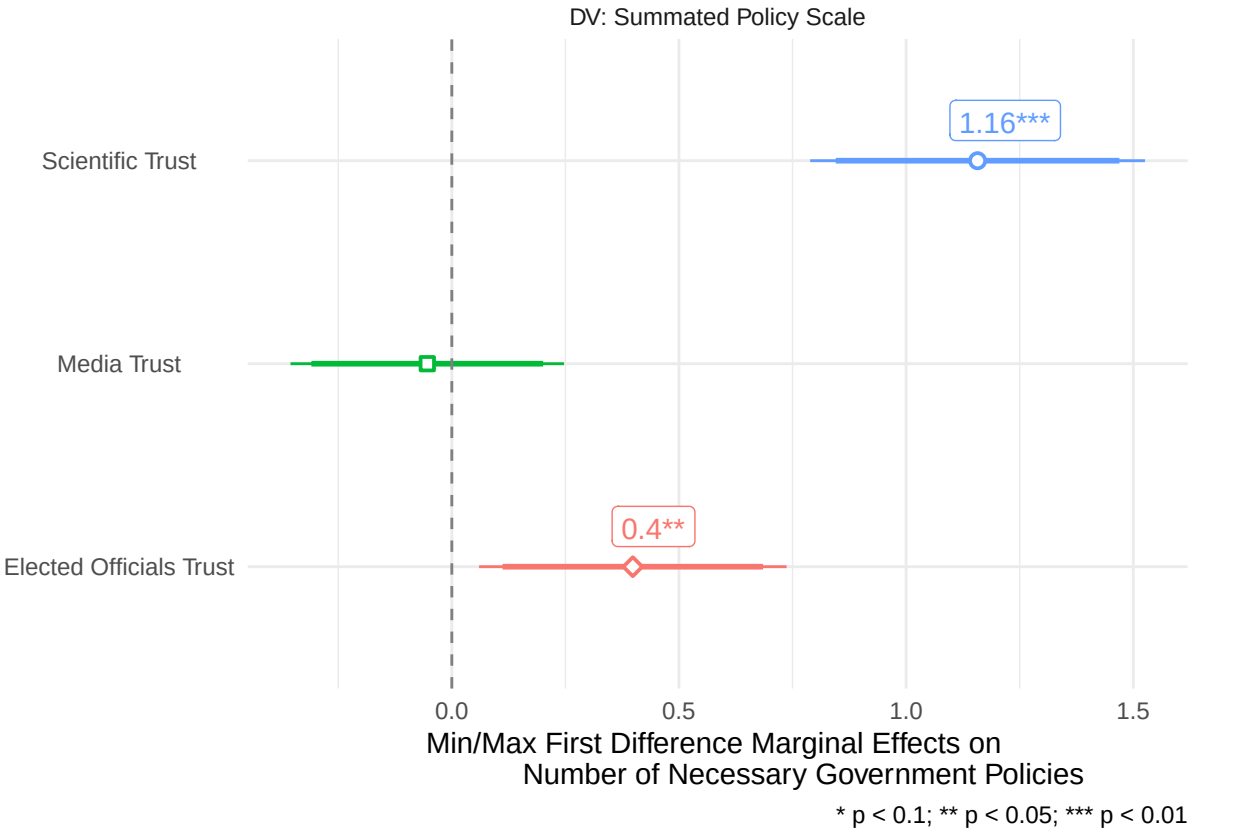


Data Analysis Figures: OLS Composite Models

```
model <- glm(covid_restriction_irt ~ trust_scientists_fa_dim1 +
                       trust_media + trust_elected_officials +
                       female + libcon + age_linear + educ_linear +
                       income_linear + race3 + region_factor,
                     data=pew, weights=weight, family = gaussian(identity))

baseline_trust_effects.2 <- summary(margins(model,
                                            variables=c("trust_scientists_fa_dim1",
                                                        "trust_media","trust_elected_officials"),
                                            type="response", change="minmax"))
baseline_trust_effects.2$model <- "DV: Latent Policy Scale"
baseline_trust_effects.2$pid3 <- "Full Sample"

effects <- baseline_trust_effects.2
effects$ylo90 <- (effects$AME - (qt(.95, 100) * effects$SE))
effects$yhi90 <- (effects$AME + (qt(.95, 100) * effects$SE))
effects$ame_label <- round(effects$AME,2)
effects$factor <- ifelse(effects$factor %in% "trust_elected_officials",
                         "Elected Officials Trust",
                  ifelse(effects$factor %in% "trust_media",
                         "Media Trust",
                  ifelse(effects$factor %in% "trust_scientists_fa_dim1",
                         "Scientific Trust",NA)))
effects$label <- ifelse(effects$p < 0.01,paste(round(effects$AME,2),"***",sep=""),
```

```
                  ifelse(effects$p < 0.05,paste(round(effects$AME,2),"**",sep=""),
                  ifelse(effects$p < 0.10,paste(round(effects$AME,2),"*",sep=""),NA)))

plot <- ggplot(effects,aes(x=factor,y=AME,factor=factor,
                           group=factor,color=factor,shape=factor,label=label,fill=factor)) +
  facet_wrap(~model) + coord_flip() +
  geom_linerange(aes(x= factor, ymin = ylo90, ymax = yhi90),
                 position = position_dodge(width=0.75), lwd  = 1) +
  geom_pointrange(aes(x= factor, ymin = lower, ymax = upper), lwd = 1/2,
                  position = position_dodge(width=0.75),fill="white") +
  theme_minimal() + scale_x_discrete("") +
  scale_y_continuous("Min/Max First Difference Marginal Effects on
                     Latent Necessary Government Policies")  +
  geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
  labs(color="Trust Effects",shape="Trust Effects") +
  theme(legend.position = "none") +
  theme(axis.text.x = element_text(hjust = 0.5),axis.text.y = element_text(hjust = 0.5)) +
  geom_label(vjust=-0.5,hjust=0.25,fill="white") +
  labs(caption="* p < 0.1; ** p < 0.05; *** p < 0.01") +
  scale_shape_manual("",values=c(23,22,21))
#ggsave(file="latent_policy_scale_model.png", plot, width = 8, height = 5.43, units = "in")

model <- glm(summated_restriction_scale ~ trust_scientists_fa_dim1 +
                       trust_media + trust_elected_officials + female +
