

new

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(1) Data cleaning

```
rm(list = ls())
gc()
```

```
##          used (Mb) gc trigger (Mb) max used (Mb)
## Ncells 469949 25.1   1012281 54.1   660860 35.3
## Vcells 880549  6.8    8388608 64.0  1800812 13.8
```

```
set.seed(123)
##### (1) Data cleaning #####
## select variables
library(NHANES)
library(car)
```

```
## Loading required package: carData
```

```
library(naniar)
library(ggplot2)
df0 <- NHANES
df <- NHANES[NHANES$Age >= 18 & NHANES$Age < 60,]
# colSums(is.na(df)) / nrow(df)
df <- df[, which(colSums(is.na(df)) / nrow(df) < 0.3)]
# exclude duplication
df <- df[!duplicated(df),]
names(df)
```

```
## [1] "ID"          "SurveyYr"    "Gender"      "Age"
## [5] "AgeDecade"   "Race1"       "Education"   "MaritalStatus"
## [9] "HHIncome"    "HHIncomeMid" "Poverty"     "HomeRooms"
## [13] "HomeOwn"     "Work"        "Weight"      "Height"
## [17] "BMI"         "BMI_WHO"     "Pulse"       "BPSysAve"
## [21] "BPDiaAve"    "BPSys1"      "BPDia1"      "BPSys2"
## [25] "BPDia2"      "BPSys3"      "BPDia3"      "DirectChol"
## [29] "TotChol"     "UrineVol1"   "UrineFlow1"  "Diabetes"
## [33] "HealthGen"   "DaysPhysHlthBad" "DaysMentHlthBad" "LittleInterest"
## [37] "Depressed"   "SleepHrsNight" "SleepTrouble" "PhysActive"
## [41] "Alcohol12PlusYr" "AlcoholYear" "Smoke100"    "Smoke100n"
## [45] "Marijuana"   "RegularMarij" "HardDrugs"   "SexEver"
## [49] "SexAge"      "SexNumPartnLife" "SexNumPartYear" "SameSex"
## [53] "SexOrientation"
```

```

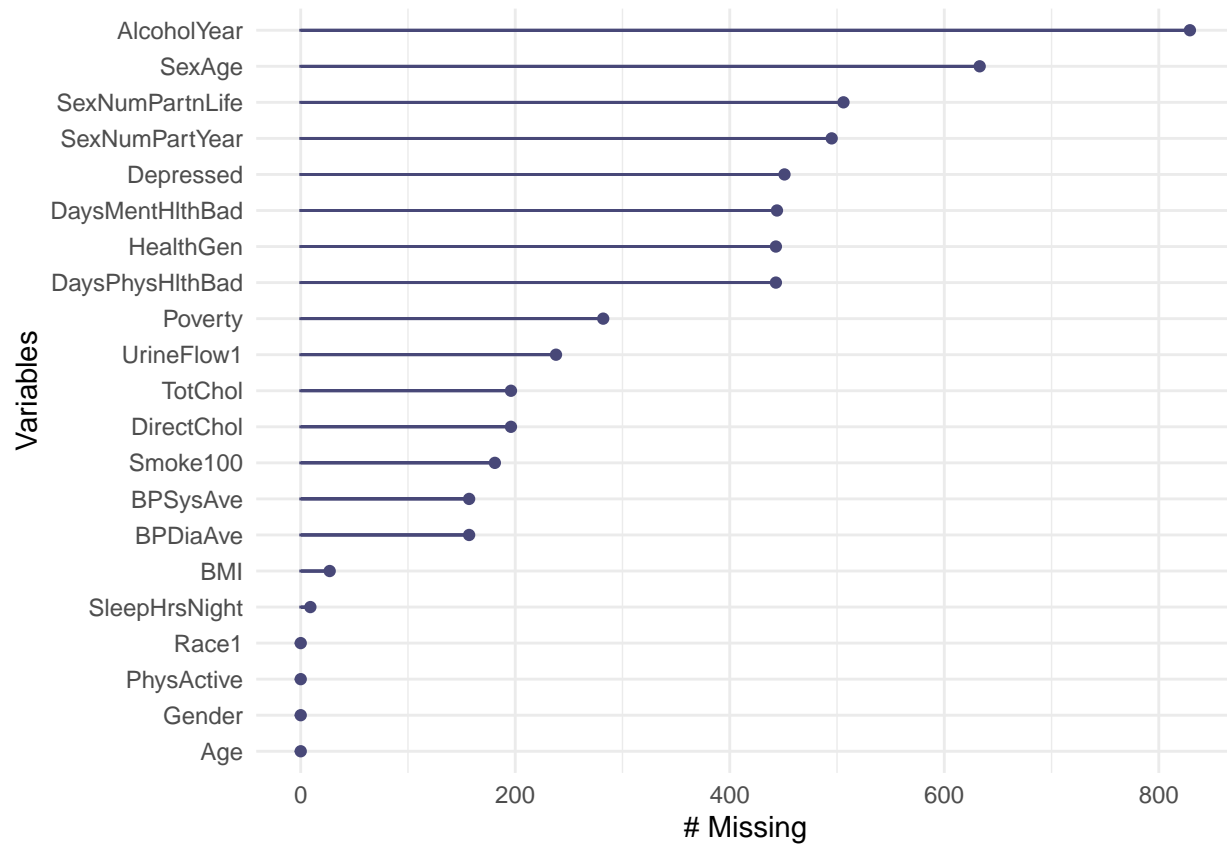
# df$BPSysAve
library(dplyr)

##
## Attaching package: 'dplyr'
## The following object is masked from 'package:car':
##
##      recode
## The following objects are masked from 'package:stats':
##
##      filter, lag
## The following objects are masked from 'package:base':
##
##      intersect, setdiff, setequal, union

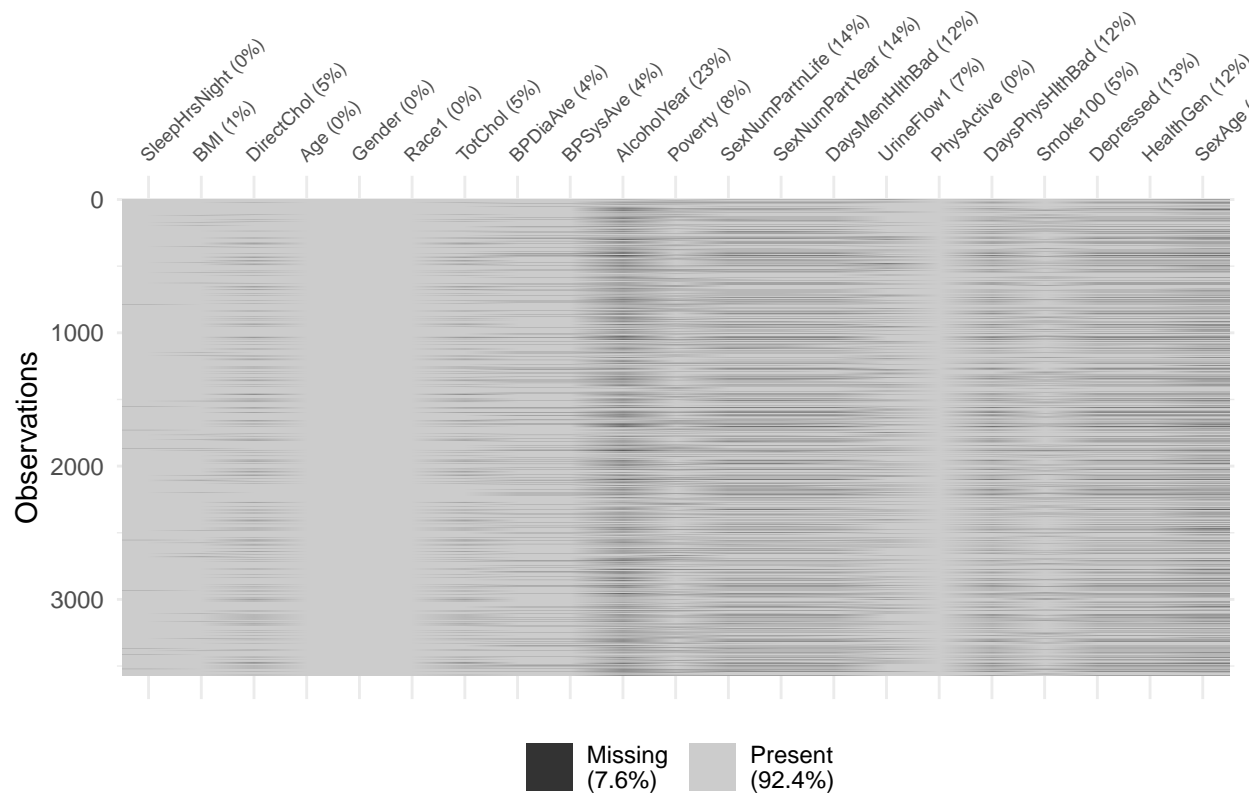
df2 <- df %>% select(
  SleepHrsNight,
  BMI,
  DirectChol,
  Age,
  Gender,
  Race1,
  TotChol,
  BPDiaAve,
  BPSysAve,
  AlcoholYear,
  Poverty,
  SexNumPartnLife,
  SexNumPartYear,
  DaysMentHlthBad,
  UrineFlow1,
  PhysActive,
  DaysPhysHlthBad,
  Smoke100,
  Depressed,
  HealthGen,
  SexAge
)

gg_miss_var(df2)

```



```
vis_miss(df2) + theme(axis.text.x = element_text(size = 7))
```



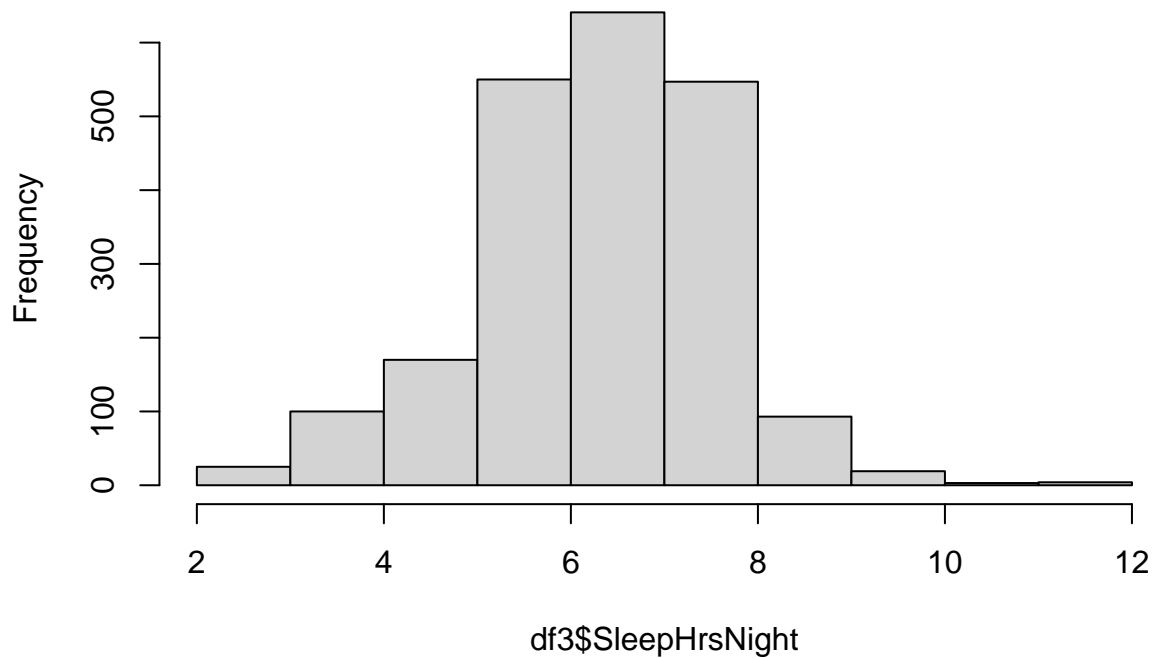
```
df3 <- na.omit(df2)
#df3$SleepHrsNight <- df3$SleepHrsNight * 60
#df3 <- df3[, -which(names(df3) %in% "SleepHrsNight")]
# cor(df3$BPSysAve, df3$BPDiaAve)
psych::describe(df3)
```

##	vars	n	mean	sd	median	trimmed	mad	min	max
## SleepHrsNight	1	2152	6.78	1.31	7.00	6.85	1.48	2.00	12.00
## BMI	2	2152	28.77	6.75	27.60	28.09	5.78	15.02	69.00
## DirectChol	3	2152	1.35	0.41	1.29	1.31	0.39	0.39	3.83
## Age	4	2152	39.18	11.33	39.00	39.15	14.83	20.00	59.00
## Gender*	5	2152	1.53	0.50	2.00	1.54	0.00	1.00	2.00
## Race1*	6	2152	3.43	1.15	4.00	3.57	0.00	1.00	5.00
## TotChol	7	2152	5.07	1.05	4.99	5.01	1.04	1.53	13.65
## BPDiaAve	8	2152	71.19	11.84	71.00	71.28	10.38	0.00	116.00
## BPSysAve	9	2152	117.43	14.28	116.00	116.50	13.34	78.00	209.00
## AlcoholYear	10	2152	70.59	94.22	24.00	50.94	35.58	0.00	364.00
## Poverty	11	2152	2.84	1.69	2.78	2.89	2.49	0.00	5.00
## SexNumPartnLife	12	2152	16.73	66.13	7.00	8.91	5.93	0.00	2000.00
## SexNumPartYear	13	2152	1.38	2.59	1.00	1.04	0.00	0.00	69.00
## DaysMentHlthBad	14	2152	4.47	8.02	0.00	2.40	0.00	0.00	30.00
## UrineFlow1	15	2152	1.07	0.97	0.81	0.91	0.60	0.00	10.14
## PhysActive*	16	2152	1.58	0.49	2.00	1.60	0.00	1.00	2.00
## DaysPhysHlthBad	17	2152	3.16	7.19	0.00	1.12	0.00	0.00	30.00
## Smoke100*	18	2152	1.46	0.50	1.00	1.45	0.00	1.00	2.00
## Depressed*	19	2152	1.30	0.58	1.00	1.16	0.00	1.00	3.00

```
## HealthGen*      20 2152   2.64  0.94   3.00    2.65  1.48  1.00    5.00
## SexAge          21 2152  17.10  3.39  17.00   16.80  2.97  9.00   44.00
##               range skew kurtosis se
## SleepHrsNight  10.00 -0.30   0.69 0.03
## BMI            53.98  1.28   2.96 0.15
## DirectChol      3.44  1.09   2.27 0.01
## Age            39.00  0.02  -1.15 0.24
## Gender*         1.00 -0.12  -1.99 0.01
## Race1*          4.00 -1.13   0.08 0.02
## TotChol         12.12  0.92   3.47 0.02
## BPDiaAve        116.00 -0.39   3.13 0.26
## BPSysAve        131.00  1.00   2.94 0.31
## AlcoholYear     364.00  1.66   1.98 2.03
## Poverty         5.00 -0.01  -1.47 0.04
## SexNumPartnLife 2000.00 18.82  456.62 1.43
## SexNumPartYear   69.00 14.07  293.16 0.06
## DaysMentHlthBad  30.00  2.16   3.76 0.17
## UrineFlow1      10.14  2.89  14.06 0.02
## PhysActive*      1.00 -0.32  -1.90 0.01
## DaysPhysHlthBad  30.00  2.80   7.06 0.15
## Smoke100*        1.00  0.15  -1.98 0.01
## Depressed*       2.00  1.83   2.21 0.01
## HealthGen*       4.00  0.11  -0.33 0.02
## SexAge           35.00  1.51   5.56 0.07
```

```
# psych::pairs.panels(df3)
hist(df3$SleepHrsNight)
```

Histogram of df3\$SleepHrsNight



```
# colSums(is.na(df2)) / nrow(df2)
fit0 <-
  lm(SleepHrsNight ~ .,
     data = df3)
#data type
df3$Gender <- ifelse(df3$Gender == "male", 0, 1)
df3 <- df3 %>%
  mutate(
    Race1 = case_when(
      Race1 == 'Black' ~ 1,
      Race1 == 'Hispanic' ~ 2,
      Race1 == 'Mexican' ~ 3,
      Race1 == 'White' ~ 4,
      Race1 == 'Other' ~ 5,
      TRUE ~ NA_integer_ # Default value if none of the conditions are met
    )
  )
```

