

# Analysis 3: Mediation Analysis (Unmatched Data)

Fan Lu & Gento Kato

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## Preparation

```
## Clean Up Space
rm(list=ls())

## Set Working Directory (Automatically) ##
require(rstudioapi); require(rprojroot)
if (rstudioapi::isAvailable() == TRUE) {
  setwd(dirname(rstudioapi::getActiveDocumentContext()$path));
}
projdir <- find_root(has_file("thisishome.txt"))
cat(paste("Working Directory Set to:\n",projdir))

## Working Directory Set to:
## /home/gentok/GoogleDrive/Projects/Fan-Gento-Lab/ForeignerJapan
setwd(projdir)

## Matched/Unmatched Data Locations
datadir0 <- paste0(projdir, "/data/sifcct_unmatched_v5.rds")
datadir1 <- paste0(projdir, "/data/sifcct_matched_1_all_v5.rds")
datadir2 <- paste0(projdir, "/data/sifcct_matched_2_all_v5.rds")
datadir3 <- paste0(projdir, "/data/sifcct_matched_3_all_v5.rds")
datadir4 <- paste0(projdir, "/data/sifcct_matched_4_all_v5.rds")
datadir5 <- paste0(projdir, "/data/sifcct_matched_5_all_v5.rds")

## packages
require(sandwich)
require(lmtest)
require(MASS)
require(ggplot2)
require(texreg)
require(mediation)

## Loading required package: mediation
## Loading required package: Matrix
## Loading required package: mvtnorm
## mediation: Causal Mediation Analysis
## Version: 4.5.0
```

```

##
vnmap <- list("edu2" = "University education",
  "female" = "Gender (female)",
  "male" = "Gender (male)",
  "age2" = "Age 50s or older",
  "agex" = "Age (by 10 years)",
  "knowledge" = "Political Knowledge",
  "ideology" = "Ideology",
  "ldpdpjft" = "LDP -DPJ Feeling Thermometer",
  "familiarityFT_KOR" = "South Korea Feeling Thermometer",
  "familiarityFT_CHN" = "China Feeling Thermometer",
  "familiarityFT_USA" = "United States Feeling Thermometer",
  "income" = "Income",
  "edu2:female" = "University * Female",
  "edu2:male" = "University * Male",
  "edu2:age2" = "University * >=50s",
  "edu2:agex" = "University * Age",
  "edu2:female:age2" = "University * Female * >=50s",
  "edu2:male:age2" = "University * Male * >=50s",
  "edu2:female:agex" = "University * Female * Age",
  "edu2:male:agex" = "University * Male * Age",
  "female:knowledge" = "Knowledge * Female",
  "male:knowledge" = "Knowledge * Male",
  "age2:knowledge" = "Knowledge * >=50s",
  "agex:knowledge" = "Knowledge * Age",
  "female:age2:knowledge" = "Knowledge * Female * >=50s",
  "male:age2:knowledge" = "Knowledge * Male * >=50s",
  "female:agex:knowledge" = "Knowledge * Female * Age",
  "male:agex:knowledge" = "Knowledge * Male * Age",
  "female:ideology" = "Ideology * Female",
  "male:ideology" = "Ideology * Male",
  "age2:ideology" = "Ideology * >=50s",
  "agex:ideology" = "Ideology * Age",
  "female:age2:ideology" = "Ideology * Female * >=50s",
  "male:age2:ideology" = "Ideology * Male * >=50s",
  "female:agex:ideology" = "Ideology * Female * Age",
  "male:agex:ideology" = "Ideology * Male * Age",
  "female:ldpdpjft" = "LDP - DPJ FT * Female",
  "male:ldpdpjft" = "LDP - DPJ FT * Male",
  "age2:ldpdpjft" = "LDP - DPJ FT * >=50s",
  "agex:ldpdpjft" = "LDP - DPJ FT * Age",
  "female:age2:ldpdpjft" = "LDP - DPJ FT * Female * >=50s",
  "male:age2:ldpdpjft" = "LDP - DPJ FT * Male * >=50s",
  "female:agex:ldpdpjft" = "LDP - DPJ FT * Female * Age",
  "male:agex:ldpdpjft" = "LDP - DPJ FT * Male * Age",
  "female:familiarityFT_KOR" = "South Korea FT * Female",
  "male:familiarityFT_KOR" = "South Korea FT * Male",
  "age2:familiarityFT_KOR" = "South Korea FT * >=50s",
  "agex:familiarityFT_KOR" = "South Korea FT * Age",
  "female:age2:familiarityFT_KOR" = "South Korea FT * Female * >=50s",
  "male:age2:familiarityFT_KOR" = "South Korea FT * Male * >=50s",
  "female:agex:familiarityFT_KOR" = "South Korea FT * Female * Age",
  "male:agex:familiarityFT_KOR" = "South Korea FT * Male * Age",

```

```

"female:familiarityFT_CHN" = "China FT * Female",
"male:familiarityFT_CHN" = "China FT * Male",
"age2:familiarityFT_CHN" = "China FT * >=50s",
"age2:familiarityFT_CHN" = "China FT * Age",
"female:age2:familiarityFT_CHN" = "China FT * Female * >=50s",
"male:age2:familiarityFT_CHN" = "China FT * Male * >=50s",
"female:age2:familiarityFT_CHN" = "China FT * Female * Age",
"male:age2:familiarityFT_CHN" = "China FT * Male * Age",
"female:familiarityFT_USA" = "United States FT * Female",
"male:familiarityFT_USA" = "United States FT * Male",
"age2:familiarityFT_USA" = "United States FT * >=50s",
"age2:familiarityFT_USA" = "United States FT * Age",
"female:age2:familiarityFT_USA" = "United States FT * Female * >=50s",
"male:age2:familiarityFT_USA" = "United States FT * Male * >=50s",
"female:age2:familiarityFT_USA" = "United States FT * Female * Age",
"male:age2:familiarityFT_USA" = "United States FT * Male * Age",
"female:income" = "Income * Female",
"male:income" = "Income * Male",
"age2:income" = "Income * >=50s",
"age2:income" = "Income * Age",
"female:age2:income" = "Income * Female * >=50s",
"male:age2:income" = "Income * Male * >=50s",
"female:age2:income" = "Income * Female * Age",
"male:age2:income" = "Income * Male * Age",
"female:age2" = "Female * >=50s",
"male:age2" = "Male * >=50s",
"female:age2" = "Female * Age",
"male:age2" = "Male * Age",
"agecatMiddle Aged (40-50s)" = "Middle Aged (40-50s)",
"agecatElder (>=60s)" = "Elder (>=60s)",
"lvpr" = "% of Life Residing Locally (zip)",
"zip_did" = "DID residence (zip)",
"sqrt(c10_sreg_fper)" = "Foreigner % sqrt. (zip)",
"c10_sreg_edu_ugsP" = "University % (zip)",
"I(c10_sreg_edu_ugsP/10)" = "University % by 10% (zip)",
"didper" = "DID proportion (mun.)",
"sqrt(c10_mun_fper)" = "Foreigner % sqrt. (mun.)",
"I(c10_mun_edu_ugsP/10)" = "University % by 10% (mun.)",
"c10_mun_edu_ugsP" = "University % (mun.)"

```

## Models

### SIFCCT (Original)

```

sifcct <- readRDS(datadir0)
sifcct$agex <- sifcct$age/10 - 4.5
sifcct$ldpdpjft <- original$ldpdpjft[match(paste(sifcct$id,sifcct$wave),paste(original$id,original$wave),
summary(sifcct$ldpdpjft)
sifcct$income <- original$income[match(paste(sifcct$id,sifcct$wave),paste(original$id,original$wave))]
summary(sifcct$income)

```

## Knowledge

```
## Outcome Model
s0mout01_1C <- lm(foreignsuff ~ edu2*male*agex + knowledge*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Mediator Model
s0mm01_1C <- lm(knowledge ~ edu2*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Table
screenreg(list(s0mm01_1C,s0mout01_1C), digits = 4, single.row = T,
  override.se = list(coeftest(s0mm01_1C,vcov.=vcovHC(s0mm01_1C))[,2],
    coeftest(s0mout01_1C,vcov.=vcovHC(s0mout01_1C))[,2]),
  override.pvalues = list(coeftest(s0mm01_1C,vcov.=vcovHC(s0mm01_1C))[,4],
    coeftest(s0mout01_1C,vcov.=vcovHC(s0mout01_1C))[,4]),
  omit.coef = "(wave)", stars = c(0.1,0.05,0.01,0.001), symbol = "+",
  custom.coef.map = vnmap,
  custom.model.names = c("Mediator","Outcome"))
```

## Ideology

```
## Outcome Model
s0mout02_1C <- lm(foreignsuff ~ edu2*male*agex + ideology*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Mediator Model
s0mm02_1C <- lm(ideology ~ edu2*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Table
screenreg(list(s0mm02_1C,s0mout02_1C), digits = 4, single.row = T,
  override.se = list(coeftest(s0mm02_1C,vcov.=vcovHC(s0mm02_1C))[,2],
    coeftest(s0mout02_1C,vcov.=vcovHC(s0mout02_1C))[,2]),
  override.pvalues = list(coeftest(s0mm02_1C,vcov.=vcovHC(s0mm02_1C))[,4],
    coeftest(s0mout02_1C,vcov.=vcovHC(s0mout02_1C))[,4]),
  omit.coef = "(wave)", stars = c(0.1,0.05,0.01,0.001), symbol = "+",
  custom.coef.map = vnmap,
  custom.model.names = c("Mediator","Outcome"))
```