                       libcon + age_linear + educ_linear + income_linear +
                       race3 + region_factor, data=pew, weights=weight,
                     family = "poisson")
baseline_trust_effects.3 <- summary(margins(model,
                                            variables=c("trust_scientists_fa_dim1",
                                                        "trust_media","trust_elected_officials"),
                                            type="response", change="minmax"))
baseline_trust_effects.3$model <- "DV: Summated Policy Scale"
baseline_trust_effects.3$pid3 <- "Full Sample"

effects <- baseline_trust_effects.3
effects$ylo90 <- (effects$AME - (qt(.95, 100) * effects$SE))
effects$yhi90 <- (effects$AME + (qt(.95, 100) * effects$SE))
effects$ame_label <- round(effects$AME,2)
effects$factor <- ifelse(effects$factor %in% "trust_elected_officials",
                         "Elected Officials Trust",
                  ifelse(effects$factor %in% "trust_media","Media Trust",
                  ifelse(effects$factor %in% "trust_scientists_fa_dim1",
                         "Scientific Trust",NA)))
effects$label <- ifelse(effects$p < 0.01,paste(round(effects$AME,2),"***",sep=""),
                 ifelse(effects$p < 0.05,paste(round(effects$AME,2),"**",sep=""),
                  ifelse(effects$p < 0.10,paste(round(effects$AME,2),"*",sep=""),NA)))

plot <- ggplot(effects,aes(x=factor,y=AME,
                           factor=factor,group=factor,
                           color=factor,shape=factor,label=label)) +
  facet_wrap(~model) + coord_flip() +
  geom_linerange(aes(x= factor, ymin = ylo90, ymax = yhi90),
                 position = position_dodge(width=0.75), lwd  = 1) +
```

```
  geom_pointrange(aes(x= factor, ymin = lower, ymax = upper), lwd = 1/2,
                  position = position_dodge(width=0.75),fill="white") +
  theme_minimal() + scale_x_discrete("") +
  scale_y_continuous("Min/Max First Difference Marginal Effects on
                     Number of Necessary Government Policies")  +
  geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
  labs(color="Trust Effects",shape="Trust Effects") + theme(legend.position = "none") +
  theme(axis.text.x = element_text(hjust = 0.5),
        axis.text.y = element_text(hjust = 0.5)) +
  geom_label(vjust=-0.5,hjust=0.25,fill="white") +
  labs(caption="* p < 0.1; ** p < 0.05; *** p < 0.01") +
  scale_shape_manual("",values=c(23,22,21))
print(plot)
```




```
#ggsave(file="summated_policy_scale_model.png", plot, width = 8, height = 5.43, units = "in")
```

Distribution of Summated Rating Scales

```
x <- subset(pew,select=c(summated_restriction_scale,trust_scientists_fa_dim1,pid3,trust_media,trust_ele
x1 <- na.omit(x)
x <- na.omit(x)
x1$race3 <- "Full Sample"

x <- subset(x,select=c(summated_restriction_scale,race3))
x$n <- 1
xs <- ddply(x,.(summated_restriction_scale,race3),summarise,total=sum(n,na.rm=T))
```

```