#Raw data normality analysis

```
# Assuming 'df3' is your dataframe from the NHANES dataset.
# Load necessary libraries
library(e1071)
library(ggplot2)
library(rlang)
```

```
# Function to perform normality analysis on a given column
```

```

perform_normality_analysis <- function(data, column_x, column_y) {
  # Check if the columns are numeric
  if(!is.numeric(data[[column_x]]) || !is.numeric(data[[column_y]])) {
    return(paste("One or both columns are not numeric. Skipping."))
  }

  # Shapiro-Wilk Test for Y column
  shapiro_test <- shapiro.test(data[[column_y]])

  # Skewness and Kurtosis for Y column
  skewness_value <- skewness(data[[column_y]])
  kurtosis_value <- kurtosis(data[[column_y]])

  # Q-Q Plot for Y column
  qqplot <- ggplot(data, aes_string(sample = column_y)) +
    stat_qq() +
    stat_qq_line() +
    ggtitle(paste("Q-Q Plot for", column_y))

  # Histogram with Normal Distribution Fit for Y column
  hist_plot <- ggplot(data, aes_string(x = column_y)) +
    geom_histogram(aes(y = ..density..), binwidth = 1, fill = "blue", alpha = 0.5) +
    geom_density(color = "red", size = 1) +
    theme_bw() +
    xlab(paste(column_y, "(Value)")) +
    ylab("Density") +
    ggtitle(paste("Histogram with Normal Distribution Fit for", column_y))

  # Scatter Plot with Jittering and Alpha adjustment
  scatter_plot <- ggplot(df3, aes_string(x = "SleepHrsNight", y = "BMI")) +
    geom_jitter(alpha = 0.5, width = 0.2) + # Add jittering and alpha adjustment
    geom_smooth(method = "lm", color = "red") +
    theme_bw() +
    ggtitle("Scatter Plot with Regression Line for SleepHrsNight vs BMI")

  # Boxplot for Y column
  boxplot <- ggplot(data, aes_string(y = column_y)) +
    geom_boxplot() +
    theme_bw() +
    ggtitle(paste("Boxplot for", column_y))

  # Density Plot for Y column
  density_plot <- ggplot(data, aes_string(x = column_y)) +
    geom_density(fill = "blue", alpha = 0.5) +
    theme_bw() +
    ggtitle(paste("Density Plot for", column_y))

  # Output results
  list(
    Column_Y = column_y,
    Shapiro_Test = shapiro_test,
    Skewness = skewness_value,
    Kurtosis = kurtosis_value,

```

```

    QQPlot = qqplot,
    Histogram = hist_plot,
    ScatterPlot = scatter_plot,
    Boxplot = boxplot,
    DensityPlot = density_plot
  )
}

# Analyze BMI with SleepHrsNight as X-axis
bmi_sleep_analysis <- perform_normality_analysis(df3, "SleepHrsNight", "BMI")

## Warning: `aes_string()` was deprecated in ggplot2 3.0.0.
## i Please use tidy evaluation idioms with `aes()`.
## i See also `vignette("ggplot2-in-packages")` for more information.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use `linewidth` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

# Display the results
print(bmi_sleep_analysis$Shapiro_Test)

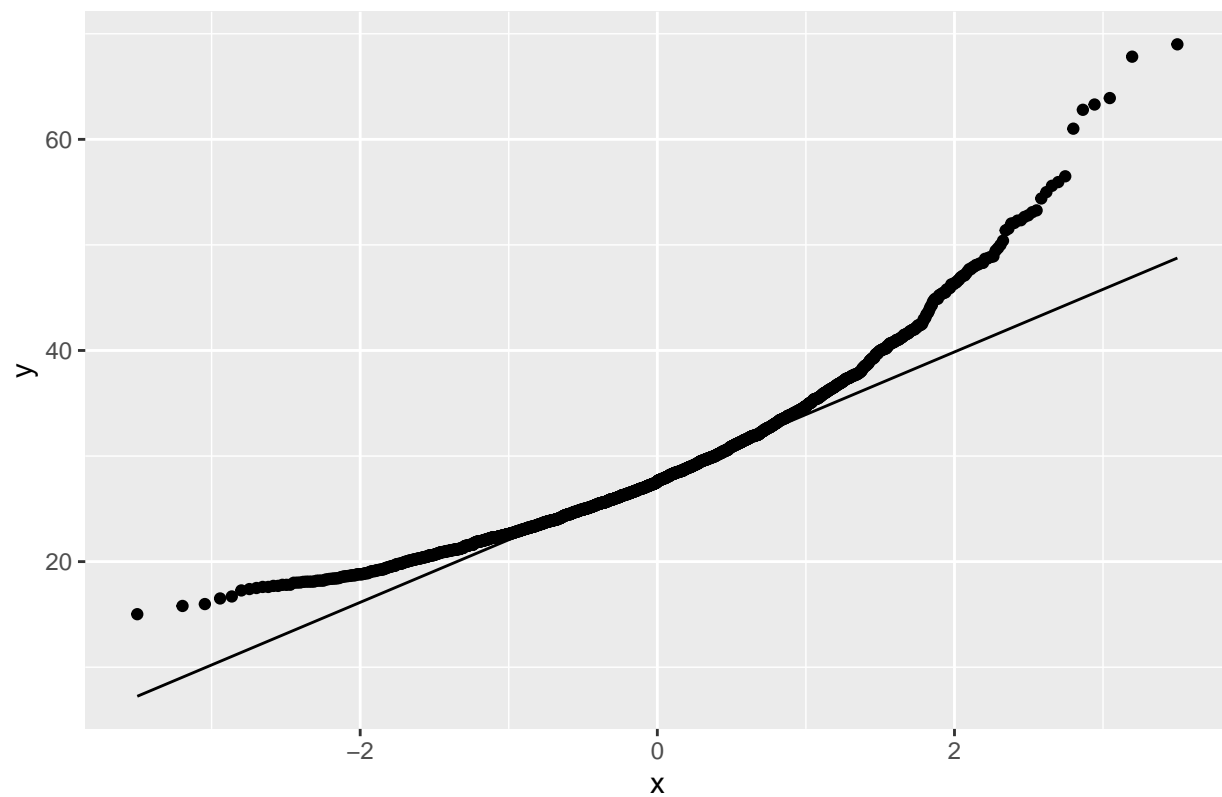
##
## Shapiro-Wilk normality test
##
## data: data[[column_y]]
## W = 0.92639, p-value < 2.2e-16
print(paste("Skewness:", bmi_sleep_analysis$Skewness))

## [1] "Skewness: 1.282503606303"
print(paste("Kurtosis:", bmi_sleep_analysis$Kurtosis))

## [1] "Kurtosis: 2.95825812976249"
print(bmi_sleep_analysis$QQPlot)

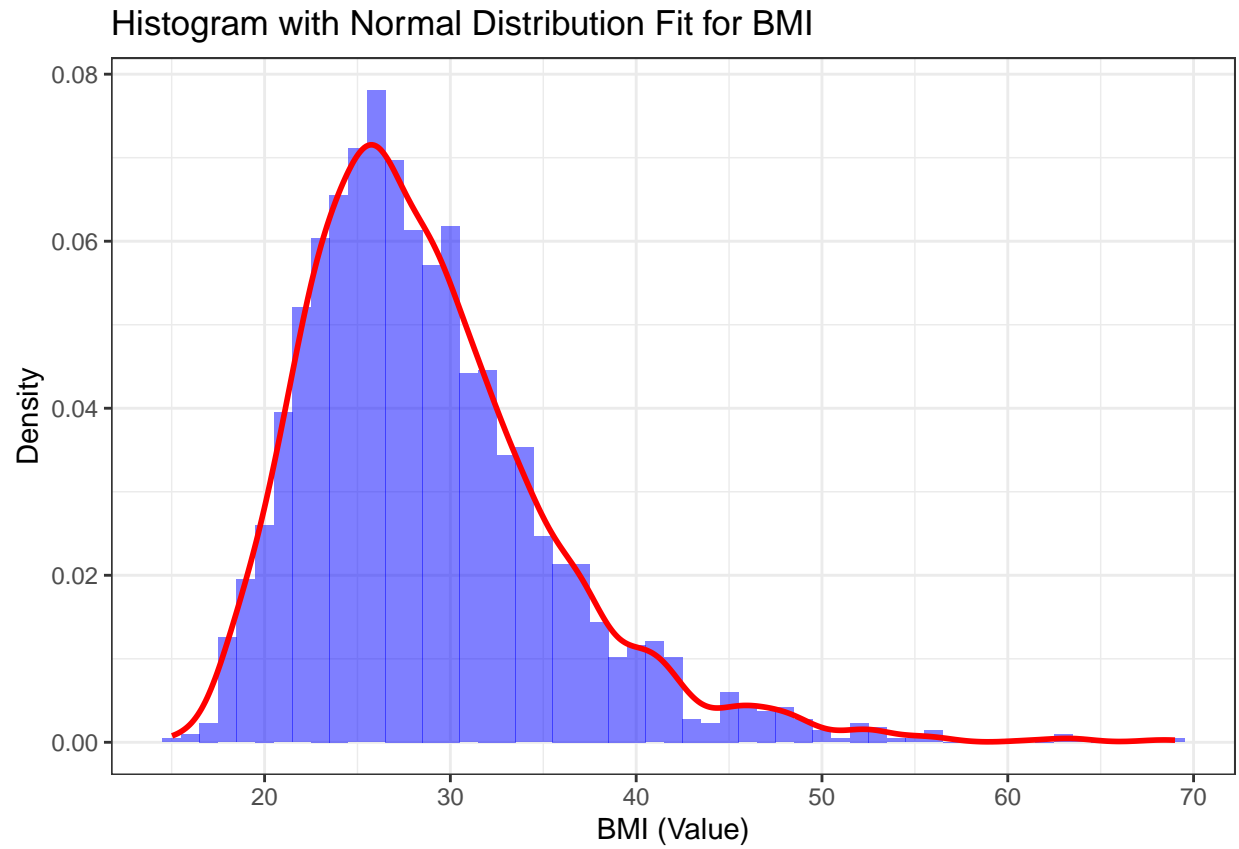
```


Q-Q Plot for BMI



```
print(bmi_sleep_analysis$Histogram)
```

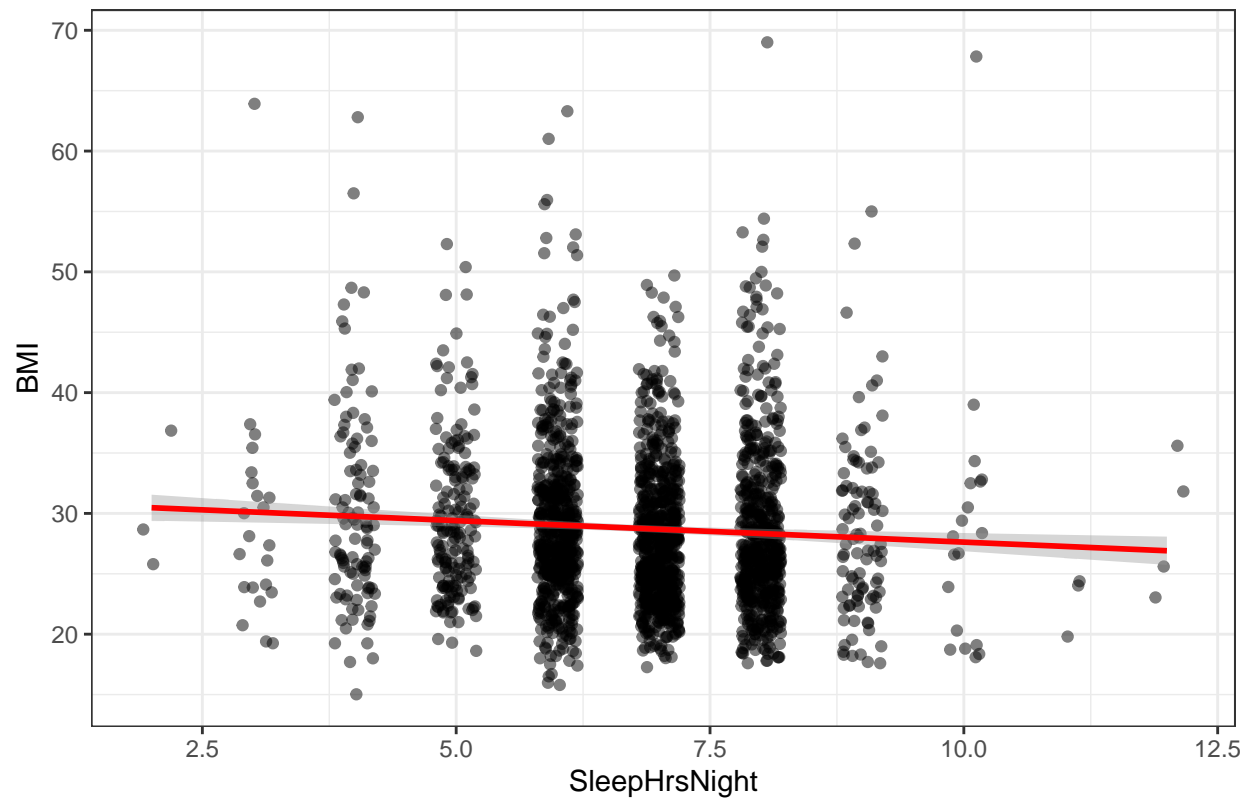
```
## Warning: The dot-dot notation (`..density..`) was deprecated in ggplot2 3.4.0.  
## i Please use `after_stat(density)` instead.  
## This warning is displayed once every 8 hours.  
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was  
## generated.
```



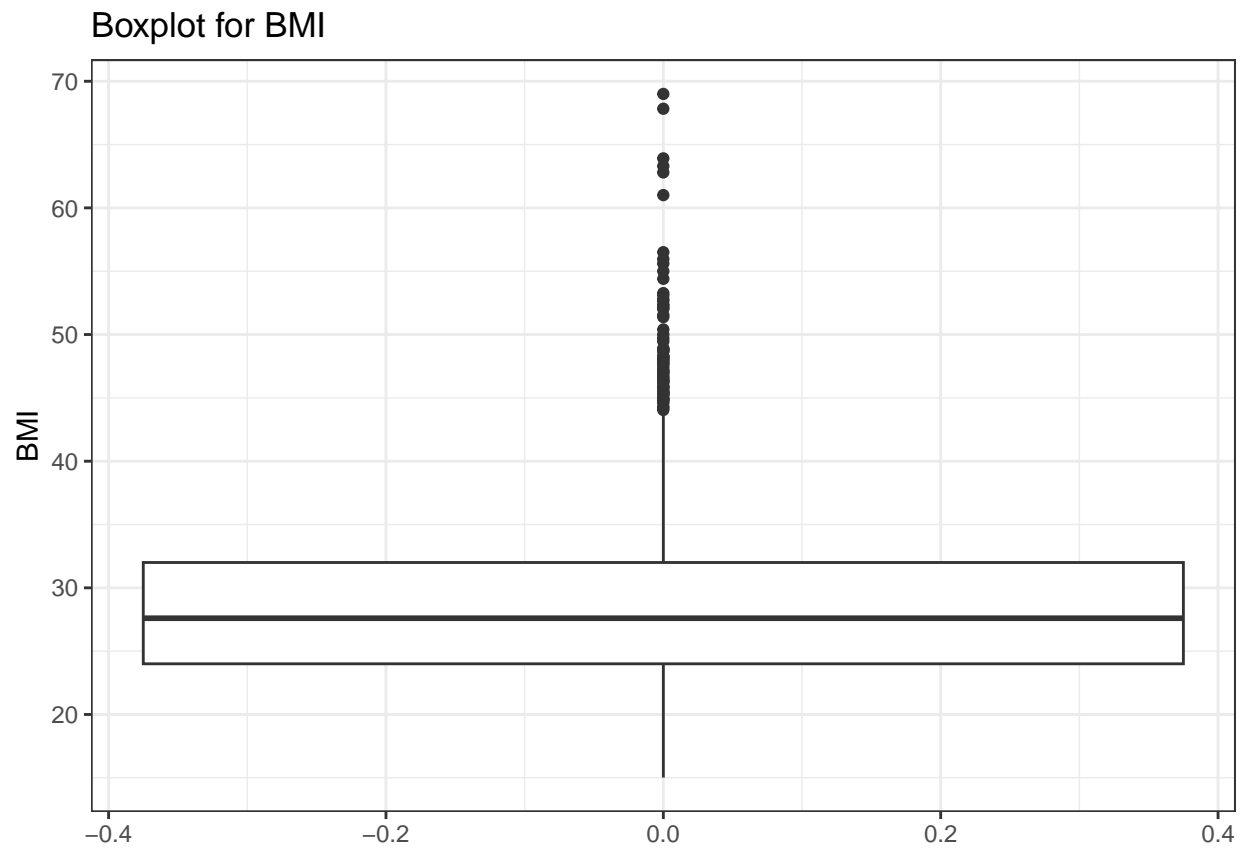
```
print(bmi_sleep_analysis$ScatterPlot)
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

Scatter Plot with Regression Line for SleepHrsNight vs BMI

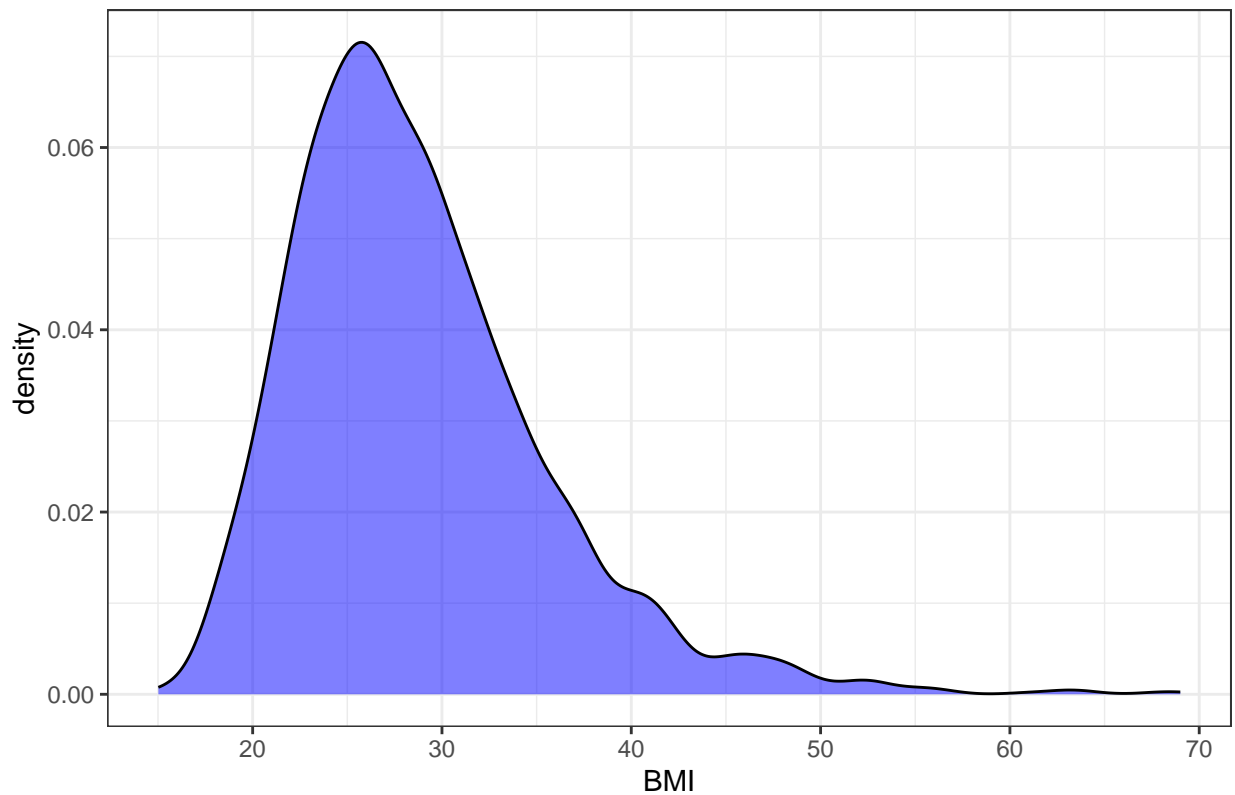