## LDP - DPJ FT

```
## Outcome Model
s0mout03_1C <- lm(foreignsuff ~ edu2*male*agex + ldpdpjft*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
```

```

        didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
        as.factor(wave), data=sifcct)

## Mediator Model
s0mm03_1C <- lm(ldpdpjft ~ edu2*male*agex + lvpr +
        zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
        didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
        as.factor(wave), data=sifcct)

## Table
screenreg(list(s0mm03_1C,s0mout03_1C), digits = 4, single.row = T,
        override.se = list(coeftest(s0mm03_1C,vcov.=vcovHC(s0mm03_1C))[,2],
        coeftest(s0mout03_1C,vcov.=vcovHC(s0mout03_1C))[,2]),
        override.pvalues = list(coeftest(s0mm03_1C,vcov.=vcovHC(s0mm03_1C))[,4],
        coeftest(s0mout03_1C,vcov.=vcovHC(s0mout03_1C))[,4]),
        omit.coef = "(wave)", stars = c(0.1,0.05,0.01,0.001), symbol = "+",
        custom.coef.map = vnmap,
        custom.model.names = c("Mediator","Outcome"))

```

## Favorability of South Korea

```

## Outcome Model
s0mout04_1C <- lm(foreignsuff ~ edu2*male*agex + familiarityFT_KOR*male*agex + lvpr +
        zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
        didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
        as.factor(wave), data=sifcct)

## Mediator Model
s0mm04_1C <- lm(familiarityFT_KOR ~ edu2*male*agex + lvpr +
        zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
        didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
        as.factor(wave), data=sifcct)

## Table
screenreg(list(s0mm04_1C,s0mout04_1C), digits = 4, single.row = T,
        override.se = list(coeftest(s0mm04_1C,vcov.=vcovHC(s0mm04_1C))[,2],
        coeftest(s0mout04_1C,vcov.=vcovHC(s0mout04_1C))[,2]),
        override.pvalues = list(coeftest(s0mm04_1C,vcov.=vcovHC(s0mm04_1C))[,4],
        coeftest(s0mout04_1C,vcov.=vcovHC(s0mout04_1C))[,4]),
        omit.coef = "(wave)", stars = c(0.1,0.05,0.01,0.001), symbol = "+",
        custom.coef.map = vnmap,
        custom.model.names = c("Mediator","Outcome"))

```

## Favorability of China

```

## Outcome Model
s0mout05_1C <- lm(foreignsuff ~ edu2*male*agex + familiarityFT_CHN*male*agex + lvpr +
        zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
        didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
        as.factor(wave), data=sifcct)

## Mediator Model
s0mm05_1C <- lm(familiarityFT_CHN ~ edu2*male*agex + lvpr +

```

```

zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
as.factor(wave), data=sifcct)

## Table
screenreg(list(s0mm05_1C,s0mout05_1C), digits = 4, single.row = T,
  override.se = list(coeftest(s0mm05_1C,vcov.=vcovHC(s0mm05_1C))[,2],
    coeftest(s0mout05_1C,vcov.=vcovHC(s0mout05_1C))[,2]),
  override.pvalues = list(coeftest(s0mm05_1C,vcov.=vcovHC(s0mm05_1C))[,4],
    coeftest(s0mout05_1C,vcov.=vcovHC(s0mout05_1C))[,4]),
  omit.coef = "(wave)", stars = c(0.1,0.05,0.01,0.001), symbol = "+",
  custom.coef.map = vnmap,
  custom.model.names = c("Mediator","Outcome"))

```

## Favorability of United States

```

## Outcome Model
s0mout06_1C <- lm(foreignsuff ~ edu2*male*agex + familiarityFT_USA*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Mediator Model
s0mm06_1C <- lm(familiarityFT_USA ~ edu2*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Table
screenreg(list(s0mm06_1C,s0mout06_1C), digits = 4, single.row = T,
  override.se = list(coeftest(s0mm06_1C,vcov.=vcovHC(s0mm06_1C))[,2],
    coeftest(s0mout06_1C,vcov.=vcovHC(s0mout06_1C))[,2]),
  override.pvalues = list(coeftest(s0mm06_1C,vcov.=vcovHC(s0mm06_1C))[,4],
    coeftest(s0mout06_1C,vcov.=vcovHC(s0mout06_1C))[,4]),
  omit.coef = "(wave)", stars = c(0.1,0.05,0.01,0.001), symbol = "+",
  custom.coef.map = vnmap,
  custom.model.names = c("Mediator","Outcome"))

```

## Income

```

## Outcome Model
s0mout07_1C <- lm(foreignsuff ~ edu2*male*agex + income*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Mediator Model
s0mm07_1C <- lm(income ~ edu2*male*agex + lvpr +
  zip_did + sqrt(c10_sreg_fper) + I(c10_sreg_edu_ugsP/10) +
  didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
  as.factor(wave), data=sifcct)

## Table

```

```

screenreg(list(s0mm07_1C,s0mout07_1C), digits = 4, single.row = T,
  override.se = list(coeftest(s0mm07_1C,vcov.=vcovHC(s0mm07_1C))[2],
    coeftest(s0mout07_1C,vcov.=vcovHC(s0mout07_1C))[2]),
  override.pvalues = list(coeftest(s0mm07_1C,vcov.=vcovHC(s0mm07_1C))[4],
    coeftest(s0mout07_1C,vcov.=vcovHC(s0mout07_1C))[4]),
  omit.coef = "(wave)", stars = c(0.1,0.05,0.01,0.001), symbol = "+",
  custom.coef.map = vnmap,
  custom.model.names = c("Mediator","Outcome"))

save.image(paste0(projdir,"/out/heavy/analysis_3_mediation_unmatched_v5.RData"))
load(paste0(projdir,"/out/heavy/analysis_3_mediation_unmatched_v5.RData"))

```

## Coefficient Plot

### Prepare Data

```

## Treatment to Mediator

extmed <- function(med,gender,ageset) {

  sifcct$med <- sifcct[,med]
  if (gender=="Male") sifcct$gender <- sifcct$female
  if (gender=="Female") sifcct$gender <- sifcct$male
  sifcct$ageset <- (sifcct$age - ageset)/10

  modset <- lm(med ~ edu2 * gender * ageset + lvpr + zip_did + sqrt(c10_sreg_fper) +
    I(c10_sreg_edu_ugsP/10) + didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
    as.factor(wave), data=sifcct)

  res <- c(med,gender,ageset,coef(modset)[2],
    coefci(modset, vcov.=vcovHC(modset), level = 0.95)[2,],
    coefci(modset, vcov.=vcovHC(modset), level = 0.90)[2,],
    coeftest(modset, vcov.=vcovHC(modset))[2,c(2,4)],
    "Treatment => Mediator")
  names(res) <- c("med","gender","age","est","lci95","uci95","lci90","uci90","se","p","mod")

  return(res)

}

meddt <- rbind(extmed("knowledge","Female",25),
  extmed("knowledge","Female",35),
  extmed("knowledge","Female",45),
  extmed("knowledge","Female",55),
  extmed("knowledge","Female",65),
  extmed("knowledge","Male",25),
  extmed("knowledge","Male",35),
  extmed("knowledge","Male",45),
  extmed("knowledge","Male",55),
  extmed("knowledge","Male",65),
  extmed("ideology","Female",25),
  extmed("ideology","Female",35),
  extmed("ideology","Female",45),

```

```

extmed("ideology", "Female", 55),
extmed("ideology", "Female", 65),
extmed("ideology", "Male", 25),
extmed("ideology", "Male", 35),
extmed("ideology", "Male", 45),
extmed("ideology", "Male", 55),
extmed("ideology", "Male", 65),
extmed("ldpdpjft", "Female", 25),
extmed("ldpdpjft", "Female", 35),
extmed("ldpdpjft", "Female", 45),
extmed("ldpdpjft", "Female", 55),
extmed("ldpdpjft", "Female", 65),
extmed("ldpdpjft", "Male", 25),
extmed("ldpdpjft", "Male", 35),
extmed("ldpdpjft", "Male", 45),
extmed("ldpdpjft", "Male", 55),
extmed("ldpdpjft", "Male", 65),
extmed("familiarityFT_KOR", "Female", 25),
extmed("familiarityFT_KOR", "Female", 35),
extmed("familiarityFT_KOR", "Female", 45),
extmed("familiarityFT_KOR", "Female", 55),
extmed("familiarityFT_KOR", "Female", 65),
extmed("familiarityFT_KOR", "Male", 25),
extmed("familiarityFT_KOR", "Male", 35),
extmed("familiarityFT_KOR", "Male", 45),
extmed("familiarityFT_KOR", "Male", 55),
extmed("familiarityFT_KOR", "Male", 65),
extmed("familiarityFT_CHN", "Female", 25),
extmed("familiarityFT_CHN", "Female", 35),
extmed("familiarityFT_CHN", "Female", 45),
extmed("familiarityFT_CHN", "Female", 55),
extmed("familiarityFT_CHN", "Female", 65),
extmed("familiarityFT_CHN", "Male", 25),
extmed("familiarityFT_CHN", "Male", 35),
extmed("familiarityFT_CHN", "Male", 45),
extmed("familiarityFT_CHN", "Male", 55),
extmed("familiarityFT_CHN", "Male", 65),
extmed("familiarityFT_USA", "Female", 25),
extmed("familiarityFT_USA", "Female", 35),
extmed("familiarityFT_USA", "Female", 45),
extmed("familiarityFT_USA", "Female", 55),
extmed("familiarityFT_USA", "Female", 65),
extmed("familiarityFT_USA", "Male", 25),
extmed("familiarityFT_USA", "Male", 35),
extmed("familiarityFT_USA", "Male", 45),
extmed("familiarityFT_USA", "Male", 55),
extmed("familiarityFT_USA", "Male", 65),
extmed("income", "Female", 25),
extmed("income", "Female", 35),
extmed("income", "Female", 45),
extmed("income", "Female", 55),
extmed("income", "Female", 65),
extmed("income", "Male", 25),