x <- ddply(x,.(race3),summarise,total_race3=sum(n,na.rm=T))
xs <- merge(xs,x,by=c("race3"))
xs$prop <- xs$total/xs$total_race3

x1 <- subset(x1,select=c(summated_restriction_scale,race3))
x1$n <- 1
xs1 <- ddply(x1,.(summated_restriction_scale),summarise,total=sum(n,na.rm=T))
xs1$total_race3 <- sum(x1$n,na.rm=T)
xs1$prop <- xs1$total/xs1$total_race3
xs1$race3 <- "Full Sample"

x <- rbind(xs,xs1)
x$race3 <- factor(x$race3,
                  levels=c("asian","black","hispanic","white","Full Sample"),
                  labels=c("Asian Respondents","Black Respondents",
                           "Hispanic Respondents","White Respondents","Full Sample"))

plot <- ggplot(x, aes(x=factor(summated_restriction_scale),
                      y=prop, label=round(prop,2))) +
  geom_point(stat='identity', size=6*1.25) +
  geom_segment(aes(y=0,x=factor(summated_restriction_scale),
                   yend=prop,xend=factor(summated_restriction_scale)))+
  geom_text(color="white", size=2*1.25) + coord_flip() +
  facet_wrap(~race3) + theme_minimal() + theme(legend.position = "none") +
  scale_x_discrete("Number of Restrictive COVID-19 Policies Necessary") +
  scale_y_continuous("Proportion of Respondents")
#ggsave(file="number_policies_dotplot.png", plot, width = 8, height = 5.43, units = "in")
```

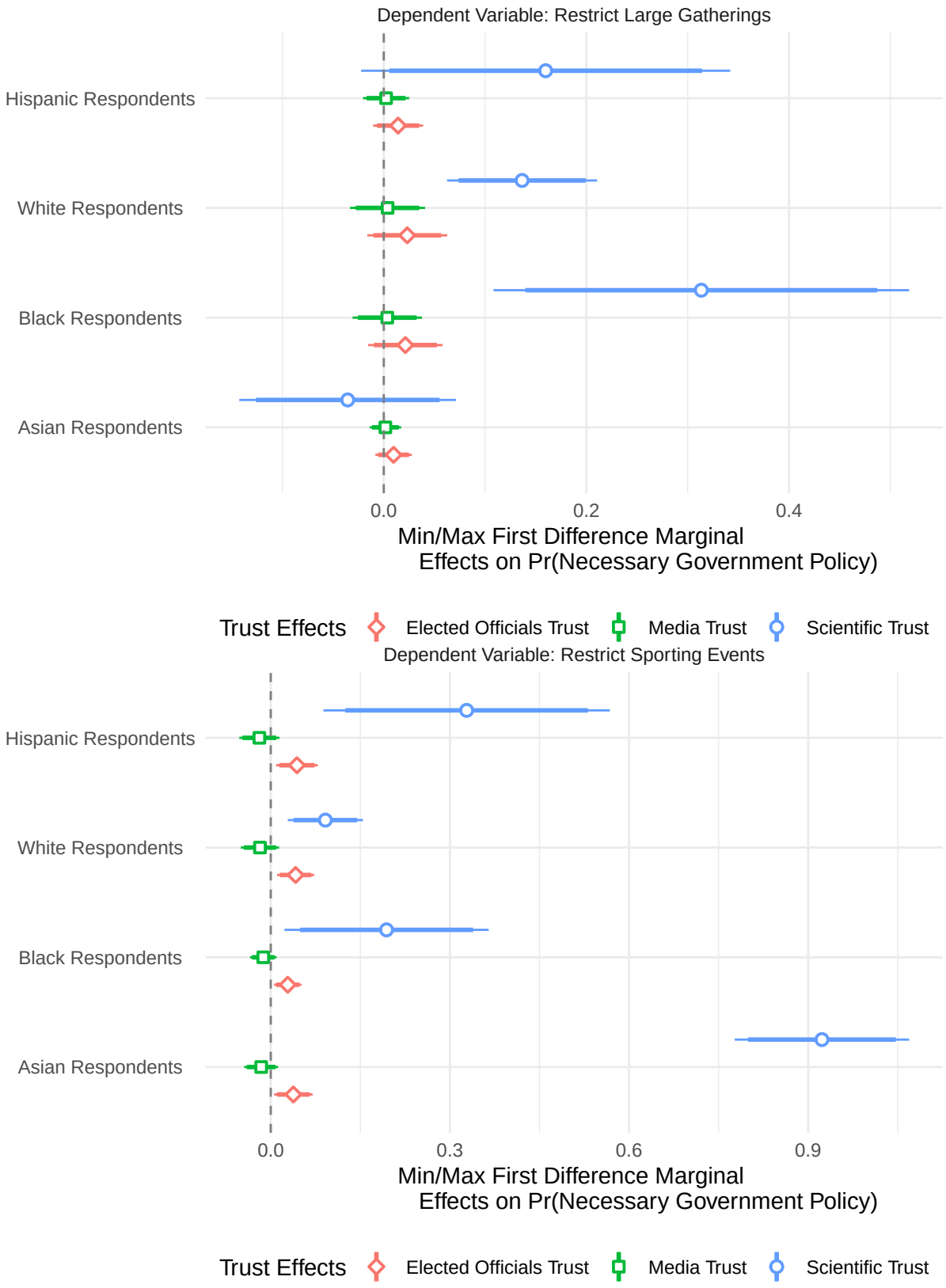
Conditioned by Race | Data Analysis: COVID Policy ~ Scientific Trust: Baseline Effects

Baseline Trust Effects

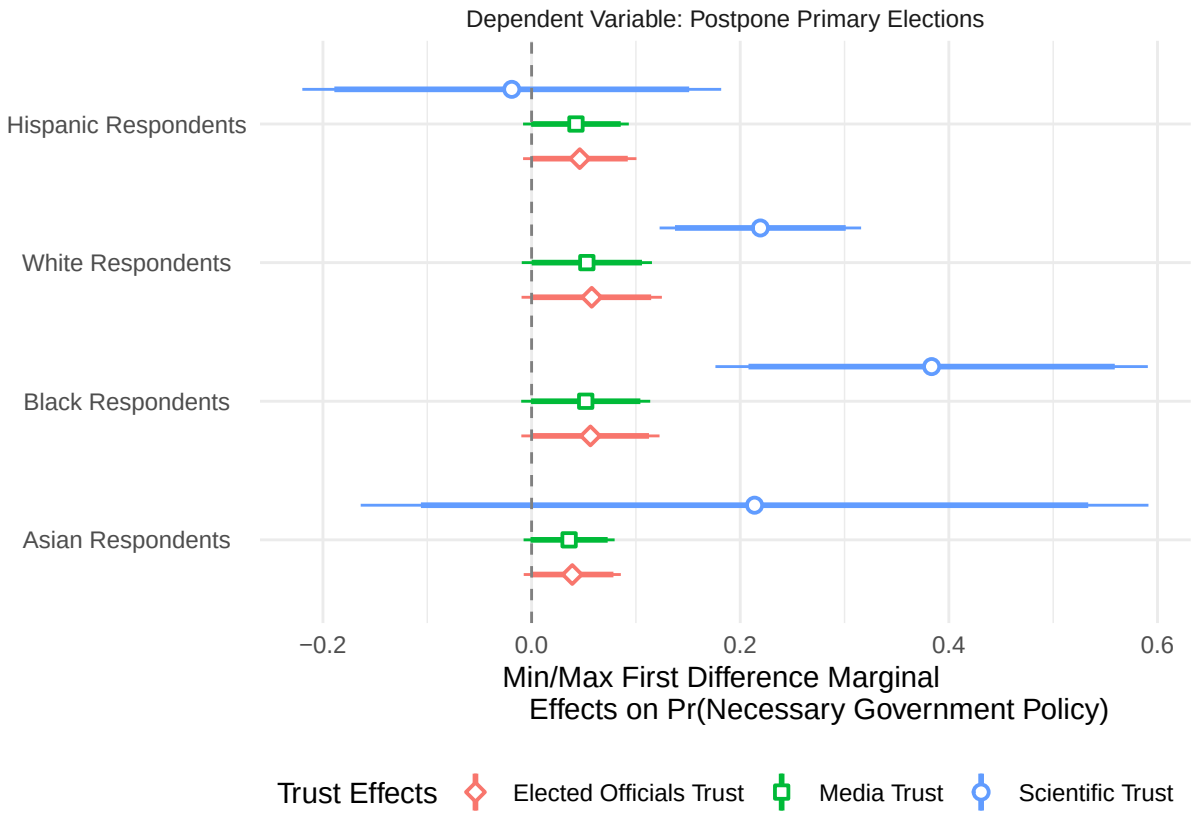
```
baseline_trust_effects.race <- list()
for(i in which(colnames(pew) == "restriction_intl_travel"):
    which(colnames(pew) == "restriction_postponing_primary")){
  summary(model <- glm(pew[,i] ~ trust_scientists_fa_dim1*race3 +
                         trust_media + trust_elected_officials +
                         female + pid3 + libcon + age_linear +
                         educ_linear + income_linear +
                         region_factor, data=pew, weights=weight,
                       family = binomial(link = "logit")))
  mes <- summary(margins(model,
                         variables=c("trust_scientists_fa_dim1","trust_media",
                                     "trust_elected_officials"),
                         at=list(race3=c("asian","black","white","hispanic")),
                         type="response", change="minmax",))
  mes$model <- colnames(pew)[i]
  mes$category <- "Full Sample Baseline"
  baseline_trust_effects.race[[i]] <- mes
}
baseline_trust_effects.race <- ldply(baseline_trust_effects.race,data.frame)
```

```
effects <- baseline_trust_effects.race
effects$ylo90 <- (effects$AME - (qt(.95, 100) * effects$SE))
effects$yhi90 <- (effects$AME + (qt(.95, 100) * effects$SE))
effects$model2 <- ifelse(effects$model %in% "restriction_carry_out_only",
                         "Dependent Variable: Restaurants Carry Out Only",
                  ifelse(effects$model %in% "restriction_closing_k12",
                         "Dependent Variable: Close K-12 Schools",