```
print(bmi_sleep_analysis$Boxplot)
```



```
print(bmi_sleep_analysis$DensityPlot)
```

Density Plot for BMI



```
#basic characteristics
# Assuming 'df3' is your dataframe.

# Load necessary library
library(dplyr)

# Function to get basic characteristics of a given column
get_basic_characteristics <- function(data, column) {
  # Ensure the column is numeric
  if(!is.numeric(data[[column]])) {
    return(data.frame(Variable = column, Mean = NA, Median = NA, SD = NA, Min = NA, Max = NA, Q1 = NA, Q3 = NA))
  }

  # Calculate basic characteristics
  characteristics <- data %>%
    summarise(
      Mean = mean(.data[[column]], na.rm = TRUE),
      Median = median(.data[[column]], na.rm = TRUE),
      SD = sd(.data[[column]], na.rm = TRUE),
      Min = min(.data[[column]], na.rm = TRUE),
      Max = max(.data[[column]], na.rm = TRUE),
      Q1 = quantile(.data[[column]], 0.25, na.rm = TRUE),
      Q3 = quantile(.data[[column]], 0.75, na.rm = TRUE)
    ) %>%
    mutate(Variable = column) %>%
    select(Variable, everything())
}
```

```

# Return the results
return(characteristics)
}

# List of columns to analyze
columns_to_analyze <- c("SleepHrsNight", "BMI", "DirectChol", "Age", "Gender", "Race1", "TotChol", "BPDiaAve", "BPSysAve", "AlcoholYear")

# Apply the function to each column and combine results
combined_characteristics <- lapply(columns_to_analyze, function(col) get_basic_characteristics(df3, col))
combined_characteristics <- do.call(bind_rows(), combined_characteristics)

# Display the combined basic characteristics
print(combined_characteristics)

```

```

## # A tibble: 21 x 8
##   Variable      Mean Median    SD   Min   Max    Q1    Q3
##   <chr>      <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1 SleepHrsNight  6.78    7    1.31    2    12     6     8
## 2 BMI          28.8   27.6  6.75  15.0   69    24    32
## 3 DirectChol    1.35    1.29  0.410  0.39   3.83   1.06   1.58
## 4 Age          39.2    39    11.3   20    59    30    49
## 5 Gender        0.470    0    0.499    0     1     0     1
## 6 Race1         3.43    4    1.15    1     5     3     4
## 7 TotChol       5.07    4.99  1.05   1.53  13.6   4.32   5.69
## 8 BPDiaAve     71.2    71    11.8    0   116    64    78
## 9 BPSysAve    117.    116   14.3    78   209   108   125
## 10 AlcoholYear  70.6    24   94.2    0   364     4   104
## # i 11 more rows

```

(2) Baseline characteristics

```
Hmisc::describe(df3)
```

```

## df3
##
## 21 Variables      2152 Observations
## -----
## SleepHrsNight
##      n missing distinct    Info    Mean      Gmd      .05      .10
##    2152      0      11    0.94   6.781    1.415      4      5
##      .25      .50      .75      .90      .95
##      6      7      8      8      9
##
## lowest :  2  3  4  5  6, highest:  8  9 10 11 12
##
## Value      2      3      4      5      6      7      8      9      10      11      12
## Frequency    3    22   100   170   550   641   547    93    19     3     4
## Proportion 0.001 0.010 0.046 0.079 0.256 0.298 0.254 0.043 0.009 0.001 0.002
## -----
## BMI
##      n missing distinct    Info    Mean      Gmd      .05      .10
##    2152      0    1072     1    28.77    7.223    20.18    21.50

```

```

##      .25      .50      .75      .90      .95
##    24.00    27.60    32.00    37.36    41.22
##
## lowest : 15.02 15.80 15.98 16.51 16.70, highest: 62.80 63.30 63.91 67.83 69.00
## -----
## DirectChol
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2152      0      98    0.999    1.346    0.4446    0.80    0.91
##      .25      .50      .75      .90      .95
##    1.06    1.29    1.58    1.89    2.09
##
## lowest : 0.39 0.41 0.52 0.54 0.57, highest: 3.13 3.41 3.44 3.59 3.83
## -----
## Age
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2152      0      40    0.999    39.18    13.08     21     23
##      .25      .50      .75      .90      .95
##     30     39     49     55     57
##
## lowest : 20 21 22 23 24, highest: 55 56 57 58 59
## -----
## Gender
##      n missing distinct      Info      Sum      Mean      Gmd
##    2152      0      2    0.747    1011    0.4698    0.4984
##
## -----
## Race1
##      n missing distinct      Info      Mean      Gmd
##    2152      0      5    0.758    3.428    1.115
##
## lowest : 1 2 3 4 5, highest: 1 2 3 4 5
##
## Value      1      2      3      4      5
## Frequency  289   145   230  1333   155
## Proportion 0.134 0.067 0.107 0.619 0.072
## -----
## TotChol
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2152      0     208      1    5.069    1.151    3.57    3.85
##      .25      .50      .75      .90      .95
##    4.32    4.99    5.69    6.36    6.83
##
## lowest : 1.53 2.69 2.74 2.79 2.82, highest: 9.31 9.34 9.90 12.28 13.65
## -----
## BPDiaAve
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2152      0      84    0.999    71.19    12.83     53     57
##      .25      .50      .75      .90      .95
##     64     71     78     85     89
##
## lowest : 0 20 21 22 25, highest: 108 109 110 114 116
## -----
## BPSysAve
##      n missing distinct      Info      Mean      Gmd      .05      .10

```

```

##      2152      0      98      0.999      117.4      15.44      97      101
##      .25      .50      .75      .90      .95
##      108      116      125      134      142
##
## lowest : 78 83 84 85 86, highest: 182 184 191 202 209
## -----
## AlcoholYear
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2152      0      56      0.993      70.59      91.9      0      0
##      .25      .50      .75      .90      .95
##      4      24      104      208      260
##
## lowest : 0 1 2 3 4, highest: 260 300 312 360 364
## -----
## Poverty
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2152      0      393      0.988      2.841      1.931      0.340      0.660
##      .25      .50      .75      .90      .95
##      1.277      2.780      4.817      5.000      5.000
##
## lowest : 0.00 0.02 0.03 0.04 0.05, highest: 4.95 4.96 4.97 4.99 5.00
## -----
## SexNumPartnLife
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2152      0      81      0.995      16.73      22.47      1      1
##      .25      .50      .75      .90      .95
##      3      7      15      30      50
##
## lowest : 0 1 2 3 4, highest: 600 800 999 1000 2000
## -----
## SexNumPartYear
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2152      0      21      0.645      1.381      1.18      0      0
##      .25      .50      .75      .90      .95
##      1      1      1      2      3
##
## lowest : 0 1 2 3 4, highest: 19 20 30 50 69
## -----
## DaysMentHlthBad
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2152      0      28      0.844      4.475      6.894      0      0
##      .25      .50      .75      .90      .95
##      0      0      5      15      30
##
## lowest : 0 1 2 3 4, highest: 25 26 27 29 30
## -----
## UrineFlow1
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2152      0      1337      1      1.074      0.9061      0.1960      0.2775
##      .25      .50      .75      .90      .95
##      0.4580      0.8100      1.3618      2.1929      2.7780
##
## lowest : 0.000 0.006 0.011 0.014 0.016, highest: 7.325 7.826 8.730 9.410 10.143
## -----

```



```

## PhysActive
##      n missing distinct
##    2152      0      2
##
## Value      No   Yes
## Frequency   906 1246
## Proportion 0.421 0.579
## -----
## DaysPhysHlthBad
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2152      0      24    0.708    3.165    5.318    0.00    0.00
##      .25      .50      .75      .90      .95
##    0.00    0.00    2.00    10.00    24.45
##
## lowest :  0  1  2  3  4, highest: 24 25 26 28 30
## -----
## Smoke100
##      n missing distinct
##    2152      0      2
##
## Value      No   Yes
## Frequency  1155  997
## Proportion 0.537 0.463
## -----
## Depressed
##      n missing distinct
##    2152      0      3
##
## Value      None Several      Most
## Frequency   1657    355    140
## Proportion  0.770  0.165  0.065
## -----
## HealthGen
##      n missing distinct
##    2152      0      5
##
## lowest : Excellent Vgood      Good      Fair      Poor
## highest: Excellent Vgood      Good      Fair      Poor
##
## Value      Excellent      Vgood      Good      Fair      Poor
## Frequency        240      697      854      313      48
## Proportion      0.112      0.324      0.397      0.145      0.022
## -----
## SexAge
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2152      0      28    0.985    17.1    3.463    13.00    14.00
##      .25      .50      .75      .90      .95
##    15.00    17.00    18.00    21.00    23.45
##
## lowest :  9 10 11 12 13, highest: 32 34 35 37 44
## -----

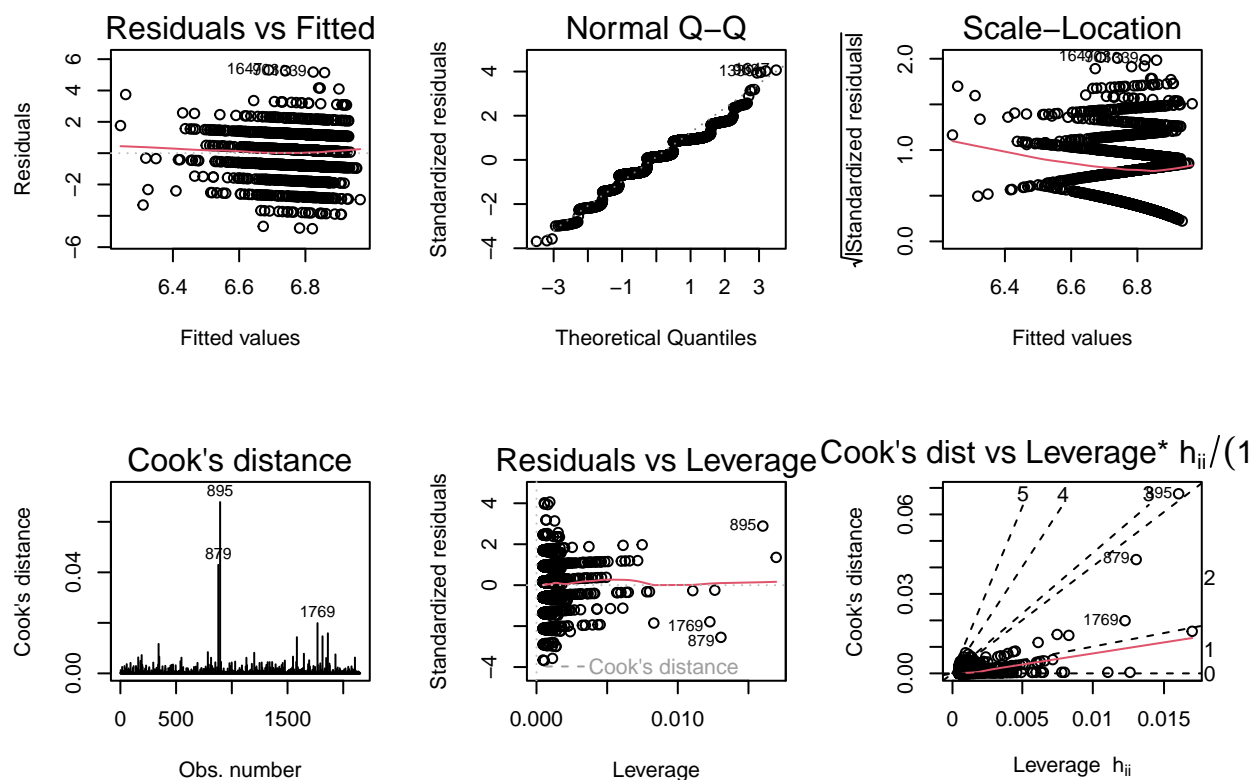
```

(3) linear regression model

```
##simple linear regression##
modell1 = lm(df3$SleepHrsNight ~ df3$BMI, data = df3)
summary(modell1)

##
## Call:
## lm(formula = df3$SleepHrsNight ~ df3$BMI, data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -4.8209 -0.8022  0.1710  1.1494  5.3105
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  7.166900   0.123331  58.111 < 2e-16 ***
## df3$BMI      -0.013409   0.004174  -3.213  0.00133 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.307 on 2150 degrees of freedom
## Multiple R-squared:  0.004778,    Adjusted R-squared:  0.004315
## F-statistic: 10.32 on 1 and 2150 DF,  p-value: 0.001334

par(mfrow = c(2, 3)) #read more from ?plot.lm
plot(modell1, which = 1)
plot(modell1, which = 2)
plot(modell1, which = 3)
plot(modell1, which = 4)
plot(modell1, which = 5)
plot(modell1, which = 6)
```



```
par(mfrow = c(1, 1)) # reset

dummy_b = 1 * (df3$Race1 == "Black")
dummy_h = 1 * (df3$Race1 == "Hispanic")
dummy_m = 1 * (df3$Race1 == "Mexican")
dummy_w = 1 * (df3$Race1 == "White")
dummy_o = 1 * (df3$Race1 == "Other")

age_quant = quantile(df3$Age)
df3$AgeC = 0
df3$AgeC[df3$Age > age_quant[2] & df3$Age <= age_quant[3]] = 1
df3$AgeC[df3$Age > age_quant[3] & df3$Age <= age_quant[4]] = 2
df3$AgeC[df3$Age > age_quant[4]] = 3

### multiple linear regression###
# model_1 add demographic
m_1 = lm(BMI ~ SleepHrsNight + Age + Gender + factor(Race1), df3)
summary(m_1)
```

```
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + factor(Race1),
##     data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
```

```

## -14.347 -4.497 -1.201 3.190 40.277
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  30.78080   0.97780  31.480 < 2e-16 ***
## SleepHrsNight -0.29383   0.11031  -2.664 0.007785 **
## Age          0.05055   0.01282   3.944 8.26e-05 ***
## Gender       0.25869   0.28895   0.895 0.370740
## factor(Race1)2 -2.28054   0.67704  -3.368 0.000769 ***
## factor(Race1)3 -1.02309   0.59140  -1.730 0.083782 .
## factor(Race1)4 -2.51942   0.43385  -5.807 7.30e-09 ***
## factor(Race1)5 -4.14341   0.66274  -6.252 4.88e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.643 on 2144 degrees of freedom
## Multiple R-squared:  0.03564,    Adjusted R-squared:  0.03249
## F-statistic: 11.32 on 7 and 2144 DF,  p-value: 3.698e-14
## model_2 add known risk factors
m_2 = lm(
  BMI ~ SleepHrsNight + Age + Gender + Race1 + TotChol + BPDiaAve + BPSysAve + AlcoholYear + Smoke100 +
    DaysPhysHlthBad + PhysActive,
  df3
)
summary(m_2)