```



```

        extmed("income", "Male", 35),
        extmed("income", "Male", 45),
        extmed("income", "Male", 55),
        extmed("income", "Male", 65))
meddt <- as.data.frame(meddt)
for(i in 3:10) meddt[,i] <- as.numeric(meddt[,i])
meddt$med <- factor(meddt$med, levels=unique(meddt$med))
meddt$gender <- factor(meddt$gender, levels=unique(meddt$gender))
summary(meddt)

## Mediator to Outcome

extout <- function(med,gender,ageset) {

  sifcct$med <- sifcct[,med]
  if (gender=="Male") sifcct$gender <- sifcct$female
  if (gender=="Female") sifcct$gender <- sifcct$male
  sifcct$ageset <- (sifcct$age - ageset)/10

  modset <- lm(foreignsuff ~ med * gender * ageset + edu2 * gender * ageset + lvpr + zip_did + sqrt(c10_
    I(c10_sreg_edu_ugsP/10) + didper + sqrt(c10_mun_fper) + I(c10_mun_edu_ugsP/10) +
    as.factor(wave), data=sifcct)

  res <- c(med,gender,ageset,coef(modset)[2],
    coefci(modset, vcov.=vcovHC(modset), level = 0.95)[2,],
    coefci(modset, vcov.=vcovHC(modset), level = 0.90)[2,],
    coeftest(modset, vcov.=vcovHC(modset))[2,c(2,4)],
    "Mediator => Outcome")
  names(res) <- c("med","gender","age","est","lci95","uci95","lci90","uci90","se","p","mod")

  return(res)
}

outdt <- rbind(extout("knowledge", "Female", 25),
  extout("knowledge", "Female", 35),
  extout("knowledge", "Female", 45),
  extout("knowledge", "Female", 55),
  extout("knowledge", "Female", 65),
  extout("knowledge", "Male", 25),
  extout("knowledge", "Male", 35),
  extout("knowledge", "Male", 45),
  extout("knowledge", "Male", 55),
  extout("knowledge", "Male", 65),
  extout("ideology", "Female", 25),
  extout("ideology", "Female", 35),
  extout("ideology", "Female", 45),
  extout("ideology", "Female", 55),
  extout("ideology", "Female", 65),
  extout("ideology", "Male", 25),
  extout("ideology", "Male", 35),
  extout("ideology", "Male", 45),
  extout("ideology", "Male", 55),

```

```

extout("ideology","Male",65),
extout("ldpdpjft","Female",25),
extout("ldpdpjft","Female",35),
extout("ldpdpjft","Female",45),
extout("ldpdpjft","Female",55),
extout("ldpdpjft","Female",65),
extout("ldpdpjft","Male",25),
extout("ldpdpjft","Male",35),
extout("ldpdpjft","Male",45),
extout("ldpdpjft","Male",55),
extout("ldpdpjft","Male",65),
extout("familiarityFT_KOR","Female",25),
extout("familiarityFT_KOR","Female",35),
extout("familiarityFT_KOR","Female",45),
extout("familiarityFT_KOR","Female",55),
extout("familiarityFT_KOR","Female",65),
extout("familiarityFT_KOR","Male",25),
extout("familiarityFT_KOR","Male",35),
extout("familiarityFT_KOR","Male",45),
extout("familiarityFT_KOR","Male",55),
extout("familiarityFT_KOR","Male",65),
extout("familiarityFT_CHN","Female",25),
extout("familiarityFT_CHN","Female",35),
extout("familiarityFT_CHN","Female",45),
extout("familiarityFT_CHN","Female",55),
extout("familiarityFT_CHN","Female",65),
extout("familiarityFT_CHN","Male",25),
extout("familiarityFT_CHN","Male",35),
extout("familiarityFT_CHN","Male",45),
extout("familiarityFT_CHN","Male",55),
extout("familiarityFT_CHN","Male",65),
extout("familiarityFT_USA","Female",25),
extout("familiarityFT_USA","Female",35),
extout("familiarityFT_USA","Female",45),
extout("familiarityFT_USA","Female",55),
extout("familiarityFT_USA","Female",65),
extout("familiarityFT_USA","Male",25),
extout("familiarityFT_USA","Male",35),
extout("familiarityFT_USA","Male",45),
extout("familiarityFT_USA","Male",55),
extout("familiarityFT_USA","Male",65),
extout("income","Female",25),
extout("income","Female",35),
extout("income","Female",45),
extout("income","Female",55),
extout("income","Female",65),
extout("income","Male",25),
extout("income","Male",35),
extout("income","Male",45),
extout("income","Male",55),
extout("income","Male",65))

outdt <- as.data.frame(outdt)
for(i in 3:10) outdt[,i] <- as.numeric(outdt[,i])

```

```

outdt$med <- factor(outdt$med, levels=unique(outdt$med))
outdt$gender <- factor(outdt$gender, levels=unique(outdt$gender))
summary(outdt)

## Mediation

extmedout <- function(med,gender,ageset,medout) {

  res1 <- c(med,gender,ageset,
            medout$d0,
            quantile(medout$d0.sims,probs=c(0.025,0.975,0.05,0.95)),
            NA,
            medout01_f25$d0.p,
            "Treat. => Med. => Out.\n(ACME)")
  names(res1) <- c("med","gender","age","est","lci95","uci95","lci90","uci90","se","p","mod")

  res2 <- c(med,gender,ageset,
            medout$z0,
            quantile(medout$z0.sims,probs=c(0.025,0.975,0.05,0.95)),
            NA,
            medout01_f25$z0.p,
            "Treatment => Outcome\n(ADE)")
  names(res1) <- c("med","gender","age","est","lci95","uci95","lci90","uci90","se","p","mod")

  return(rbind(res1,res2))
}

medoutdt <- rbind(extmedout("knowledge","Female",25,medout01_f25),
                  extmedout("knowledge","Female",35,medout01_f35),
                  extmedout("knowledge","Female",45,medout01_f45),
                  extmedout("knowledge","Female",55,medout01_f55),
                  extmedout("knowledge","Female",65,medout01_f65),
                  extmedout("knowledge","Male",25,medout01_m25),
                  extmedout("knowledge","Male",35,medout01_m35),
                  extmedout("knowledge","Male",45,medout01_m45),
                  extmedout("knowledge","Male",55,medout01_m55),
                  extmedout("knowledge","Male",65,medout01_m65),
                  extmedout("ideology","Female",25,medout02_f25),
                  extmedout("ideology","Female",35,medout02_f35),
                  extmedout("ideology","Female",45,medout02_f45),
                  extmedout("ideology","Female",55,medout02_f55),
                  extmedout("ideology","Female",65,medout02_f65),
                  extmedout("ideology","Male",25,medout02_m25),
                  extmedout("ideology","Male",35,medout02_m35),
                  extmedout("ideology","Male",45,medout02_m45),
                  extmedout("ideology","Male",55,medout02_m55),
                  extmedout("ideology","Male",65,medout02_m65),
                  extmedout("ldpdpjft","Female",25,medout03_f25),
                  extmedout("ldpdpjft","Female",35,medout03_f35),
                  extmedout("ldpdpjft","Female",45,medout03_f45),
                  extmedout("ldpdpjft","Female",55,medout03_f55),
                  extmedout("ldpdpjft","Female",65,medout03_f65),