                  ifelse(effects$model %in% "restriction_intl_travel",
                         "Dependent Variable: Restrict International Travel",
                  ifelse(effects$model %in% "restriction_large_gatherings",
                         "Dependent Variable: Restrict Large Gatherings",
                  ifelse(effects$model %in% "restriction_most_business",
                         "Dependent Variable: Restrict Most Businesses",
                  ifelse(effects$model %in% "restriction_postponing_primary",
                         "Dependent Variable: Postpone Primary Elections",
                  ifelse(effects$model %in% "restriction_sporting_events",
                         "Dependent Variable: Restrict Sporting Events",NA)))))))
effects$factor <- ifelse(effects$factor %in% "trust_elected_officials",
                         "Elected Officials Trust",
                  ifelse(effects$factor %in% "trust_media","Media Trust",
                  ifelse(effects$factor %in% "trust_scientists_fa_dim1",
                         "Scientific Trust",NA)))
effects$race3 <- factor(effects$race3,levels=c("asian","black","white","hispanic"),
                        labels=c("Asian Respondents","Black Respondents",
                                 "White Respondents","Hispanic Respondents"))

for(i in unique(effects$model)){
  x <- subset(effects,effects$model %in% i)
  plot <- ggplot(x,aes(x=race3,y=AME,factor=factor,group=factor,
                       color=factor,shape=factor)) +
    facet_wrap(~model2) + coord_flip() +
    geom_linerange(aes(x= race3, ymin = ylo90, ymax = yhi90),
                   position = position_dodge(width=0.75), lwd  = 1) +
    geom_pointrange(aes(x= race3, ymin = lower, ymax = upper), lwd = 1/2,
                    position = position_dodge(width=0.75),fill="white") +
    theme_minimal() + scale_x_discrete("") +
    scale_y_continuous("Min/Max First Difference Marginal
                       Effects on Pr(Necessary Government Policy)") +
    geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
    labs(color="Trust Effects",shape="Trust Effects") + theme(legend.position = "bottom") +
    theme(axis.text.x = element_text(hjust = 0.5),axis.text.y = element_text(hjust = 0.5)) +
    scale_shape_manual("Trust Effects",values=c(23,22,21))
  print(plot)
  #ggsave(file=paste(i,"_race3_model",".png",sep=""), plot, width = 8, height = 5.43, units = "in")
}
```


Dependent Variable: Restrict International Travel
Hispanic Respondents
White Respondents
Black Respondents
Asian Respondents
0.00
0.25
0.50
0.75
1.00
Min/Max First Difference Marginal
Effects on Pr(Necessary Government Policy)
Trust Effects
Elected Officials Trust
Media Trust
Scientific Trust
Dependent Variable: Restrict Most Businesses
Hispanic Respondents
White Respondents
Black Respondents
Asian Respondents
0.0
0.2
0.4
0.6
0.8
Min/Max First Difference Marginal
