Study 2B

April 06, 2025

Items

Read Data

```
# Set this to TRUE if you have API access, FALSE if using CSV
USE_API <- FALSE

if(USE_API) {
  ## Pull directly from Qualtrics API
  qual_data <- fetch_survey(surveyID='SV_9KBd2ktMonQbXWS',
                    label = T,
                    convert = F,
                    start_date = "2022-10-14",
                    force_request = T)
} else {
  # Read the processed data directly from CSV
  d0 <- read.csv('Study2B.csv', check.names = F)
  num_excluded <- unique(d0$num_excluded_total)
}

# Define the categories
books_list <- c("Agatha Christie", "Alice Walker", "Charles Dickens", "Herman Melville",
↪  "Isabel Allende", "Jack London", "John Steinbeck", "Joyce Carol Oates", "Jorge Luis
↪  Borges", "JRR Tolkien", "Louisa May Alcott", "Lucy Maud", "Michael Crichton", "Sandra
↪  Cisneros", "Toni Morrison")
oldies_list <- c("Agatha Christie", "Charles Dickens", "Emily Bronte", "Ernest
↪  Hemingway", "Herman Melville", "Jack London", "Jane Austen", "Jorge Luis Borges",
↪  "JRR Tolkien", "Louisa May Alcott", "Lucy Maud", "Nathaniel Hawthorne", "WEB Du
↪  Bois")
poets_list <- c("Alice Walker", "Charles Dickens", "Emily Bronte", "George Orwell", "Jack
↪  London", "James Baldwin", "Joyce Carol Oates", "Jorge Luis Borges", "Louisa May
↪  Alcott", "Lucy Maud", "Sandra Cisneros", "Sylvia Plath", "Toni Morrison")
race_list <- c("Alice Walker", "Gabriel Garcia Marquez", "Isabel Allende", "James
↪  Baldwin", "Sandra Cisneros", "Toni Morrison", "WEB Du Bois", "Jorge Luis Borges")

if(USE_API) {
  d0 <- qual_data |>
    mutate(ec_2 = tolower(ec_2)) |>
    filter(workerId!="", selection_6 != "", ec_2 %in% c("one one", "\"one one\""),
    ↪  bonus_ctrl2_7 != "" |
                  bonus_ctrl1_7 != "" |
                  bonus_trt_7 != "", Finished==1) |>
    dplyr::select(c(selection_1:last_col()))  |>
    # Replace NA with an empty string in relevant columns
    mutate(across(starts_with("race"), ~replace_na(., ""), .names = "new_{.col}")) %>%
    # Combine race columns into a single column
    unite("race_combined", starts_with("new_race"), sep = ", ", na.rm = TRUE, remove =
    ↪  TRUE) %>%
    # Clean up the race column
    mutate(race = sapply(strsplit(race_combined, ", "), function(x) {
      cleaned_entries = x[!str_detect(x, "^\\s*$")]
      paste(cleaned_entries, collapse = ", ")
    }))  |>
    mutate(race_choice = across(c(bonus_ctrl2_7, bonus_ctrl1_7, bonus_trt_7),
                  ~ case_when(. %in% race_list ~ 1,
```

```
                              TRUE ~ 0)),
         book_choice = across(c(bonus_ctrl2_7, bonus_ctrl1_7, bonus_trt_7),
                ~ case_when(. %in% books_list  ~ 1,
                              TRUE ~ 0)),
          oldies_choice = across(c(bonus_ctrl2_7, bonus_ctrl1_7, bonus_trt_7),
                ~ case_when(. %in% oldies_list ~ 1,
                  TRUE ~ 0)),
          poets_choice = across(c(bonus_ctrl2_7, bonus_ctrl1_7, bonus_trt_7),
                ~ case_when(. %in% poets_list ~ 1,
                  TRUE ~ 0)),
         race_feedback = case_when(group %in% c("control1", "control2") ~ 0,
                                   TRUE ~ 1)) |>
  mutate(race_pick = case_when(race_choice$bonus_ctrl2_7==1 |
  ↪  race_choice$bonus_ctrl1_7==1 |  race_choice$bonus_trt_7==1 ~ 1, TRUE ~ 0),
         poets_pick = case_when(poets_choice$bonus_ctrl2_7==1 |
         ↪  poets_choice$bonus_ctrl1_7==1 |  poets_choice$bonus_trt_7==1 ~ 1, TRUE ~