```

```

extmedout("ldpdpjft", "Male", 25, medout03_m25),
extmedout("ldpdpjft", "Male", 35, medout03_m35),
extmedout("ldpdpjft", "Male", 45, medout03_m45),
extmedout("ldpdpjft", "Male", 55, medout03_m55),
extmedout("ldpdpjft", "Male", 65, medout03_m65),
extmedout("familiarityFT_KOR", "Female", 25, medout04_f25),
extmedout("familiarityFT_KOR", "Female", 35, medout04_f35),
extmedout("familiarityFT_KOR", "Female", 45, medout04_f45),
extmedout("familiarityFT_KOR", "Female", 55, medout04_f55),
extmedout("familiarityFT_KOR", "Female", 65, medout04_f65),
extmedout("familiarityFT_KOR", "Male", 25, medout04_m25),
extmedout("familiarityFT_KOR", "Male", 35, medout04_m35),
extmedout("familiarityFT_KOR", "Male", 45, medout04_m45),
extmedout("familiarityFT_KOR", "Male", 55, medout04_m55),
extmedout("familiarityFT_KOR", "Male", 65, medout04_m65),
extmedout("familiarityFT_CHN", "Female", 25, medout05_f25),
extmedout("familiarityFT_CHN", "Female", 35, medout05_f35),
extmedout("familiarityFT_CHN", "Female", 45, medout05_f45),
extmedout("familiarityFT_CHN", "Female", 55, medout05_f55),
extmedout("familiarityFT_CHN", "Female", 65, medout05_f65),
extmedout("familiarityFT_CHN", "Male", 25, medout05_m25),
extmedout("familiarityFT_CHN", "Male", 35, medout05_m35),
extmedout("familiarityFT_CHN", "Male", 45, medout05_m45),
extmedout("familiarityFT_CHN", "Male", 55, medout05_m55),
extmedout("familiarityFT_CHN", "Male", 65, medout05_m65),
extmedout("familiarityFT_USA", "Female", 25, medout06_f25),
extmedout("familiarityFT_USA", "Female", 35, medout06_f35),
extmedout("familiarityFT_USA", "Female", 45, medout06_f45),
extmedout("familiarityFT_USA", "Female", 55, medout06_f55),
extmedout("familiarityFT_USA", "Female", 65, medout06_f65),
extmedout("familiarityFT_USA", "Male", 25, medout06_m25),
extmedout("familiarityFT_USA", "Male", 35, medout06_m35),
extmedout("familiarityFT_USA", "Male", 45, medout06_m45),
extmedout("familiarityFT_USA", "Male", 55, medout06_m55),
extmedout("familiarityFT_USA", "Male", 65, medout06_m65),
extmedout("income", "Female", 25, medout07_f25),
extmedout("income", "Female", 35, medout07_f35),
extmedout("income", "Female", 45, medout07_f45),
extmedout("income", "Female", 55, medout07_f55),
extmedout("income", "Female", 65, medout07_f65),
extmedout("income", "Male", 25, medout07_m25),
extmedout("income", "Male", 35, medout07_m35),
extmedout("income", "Male", 45, medout07_m45),
extmedout("income", "Male", 55, medout07_m55),
extmedout("income", "Male", 65, medout07_m65))

medoutdt <- as.data.frame(medoutdt)
for(i in 3:10) medoutdt[,i] <- as.numeric(medoutdt[,i])
medoutdt$med <- factor(medoutdt$med, levels=unique(medoutdt$med))
medoutdt$gender <- factor(medoutdt$gender, levels=unique(medoutdt$gender))
summary(medoutdt)

## Combine All Data

```

```

coefdt <- rbind(meddt,outdt,medoutdt)
coefdt$mod <- factor(coefdt$mod, levels=unique(coefdt$mod))

coefdt$lambda <- "Unmatched"
# coefdt$lambda <- rep(c("Unmatched",
#                        "Matched without Distance Adj.",
#                        "Matched with Lambda = 350km",
#                        "Matched with Lambda = 200km",
#                        "Matched with Lambda = 100km",
#                        "Matched with Lambda = 50km"), each=8)
# coefdt$lambda <- factor(coefdt$lambda, levels=unique(coefdt$lambda))
#

coefdt$pstar <- factor(ifelse(coefdt$lci95>0|coefdt$uci95<0,"p<.05",
                             ifelse(coefdt$lci90>0|coefdt$uci90<0,"p<.1","n.s."),
                             levels = c("p<.05","p<.1","n.s."))

## Save Data Temporarily
saveRDS(coefdt, paste0(projdir,"/out/medoutcoefdt_unmatched_v5.rds"))

```

## Plotting for knowledge

```

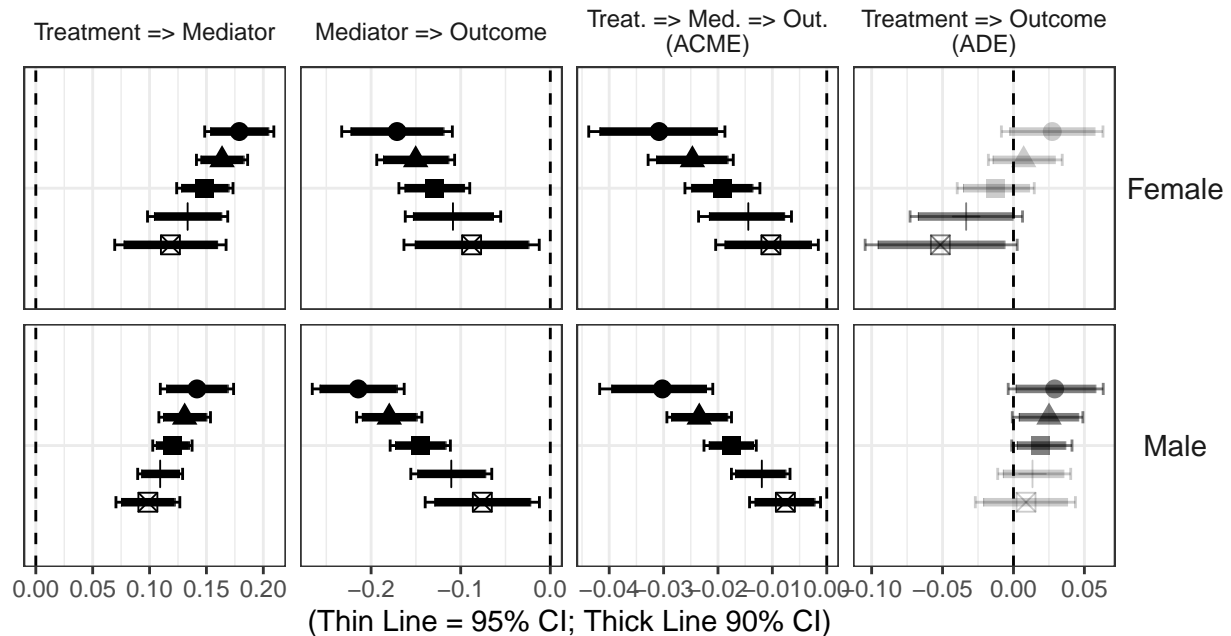
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="knowledge",], aes(x=gender, y=est)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
               position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
               position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
             position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
  scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
  scale_shape_discrete(name="Age") +
  scale_color_manual(name="Age",values=rep("black", 5)) +
  ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
  xlab(NULL) +
  labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: Political knowledge") +
  coord_flip() + theme_bw() +
  theme(legend.position = "bottom",
        strip.text.x = element_text(size=9),
        strip.text.y = element_text(angle=0,size=11),
        strip.background = element_rect(fill=NA,color=NA),
        plot.caption = element_text(hjust=0),
        plot.subtitle = element_text(hjust=0.5),
        axis.text.y = element_blank(),
        axis.ticks.y = element_blank())
p

```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```



Age ● 25 ▲ 35 ■ 45 + 55 ☒ 65    Significance ● p<.05 ● p<.1 ● n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: Political knowledge (rescaled to 0–1 with 1 being the most knowledgeable).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot_knowledge_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
require(ggplot2)
```

```
p <- ggplot(coefdt[coefdt$med=="knowledge" & coefdt$mod!="Treatment => Outcome\n(ADE)",], aes(x=gender,  
  geom_hline(aes(yintercept=0), linetype=2) +  
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),  
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +  
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),  
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +  
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),  
    position=position_dodge(width=-0.7), size=3) +  
  facet_grid(gender ~ mod, scales = "free") +  
  scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +  
  scale_shape_discrete(name="Age") +  
  scale_color_manual(name="Age",values=rep("black", 5)) +  
  ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +  
  xlab(NULL) +  
  labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: Political kn  
  coord_flip() + theme_bw() +  
  theme(legend.position = "bottom",  
    strip.text.x = element_text(size=9),  
    strip.text.y = element_text(angle=0,size=11),  
    strip.background = element_rect(fill=NA,color=NA),  
    plot.caption = element_text(hjust=0),  
    plot.subtitle = element_text(hjust=0.5),  
    axis.text.y = element_blank(),  
    axis.ticks.y = element_blank())  
p
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