Effects on Pr(Necessary Government Policy)
Trust Effects
Elected Officials Trust
Media Trust
Scientific Trust


Dependent Variable: Restrict Large Gatherings
Hispanic Respondents
White Respondents
Black Respondents
Asian Respondents
0.0
0.2
0.4
Min/Max First Difference Marginal
Effects on Pr(Necessary Government Policy)
Trust Effects
Elected Officials Trust
Media Trust
Scientific Trust
Dependent Variable: Restrict Sporting Events
Hispanic Respondents
White Respondents
Black Respondents
Asian Respondents
0.0
0.3
0.6
0.9
Min/Max First Difference Marginal
Effects on Pr(Necessary Government Policy)
Trust Effects
Elected Officials Trust
Media Trust
Scientific Trust

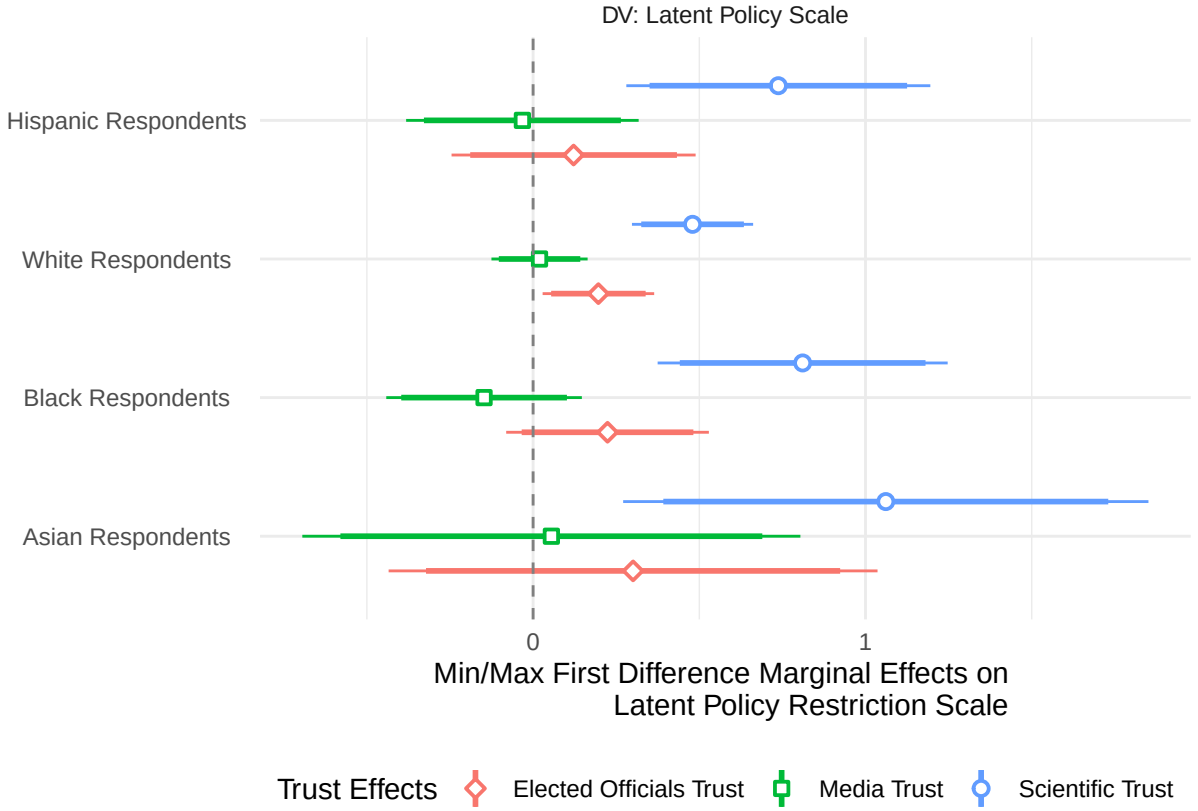

Dependent Variable: Close K−12 Schools
Hispanic Respondents
White Respondents
Black Respondents
Asian Respondents
0.00
0.25
0.50
0.75
1.00
Min/Max First Difference Marginal
Effects on Pr(Necessary Government Policy)
Trust Effects
Elected Officials Trust
Media Trust
Scientific Trust
Dependent Variable: Restaurants Carry Out Only
Hispanic Respondents
White Respondents
Black Respondents
Asian Respondents
0.0
0.2
0.4
0.6
0.8
Min/Max First Difference Marginal
Effects on Pr(Necessary Government Policy)
Trust Effects
Elected Officials Trust
Media Trust
Scientific Trust



Data Analysis Figures: OLS Composite Models

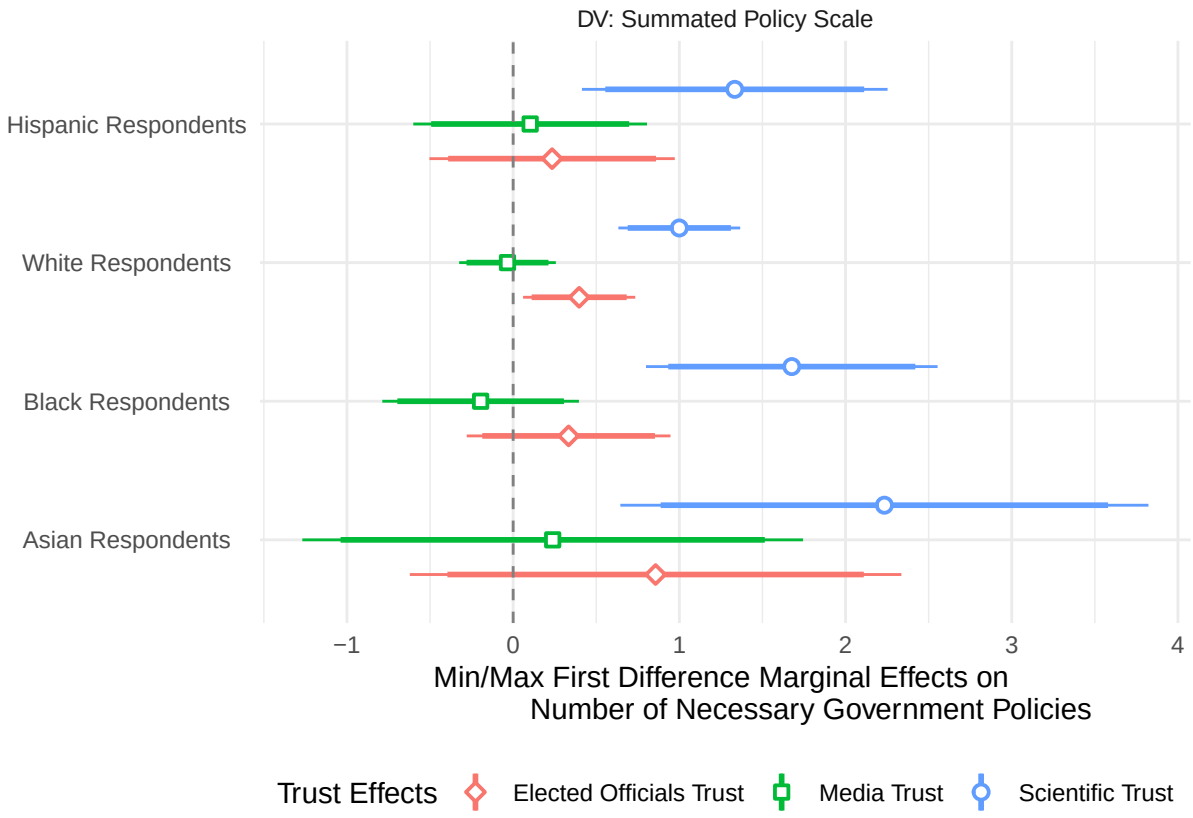
```
model <- glm(covid_restriction_irt ~ trust_scientists_fa_dim1*race3 +
                       trust_media*race3 + trust_elected_officials*race3 +
                       female + libcon + age_linear + educ_linear +
                       income_linear + region_factor, data=pew,
                     weights=weight, family = gaussian(identity))
baseline_trust_effects.4 <- summary(margins(model,
                                            variables=c("trust_scientists_fa_dim1",
                                                        "trust_media","trust_elected_officials"),
                                            at=list(race3=c("asian","white","black","hispanic")),
                                            type="response", change="minmax"))
baseline_trust_effects.4$model <- "DV: Latent Policy Scale"
baseline_trust_effects.4$pid3 <- "Full Sample"

effects <- baseline_trust_effects.4
effects$race3 <- factor(effects$race3,levels=c("asian","black","white","hispanic"),
                        labels=c("Asian Respondents","Black Respondents",
                                 "White Respondents","Hispanic Respondents"))

effects$ylo90 <- (effects$AME - (qt(.95, 100) * effects$SE))
effects$yhi90 <- (effects$AME + (qt(.95, 100) * effects$SE))

effects$factor <- ifelse(effects$factor %in% "trust_elected_officials",
                         "Elected Officials Trust",
                  ifelse(effects$factor %in% "trust_media","Media Trust",
```

```
                  ifelse(effects$factor %in% "trust_scientists_fa_dim1",
                         "Scientific Trust",NA)))