         ↪  0),
         oldies_pick = case_when(oldies_choice$bonus_ctrl2_7==1 |
         ↪  oldies_choice$bonus_ctrl1_7==1 |  oldies_choice$bonus_trt_7==1 ~ 1, TRUE ~
         ↪  0),
         book_pick = case_when(book_choice$bonus_ctrl2_7==1 |
         ↪  book_choice$bonus_ctrl1_7==1 |  book_choice$bonus_trt_7==1 ~ 1, TRUE ~ 0),
         poets = case_when((group == "control1" & (`count_type-1` == "wrote poetry" |
         ↪  `count_type-2` == "wrote poetry")) | (group=="control2") |
         ↪  (group=="treatment" & (`minority_count_type-1` == "wrote poetry" |
         ↪  `minority_count_type-2` == "wrote poetry" | `minority_count_type-3` ==
         ↪  "wrote poetry")) ~ 1, TRUE ~ 0),
         oldies = case_when((group == "control1" & (`count_type-1` == "were born in the
         ↪  1800s" | `count_type-2` == "were born in the 1800s")) |
         ↪  (group=="control2") | (group=="treatment" & (`minority_count_type-1` ==
         ↪  "were born in the 1800s" | `minority_count_type-2` == "were born in the
         ↪  1800s" | `minority_count_type-3` == "were born in the 1800s")) ~ 1, TRUE ~
         ↪  0),
         books = case_when((group == "control1" & (`count_type-1` == "wrote more than
         ↪  10 books" | `count_type-2` == "wrote more than 10 books")) |
         ↪  (group=="control2") | (group=="treatment" & (`minority_count_type-1` ==
         ↪  "wrote more than 10 books" | `minority_count_type-2` == "wrote more than
         ↪  10 books" | `minority_count_type-3` == "wrote more than 10 books")) ~ 1,
         ↪  TRUE ~ 0),
          gender_code = case_when(gender=="Man" ~ 1, TRUE ~ 0),
          race_code = case_when(str_detect(race, "White / Caucasian") ~ 1, TRUE ~ 0),
         age = as.numeric(age),
         list_two = case_when(group=="control1" ~ 1, group=="control2" ~ 0, TRUE ~
         ↪  NA_real_)) |>
  mutate(
    across(c(I1:E3),
           ~ case_when(
             . == "Strongly disagree" ~ 1, . == "Disagree" ~ 2, . == "Somewhat
↪  disagree" ~ 3, . == "Neither agree nor disagree" ~ 4,
             . == "Somewhat agree" ~ 5, . == "Agree" ~ 6, . == "Strongly agree" ~ 7,
↪  TRUE ~ NA_integer_))) |>
  mutate(
    internal1Z = (I1 - mean(I1, na.rm = TRUE)) / sd(I1, na.rm = TRUE),
```

```
      internal2Z = (I2 - mean(I2, na.rm = TRUE)) / sd(I2, na.rm = TRUE),
      internal3Z = (I3 - mean(I3, na.rm = TRUE)) / sd(I3, na.rm = TRUE),
      internal4Z = (I4 - mean(I4, na.rm = TRUE)) / sd(I4, na.rm = TRUE),
      internal = (internal1Z + internal2Z + internal3Z + internal4Z) / 4,
      external1Z = (E1 - mean(E1, na.rm = TRUE)) / sd(E1, na.rm = TRUE),
      external2Z = (E2 - mean(E2, na.rm = TRUE)) / sd(E2, na.rm = TRUE),
      external3Z = (E3 - mean(E3, na.rm = TRUE)) / sd(E3, na.rm = TRUE),
      external = (external1Z + external2Z + external3Z) / 3,
      base_race = rowSums(across(selection_1:selection_6, ~ . %in% race_list))
    ) |>
    dplyr::select(list_two, race_feedback, race_pick:books, base_race,
↪   selection_1:selection_6,bonus_ctrl2_7, bonus_ctrl1_7, bonus_trt_7, race, gender, age,
↪   gender_code, race_code, internal1Z:external) |>
    slice(1:1000) #pre-registered sample size

  # Calculate the number of excluded participants
  num_excluded <- nrow(qual_data) - nrow(d0)

  # Save num_excluded in d0
  d0$num_excluded_total <- num_excluded  # As a column

  # Write the API-pulled data into a CSV file
  write.csv(d0, 'Study2B.csv', row.names = FALSE, quote = TRUE)
}
```