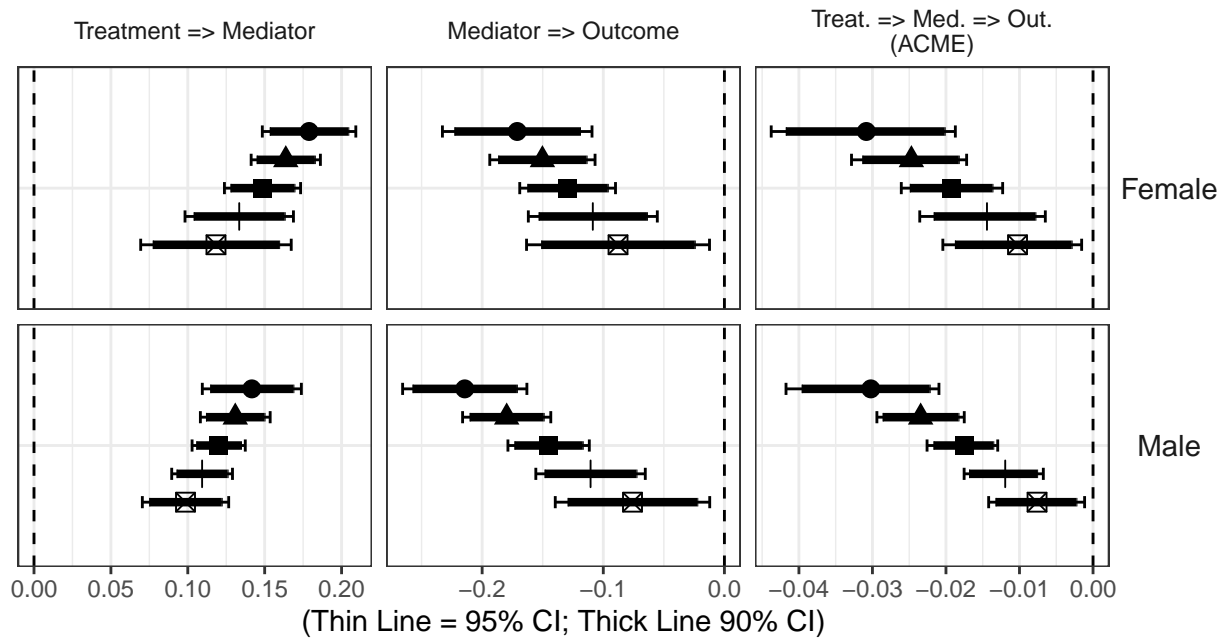
```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```



Age ● 25 ▲ 35 ■ 45 + 55 ☒ 65      Significance ● p<.05 ● p<.1 ● n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: Political knowledge (rescaled to 0–1 with 1 being the most knowledgeable).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir,"/out/mediationplot2_knowledge_unmatched_v5.png"),p,width=8,height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

## Plotting for ideology

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="ideology",], aes(x=gender, y=est)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
  scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
```



```

scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: Political id
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

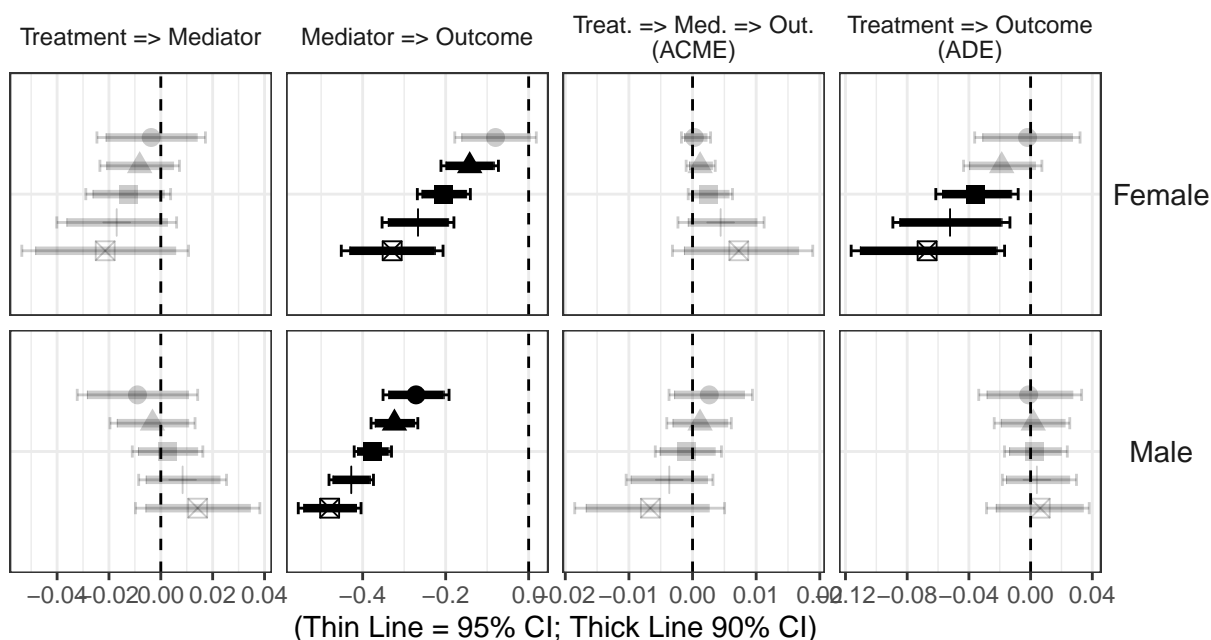
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ☒ 65      Significance ● p<.05 ● p<.1 ○ n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: Political ideology (rescaled to 0–1 with 1 being the most conservative).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot_ideology_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="ideology" & coefdt$mod!="Treatment => Outcome\n(ADE)",], aes(x=gender, y=estimate)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
```

```

scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: Political id
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

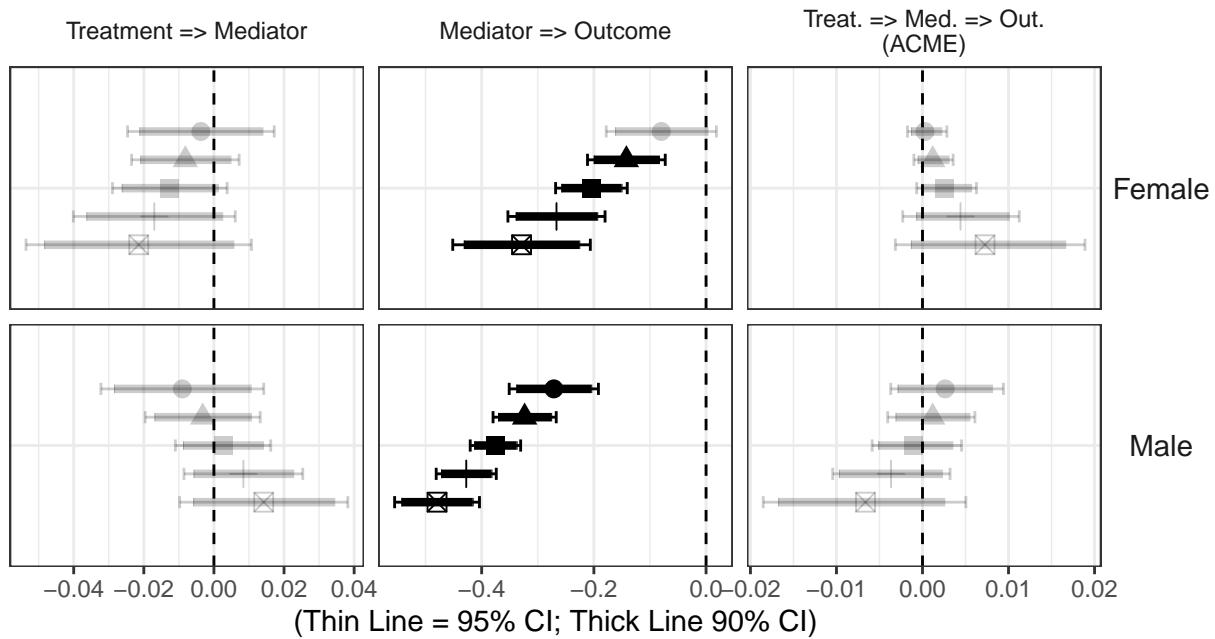
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ☒ 65      Significance ● p<.05 ● p<.1 ● n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: Political ideology (rescaled to 0–1 with 1 being the most conservative).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot2_ideology_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

## Plotting for ldpdpjft

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="ldpdpjft",], aes(x=gender, y=est)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
  scale_alpha_manual(name="Significance", values=c(1,0.5,0.2), drop=FALSE) +
```

```

scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: LDP - DPJ Fe
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

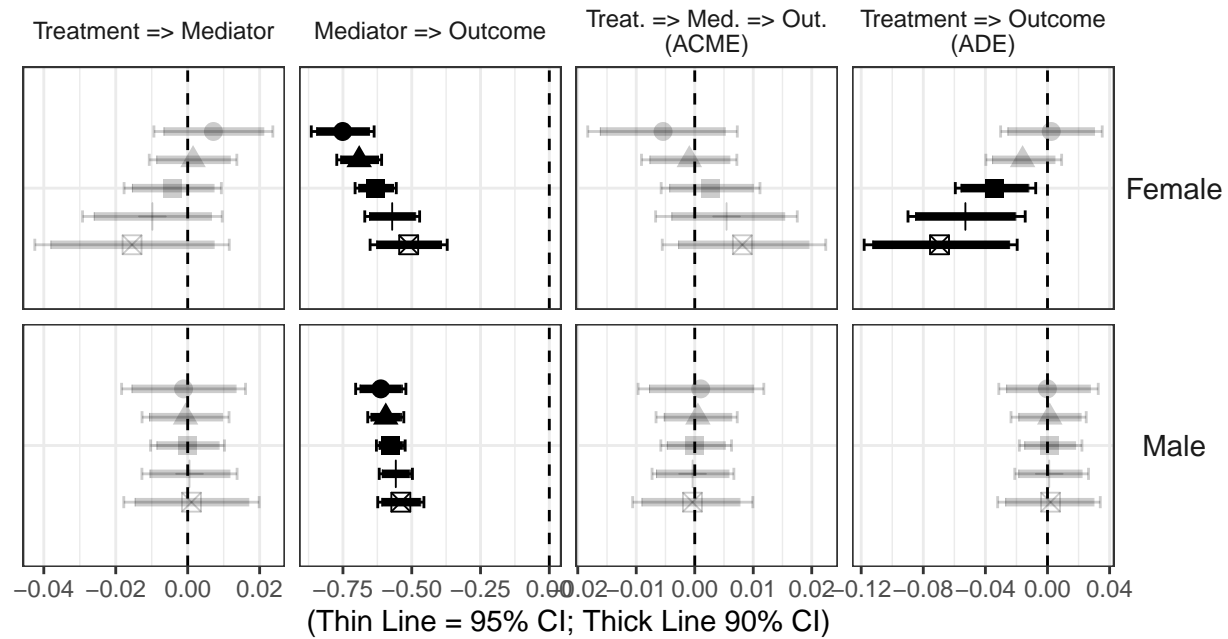