##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + TotChol +
##     BPDiaAve + BPSysAve + AlcoholYear + Smoke100 + DaysPhysHlthBad +
##     PhysActive, data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -14.752  -4.236  -0.849   3.055  37.857
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  21.023150   1.610401  13.055 < 2e-16 ***
## SleepHrsNight -0.212193   0.107400  -1.976 0.048314 *
## Age          0.012839   0.013495   0.951 0.341528
## Gender       0.514621   0.291331   1.766 0.077463 .
## Race1       -0.622971   0.122615  -5.081 4.09e-07 ***
## TotChol      0.076572   0.139325   0.550 0.582658
## BPDiaAve     0.054500   0.014049   3.879 0.000108 ***
## BPSysAve     0.066004   0.012027   5.488 4.55e-08 ***
## AlcoholYear  -0.009762   0.001533  -6.368 2.34e-10 ***
## Smoke100Yes  -0.507830   0.287921  -1.764 0.077911 .
## DaysPhysHlthBad 0.066309   0.019785   3.352 0.000818 ***
## PhysActiveYes -1.260928   0.292769  -4.307 1.73e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.413 on 2140 degrees of freedom

```

```
## Multiple R-squared:  0.1029, Adjusted R-squared:  0.09826
## F-statistic: 22.31 on 11 and 2140 DF,  p-value: < 2.2e-16
```

```
#LINE
```

```
#influential observations
```

```
#multicollinearity
```

```
vif(m_1)
```

```
##              GVIF Df GVIF^(1/(2*Df))
## SleepHrsNight 1.017942  1      1.008931
## Age           1.028310  1      1.014056
## Gender        1.014189  1      1.007069
## factor(Race1) 1.042495  4      1.005216
```

```
vif(m_2)
```

```
##      SleepHrsNight      Age      Gender      Race1      TotChol
##      1.035419      1.223319      1.106167      1.045711      1.122357
##      BPDiaAve      BPSysAve      AlcoholYear      Smoke100      DaysPhysHlthBad
##      1.447702      1.542999      1.091195      1.078534      1.057582
##      PhysActive
##      1.093222
```

```
## model_3 add additional risk factors
```

```
m_3 = lm(
  BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + TotChol + BPDiaAve + BPSysAve + AlcoholYear +
  DaysPhysHlthBad + HealthGen + PhysActive,
  df3
)
summary(m_3)
```

```
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty +
##      TotChol + BPDiaAve + BPSysAve + AlcoholYear + Smoke100 +
##      UrineFlow1 + DaysMentHlthBad + DaysPhysHlthBad + HealthGen +
##      PhysActive, data = df3)
##
```

```
## Residuals:
##      Min       1Q   Median       3Q      Max
## -16.838  -4.054  -0.646   3.203  35.902
##
```

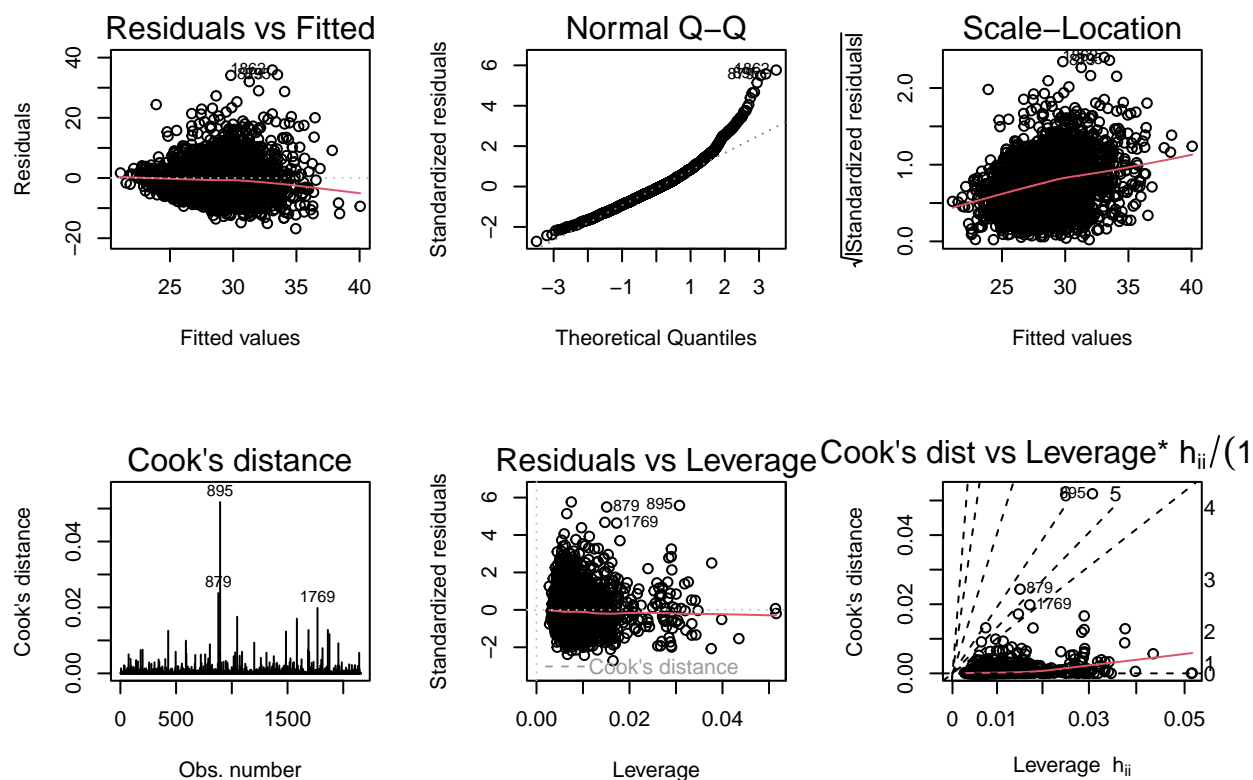
```
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  18.471020   1.621565  11.391 < 2e-16 ***
## SleepHrsNight -0.121393   0.106352  -1.141  0.25382
## Age           0.010806   0.013725   0.787  0.43118
## Gender        0.532917   0.286537   1.860  0.06304 .
## Race1        -0.500763   0.122151  -4.100  4.29e-05 ***
## Poverty       0.073370   0.090958   0.807  0.41997
## TotChol       0.030653   0.136000   0.225  0.82170
## BPDiaAve      0.058458   0.013721   4.260  2.13e-05 ***
```

```
## BPSysAve      0.053724    0.011806    4.550 5.65e-06 ***
## AlcoholYear   -0.008337    0.001515   -5.503 4.18e-08 ***
## Smoke100Yes   -0.807332    0.287264   -2.810 0.00499 **
## UrineFlow1    -0.113369    0.142545   -0.795 0.42652
## DaysMentHlthBad -0.030360    0.017984   -1.688 0.09153 .
## DaysPhysHlthBad 0.014779    0.020974    0.705 0.48112
## HealthGenVgood 1.922013    0.470923    4.081 4.64e-05 ***
## HealthGenGood  3.569501    0.468730    7.615 3.93e-14 ***
## HealthGenFair  5.283476    0.575334    9.183 < 2e-16 ***
## HealthGenPoor  7.546146    1.078147    6.999 3.43e-12 ***
## PhysActiveYes  -0.818408    0.294015   -2.784 0.00542 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.251 on 2133 degrees of freedom
## Multiple R-squared:  0.1504, Adjusted R-squared:  0.1432
## F-statistic: 20.97 on 18 and 2133 DF,  p-value: < 2.2e-16
```

```
vif(m_3)
```

```
##              GVIF Df GVIF^(1/(2*Df))
## SleepHrsNight 1.068552 1      1.033708
## Age           1.331598 1      1.153949
## Gender        1.126176 1      1.061214
## Race1         1.092236 1      1.045101
## Poverty       1.302699 1      1.141358
## TotChol       1.125511 1      1.060901
## BPDiaAve      1.453387 1      1.205565
## BPSysAve      1.564805 1      1.250922
## AlcoholYear   1.121584 1      1.059049
## Smoke100      1.129923 1      1.062979
## UrineFlow1    1.044330 1      1.021925
## DaysMentHlthBad 1.145584 1      1.070320
## DaysPhysHlthBad 1.250957 1      1.118462
## HealthGen     1.435741 4      1.046248
## PhysActive    1.160363 1      1.077202
```

```
par(mfrow = c(2, 3)) #read more from ?plot.lm
plot(m_3, which = 1)
plot(m_3, which = 2)
plot(m_3, which = 3)
plot(m_3, which = 4)
plot(m_3, which = 5)
plot(m_3, which = 6)
```



```
par(mfrow = c(1, 1)) # reset

# model_4 add additional risk factors
m_full = lm(
  BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + TotChol + BPDiaAve + BPSysAve + AlcoholYear +
    DaysPhysHlthBad + HealthGen + PhysActive + SleepHrsNight * Age + SleepHrsNight *
    Gender,
  df3
)
summary(m_full)
```

```
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty +
##     TotChol + BPDiaAve + BPSysAve + AlcoholYear + Smoke100 +
##     UrineFlow1 + DaysMentHlthBad + DaysPhysHlthBad + HealthGen +
##     PhysActive + SleepHrsNight * Age + SleepHrsNight * Gender,
##     data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -17.019  -4.059  -0.648   3.165  36.301
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    21.349305    2.996916   7.124 1.43e-12 ***
```

```
## SleepHrsNight      -0.542616    0.378594   -1.433    0.15194
## Age                -0.105136    0.062783   -1.675    0.09416 .
## Gender              3.768696    1.435161    2.626    0.00870 **
## Race1              -0.503222    0.121964   -4.126    3.83e-05 ***
## Poverty             0.072729    0.090968    0.800    0.42409
## TotChol             0.014773    0.135905    0.109    0.91345
## BPDiaAve           0.058709    0.013701    4.285    1.91e-05 ***
## BPSysAve           0.054450    0.011792    4.617    4.12e-06 ***
## AlcoholYear        -0.008396    0.001513   -5.549    3.23e-08 ***
## Smoke100Yes        -0.802999    0.286852   -2.799    0.00517 **
## UrineFlow1         -0.102218    0.142435   -0.718    0.47305
## DaysMentHlthBad    -0.030250    0.017962   -1.684    0.09230 .
## DaysPhysHlthBad     0.015142    0.020943    0.723    0.46975
## HealthGenVgood      1.928283    0.470249    4.101    4.28e-05 ***
## HealthGenGood       3.559316    0.468010    7.605    4.24e-14 ***
## HealthGenFair       5.299570    0.575060    9.216    < 2e-16 ***
## HealthGenPoor       7.640142    1.077494    7.091    1.81e-12 ***
## PhysActiveYes       -0.837418    0.294615   -2.842    0.00452 **
## SleepHrsNight:Age    0.017092    0.009024    1.894    0.05837 .
## SleepHrsNight:Gender -0.477032    0.206903   -2.306    0.02123 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.242 on 2131 degrees of freedom
## Multiple R-squared:  0.1538, Adjusted R-squared:  0.1459
## F-statistic: 19.37 on 20 and 2131 DF,  p-value: < 2.2e-16
```

```
vif(m_full)
```

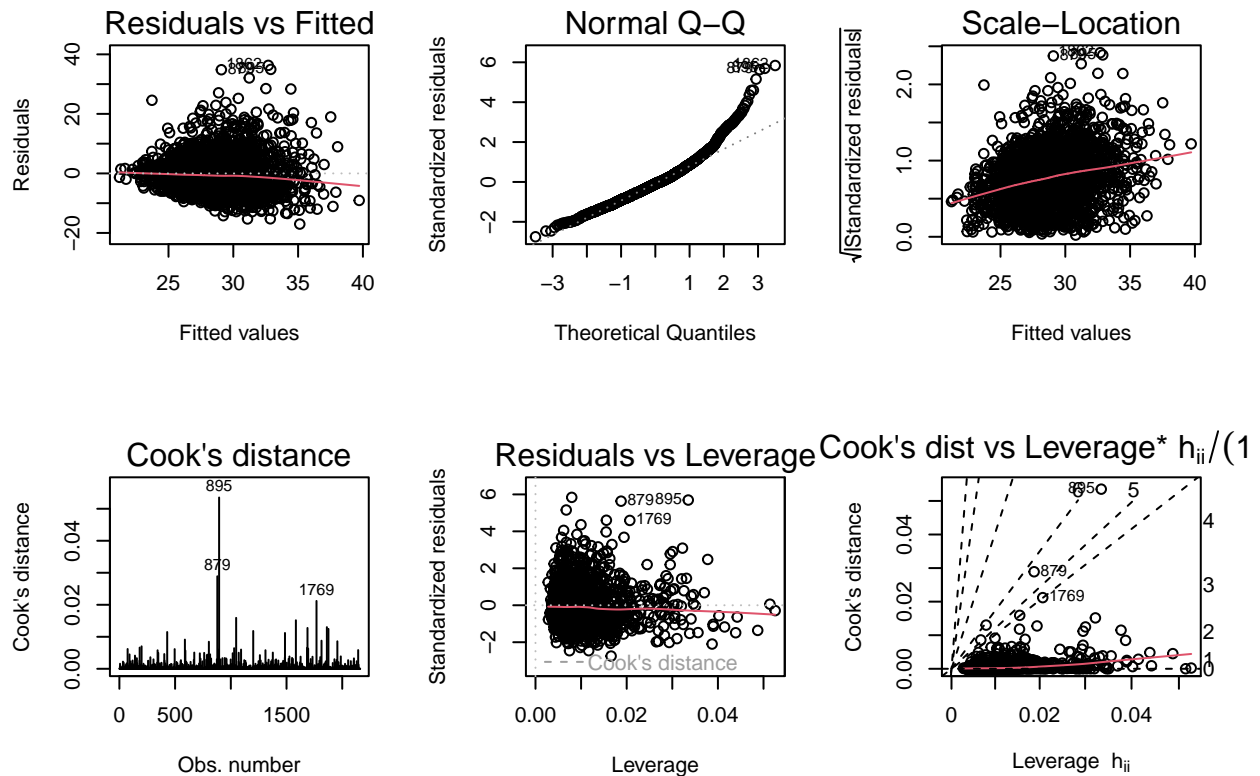
```
## there are higher-order terms (interactions) in this model
## consider setting type = 'predictor'; see ?vif
```

```
##              GVIF Df GVIF^(1/(2*Df))
## SleepHrsNight    13.583457  1      3.685574
## Age              27.952318  1      5.286995
## Gender            28.340488  1      5.323579
## Race1             1.092306  1      1.045135
## Poverty           1.307058  1      1.143266
## TotChol           1.127465  1      1.061822
## BPDiaAve          1.453678  1      1.205686
## BPSysAve          1.565996  1      1.251398
## AlcoholYear       1.122185  1      1.059332
## Smoke100          1.130221  1      1.063119
## UrineFlow1        1.045986  1      1.022734
## DaysMentHlthBad   1.146283  1      1.070646
## DaysPhysHlthBad   1.251072  1      1.118513
## HealthGen          1.447335  4      1.047300
## PhysActive         1.168763  1      1.081093
## SleepHrsNight:Age  37.541993  1      6.127152
## SleepHrsNight:Gender 29.940850  1      5.471823
```

```
par(mfrow = c(2, 3)) #read more from ?plot.lm
plot(m_full, which = 1)
plot(m_full, which = 2)
plot(m_full, which = 3)
plot(m_full, which = 4)
```