Variable Names

Variable	Description
list_two	Binary indicator of whether the control received a list of two attributes (list_two=1) or not (list_two=0).
race_feedback	Binary indicator of whether a participant was randomly assigned to race feedback condition.
race_pick	Binary indicator of whether a participant selected a racial minority protagonist for their seventh author selection
poets_pick	Binary indicator of whether a participant selected an author that wrote poetry for their seventh selection.
oldies_pick	Binary indicator of whether a participant selected an author that was born in the 1800*s* for their seventh selection.
book_pick	Binary indicator of whether a participant selected an author that wrote more than 10 books for their seventh selection.
base_race	Count of the number of racial minority authors selected in the initial six authors.
selection_1 to selection_6	The selected authors
bonus_ctrl1_7, bonus_ctrl2_7	The final selected author for control
bonus_trt_7	The final selected author for treatment
gender	Self-selected gender.
race	Self-selected race.
age	Self-entered age.
gender_code	Dummy code for gender (male = 1).
race_code	Dummy code for race (white = 1).
internal1Z-4Z	Individual standardized scale items for Internal Motivation to Respond Without Prejudice.
external1Z-3Z	Individual standardized scale items for External Motivation to Respond Without Prejudice.
internal	Aggregated scale items for Internal Motivation to Respond Without Prejudice.
external	Aggregated scale items for External Motivation to Respond Without Prejudice.