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ⊠ 65      Significance ● p<.05 ● p<.1 ○ n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: LDP – DPJ Feeling Thermometer (rescaled to 0–1).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot_ldpdjft_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="ldpdjft" & coefdt$mod!="Treatment => Outcome\n(ADE)",], aes(x=gender, y=coef,
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
```

```

scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: LDP - DPJ Fe
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

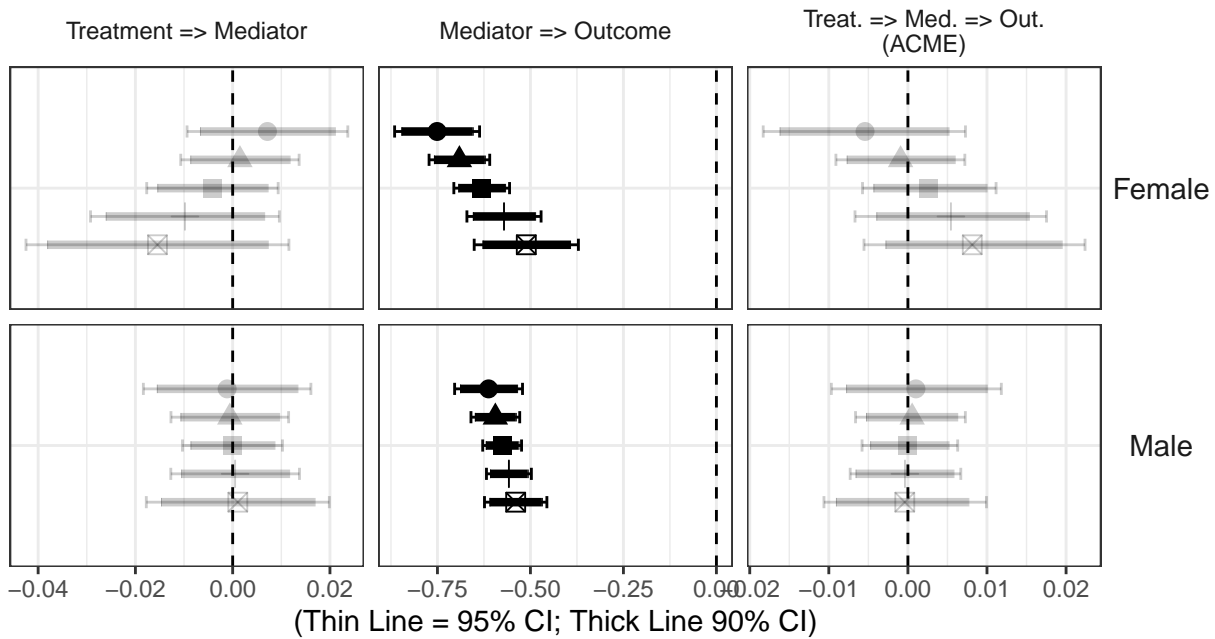
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ⊠ 65      Significance ● p<.05    ● p<.1    ● n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: LDP – DPJ Feeling Thermometer (rescaled to 0–1).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir,"/out/mediationplot2_ldpdjft_unmatched_v5.png"),p,width=8,height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

## Plotting for South Korea Feeling Thermometer

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="familiarityFT_KOR",], aes(x=gender, y=est)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
  scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
```



```

scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: South Korea L
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

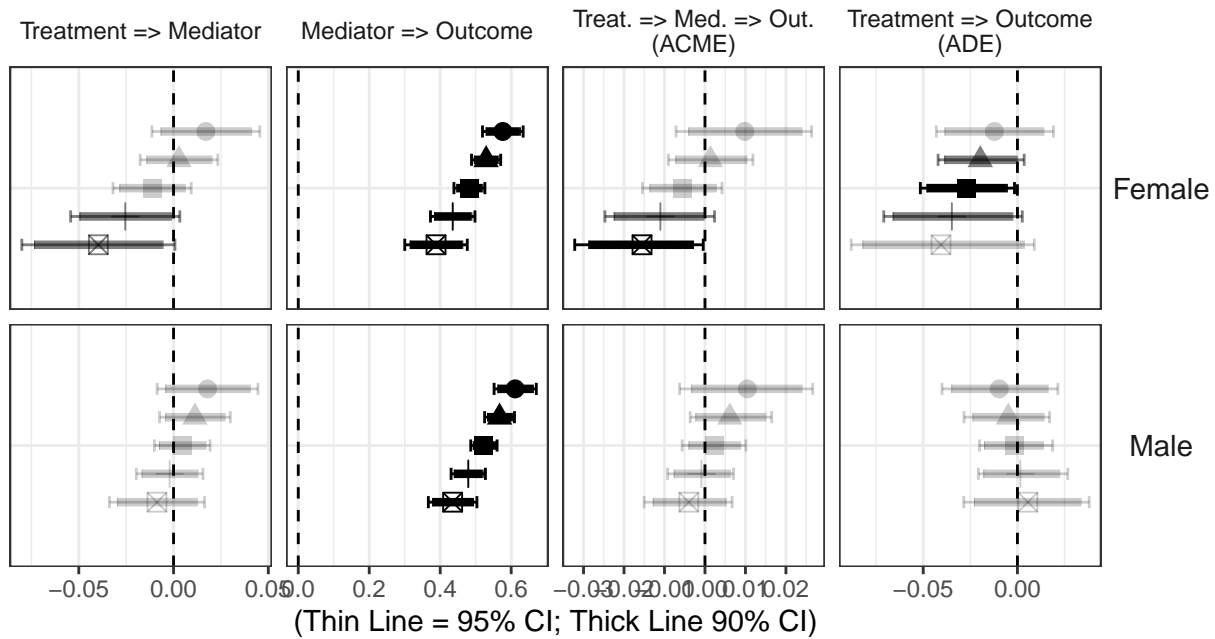
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ⊠ 65      Significance ● p<.05 ● p<.1 ○ n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: South Korea Feeling Thermometer (rescaled to 0–1 with 1 being the most favorable).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot_familiarityFT_KOR_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
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## Warning: position_dodge requires non-overlapping x intervals
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```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="familiarityFT_KOR" & coefdt$mod!="Treatment => Outcome\n(ADE)",], aes(x=
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
```

```

scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: South Korea I
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

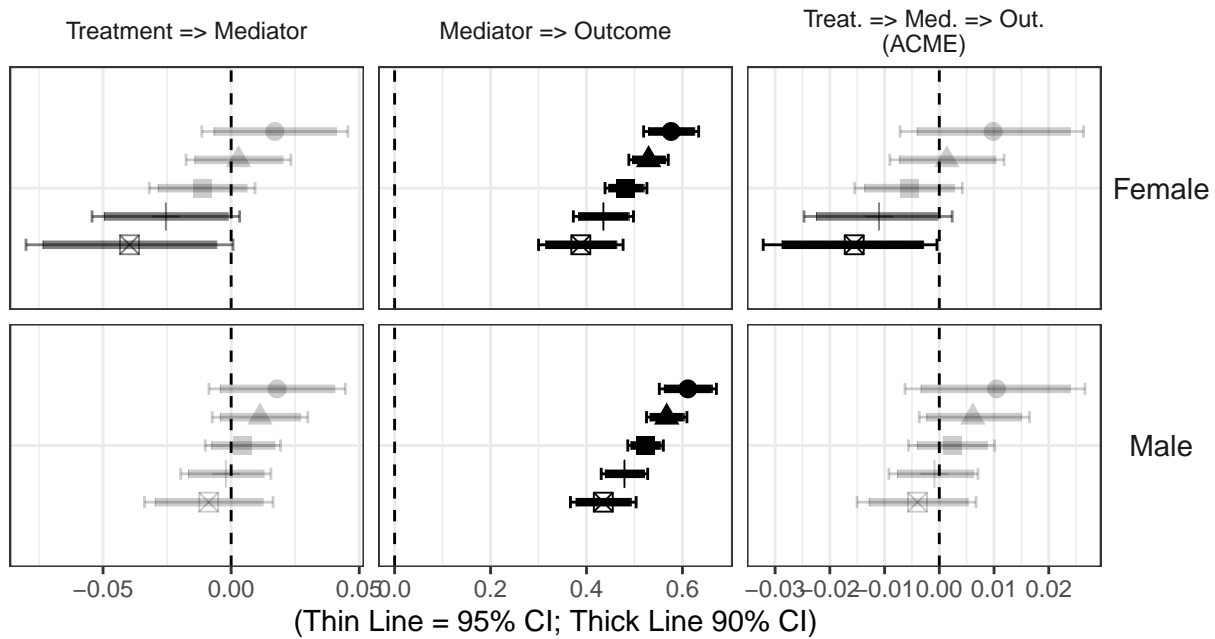
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ☒ 65      Significance ● p<.05 ● p<.1 ○ n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: South Korea Feeling Thermometer (rescaled to 0–1 with 1 being the most favorable).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir,"/out/mediationplot2_familiarityFT_KOR_unmatched_v5.png"),p,width=8,height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