plot <- ggplot(effects,aes(x=race3,y=AME,factor=factor,group=factor,color=factor,shape=factor)) +
  facet_wrap(~model) + coord_flip() +
  geom_linerange(aes(x= race3, ymin = ylo90, ymax = yhi90),
                 position = position_dodge(width=0.75), lwd  = 1) +
  geom_pointrange(aes(x= race3, ymin = lower, ymax = upper), lwd = 1/2,
                  position = position_dodge(width=0.75),fill="white") +
  theme_minimal() + scale_x_discrete("") +
  scale_y_continuous("Min/Max First Difference Marginal Effects on
                     Latent Policy Restriction Scale") +
  geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
  labs(color="Trust Effects",shape="Trust Effects") +
  theme(legend.position = "bottom") +
  theme(axis.text.x = element_text(hjust = 0.5),
        axis.text.y = element_text(hjust = 0.5)) +
  scale_shape_manual("Trust Effects",values=c(23,22,21))
print(plot)
```




```
#ggsave(file="latent_policy_scale_race3_model.png", plot, width = 8, height = 5.43, units = "in")

model <- glm(summated_restriction_scale ~ trust_scientists_fa_dim1*race3 +
                       trust_media*race3 + trust_elected_officials*race3 +
                       female + libcon + age_linear + educ_linear +
                       income_linear + region_factor, data=pew,
                     weights=weight, family = gaussian(identity))
baseline_trust_effects.5 <- summary(margins(model,
```

```
                                          variables=c("trust_scientists_fa_dim1",
                                                      "trust_media",
                                                      "trust_elected_officials"),
                                          at=list(race3=c("asian","white","black",
                                                          "hispanic")),
                                          type="response", change="minmax"))
baseline_trust_effects.5$model <- "DV: Summated Policy Scale"
baseline_trust_effects.5$pid3 <- "Full Sample"

effects <- baseline_trust_effects.5
effects$race3 <- factor(effects$race3,levels=c("asian","black","white","hispanic"),
                        labels=c("Asian Respondents","Black Respondents",
                                 "White Respondents","Hispanic Respondents"))

effects$ylo90 <- (effects$AME - (qt(.95, 100) * effects$SE))
effects$yhi90 <- (effects$AME + (qt(.95, 100) * effects$SE))

effects$factor <- ifelse(effects$factor %in% "trust_elected_officials",
                         "Elected Officials Trust",
                  ifelse(effects$factor %in% "trust_media","Media Trust",
                  ifelse(effects$factor %in% "trust_scientists_fa_dim1",
                         "Scientific Trust",NA)))

plot <- ggplot(effects,aes(x=race3,y=AME,factor=factor,group=factor,color=factor,shape=factor)) +
  facet_wrap(~model) + coord_flip() +
  geom_linerange(aes(x= race3, ymin = ylo90, ymax = yhi90),