Demographics

```
## Excluded Participants: 138
```

```
##                         Percentage gender
## 1 Another gender not listed here:    0.2
## 2                              Man   47.6
## 3                       Non-binary    0.7
## 4                            Woman   51.5
```

```
##                                Race Percentage
## 1 American Indian or Alaskan Native       1.45
## 2          Asian / Pacific Islander       8.83
## 3         Black or African American       9.21
## 4                 Hispanic / Latinx       4.75
## 5                 White / Caucasian      75.75
```

```
##   mean_age   sd_age
## 1   42.529 12.74117
```

```
## Mean (num of initial women selected):  1.31
```

```
## SD (num of initial women selected):  1.32
```

```
## Percentage (initial women selected):  0.2183333
```

```
## SD (initial women selected):  0.22
```

```
## # A tibble: 2 x 2
##   race_feedback  mean
##           <int> <dbl>
## 1             0 0.207
## 2             1 0.229
```

```
##
##  Welch Two Sample t-test
##
## data:  base_race/6 by race_feedback
## t = -1.5834, df = 993.88, p-value = 0.1137
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0
## 95 percent confidence interval:
##  -0.049265679  0.005265679
## sample estimates:
## mean in group 0 mean in group 1
##       0.2066667       0.2286667
```

Cronbach's Alpha

```r
# Calculating Cronbach's Alpha for the Internal subscale
internal_items <- d0[, c("internal1Z", "internal2Z", "internal3Z", "internal4Z")]
alpha_internal <- alpha(internal_items)

cat("Cronbach's Alpha for Internal Subscale: ", alpha_internal$total$raw_alpha, "\n")
```

```
## Cronbach's Alpha for Internal Subscale:  0.9349041
```

```r
# Calculating Cronbach's Alpha for the External subscale
external_items <- d0[, c("external1Z", "external2Z", "external3Z")]
alpha_external <- alpha(external_items)
cat("Cronbach's Alpha for External Subscale: ", alpha_external$total$raw_alpha, "\n")
```

```
## Cronbach's Alpha for External Subscale:  0.8995114
```

Pooled Analysis

```
r0 <- lm(race_pick ~ list_two, data=d0)

# Display the summary with robust standard errors
robust_summary(r0)
```

```
##
## Call:
## lm(formula = race_pick ~ list_two, data = d0)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.2910 -0.2910 -0.2734  0.7090  0.7266
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.27344    0.02797   9.777   <2e-16 ***
## list_two     0.01755    0.04043   0.434    0.664
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4508 on 498 degrees of freedom
##   (500 observations deleted due to missingness)
## Multiple R-squared:  0.0003799,  Adjusted R-squared:  -0.001627
## F-statistic: 0.1893 on 1 and 498 DF,  p-value: 0.6637
```

Primary Analysis

```
# primary model
r1 <- lm(race_pick ~ race_feedback, data=d0)
summary(r1)
```

```
##
## Call:
## lm(formula = race_pick ~ race_feedback, data = d0)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -0.416 -0.416 -0.282  0.584  0.718
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.28200    0.02113  13.348  < 2e-16 ***
## race_feedback  0.13400    0.02988   4.485 8.13e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4724 on 998 degrees of freedom
```

```
## Multiple R-squared:  0.01976,    Adjusted R-squared:  0.01878
## F-statistic: 20.12 on 1 and 998 DF,  p-value: 8.135e-06
```

```
# Display the summary with robust standard errors
robust_summary(r1)
```

```
##
## Call:
## lm(formula = race_pick ~ race_feedback, data = d0)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -0.416 -0.416 -0.282  0.584  0.718
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.28200    0.02016  13.985  < 2e-16 ***
## race_feedback  0.13400    0.02991   4.481  8.3e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4724 on 998 degrees of freedom
## Multiple R-squared:  0.01976,    Adjusted R-squared:  0.01878
## F-statistic: 20.12 on 1 and 998 DF,  p-value: 8.135e-06
```

```
robust_confint(r1)
```

```
##                    2.5 %    97.5 %
## (Intercept)   0.24243180 0.3215682
## race_feedback 0.07531266 0.1926873
```