## Plotting for China Feeling Thermometer

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="familiarityFT_CHN",], aes(x=gender, y=est)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
  scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
```

```

scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: China Feeling") +
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

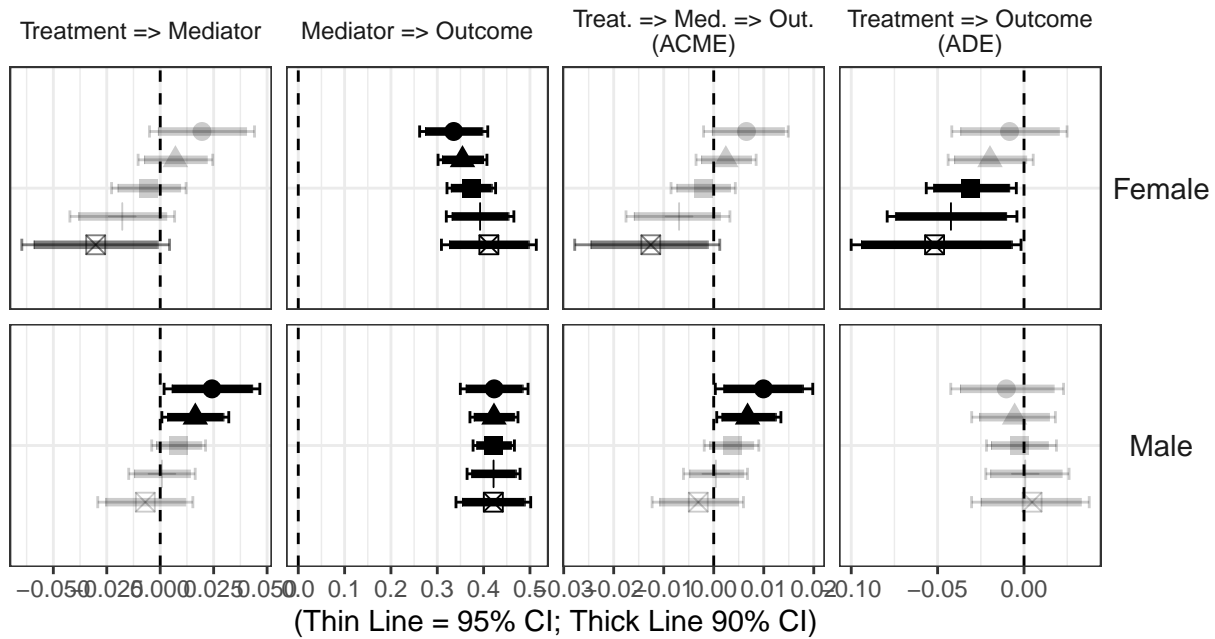
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ⊠ 65      Significance ● p<.05 ● p<.1 ○ n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: China Feeling Thermometer (rescaled to 0–1 with 1 being the most favorable).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot_familiarityFT_CHN_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
require(ggplot2)
```

```
p <- ggplot(coefdt[coefdt$med=="familiarityFT_CHN" & coefdt$mod!="Treatment => Outcome\n(ADE)",], aes(x=
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
```

```

scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: China Feeling",
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

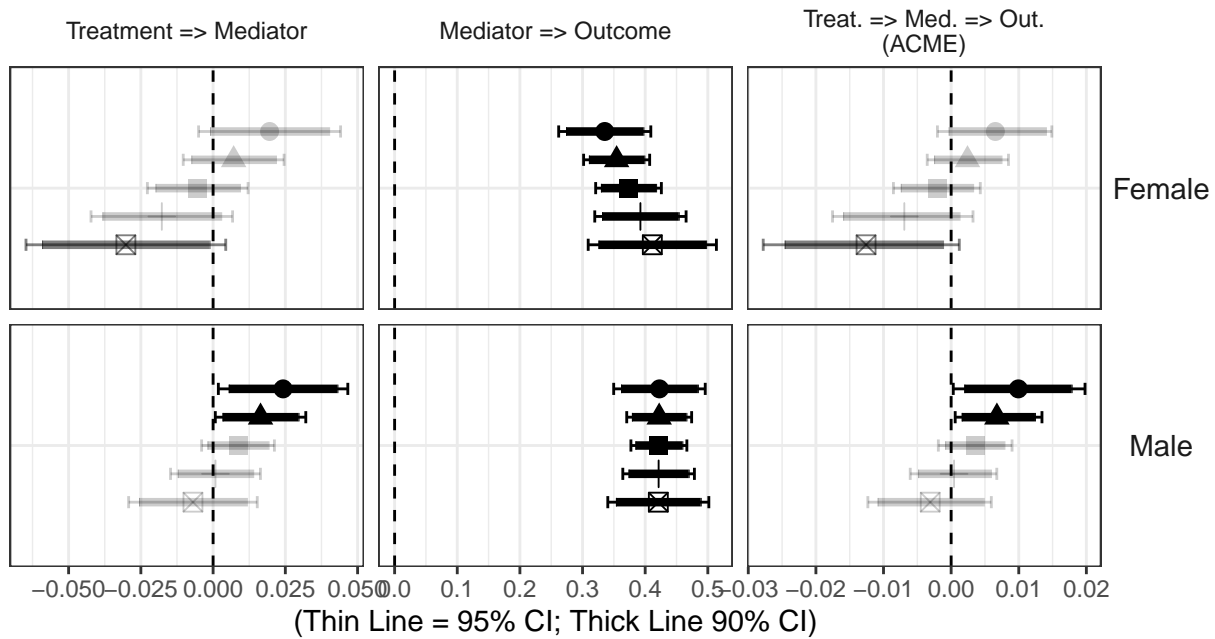
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ⊠ 65      Significance ● p<.05 ● p<.1 ● n.s.

Treatment: University education (1:attained, 0:not attained).

Mediator: China Feeling Thermometer (rescaled to 0–1 with 1 being the most favorable).

Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir,"/out/mediationplot2_familiarityFT_CHN_unmatched_v5.png"),p,width=8,height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

## Plotting for United States Feeling Thermometer

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="familiarityFT_USA",], aes(x=gender, y=est)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
  scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
```



```

scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: United States",
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

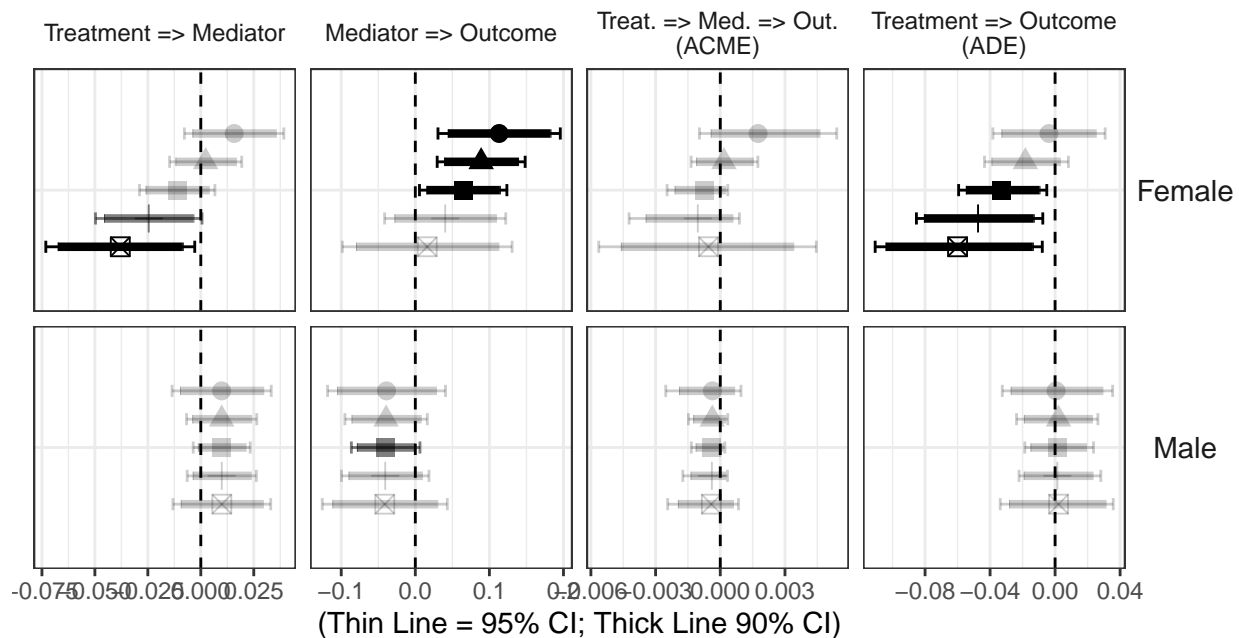
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ☒ 65      Significance ● p<.05 ■ p<.1 ○ n.s.

Treatment: University education (1:attained, 0:not attained).

Mediator: United States Feeling Thermometer (rescaled to 0–1 with 1 being the most favorable).

Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot_familiarityFT_USA_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