                 position = position_dodge(width=0.75), lwd  = 1) +
  geom_pointrange(aes(x= race3, ymin = lower, ymax = upper), lwd = 1/2,
                  position = position_dodge(width=0.75),fill="white") +
  theme_minimal() + scale_x_discrete("") +
  scale_y_continuous("Min/Max First Difference Marginal Effects on
                      Number of Necessary Government Policies") +
  geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
  labs(color="Trust Effects",shape="Trust Effects") +
  theme(legend.position = "bottom") + theme(axis.text.x = element_text(hjust = 0.5),
                                            axis.text.y = element_text(hjust = 0.5)) +
  scale_shape_manual("Trust Effects",values=c(23,22,21))
print(plot)
```




```
#ggsave(file="summated_policy_scale_race3_model.png", plot, width = 8, height = 5.43, units = "in")
```

Boxplot by Race

```
x <- subset(pew,select=c(race3,trust_scientists_fa_dim1))
x <- na.omit(x)
print(summary(aov(trust_scientists_fa_dim1 ~ race3, data = x)))
```

```
##               Df Sum Sq Mean Sq F value Pr(>F)
## race3          3    8.5   2.818   4.302 0.0049 **
## Residuals   3154 2065.7   0.655
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
y <- subset(pew,select=c(race3,trust_scientists_fa_dim1))
y$race3 <- "Full Sample"
x <- rbind(x,y)

plot <- ggplot(x, aes(x=race3,y=trust_scientists_fa_dim1, group=race3,fill=race3)) +
  geom_boxplot(alpha=0.2) + theme_minimal() +
  scale_y_continuous("Latent Scientific Trust") +
  scale_x_discrete("",labels=c("White Respondents","Black Respondents",
                               "Hispanic Respondents","Asian Respondents","Full Sample")) +
  theme(legend.position = "none") +
  labs(caption="ANOVA suggests significant differences in mean latent
       scientific trust across racial groups, p < 0.01.") +
  geom_jitter(aes(colour=race3),alpha=0.075) +
```

```
  scale_color_manual("",values=c("#F8766D","#7CAE00","#00BFC4","#529EFF","gray")) +
  scale_fill_manual("",values=c("#F8766D","#7CAE00","#00BFC4","#529EFF","gray"))
#ggsave(file="scientific_trust_boxplots_by_race3.png", plot, width = 8, height = 5.43, units = "in")
```

Data Analysis Figures: OLS Composite Models

```
model <- lm(trust_scientists_fa_dim1 ~ female + pid3 + libcon +
                      age_linear + educ_linear + income_linear + race3 +
                      region_factor, data=pew, weights=weight)

mes <- summary(margins(model, type="response", change="minmax"))
mes$race3 <- factor(mes$factor,levels=c("race3asian","race3black","race3hispanic"),
                    labels=c("Asian Respondents","Black Respondents",
                             "Hispanic Respondents"))

mes$label <- ifelse(mes$p < 0.01,paste(round(mes$AME,2),"***",sep=""),
                    ifelse(mes$p < 0.05,paste(round(mes$AME,2),"**",sep=""),
                    ifelse(mes$p < 0.10,paste(round(mes$AME,2),"*",sep=""),NA)))

mes$ylo90 <- (mes$AME - (qt(.95, 100) * mes$SE))