Robustness

```
## which feedback was shown with gender, remove constant due to collinearity
r2 <- lm(race_pick ~ race_feedback + oldies_pick + poets_pick + book_pick - 1, data=d0)


# Display the summary with robust standard errors
robust_summary(r2)
```

```
##
## Call:
## lm(formula = race_pick ~ race_feedback + oldies_pick + poets_pick +
##     book_pick - 1, data = d0)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.7306 -0.2526  0.0000  0.2694  1.2283
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## race_feedback  0.24974    0.02608   9.577   <2e-16 ***
## oldies_pick   -0.22825    0.02344  -9.738   <2e-16 ***
## poets_pick     0.32392    0.02425  13.356   <2e-16 ***
## book_pick      0.15694    0.02395   6.554    9e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4393 on 996 degrees of freedom
## Multiple R-squared:  0.4493, Adjusted R-squared:  0.4471
## F-statistic: 203.1 on 4 and 996 DF,  p-value: < 2.2e-16
```

```
## robust to demographic controls

r3 <- lm(race_pick~ race_feedback + gender_code + race_code + age, data=d0)

# robust standard errors
robust_summary(r3)
```

```
##
## Call:
## lm(formula = race_pick ~ race_feedback + gender_code + race_code +
##     age, data = d0)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.5289 -0.3624 -0.2584  0.5597  0.8435
##
## Coefficients:
##                Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.448277   0.059960   7.476 1.67e-13 ***
## race_feedback  0.134679   0.029791   4.521 6.90e-06 ***
```

```
## gender_code   -0.103115   0.029754  -3.466 0.000552 ***
## race_code     -0.016756   0.037118  -0.451 0.651787
## age           -0.002456   0.001148  -2.139 0.032674 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4694 on 995 degrees of freedom
## Multiple R-squared:  0.03512,    Adjusted R-squared:  0.03124
## F-statistic: 9.053 on 4 and 995 DF,  p-value: 3.491e-07
```

```
robust_confint(r3)
```

```
##                      2.5 %        97.5 %
## (Intercept)    0.330615178  0.5659397546
## race_feedback  0.076218684  0.1931394470
## gender_code   -0.161502152 -0.0447274505
## race_code     -0.089594893  0.0560831820
## age           -0.004708967 -0.0002028828
```

```
## logistic regression
# Fit the logistic regression model
r4 <- glm(race_pick ~ race_feedback, family = binomial, data=d0)
summary(r4)
```

```
##
## Call:
## glm(formula = race_pick ~ race_feedback, family = binomial, data = d0)
##
## Coefficients:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)   -0.93456    0.09939  -9.403  < 2e-16 ***
## race_feedback  0.59535    0.13457   4.424 9.69e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1293.7  on 999  degrees of freedom
## Residual deviance: 1273.8  on 998  degrees of freedom
## AIC: 1277.8
##
## Number of Fisher Scoring iterations: 4
```

```
# Odds ratio
tidy_r4 <- tidy(r4, exponentiate = TRUE, conf.int = T)
print(tidy_r4)
```

```
## # A tibble: 2 x 7
##   term          estimate std.error statistic  p.value conf.low conf.high
##   <chr>            <dbl>     <dbl>     <dbl>    <dbl>    <dbl>     <dbl>
## 1 (Intercept)      0.393    0.0994     -9.40 5.29e-21    0.322     0.476
## 2 race_feedback    1.81     0.135       4.42 9.69e- 6    1.39      2.36
```

Interaction Analysis

```r
## interaction of base gender
# primary model
r_interaction <- lm(race_pick ~ race_feedback*base_race, data=d0)


# Display the summary with robust standard errors
robust_summary(r_interaction)
```

```
##
## Call:
## lm(formula = race_pick ~ race_feedback * base_race, data = d0)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.4883 -0.4153 -0.2716  0.5838  0.7718
##
## Coefficients:
##                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)               0.22825    0.02640   8.645  < 2e-16 ***
## race_feedback             0.18830    0.04091   4.603 4.71e-06 ***
## base_race                 0.04334    0.01603   2.703  0.00698 **
## race_feedback:base_race -0.04375    0.02274  -1.924  0.05468 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4712 on 996 degrees of freedom
## Multiple R-squared:  0.02647,    Adjusted R-squared:  0.02353
## F-statistic: 9.026 on 3 and 996 DF,  p-value: 6.711e-06
```