```
plot(m_full, which = 5)
plot(m_full, which = 6)
```



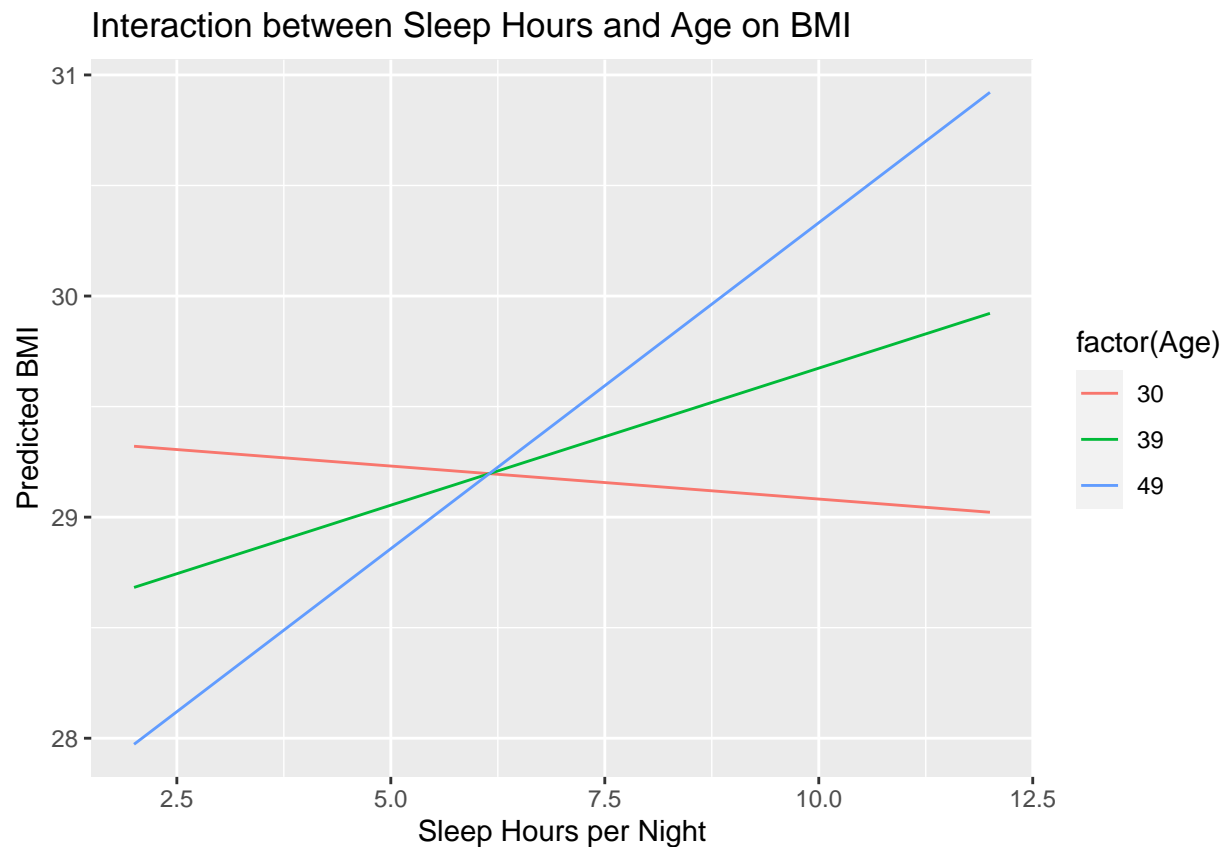
```
par(mfrow = c(1, 1)) # reset
```

```
getMode <- function(v) {
  univq <- unique(v)
  univq[which.max(tabulate(match(v, univq)))]
}
```

```
new_data <- expand.grid(SleepHrsNight = seq(min(df3$SleepHrsNight), max(df3$SleepHrsNight), length.out = 10),
  Age = quantile(df3$Age, probs = c(0.25, 0.5, 0.75)),
  Gender = median(df3$Gender, na.rm = TRUE),
  Race1 = median(df3$Race1, na.rm = TRUE),
  Poverty = median(df3$Poverty, na.rm = TRUE),
  TotChol = median(df3$TotChol, na.rm = TRUE),
  BPDiaAve = median(df3$BPDiaAve, na.rm = TRUE),
  BPSysAve = median(df3$BPSysAve, na.rm = TRUE),
  AlcoholYear = median(df3$AlcoholYear, na.rm = TRUE),
  Smoke100 = getMode(df3$Smoke100),
  UrineFlow1 = median(df3$UrineFlow1, na.rm = TRUE),
  DaysMentHlthBad = median(df3$DaysMentHlthBad, na.rm = TRUE),
  DaysPhysHlthBad = median(df3$DaysPhysHlthBad, na.rm = TRUE),
  HealthGen = getMode(df3$HealthGen),
  PhysActive = getMode(df3$PhysActive)
```

```
)
```

```
# predict
new_data$predicted_BMI <- predict(m_full, newdata = new_data)
# interaction
library(ggplot2)
ggplot(new_data, aes(x = SleepHrsNight, y = predicted_BMI, group = factor(Age))) +
  geom_line(aes(color = factor(Age))) +
  labs(title = "Interaction between Sleep Hours and Age on BMI",
       x = "Sleep Hours per Night",
       y = "Predicted BMI")
```



(4) Diagnosis: 10-fold CV

```
library(caret)

## Loading required package: lattice
splitIndex <-
  createDataPartition(df3$SleepHrsNight, p = 0.7, list = FALSE)
trainData <- df3[splitIndex, ]
testData <- df3[-splitIndex, ]
predictions <- predict(m_full, newdata = testData)
mse <- mean((testData$SleepHrsNight - predictions) ^ 2)
control <-
  trainControl(method = "cv", number = 10) # 10-fold cross-validation
```

```

cv_model <-
  train(
    SleepHrsNight ~ .,
    data = df3,
    method = "lm",
    trControl = control
  )
cv_model

## Linear Regression
##
## 2152 samples
## 21 predictor
##
## No pre-processing
## Resampling: Cross-Validated (10 fold)
## Summary of sample sizes: 1937, 1938, 1936, 1937, 1937, 1937, ...
## Resampling results:
##
## RMSE      Rsquared    MAE
## 1.280209  0.05043061  0.9931499
##
## Tuning parameter 'intercept' was held constant at a value of TRUE
(cv_results <- cv_model$results)

## intercept      RMSE    Rsquared      MAE      RMSESD RsquaredSD      MAESD
## 1      TRUE 1.280209 0.05043061 0.9931499 0.04543809 0.02732622 0.02794626

```

(4) Diagnosis: Normality Assumption

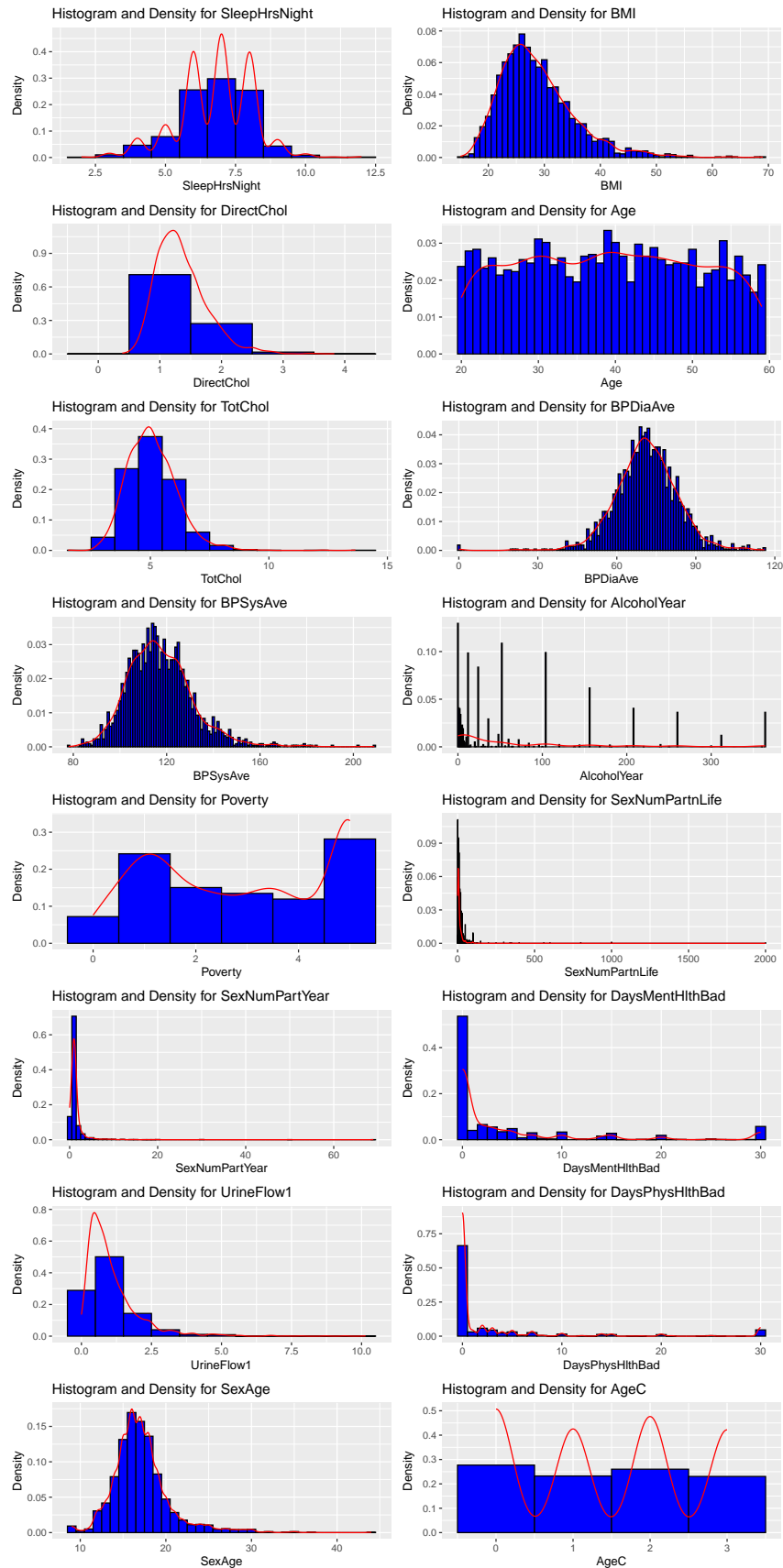
```

library(ggplot2)
library(patchwork)
# Initializes an empty patchwork object
plot_list <- list()

# Draw a histogram for each numeric variable (except Race1 and Gender) and add it to the list
for (var in names(df3)) {
  if (is.numeric(df3[[var]]) && !(var %in% c("Race1", "Gender"))) {
    p <- ggplot(df3, aes(x = .data[[var]])) +
      geom_histogram(
        aes(y = after_stat(density)),
        binwidth = 1,
        fill = "blue",
        color = "black"
      ) +
      geom_density(col = "red") +
      ggtitle(paste("Histogram and Density for", var)) +
      xlab(var) +
      ylab("Density")
    plot_list[[length(plot_list) + 1]] <- p
  }
}

```

```
}  
  
# Use patchwork to put all the charts together  
combined_plot <- wrap_plots(plot_list, ncol = 2)  
print(combined_plot)
```



```

df3 <- data.frame(df3)
library(dplyr)
# Shapiro-Wilk normality test is performed for each numerical variable in df3
results <- sapply(df3, function(x) {
  if (is.numeric(x)) {
    shapiro_test <- shapiro.test(x)
    return(c(shapiro_test$statistic, shapiro_test$p.value))
  } else {
    return(c(NA, NA))
  }
})
# Convert the result to a data box and name the column
results_df <- as.data.frame(t(results))
names(results_df) <- c("W", "p.value")
# Add a variable name as a new column
results_df$Variable <- rownames(results_df)
# Rearrange the order of columns
results_df <- results_df[, c("Variable", "W", "p.value")]
# Calculate the corrected P-value (for example, using Bonferroni correction)
results_df$p.adjusted <-
  p.adjust(results_df$p.value, method = "bonferroni")
print(results_df)

```

```

##           Variable      W      p.value  p.adjusted
## SleepHrsNight SleepHrsNight 0.9347691 1.022342e-29 1.840215e-28
## BMI           BMI          0.9263898 2.950926e-31 5.311666e-30
## DirectChol    DirectChol   0.9439221 7.552977e-28 1.359536e-26
## Age           Age          0.9579654 1.832383e-24 3.298290e-23
## Gender        Gender       0.6352876 1.636740e-55 2.946133e-54
## Race1         Race1        0.7327797 3.104346e-50 5.587823e-49
## TotChol       TotChol      0.9642744 1.175111e-22 2.115200e-21
## BPDiaAve      BPDiaAve     0.9718079 3.709893e-20 6.677808e-19
## BPSysAve      BPSysAve     0.9554033 3.865527e-25 6.957949e-24
## AlcoholYear   AlcoholYear  0.7454040 1.944127e-49 3.499428e-48
## Poverty       Poverty      0.8942742 4.092136e-36 7.365845e-35
## SexNumPartnLife SexNumPartnLife 0.1496531 2.951432e-71 5.312577e-70
## SexNumPartYear SexNumPartYear 0.2562318 1.244353e-68 2.239836e-67
## DaysMentHlthBad DaysMentHlthBad 0.6112779 1.254550e-56 2.258190e-55
## UrineFlow1    UrineFlow1   0.7555438 8.969094e-49 1.614437e-47
## PhysActive     PhysActive    NA           NA           NA
## DaysPhysHlthBad DaysPhysHlthBad 0.4968273 2.926552e-61 5.267794e-60
## Smoke100       Smoke100      NA           NA           NA
## Depressed      Depressed      NA           NA           NA
## HealthGen      HealthGen      NA           NA           NA
## SexAge         SexAge        0.8954434 5.842918e-36 1.051725e-34
## AgeC           AgeC          0.8533480 8.034125e-41 1.446143e-39

```

Standardized residuals, Studentized residuals

```

# Regular residuals
residual_1 <- m_full$residuals

```

```

# Standardized residuals
residual_2 <- rstandard(m_full)

# Studentized residuals
residual_3 <- rstudent(m_full)

# Externally studentized residuals
# Note: Externally studentized residuals are the same as studentized residuals in most cases
residual_4 <- rstudent(m_full)

# Creating a data frame to summarize these residuals
residual_summary <- data.frame(
  Residuals = c("Regular", "Standardized", "Studentized", "Externally Studentized"),
  Mean = c(mean(residual_1), mean(residual_2), mean(residual_3), mean(residual_4)),
  SD = c(sd(residual_1), sd(residual_2), sd(residual_3), sd(residual_4)),
  Min = c(min(residual_1), min(residual_2), min(residual_3), min(residual_4)),
  Max = c(max(residual_1), max(residual_2), max(residual_3), max(residual_4))
)

# Display the summary
print(residual_summary)

```

	Residuals	Mean	SD	Min	Max
## 1	Regular	-1.448790e-16	6.212489	-17.019074	36.300973
## 2	Standardized	-2.232345e-05	1.000939	-2.749618	5.839262
## 3	Studentized	2.310529e-04	1.002091	-2.753862	5.885164
## 4	Externally Studentized	2.310529e-04	1.002091	-2.753862	5.885164

```

# Load necessary library
library(ggplot2)

# Assuming m_full is your linear model
# m_full <- lm(SleepMinNight ~ ., data = df3)

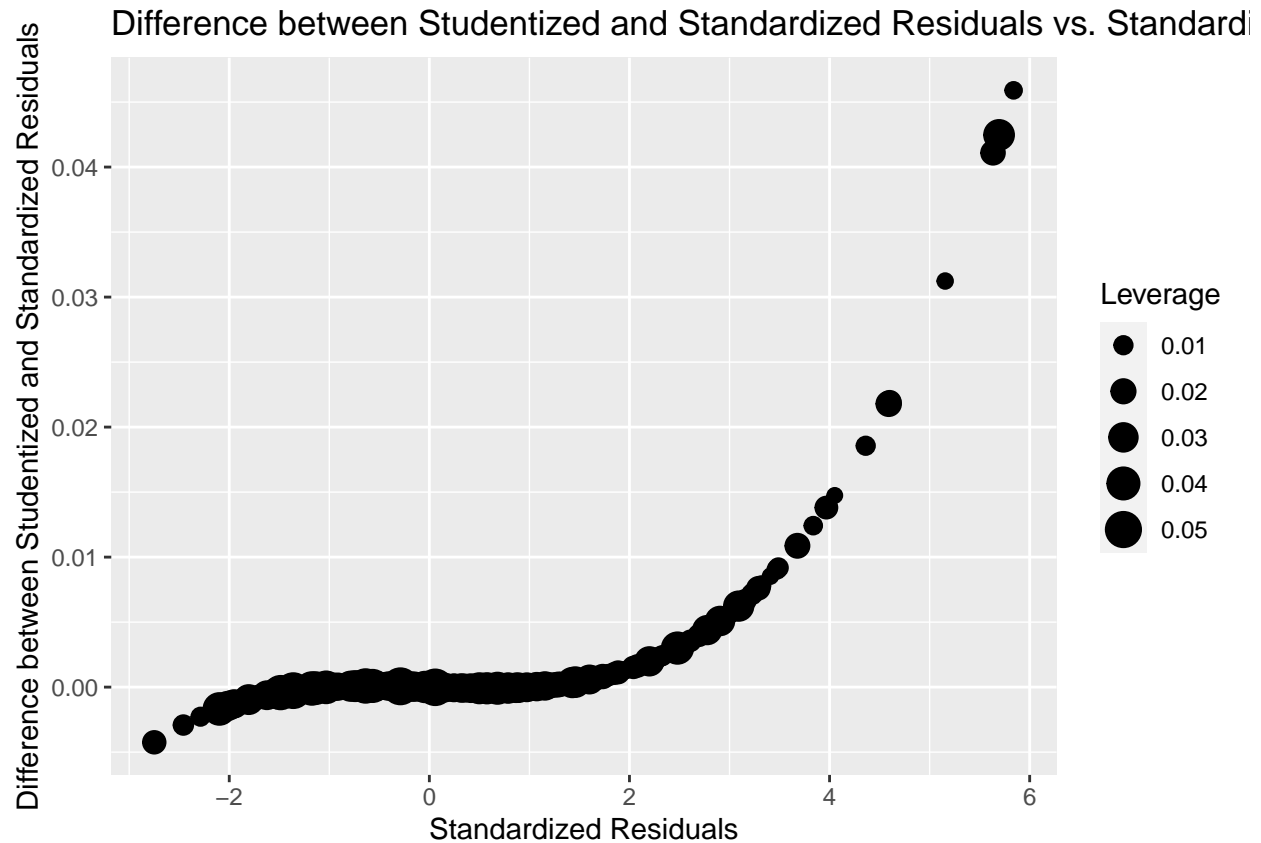
# Calculate standardized and studentized residuals
residual_2 <- rstandard(m_full)
residual_3 <- rstudent(m_full)