```
require(ggplot2)
```

```
p <- ggplot(coefdt[coefdt$med=="familiarityFT_USA" & coefdt$mod!="Treatment => Outcome\n(ADE)",], aes(x=
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
```

```

scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: United States",
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

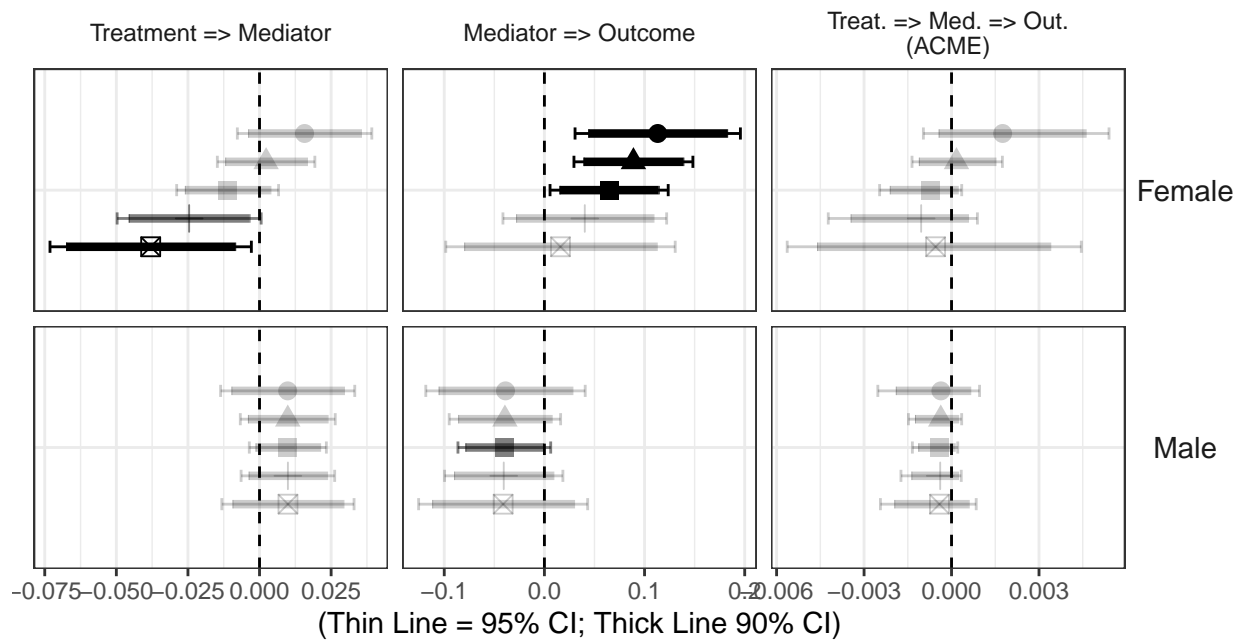
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals

```



Age ● 25 ▲ 35 ■ 45 + 55 ⊠ 65      Significance ● p<.05 ● p<.1 ● n.s.

Treatment: University education (1:attained, 0:not attained).

Mediator: United States Feeling Thermometer (rescaled to 0–1 with 1 being the most favorable).

Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir,"/out/mediationplot2_familiarityFT_USA_unmatched_v5.png"),p,width=8,height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
```

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```

```
## Warning: position_dodge requires non-overlapping x intervals
```

## Plotting for Income

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="income",], aes(x=gender, y=est)) +
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
  scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
```

```

scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: Income (resc
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

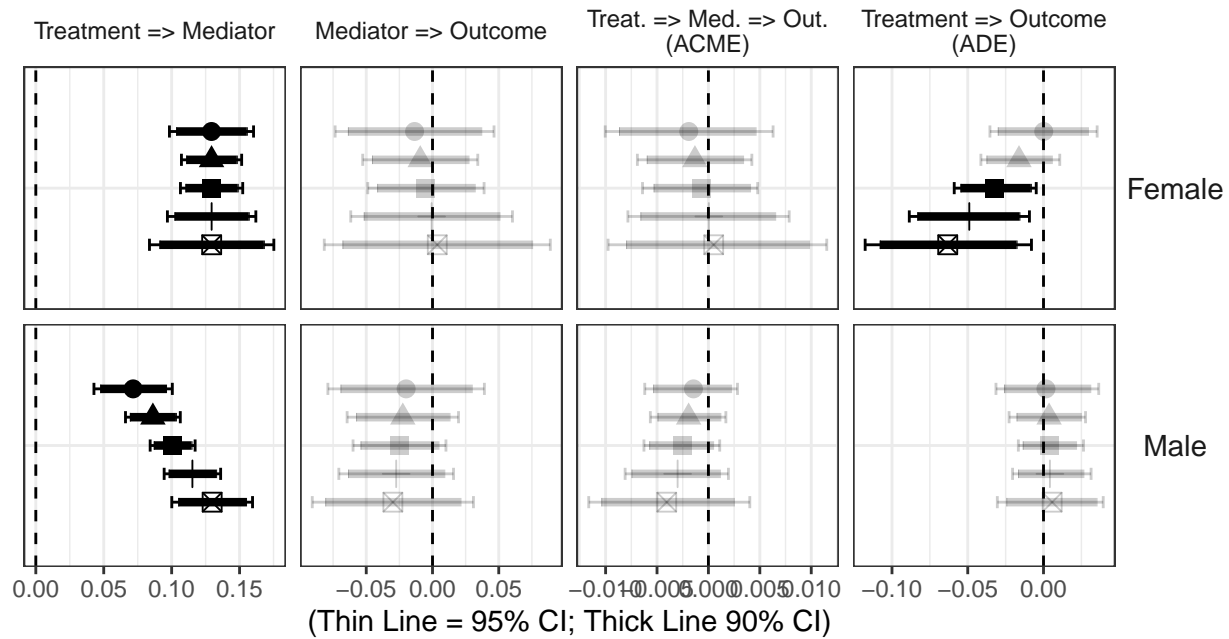
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
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```



Age ● 25 ▲ 35 ■ 45 + 55 ⊠ 65      Significance ● p<.05 ◐ p<.1 ○ n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: Income (rescaled to 0–1 with 1 being the richest).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir, "/out/mediationplot_income_unmatched_v5.png"), p, width=8, height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
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## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
## Warning: position_dodge requires non-overlapping x intervals
```

```
require(ggplot2)
p <- ggplot(coefdt[coefdt$med=="income" & coefdt$mod!="Treatment => Outcome\n(ADE)",], aes(x=gender, y=
  geom_hline(aes(yintercept=0), linetype=2) +
  geom_errorbar(aes(ymin=lci95,ymax=uci95,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=0.5, width=0.3) +
  geom_errorbar(aes(ymin=lci90,ymax=uci90,colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=1.5, width=0.0) +
  geom_point(aes(shape=as.factor(age), colour=as.factor(age), alpha=pstar),
    position=position_dodge(width=-0.7), size=3) +
  facet_grid(gender ~ mod, scales = "free") +
```

```

scale_alpha_manual(name="Significance",values=c(1,0.5,0.2), drop=FALSE) +
scale_shape_discrete(name="Age") +
scale_color_manual(name="Age",values=rep("black", 5)) +
ylab("(Thin Line = 95% CI; Thick Line 90% CI)") +
xlab(NULL) +
labs(caption="Treatment: University education (1:attained, 0:not attained). \nMediator: Income (resc
coord_flip() + theme_bw() +
theme(legend.position = "bottom",
      strip.text.x = element_text(size=9),
      strip.text.y = element_text(angle=0,size=11),
      strip.background = element_rect(fill=NA,color=NA),
      plot.caption = element_text(hjust=0),
      plot.subtitle = element_text(hjust=0.5),
      axis.text.y = element_blank(),
      axis.ticks.y = element_blank())

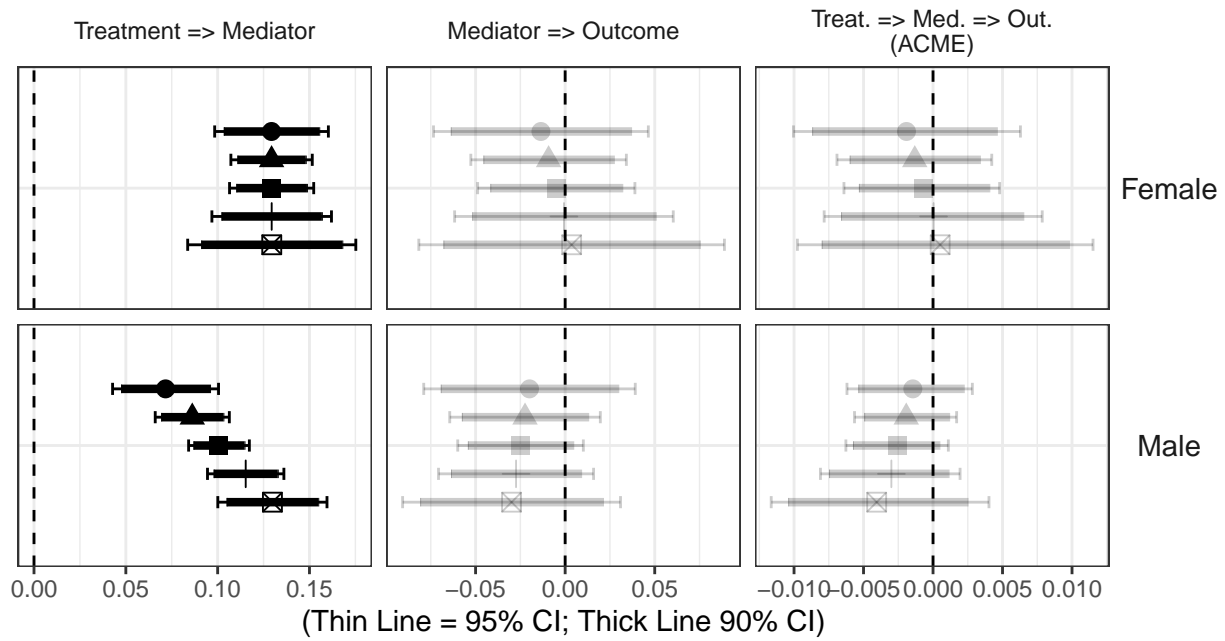
```

p

```

## Warning: position_dodge requires non-overlapping x intervals
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```



Age    25    35    45    55    65      Significance    ● p<.05    ● p<.1    ● n.s.

Treatment: University education (1:attained, 0:not attained).  
 Mediator: Income (rescaled to 0–1 with 1 being the richest).  
 Outcome: Agreement with granting suffrage to permanent residents (rescaled to 0–1).

```
ggsave(paste0(projdir,"/out/mediationplot2_income_unmatched_v5.png"),p,width=8,height=5)
```

```
## Warning: position_dodge requires non-overlapping x intervals
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```