Secondary Analysis

Mediation

```
# Set seed for reproducibility
set.seed(123)

# Define function for Sobel Test
sobel_test <- function(med.fit, out.fit, mediator) {
  med.se <- sqrt(diag(vcovHC(med.fit)))[mediator]
  out.se <- sqrt(diag(vcovHC(out.fit)))[mediator]
  sobel_test_statistic <- coef(out.fit)[mediator] / sqrt(vcovHC(out.fit)[mediator,
↪  mediator])
  sobel_p_value <- 2 * (1 - pnorm(abs(sobel_test_statistic)))
  list(statistic = sobel_test_statistic, p_value = sobel_p_value, se = out.se)
}

# ------------------------------
# Internal Motivation Analysis
# ------------------------------

# Direct effect model
dir.fit.internal <- lm(race_pick ~ race_feedback, data=d0)

# Mediator model
med.fit.internal <- lm(internal ~ race_feedback, data = d0)

# Outcome model including mediator
out.fit.internal <- lm(race_pick ~ race_feedback + internal, data = d0)

# Mediation analysis
med.out.internal <- mediate(med.fit.internal, out.fit.internal, boot = TRUE,
                            treat = "race_feedback", boot.ci.type = "perc", mediator =
                            ↪  "internal", sims = 10000)

# Sensitivity analysis
sens.out.internal <- medsens(med.out.internal, rho.by = 0.01, eps=.01, effect.type =
↪  "indirect", sims = 10000)

# Sobel test for internal motivation
sobel.internal <- sobel_test(med.fit.internal, out.fit.internal, "internal")

# Print and visualize results for internal motivation
cat("Sobel test for Internal Motivation\n")
```

```
## Sobel test for Internal Motivation
```

```
print(sobel.internal)
```

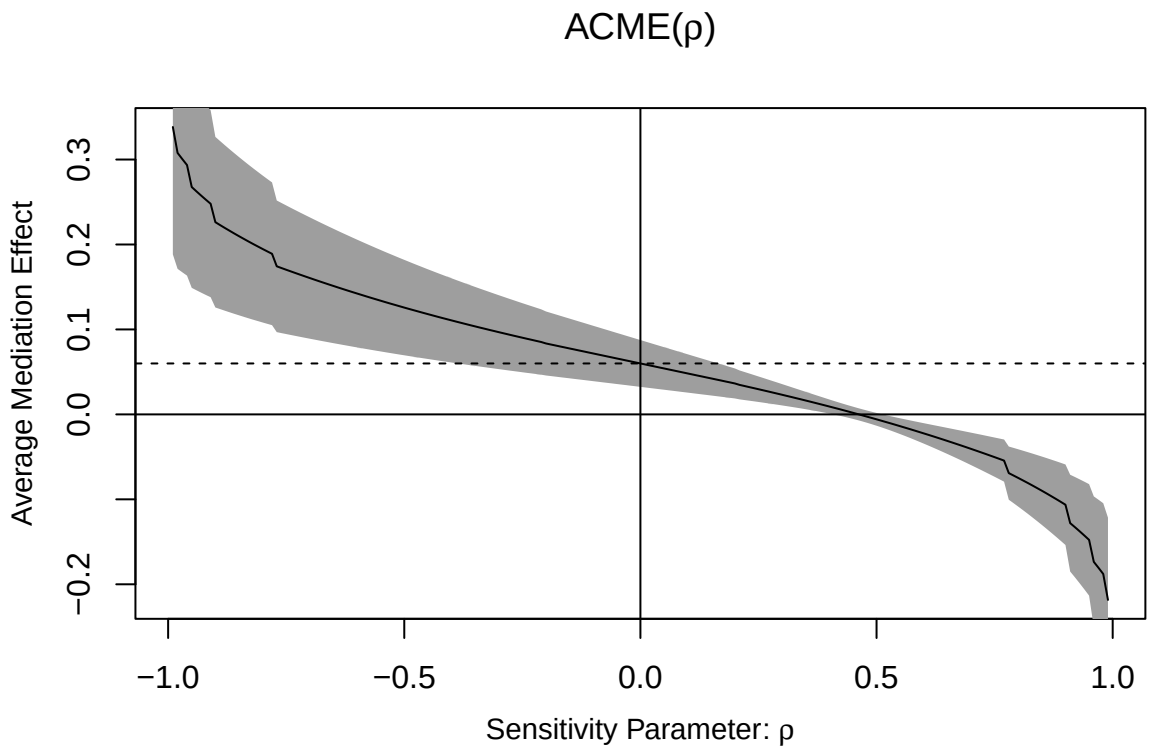
```
## $statistic
## internal
## 16.80819
##
```

```
## $p_value
## internal
##        0
##
## $se
##   internal
## 0.01408376
```

```
summary(med.out.internal)
```

```
##
## Causal Mediation Analysis
##
## Nonparametric Bootstrap Confidence Intervals with the Percentile Method
##
##                Estimate 95% CI Lower 95% CI Upper p-value
## ACME             0.0600       0.0335         0.09  <2e-16 ***
## ADE              0.0740       0.0203         0.13   0.008 **
## Total Effect     0.1340       0.0756         0.19  <2e-16 ***
## Prop. Mediated   0.4474       0.2626         0.76  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Sample Size Used: 1000
##
##
## Simulations: 10000
```

```
plot(sens.out.internal)
```



```r
# ----------------------------
# External Motivation Analysis
# ----------------------------

# Direct effect model (same as internal, so no need to recompute)
# dir.fit.external <- dir.fit.internal

# Mediator model
med.fit.external <- lm(external ~ race_feedback, data = d0)

# Outcome model including mediator
out.fit.external <- lm(race_pick ~ race_feedback + external, data = d0)

# Mediation analysis
med.out.external <- mediate(med.fit.external, out.fit.external, boot = TRUE,
                            treat = "race_feedback", boot.ci.type = "perc", mediator =
                            ↪  "external", sims = 10000)

# Sensitivity analysis
sens.out.external <- medsens(med.out.external, rho.by = 0.01, eps=.01, effect.type =
↪  "indirect", sims = 10000)

# Sobel test for external motivation
sobel.external <- sobel_test(med.fit.external, out.fit.external, "external")

# Print and visualize results for external motivation
cat("Sobel test for External Motivation\n")
```

```
## Sobel test for External Motivation
```

```r
print(sobel.external)
```