# Calculate leverage values
leverage_values <- hatvalues(m_full)

# Create a data frame for plotting
plot_data <- data.frame(
  Standardized_Residuals = residual_2,
  Difference = residual_3 - residual_2,
  Leverage = leverage_values
)

# Create the plot
ggplot(plot_data, aes(x = Standardized_Residuals, y = Difference)) +
  geom_point(aes(size = Leverage)) +
  ggtitle("Difference between Studentized and Standardized Residuals vs. Standardized Residuals") +
  xlab("Standardized Residuals") +
  ylab("Difference between Studentized and Standardized Residuals")

```



```
# Display the plot
print(ggplot)
```

```
## function (data = NULL, mapping = aes(), ..., environment = parent.frame())
## {
##   UseMethod("ggplot")
## }
## <bytecode: 0x5615eb8>
## <environment: namespace:ggplot2>
```

```
# Load necessary library
library(ggplot2)
```

```
# Assuming m_full is your linear model
# m_full <- lm(SleepMinNight ~ ., data = df3)
```

```
# Calculate studentized and externally studentized residuals
```

```
residual_3 <- rstudent(m_full)
```

```
residual_4 <- rstudent(m_full) # Externally studentized residuals are typically the same as studentized
```

```
# Regular residuals
```

```
residual_1 <- m_full$residuals
```

```
# Create a data frame for plotting
```

```
plot_data <- data.frame(
  Studentized_Residuals = residual_3,
  Difference = residual_4 - residual_3,
```

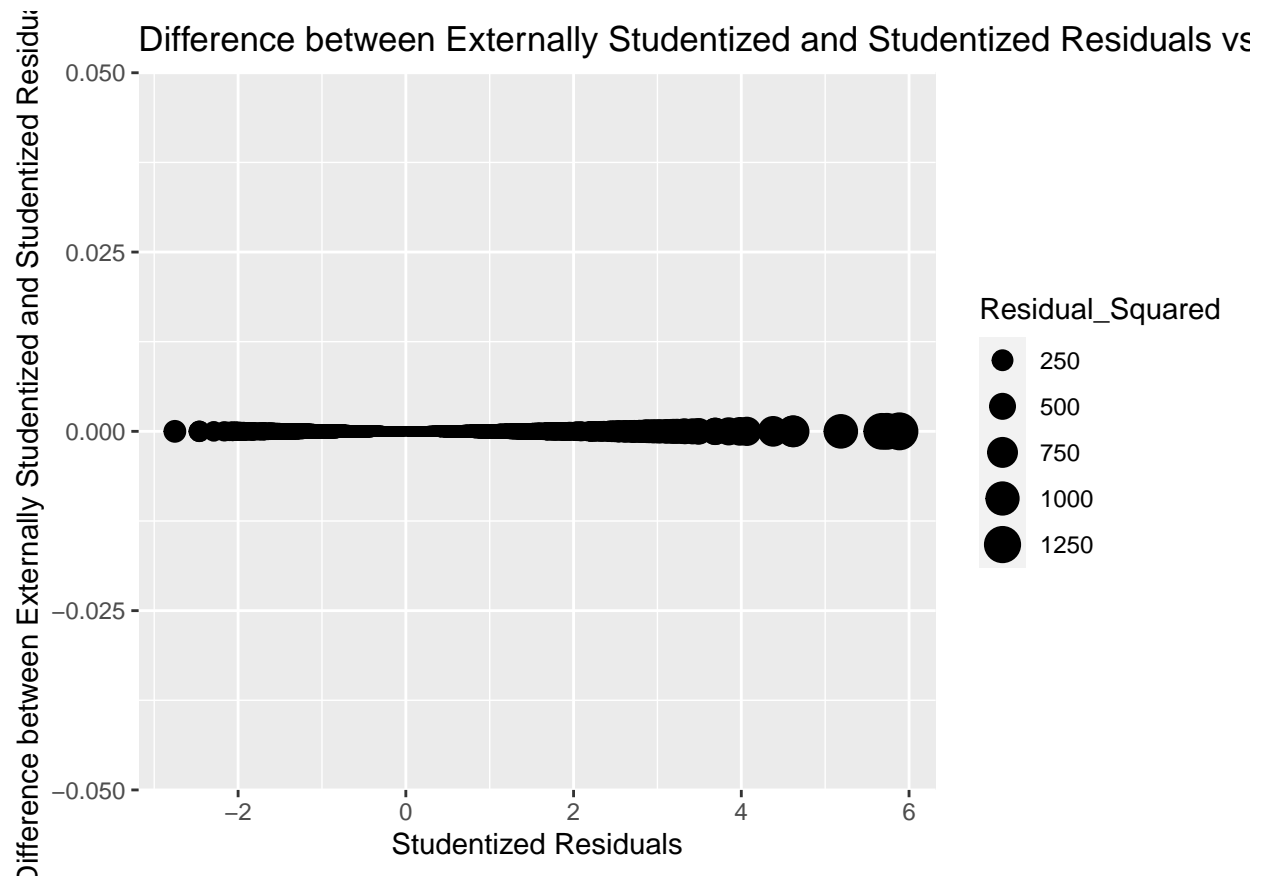


```

Residual_Squared = residual_1^2
)

# Create the plot
ggplot(plot_data, aes(x = Studentized_Residuals, y = Difference)) +
  geom_point(aes(size = Residual_Squared)) +
  ggtitle("Difference between Externally Studentized and Studentized Residuals vs. Studentized Residuals") +
  xlab("Studentized Residuals") +
  ylab("Difference between Externally Studentized and Studentized Residuals")

```



```

# Display the plot
print(ggplot)

```

```

## function (data = NULL, mapping = aes(), ..., environment = parent.frame())
## {
##   UseMethod("ggplot")
## }
## <bytecode: 0x5615eb8>
## <environment: namespace:ggplot2>

```

```

# Load necessary library
library(ggplot2)

# Assuming m_full is your linear model
# m_full <- lm(SleepMinNight ~ ., data = df3)

# Calculate regular residuals

```

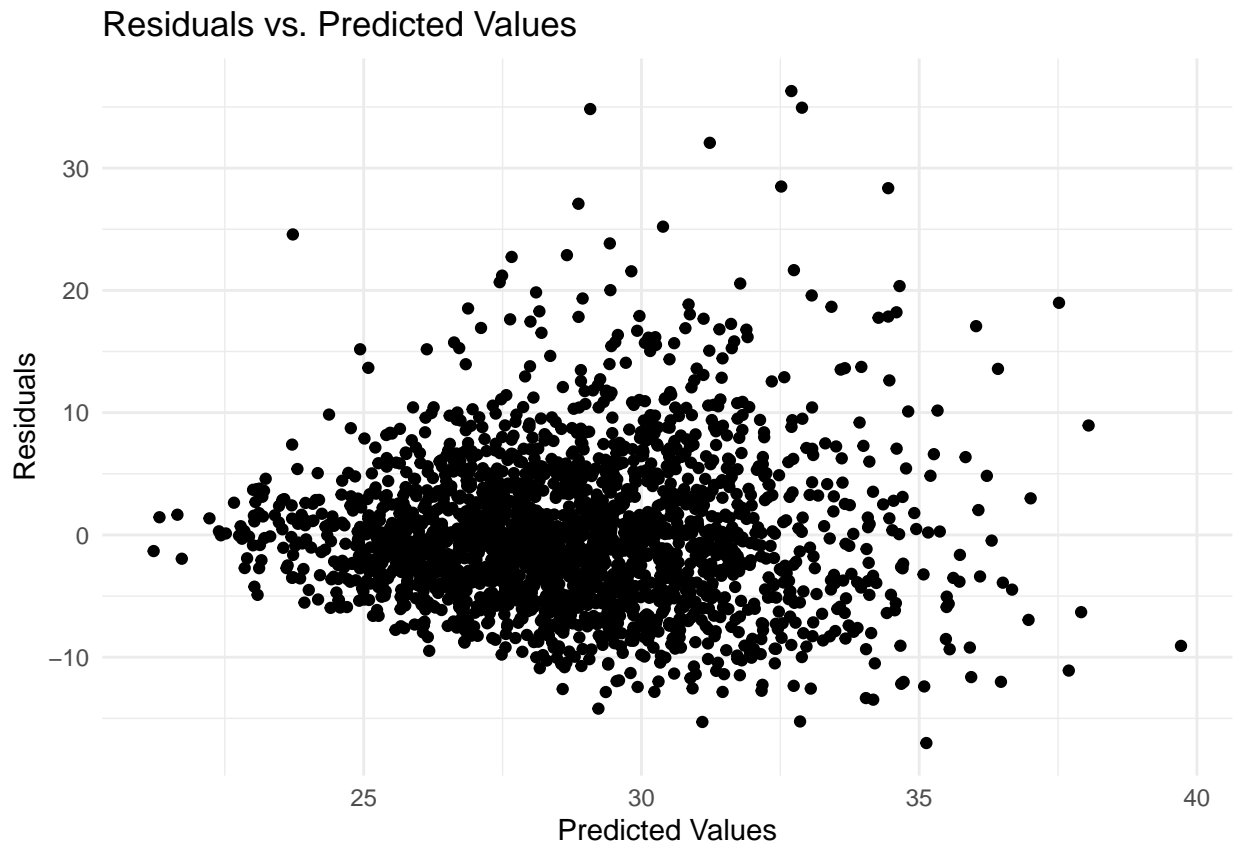
```

residual_1 <- m_full$residuals

# Get predicted values from the model
predicted_values <- predict(m_full)

# Create the plot
ggplot() +
  geom_point(aes(x = predicted_values, y = residual_1)) +
  ggtitle("Residuals vs. Predicted Values") +
  xlab("Predicted Values") +
  ylab("Residuals") +
  theme_minimal()

```



```

# Display the plot
print(ggplot)

## function (data = NULL, mapping = aes(), ..., environment = parent.frame())
## {
##   UseMethod("ggplot")
## }
## <bytecode: 0x5615eb8>
## <environment: namespace:ggplot2>

# Load necessary library
library(ggplot2)

# Assuming m_full is your linear model

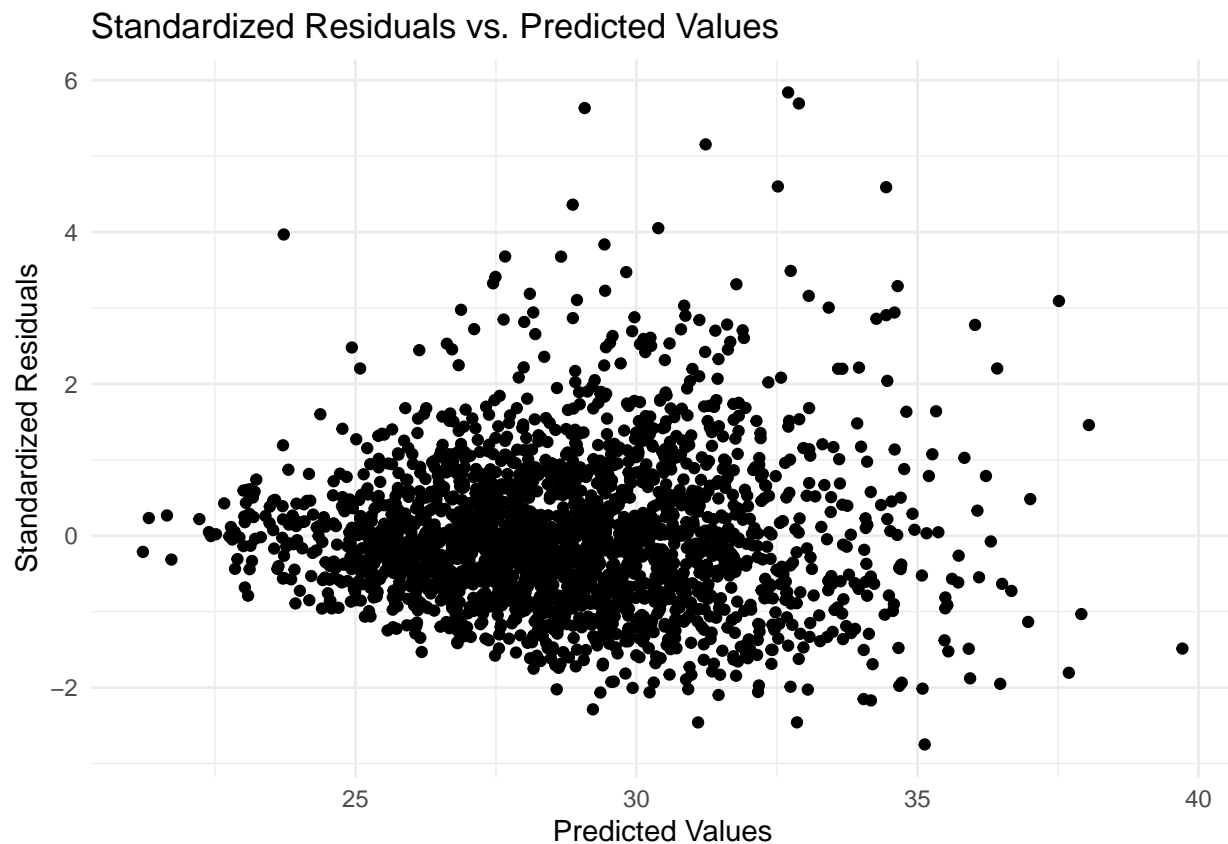
```

```
# m_full <- lm(SleepMinNight ~ ., data = df3)

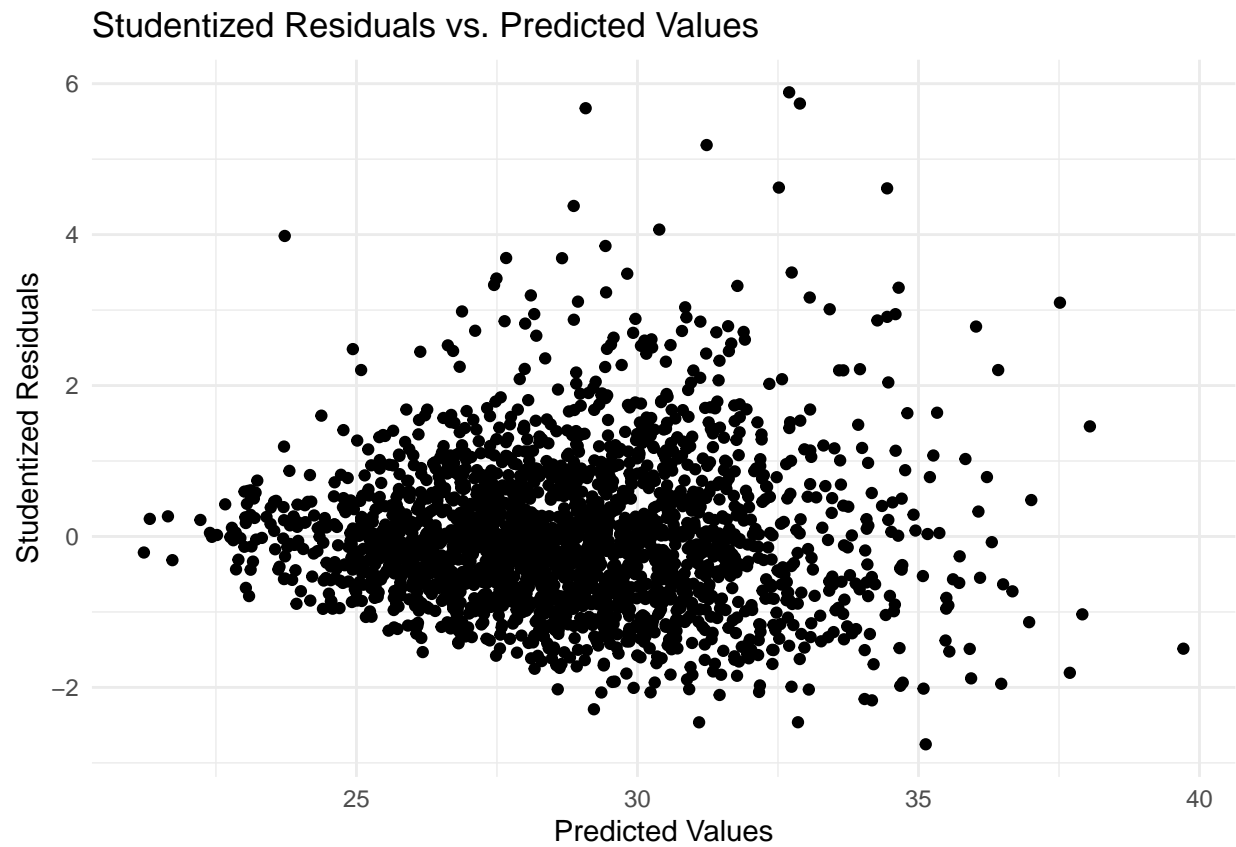
# Calculate different types of residuals
residual_2 <- rstandard(m_full)
residual_3 <- rstudent(m_full)
residual_4 <- rstudent(m_full) # Externally studentized residuals