mes$yhi90 <- (mes$AME + (qt(.95, 100) * mes$SE))
mes$model <- "DV: Latent Scientific Trust "

plot <- ggplot(subset(mes,!is.na(mes$race3)),
               aes(x=race3,y=AME,factor=race3,group=race3,
                   color=race3,shape=race3,label=label,fill=race3)) +
  facet_wrap(~model) + coord_flip() +
  geom_linerange(aes(x= race3, ymin = ylo90, ymax = yhi90),
                 position = position_dodge(width=0.75), lwd  = 1) +
  geom_pointrange(aes(x= race3, ymin = lower, ymax = upper), lwd = 1/2,
                  position = position_dodge(width=0.75),fill="white") +
  theme_minimal() + scale_x_discrete("") +
  scale_y_continuous("Marginal Effect of Race on Latent Scientific Trust")  +
  geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
  labs(color="Trust Effects",shape="Trust Effects") +
  theme(legend.position = "none") +
  theme(axis.text.x = element_text(hjust = 0.5),axis.text.y = element_text(hjust = 0.5)) +
  geom_label(vjust=-0.5,hjust=0.25,fill="white") +
  labs(caption="Note marginal effects relative to
       white respondents. \n* p < 0.1; ** p < 0.05; *** p < 0.01") +
  facet_wrap(~model) + scale_shape_manual("Trust Effects",values=c(23,22,21))
ggsave(file="latent_scientific_trust_model.png", plot, width = 8, height = 5.43, units = "in")

mes <- subset(mes,!(mes$factor %in% c("region_factorWest","region_factorSouth","region_factorMidwest")))

plot <- ggplot(mes,aes(x=factor,y=AME,factor=factor,group=factor,label=label)) +
  facet_wrap(~model) + coord_flip() +
  geom_linerange(aes(x= factor, ymin = ylo90, ymax = yhi90),
                 position = position_dodge(width=0.75), lwd  = 1) +
  geom_pointrange(aes(x= factor, ymin = lower, ymax = upper), lwd = 1/2,
                  position = position_dodge(width=0.75),fill="white",shape=21) +
  theme_minimal() + scale_x_discrete("",labels=c("Age","Education","Female",
```

```
                                                "Income","Liberal Ideology",
                                                "Democrat","Independent",
                                                "Asian Respondent","Black Respondent",
                                                "Hispanic Respondent")) +
  scale_y_continuous("Marginal Effect of Covariates on Latent Scientific Trust")  +
  geom_hline(yintercept = 0, colour = gray(1/2), lty = 2) +
  labs(color="Trust Effects",shape="Trust Effects") + theme(legend.position = "none") +
  theme(axis.text.x = element_text(hjust = 0.5),axis.text.y = element_text(hjust = 0.5)) +
  geom_label(vjust=-0.5,hjust=0.25,fill="white") +
  labs(caption="Note marginal effects for respondent race &
       partisanship relative to baseline factor categories. Contextual
       regions omitted. \nFactor Baselines: white respondents, Republican
       identifiers. * p < 0.1; ** p < 0.05; *** p < 0.01") + facet_wrap(~model)
ggsave(file="latent_scientific_trust_model_full.png", plot, width = 8, height = 5.43, units = "in")
```