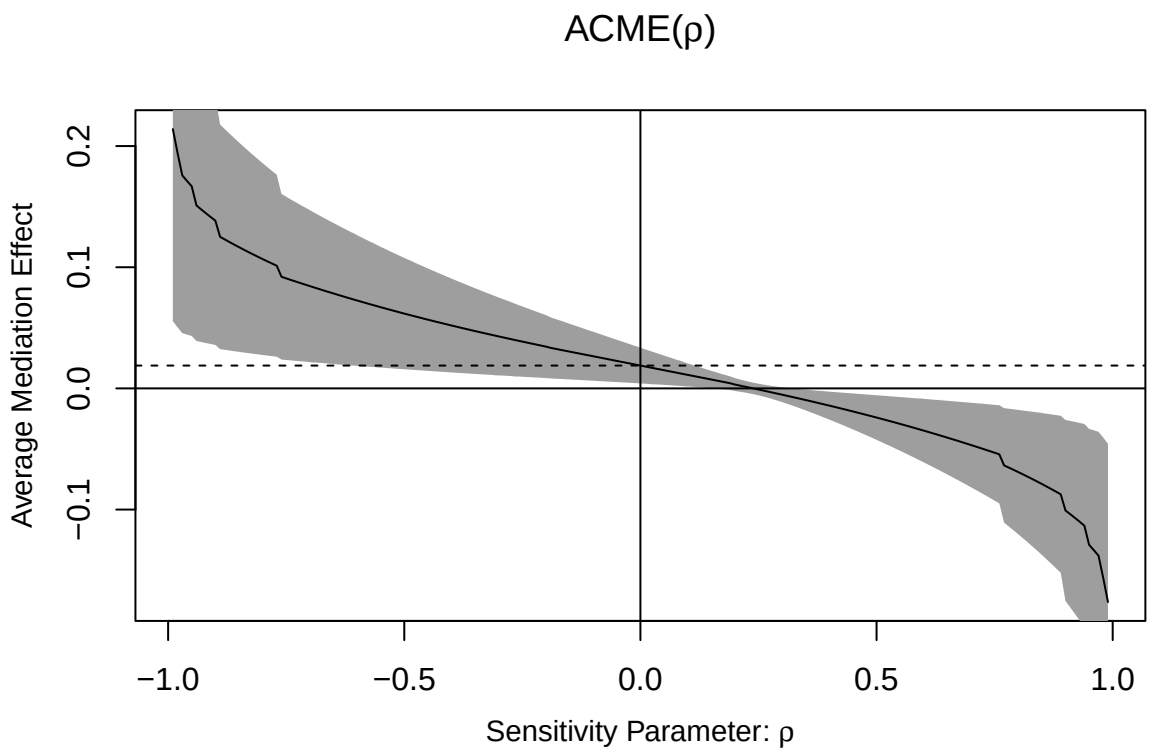
```
## $statistic
## external
## 7.576647
##
## $p_value
##     external
## 3.552714e-14
##
## $se
##   external
## 0.01636691
```

```r
summary(med.out.external)
```

```
##
## Causal Mediation Analysis
##
## Nonparametric Bootstrap Confidence Intervals with the Percentile Method
##
```

```
##                 Estimate 95% CI Lower 95% CI Upper p-value
## ACME             0.01884      0.00457         0.03  0.0076 **
## ADE              0.11516      0.05774         0.17  <2e-16 ***
## Total Effect     0.13400      0.07521         0.19  <2e-16 ***
## Prop. Mediated   0.14062      0.03630         0.29  0.0076 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Sample Size Used: 1000
##
##
## Simulations: 10000
```

```r
plot(sens.out.external)
```




```r
# ---------------------------------
# Combined Multiple Mediation Model
# ---------------------------------

# Compute the correlation coefficient and p-value
correlation_result <- cor.test(d0$internal, d0$external)
correlation_coefficient <- correlation_result$estimate
p_value <- correlation_result$p.value

# Print the results
cat("Correlation Between Internal and External: ", correlation_coefficient, "\n")
```

```
## Correlation Between Internal and External:  0.7246567
```

```r
cat("P-value: ", p_value, "\n")
```

```
## P-value:  1.424694e-163
```

```r
# Building combined outcome model with both mediators
out.fit.combined <- lm(race_pick ~ race_feedback + internal + external, data = d0)

# Run combined mediation analyses
med.out.combined.internal <- mediate(med.fit.internal, out.fit.combined, boot = TRUE,
                                     treat = "race_feedback", boot.ci.type = "perc",
                                     ↪  mediator = "internal", sims = 10000)
med.out.combined.external <- mediate(med.fit.external, out.fit.combined, boot = TRUE,
                                     treat = "race_feedback", boot.ci.type = "perc",
                                     ↪  mediator = "external", sims = 10000)

# Summarize and print the results for combined analysis
cat("Combined Multiple Mediation Model Results\n")
```

```
## Combined Multiple Mediation Model Results
```

```r
summary(med.out.combined.internal)
```

```
##
## Causal Mediation Analysis
##
## Nonparametric Bootstrap Confidence Intervals with the Percentile Method
##
##                Estimate 95% CI Lower 95% CI Upper p-value
## ACME             0.0779       0.0424         0.11  <2e-16 ***
## ADE              0.0710       0.0181         0.12  0.0084 **
## Total Effect     0.1488       0.0870         0.21  0.0002 ***
## Prop. Mediated   0.5231       0.3240         0.82  0.0002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Sample Size Used: 1000
##
##
## Simulations: 10000
```

```r
summary(med.out.combined.external)
```

```
##
## Causal Mediation Analysis
##
## Nonparametric Bootstrap Confidence Intervals with the Percentile Method
##
##                Estimate 95% CI Lower 95% CI Upper p-value
## ACME           -0.01482     -0.02886         0.00  0.0060 **
## ADE             0.07097      0.01840         0.12  0.0062 **
```

```
## Total Effect    0.05615      0.00238         0.11  0.0424 *
## Prop. Mediated -0.26397     -1.78186         0.00  0.0484 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Sample Size Used: 1000
##
##
## Simulations: 10000
```