# Get predicted values from the model
predicted_values <- predict(m_full)

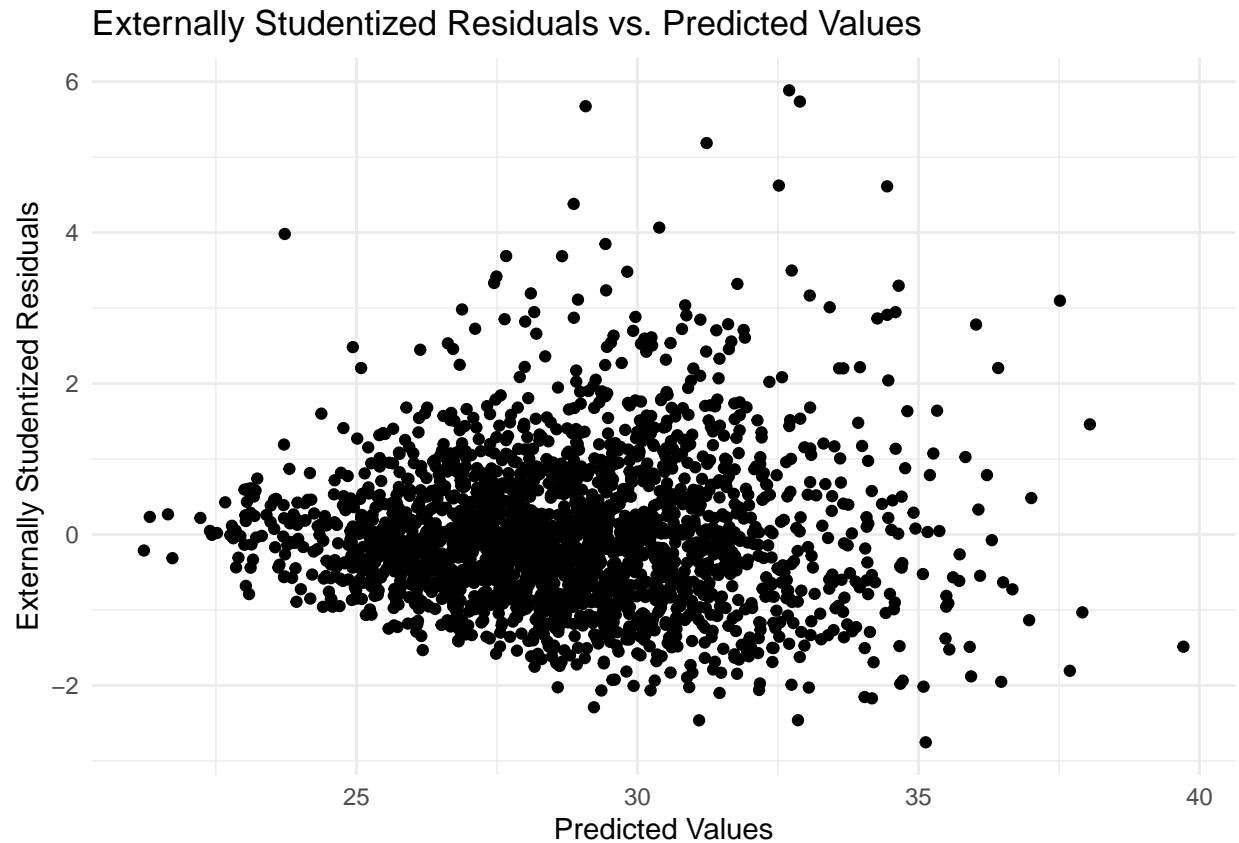
# Plot for Standardized Residuals
ggplot() +
  geom_point(aes(x = predicted_values, y = residual_2)) +
  ggtitle("Standardized Residuals vs. Predicted Values") +
  xlab("Predicted Values") +
  ylab("Standardized Residuals") +
  theme_minimal()
```



```
# Plot for Studentized Residuals
ggplot() +
  geom_point(aes(x = predicted_values, y = residual_3)) +
  ggtitle("Studentized Residuals vs. Predicted Values") +
  xlab("Predicted Values") +
  ylab("Studentized Residuals") +
  theme_minimal()
```



```
# Plot for Externally Studentized Residuals  
ggplot() +  
  geom_point(aes(x = predicted_values, y = residual_4)) +  
  ggtitle("Externally Studentized Residuals vs. Predicted Values") +  
  xlab("Predicted Values") +  
  ylab("Externally Studentized Residuals") +  
  theme_minimal()
```



(5) Model Selection

```
step(m_full)
```

```
## Start:  AIC=7902.52
## BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + TotChol +
##       BPDiaAve + BPSysAve + AlcoholYear + Smoke100 + UrineFlow1 +
##       DaysMentHlthBad + DaysPhysHlthBad + HealthGen + PhysActive +
##       SleepHrsNight * Age + SleepHrsNight * Gender
##
##              Df Sum of Sq  RSS   AIC
## - TotChol      1      0.5 83018 7900.5
## - UrineFlow1    1     20.1 83038 7901.0
## - DaysPhysHlthBad 1     20.4 83038 7901.0
## - Poverty       1     24.9 83043 7901.2
## <none>          0      NA    NA    NA
## - DaysMentHlthBad 1    110.5 83128 7903.4
## - SleepHrsNight:Age 1    139.7 83158 7904.1
## - SleepHrsNight:Gender 1   207.1 83225 7905.9
## - Smoke100       1    305.3 83323 7908.4
## - PhysActive      1    314.7 83333 7908.7
## - Race1          1    663.2 83681 7917.6
## - BPDiaAve       1    715.3 83733 7919.0
## - BPSysAve       1    830.6 83848 7921.9
```

```

## - AlcoholYear          1    1199.6 84217 7931.4
## - HealthGen            4    4547.8 87566 8009.3
##
## Step:  AIC=7900.53
## BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + BPDiaAve +
##       BPSysAve + AlcoholYear + Smoke100 + UrineFlow1 + DaysMentHlthBad +
##       DaysPhysHlthBad + HealthGen + PhysActive + SleepHrsNight:Age +
##       SleepHrsNight:Gender
##
##              Df Sum of Sq  RSS    AIC
## - UrineFlow1      1      20.0 83038 7899.1
## - DaysPhysHlthBad  1      20.3 83039 7899.1
## - Poverty          1      24.8 83043 7899.2
## <none>              83018 7900.5
## - DaysMentHlthBad  1     110.9 83129 7901.4
## - SleepHrsNight:Age 1     140.5 83159 7902.2
## - SleepHrsNight:Gender 1    207.6 83226 7903.9
## - Smoke100         1     306.6 83325 7906.5
## - PhysActive       1     315.3 83334 7906.7
## - Race1            1     662.9 83681 7915.6
## - BPDiaAve         1     725.3 83744 7917.3
## - BPSysAve         1     832.7 83851 7920.0
## - AlcoholYear      1    1200.1 84218 7929.4
## - HealthGen        4    4554.4 87573 8007.5
##
## Step:  AIC=7899.05
## BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + BPDiaAve +
##       BPSysAve + AlcoholYear + Smoke100 + DaysMentHlthBad + DaysPhysHlthBad +
##       HealthGen + PhysActive + SleepHrsNight:Age + SleepHrsNight:Gender
##
##              Df Sum of Sq  RSS    AIC
## - DaysPhysHlthBad  1      20.2 83058 7897.6
## - Poverty          1      21.7 83060 7897.6
## <none>              83038 7899.1
## - DaysMentHlthBad  1     113.2 83152 7900.0
## - SleepHrsNight:Age 1     144.9 83183 7900.8
## - SleepHrsNight:Gender 1    207.9 83246 7902.4
## - Smoke100         1     307.7 83346 7905.0
## - PhysActive       1     325.0 83363 7905.5
## - Race1            1     690.4 83729 7914.9
## - BPDiaAve         1     728.0 83766 7915.8
## - BPSysAve         1     828.9 83867 7918.4
## - AlcoholYear      1    1223.1 84261 7928.5
## - HealthGen        4    4580.6 87619 8006.6
##
## Step:  AIC=7897.57
## BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + BPDiaAve +
##       BPSysAve + AlcoholYear + Smoke100 + DaysMentHlthBad + HealthGen +
##       PhysActive + SleepHrsNight:Age + SleepHrsNight:Gender
##
##              Df Sum of Sq  RSS    AIC
## - Poverty          1      21.3 83080 7896.1
## <none>              83058 7897.6
## - DaysMentHlthBad  1     100.0 83158 7898.2

```

```

## - SleepHrsNight:Age      1      143.8 83202 7899.3
## - SleepHrsNight:Gender  1      207.9 83266 7901.0
## - Smoke100              1      301.9 83360 7903.4
## - PhysActive            1      334.8 83393 7904.2
## - Race1                 1      688.1 83747 7913.3
## - BPDiaAve              1      719.1 83778 7914.1
## - BPSysAve              1      829.9 83888 7917.0
## - AlcoholYear           1     1235.8 84294 7927.4
## - HealthGen              4     5008.6 88067 8015.6
##
## Step:  AIC=7896.12
## BMI ~ SleepHrsNight + Age + Gender + Race1 + BPDiaAve + BPSysAve +
##       AlcoholYear + Smoke100 + DaysMentHlthBad + HealthGen + PhysActive +
##       SleepHrsNight:Age + SleepHrsNight:Gender
##
##              Df Sum of Sq  RSS    AIC
## <none>                    83080 7896.1
## - DaysMentHlthBad        1    105.0 83185 7896.8
## - SleepHrsNight:Age      1    148.8 83229 7898.0
## - SleepHrsNight:Gender  1    203.5 83283 7899.4
## - PhysActive             1    317.7 83397 7902.3
## - Smoke100               1    338.7 83418 7902.9
## - Race1                  1    668.7 83748 7911.4
## - BPDiaAve               1    726.3 83806 7912.9
## - BPSysAve               1    818.4 83898 7915.2
## - AlcoholYear            1   1214.9 84295 7925.4
## - HealthGen              4   5098.7 88178 8016.3
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + BPDiaAve +
##       BPSysAve + AlcoholYear + Smoke100 + DaysMentHlthBad + HealthGen +
##       PhysActive + SleepHrsNight:Age + SleepHrsNight:Gender, data = df3)
##
## Coefficients:
##      (Intercept)      SleepHrsNight           Age
##      21.620969      -0.565231      -0.104961
##      Gender           Race1      BPDiaAve
##      3.749303      -0.498750      0.058815
##      BPSysAve      AlcoholYear      Smoke100Yes
##      0.053941      -0.008364      -0.832608
##      DaysMentHlthBad      HealthGenVgood      HealthGenGood
##      -0.028955      1.913856      3.548945
##      HealthGenFair      HealthGenPoor      PhysActiveYes
##      5.292807      7.773117      -0.830109
##      SleepHrsNight:Age      SleepHrsNight:Gender
##      0.017598      -0.472517

```

```
library(olsrr)
```

```

##
## Attaching package: 'olsrr'
##
## The following object is masked from 'package:datasets':
##
##     rivers

```

```
ols_step_forward_p(m_full, penter = 0.1, details = F)
```

```
##
##                               Selection Summary
## -----
##      Variable                Adj.
## Step      Entered      R-Square  R-Square      C(p)      AIC      RMSE
## -----
##   1  HealthGen           0.0826   0.0809   162.3618   14153.5414   6.4747
##   2  BPDiaAve           0.1066   0.1045   103.8740   14098.4490   6.3908
##   3  AlcoholYear        0.1226   0.1201    65.6513   14061.6280   6.3349
##   4  Race1              0.1323   0.1295    43.2247   14039.7062   6.3013
##   5  BPSysAve           0.1401   0.1369    25.5844   14022.2771   6.2744
##   6  Smoke100           0.1430   0.1394    20.2357   14016.9620   6.2652
##   7  PhysActive         0.1463   0.1424    13.8134   14010.5477   6.2544
##   8  Gender             0.1476   0.1432    12.6813   14009.4102   6.2513
##   9  SleepHrsNight:Gender 0.1497   0.1449     9.4392   14006.1486   6.2451
##  10  DaysMentHlthBad     0.1509   0.1458     8.3036   14004.9953   6.2420
##  11  Poverty             0.1514   0.1458     9.1090   14005.7926   6.2417
##  12  DaysPhysHlthBad     0.1516   0.1457    10.4990   14007.1783   6.2423
##  13  TotChol            0.1517   0.1453    12.3665   14009.0448   6.2436
##  14  UrineFlow1         0.1519   0.1452    13.7880   14010.4620   6.2442
##  15  Age                0.1522   0.1450    15.1916   14011.8610   6.2448
##  16  SleepHrsNight       0.1524   0.1448    16.5871   14013.2516   6.2454
##  17  SleepHrsNight:Age   0.1538   0.1459    15.0000   14011.6323   6.2416
## -----
```

```
ols_step_forward_p(m_full, penter = 0.05, details = F)
```

```
##
##                               Selection Summary
## -----
##      Variable                Adj.
## Step      Entered      R-Square  R-Square      C(p)      AIC      RMSE
## -----
##   1  HealthGen           0.0826   0.0809   162.3618   14153.5414   6.4747
##   2  BPDiaAve           0.1066   0.1045   103.8740   14098.4490   6.3908
##   3  AlcoholYear        0.1226   0.1201    65.6513   14061.6280   6.3349
##   4  Race1              0.1323   0.1295    43.2247   14039.7062   6.3013
##   5  BPSysAve           0.1401   0.1369    25.5844   14022.2771   6.2744
##   6  Smoke100           0.1430   0.1394    20.2357   14016.9620   6.2652
##   7  PhysActive         0.1463   0.1424    13.8134   14010.5477   6.2544
## -----
```

```
ols_mallows_cp(model = m_3, fullmodel = m_full) # Mallows' Cp
```

```
## [1] 19.69163
```

```
#general hypothesis test
```

```
# Load the required libraries
```

```
library(dplyr)
```

```
library(car)
```

```
library(emmeans)
```

```
# Assuming your dataframe is df3
```



```

# Categorizing Age
df3 <- df3 %>%
  mutate(
    Age_Category = case_when(
      Age >= 18 & Age < 30 ~ "18-29",
      Age >= 30 & Age < 40 ~ "30-39",
      Age >= 40 & Age < 50 ~ "40-49",
      Age >= 50 & Age < 60 ~ "50-59",
      TRUE ~ NA_character_ # For cases not in the 18 to 60 age range
    ),
    Gender = as.factor(Gender), # Ensure Gender is a factor type
    Race1 = as.factor(Race1)    # Ensure Race1 is a factor type
  )

# Update the model using categorical variables
m_full_updated <- lm(SleepHrsNight ~ Age_Category + Gender + Race1, data = df3)

# Overall hypothesis test
anova_results_updated <- Anova(m_full_updated, type="III")

```

```

## Warning in printHypothesis(L, rhs, names(b)): one or more coefficients in the hypothesis include
##      arithmetic operators in their names;
##      the printed representation of the hypothesis will be omitted

```

```
summary(anova_results_updated)
```

```

##      Sum Sq      Df    F value    Pr(>F)
## Min.   : 15.29  Min.   :  1.0  Min.   :  3.014  Min.   :0.0000000
## 1st Qu.: 20.99  1st Qu.:  1.0  1st Qu.:  4.783  1st Qu.:0.0001986
## Median : 36.33  Median :  3.0  Median :  8.894  Median :0.0003498
## Mean   :2332.98  Mean   :430.4  Mean   :1183.827  Mean   :0.0074135
## 3rd Qu.:3622.64  3rd Qu.:  4.0  3rd Qu.:1187.938  3rd Qu.:0.0075647
## Max.   :7969.66  Max.   :2143.0  Max.   :4714.505  Max.   :0.0289545
##                                     NA's   :1      NA's   :1

```

```
# Post-hoc comparisons using emmeans
```

```
emmeans_results_updated <- emmeans(m_full_updated, specs = pairwise ~ Age_Category + Gender + Race1)
summary(emmeans_results_updated)
```