Figure S3

```
drace_plot <- d0 |>
  dplyr::select(race_feedback, race_pick) |>
  dplyr::group_by(race_feedback) |>
  dplyr::summarise(
    n = n(),
    freq = mean(race_pick),
    sd = sd(race_pick) * 100,
    se = (sd(race_pick) / sqrt(n())) * 100
  ) |>
  mutate(race_feedback = case_when(race_feedback==1 ~ "\"Treatment\"",
                          TRUE ~ "\"Control\"")) |>
  rename(Condition = race_feedback)

##### poets


r_poets <- lm(poets_pick ~ poets, data=d0)

dpoets_plot <- d0 |>
  dplyr::select(poets, poets_pick) |>
  dplyr::group_by(poets) |>
  dplyr::summarise(
    n = n(),
    freq = mean(poets_pick),
    sd = sd(poets_pick) * 100,
    se = (sd(poets_pick) / sqrt(n())) * 100
  ) |>
  mutate(poets = case_when(poets==1 ~ "\"Treatment\"",
                          TRUE ~ "\"Control\"")) |>
  rename(Condition = poets)


##### books

r_books <- lm(book_pick ~ books, data=d0)

dbooks_plot <- d0 |>
  dplyr::select(books, book_pick) |>
  dplyr::group_by(books) |>
  dplyr::summarise(
    n = n(),
    freq = mean(book_pick),
    sd = sd(book_pick) * 100,
    se = (sd(book_pick) / sqrt(n())) * 100
  ) |>
  mutate(books = case_when(books==1 ~ "\"Treatment\"",
                          TRUE ~ "\"Control\"")) |>
  rename(Condition = books)


#### oldies
```

```
r_oldies <- lm(oldies_pick ~ oldies, data=d0)

doldies_plot <- d0 |>
  dplyr::select(oldies, oldies_pick) |>
  dplyr::group_by(oldies) |>
  dplyr::summarise(
    n = n(),
    freq = mean(oldies_pick),
    sd = sd(oldies_pick) * 100,
    se = (sd(oldies_pick) / sqrt(n())) * 100
  ) |>
  mutate(oldies = case_when(oldies==1 ~ "\"Treatment\"",
                            TRUE ~ "\"Control\"")) |>
  rename(Condition = oldies)

## Combine plots

df_combined <- bind_rows(
  dpoets_plot %>% mutate(Category = "\nWrote Poetry"),
  dbooks_plot %>% mutate(Category = "\nWrote > 10 books"),
  doldies_plot %>% mutate(Category = "\nWere Born\nin the 1800s"),
  drace_plot %>% mutate(Category = "\nWere Racial\nMinorities")
, .id = "id") %>%
  mutate(Category = factor(Category, levels = c('\nWrote Poetry', '\nWrote > 10 books',
  ↪  '\nWere Born\nin the 1800s', '\nWere Racial\nMinorities')))

p_combined <- ggplot(df_combined, aes(x = Condition, y = freq*100, fill = Condition)) +
  geom_bar(stat="identity", width = 0.85, position = position_dodge(width = 0.7)) +
  geom_text(aes(label=paste0(sprintf("%.1f", freq*100),"%")),
            position=position_dodge(width=0.7), vjust=5, size = 5, color = "white") +
  geom_errorbar(aes(ymin=freq*100-se, ymax=freq*100+se), width = .1, position =
  ↪  position_dodge(width = 0.7)) +
  facet_wrap(~factor(Category, c('\nWrote Poetry', '\nWrote > 10 books', '\nWere Born\nin
  ↪  the 1800s', '\nWere Racial\nMinorities')), nrow = 1, strip.position = "bottom") +
   geom_segment(data = df_combined %>% filter(Condition == "\"Treatment\""),
                aes(x = 1, xend = 2, y = freq*100 + se + 5, yend = freq*100 + se + 5),
                inherit.aes = FALSE) +
   geom_text(data = df_combined %>% filter(Category %in% c('\nWrote > 10 books') &
   ↪  Condition == "\"Treatment\""),
             aes(x = 1.5, xend = 1.5, y = freq*100 + se + 7, yend = freq*100 + se + 7,
             ↪  label = "n.s."),
             inherit.aes = FALSE, vjust = 0, size = 5) +
    geom_text(data = df_combined %>% filter(Category %in% c('\nWrote Poetry', '\nWere
    ↪  Born\nin the 1800s') & Condition == "\"Treatment\""),
             aes(x = 1.5, xend = 1.5, y = freq*100 + se + 7, yend = freq*100 + se + 7,
             ↪  label = "+"),
             inherit.aes = FALSE, vjust = 0, size = 5) +
   geom_text(data = df_combined %>% filter(Category == '\nWere Racial\nMinorities' &
   ↪  Condition == "\"Treatment\""),
             aes(x = 1.5, xend = 1.5, y = freq*100 + se + 5, yend = freq*100 + se + 5,
             ↪  label = "***"),
             inherit.aes = FALSE, vjust = 0, size = 5) +
```

```
  theme_bw() +
  scale_fill_manual(values = c("#990000", "#011F5B"), labels = c("No feedback provided",
  ↪  "Feedback provided"), "Feedback") +
  scale_y_continuous(labels = function(x) paste0(x,"%"), limits = c(0,95)) +
  scale_x_discrete(labels = c("\"Control\"" = "Not\nShown", "\"Treatment\"" = "Shown")) +
  labs(x = "Feedback on % of authors who...", y = "% of New Authors with the Target
  ↪  Attribute",
       caption = 'Note: Error Bars are SEs', title = "The Effect of Getting Feedback on
       ↪  Your Author Selections") +
  theme(plot.caption = element_text(face = "italic"),
        legend.position = c(0.5, 0.95),
        legend.title = element_blank(),
        legend.direction = "horizontal",
        legend.text = element_text(size = 20),
        legend.key.size = unit(7, 'mm'),
        legend.background = element_rect(fill = "white"),
        panel.grid.minor = element_blank(),
        panel.grid = element_blank(),
        panel.border = element_rect(fill= NA, color = "white"),
        plot.background = element_rect(fill = "white"),
        panel.background = element_rect(fill = "white"),
        axis.title.x = element_text(face="bold", size = 21, vjust = 17),
        plot.title = element_blank(),
        axis.title.y = element_text(size = 20, color = "black"),
        axis.text.x = element_blank(),
        axis.ticks = element_blank(),
        axis.text.y = element_text(size = 20, color = "black"),
        strip.text = element_text(size = 20, color = "black"),
        strip.background = element_rect(colour = "white", fill = "white"))

#p_combined
# Save the plot with Times New Roman font
# ggsave("../Supplemental Studies/Supplemental_Figures/Figure-S2.pdf", plot = p_combined,
↪  width = 10, height = 8, units = "in", device = cairo_pdf, family = "Times New Roman")
```

System of Simultaneous Equations

```
##                                 Wald.Coefficient    P_Value
## Race Feedback - poets Feedback          6.192915 0.01290740
## Race Feedback - books Feedback          5.504652 0.01906350
## Race Feedback - oldies Feedback         5.264682 0.02186598
```