```

## $emmeans
## Age_Category Gender Race1 emmean    SE    df lower.CL upper.CL
## 18-29         0      1      6.51 0.0947 2143    6.32    6.69
## 30-39         0      1      6.42 0.0948 2143    6.24    6.61
## 40-49         0      1      6.30 0.0954 2143    6.11    6.48
## 50-59         0      1      6.31 0.0965 2143    6.12    6.50
## 18-29         1      1      6.70 0.0936 2143    6.52    6.89
## 30-39         1      1      6.62 0.0935 2143    6.44    6.81
## 40-49         1      1      6.49 0.0950 2143    6.31    6.68
## 50-59         1      1      6.51 0.0970 2143    6.32    6.70
## 18-29         0      2      6.69 0.1197 2143    6.46    6.93
## 30-39         0      2      6.61 0.1209 2143    6.37    6.85
## 40-49         0      2      6.48 0.1212 2143    6.25    6.72
## 50-59         0      2      6.50 0.1246 2143    6.26    6.74
## 18-29         1      2      6.89 0.1202 2143    6.66    7.13
## 30-39         1      2      6.81 0.1213 2143    6.57    7.05

```

```

## 40-49      1      2      6.68 0.1222 2143      6.44      6.92
## 50-59      1      2      6.70 0.1263 2143      6.45      6.95
## 18-29      0      3      6.93 0.0989 2143      6.73      7.12
## 30-39      0      3      6.85 0.0995 2143      6.65      7.04
## 40-49      0      3      6.72 0.0999 2143      6.52      6.91
## 50-59      0      3      6.74 0.1056 2143      6.53      6.94
## 18-29      1      3      7.13 0.1031 2143      6.93      7.33
## 30-39      1      3      7.04 0.1036 2143      6.84      7.25
## 40-49      1      3      6.92 0.1047 2143      6.71      7.12
## 50-59      1      3      6.93 0.1110 2143      6.72      7.15
## 18-29      0      4      6.87 0.0688 2143      6.73      7.00
## 30-39      0      4      6.79 0.0661 2143      6.66      6.91
## 40-49      0      4      6.66 0.0646 2143      6.53      6.78
## 50-59      0      4      6.67 0.0658 2143      6.55      6.80
## 18-29      1      4      7.07 0.0689 2143      6.93      7.20
## 30-39      1      4      6.98 0.0659 2143      6.85      7.11
## 40-49      1      4      6.86 0.0657 2143      6.73      6.99
## 50-59      1      4      6.87 0.0681 2143      6.74      7.01
## 18-29      0      5      6.80 0.1173 2143      6.57      7.03
## 30-39      0      5      6.71 0.1157 2143      6.49      6.94
## 40-49      0      5      6.59 0.1185 2143      6.35      6.82
## 50-59      0      5      6.60 0.1212 2143      6.36      6.84
## 18-29      1      5      6.99 0.1185 2143      6.76      7.23
## 30-39      1      5      6.91 0.1168 2143      6.68      7.14
## 40-49      1      5      6.78 0.1202 2143      6.55      7.02
## 50-59      1      5      6.80 0.1235 2143      6.56      7.04
##
## Confidence level used: 0.95
##
## $contrasts
## contrast      estimate      SE      df t.ratio
## (18-29 Gender0 Race11) - (30-39 Gender0 Race11) 0.082425 0.0787 2143 1.047
## (18-29 Gender0 Race11) - (40-49 Gender0 Race11) 0.209495 0.0791 2143 2.648
## (18-29 Gender0 Race11) - (50-59 Gender0 Race11) 0.193261 0.0822 2143 2.352
## (18-29 Gender0 Race11) - (18-29 Gender1 Race11) -0.198758 0.0564 2143 -3.524
## (18-29 Gender0 Race11) - (30-39 Gender1 Race11) -0.116333 0.0967 2143 -1.203
## (18-29 Gender0 Race11) - (40-49 Gender1 Race11) 0.010737 0.0978 2143 0.110
## (18-29 Gender0 Race11) - (50-59 Gender1 Race11) -0.005496 0.1012 2143 -0.054
## (18-29 Gender0 Race11) - (18-29 Gender0 Race12) -0.187693 0.1325 2143 -1.417
## (18-29 Gender0 Race11) - (30-39 Gender0 Race12) -0.105268 0.1550 2143 -0.679
## (18-29 Gender0 Race11) - (40-49 Gender0 Race12) 0.021802 0.1551 2143 0.141
## (18-29 Gender0 Race11) - (50-59 Gender0 Race12) 0.005568 0.1586 2143 0.035
## (18-29 Gender0 Race11) - (18-29 Gender1 Race12) -0.386451 0.1451 2143 -2.663
## (18-29 Gender0 Race11) - (30-39 Gender1 Race12) -0.304026 0.1659 2143 -1.832
## (18-29 Gender0 Race11) - (40-49 Gender1 Race12) -0.176956 0.1664 2143 -1.063
## (18-29 Gender0 Race11) - (50-59 Gender1 Race12) -0.193190 0.1702 2143 -1.135
## (18-29 Gender0 Race11) - (18-29 Gender0 Race13) -0.423084 0.1155 2143 -3.664
## (18-29 Gender0 Race11) - (30-39 Gender0 Race13) -0.340659 0.1402 2143 -2.430
## (18-29 Gender0 Race11) - (40-49 Gender0 Race13) -0.213589 0.1402 2143 -1.523
## (18-29 Gender0 Race11) - (50-59 Gender0 Race13) -0.229823 0.1454 2143 -1.581
## (18-29 Gender0 Race11) - (18-29 Gender1 Race13) -0.621842 0.1326 2143 -4.690
## (18-29 Gender0 Race11) - (30-39 Gender1 Race13) -0.539417 0.1545 2143 -3.491
## (18-29 Gender0 Race11) - (40-49 Gender1 Race13) -0.412347 0.1550 2143 -2.660
## (18-29 Gender0 Race11) - (50-59 Gender1 Race13) -0.428580 0.1602 2143 -2.675

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##	(18-29 Gender0 Race11)	-	(18-29 Gender0 Race14)	-0.362270	0.0845	2143	-4.285
##	(18-29 Gender0 Race11)	-	(30-39 Gender0 Race14)	-0.279845	0.1139	2143	-2.458
##	(18-29 Gender0 Race11)	-	(40-49 Gender0 Race14)	-0.152775	0.1128	2143	-1.354
##	(18-29 Gender0 Race11)	-	(50-59 Gender0 Race14)	-0.169008	0.1147	2143	-1.473
##	(18-29 Gender0 Race11)	-	(18-29 Gender1 Race14)	-0.561028	0.1027	2143	-5.462
##	(18-29 Gender0 Race11)	-	(30-39 Gender1 Race14)	-0.478602	0.1278	2143	-3.744
##	(18-29 Gender0 Race11)	-	(40-49 Gender1 Race14)	-0.351533	0.1275	2143	-2.757
##	(18-29 Gender0 Race11)	-	(50-59 Gender1 Race14)	-0.367766	0.1299	2143	-2.832
##	(18-29 Gender0 Race11)	-	(18-29 Gender0 Race15)	-0.290337	0.1296	2143	-2.239
##	(18-29 Gender0 Race11)	-	(30-39 Gender0 Race15)	-0.207912	0.1505	2143	-1.382
##	(18-29 Gender0 Race11)	-	(40-49 Gender0 Race15)	-0.080842	0.1524	2143	-0.530
##	(18-29 Gender0 Race11)	-	(50-59 Gender0 Race15)	-0.097076	0.1554	2143	-0.625
##	(18-29 Gender0 Race11)	-	(18-29 Gender1 Race15)	-0.489095	0.1431	2143	-3.417
##	(18-29 Gender0 Race11)	-	(30-39 Gender1 Race15)	-0.406670	0.1621	2143	-2.508
##	(18-29 Gender0 Race11)	-	(40-49 Gender1 Race15)	-0.279600	0.1644	2143	-1.701
##	(18-29 Gender0 Race11)	-	(50-59 Gender1 Race15)	-0.295834	0.1677	2143	-1.764
##	(30-39 Gender0 Race11)	-	(40-49 Gender0 Race11)	0.127070	0.0776	2143	1.638
##	(30-39 Gender0 Race11)	-	(50-59 Gender0 Race11)	0.110836	0.0805	2143	1.377
##	(30-39 Gender0 Race11)	-	(18-29 Gender1 Race11)	-0.281183	0.0970	2143	-2.900
##	(30-39 Gender0 Race11)	-	(30-39 Gender1 Race11)	-0.198758	0.0564	2143	-3.524
##	(30-39 Gender0 Race11)	-	(40-49 Gender1 Race11)	-0.071688	0.0967	2143	-0.741
##	(30-39 Gender0 Race11)	-	(50-59 Gender1 Race11)	-0.087921	0.0999	2143	-0.880
##	(30-39 Gender0 Race11)	-	(18-29 Gender0 Race12)	-0.270119	0.1531	2143	-1.764
##	(30-39 Gender0 Race11)	-	(30-39 Gender0 Race12)	-0.187693	0.1325	2143	-1.417
##	(30-39 Gender0 Race11)	-	(40-49 Gender0 Race12)	-0.060623	0.1533	2143	-0.395
##	(30-39 Gender0 Race11)	-	(50-59 Gender0 Race12)	-0.076857	0.1568	2143	-0.490
##	(30-39 Gender0 Race11)	-	(18-29 Gender1 Race12)	-0.468876	0.1643	2143	-2.854
##	(30-39 Gender0 Race11)	-	(30-39 Gender1 Race12)	-0.386451	0.1451	2143	-2.663
##	(30-39 Gender0 Race11)	-	(40-49 Gender1 Race12)	-0.259381	0.1649	2143	-1.573
##	(30-39 Gender0 Race11)	-	(50-59 Gender1 Race12)	-0.275615	0.1686	2143	-1.635
##	(30-39 Gender0 Race11)	-	(18-29 Gender0 Race13)	-0.505509	0.1393	2143	-3.629
##	(30-39 Gender0 Race11)	-	(30-39 Gender0 Race13)	-0.423084	0.1155	2143	-3.664
##	(30-39 Gender0 Race11)	-	(40-49 Gender0 Race13)	-0.296014	0.1389	2143	-2.131
##	(30-39 Gender0 Race11)	-	(50-59 Gender0 Race13)	-0.312248	0.1440	2143	-2.169
##	(30-39 Gender0 Race11)	-	(18-29 Gender1 Race13)	-0.704267	0.1539	2143	-4.577
##	(30-39 Gender0 Race11)	-	(30-39 Gender1 Race13)	-0.621842	0.1326	2143	-4.690
##	(30-39 Gender0 Race11)	-	(40-49 Gender1 Race13)	-0.494772	0.1539	2143	-3.214
##	(30-39 Gender0 Race11)	-	(50-59 Gender1 Race13)	-0.511006	0.1591	2143	-3.213
##	(30-39 Gender0 Race11)	-	(18-29 Gender0 Race14)	-0.444695	0.1171	2143	-3.797
##	(30-39 Gender0 Race11)	-	(30-39 Gender0 Race14)	-0.362270	0.0845	2143	-4.285
##	(30-39 Gender0 Race11)	-	(40-49 Gender0 Race14)	-0.235200	0.1134	2143	-2.074
##	(30-39 Gender0 Race11)	-	(50-59 Gender0 Race14)	-0.251434	0.1151	2143	-2.184
##	(30-39 Gender0 Race11)	-	(18-29 Gender1 Race14)	-0.643453	0.1309	2143	-4.914
##	(30-39 Gender0 Race11)	-	(30-39 Gender1 Race14)	-0.561028	0.1027	2143	-5.462
##	(30-39 Gender0 Race11)	-	(40-49 Gender1 Race14)	-0.433958	0.1281	2143	-3.387
##	(30-39 Gender0 Race11)	-	(50-59 Gender1 Race14)	-0.450191	0.1303	2143	-3.454
##	(30-39 Gender0 Race11)	-	(18-29 Gender0 Race15)	-0.372762	0.1529	2143	-2.438
##	(30-39 Gender0 Race11)	-	(30-39 Gender0 Race15)	-0.290337	0.1296	2143	-2.239
##	(30-39 Gender0 Race11)	-	(40-49 Gender0 Race15)	-0.163267	0.1528	2143	-1.068
##	(30-39 Gender0 Race11)	-	(50-59 Gender0 Race15)	-0.179501	0.1557	2143	-1.153
##	(30-39 Gender0 Race11)	-	(18-29 Gender1 Race15)	-0.571520	0.1645	2143	-3.474
##	(30-39 Gender0 Race11)	-	(30-39 Gender1 Race15)	-0.489095	0.1431	2143	-3.417
##	(30-39 Gender0 Race11)	-	(40-49 Gender1 Race15)	-0.362025	0.1649	2143	-2.196
##	(30-39 Gender0 Race11)	-	(50-59 Gender1 Race15)	-0.378259	0.1680	2143	-2.251

##	(40-49 Gender0 Race11)	-	(50-59 Gender0 Race11)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender0 Race11)	-	(18-29 Gender1 Race11)	-0.408253	0.0965	2143	-4.230
##	(40-49 Gender0 Race11)	-	(30-39 Gender1 Race11)	-0.325828	0.0951	2143	-3.426
##	(40-49 Gender0 Race11)	-	(40-49 Gender1 Race11)	-0.198758	0.0564	2143	-3.524
##	(40-49 Gender0 Race11)	-	(50-59 Gender1 Race11)	-0.214991	0.0991	2143	-2.169
##	(40-49 Gender0 Race11)	-	(18-29 Gender0 Race12)	-0.397188	0.1535	2143	-2.587
##	(40-49 Gender0 Race11)	-	(30-39 Gender0 Race12)	-0.314763	0.1537	2143	-2.048
##	(40-49 Gender0 Race11)	-	(40-49 Gender0 Race12)	-0.187693	0.1325	2143	-1.417
##	(40-49 Gender0 Race11)	-	(50-59 Gender0 Race12)	-0.203927	0.1569	2143	-1.299
##	(40-49 Gender0 Race11)	-	(18-29 Gender1 Race12)	-0.595946	0.1642	2143	-3.630
##	(40-49 Gender0 Race11)	-	(30-39 Gender1 Race12)	-0.513521	0.1643	2143	-3.126
##	(40-49 Gender0 Race11)	-	(40-49 Gender1 Race12)	-0.386451	0.1451	2143	-2.663
##	(40-49 Gender0 Race11)	-	(50-59 Gender1 Race12)	-0.402685	0.1683	2143	-2.393
##	(40-49 Gender0 Race11)	-	(18-29 Gender0 Race13)	-0.632579	0.1397	2143	-4.527
##	(40-49 Gender0 Race11)	-	(30-39 Gender0 Race13)	-0.550154	0.1393	2143	-3.949
##	(40-49 Gender0 Race11)	-	(40-49 Gender0 Race13)	-0.423084	0.1155	2143	-3.664
##	(40-49 Gender0 Race11)	-	(50-59 Gender0 Race13)	-0.439318	0.1441	2143	-3.048
##	(40-49 Gender0 Race11)	-	(18-29 Gender1 Race13)	-0.831337	0.1538	2143	-5.407
##	(40-49 Gender0 Race11)	-	(30-39 Gender1 Race13)	-0.748912	0.1533	2143	-4.886
##	(40-49 Gender0 Race11)	-	(40-49 Gender1 Race13)	-0.621842	0.1326	2143	-4.690
##	(40-49 Gender0 Race11)	-	(50-59 Gender1 Race13)	-0.638075	0.1587	2143	-4.020
##	(40-49 Gender0 Race11)	-	(18-29 Gender0 Race14)	-0.571765	0.1187	2143	-4.816
##	(40-49 Gender0 Race11)	-	(30-39 Gender0 Race14)	-0.489340	0.1161	2143	-4.215
##	(40-49 Gender0 Race11)	-	(40-49 Gender0 Race14)	-0.362270	0.0845	2143	-4.285
##	(40-49 Gender0 Race11)	-	(50-59 Gender0 Race14)	-0.378503	0.1164	2143	-3.251
##	(40-49 Gender0 Race11)	-	(18-29 Gender1 Race14)	-0.770523	0.1318	2143	-5.847
##	(40-49 Gender0 Race11)	-	(30-39 Gender1 Race14)	-0.688098	0.1293	2143	-5.321
##	(40-49 Gender0 Race11)	-	(40-49 Gender1 Race14)	-0.561028	0.1027	2143	-5.462
##	(40-49 Gender0 Race11)	-	(50-59 Gender1 Race14)	-0.577261	0.1309	2143	-4.411
##	(40-49 Gender0 Race11)	-	(18-29 Gender0 Race15)	-0.499832	0.1514	2143	-3.302
##	(40-49 Gender0 Race11)	-	(30-39 Gender0 Race15)	-0.417407	0.1493	2143	-2.795
##	(40-49 Gender0 Race11)	-	(40-49 Gender0 Race15)	-0.290337	0.1296	2143	-2.239
##	(40-49 Gender0 Race11)	-	(50-59 Gender0 Race15)	-0.306571	0.1539	2143	-1.992
##	(40-49 Gender0 Race11)	-	(18-29 Gender1 Race15)	-0.698590	0.1627	2143	-4.295
##	(40-49 Gender0 Race11)	-	(30-39 Gender1 Race15)	-0.616165	0.1607	2143	-3.834
##	(40-49 Gender0 Race11)	-	(40-49 Gender1 Race15)	-0.489095	0.1431	2143	-3.417
##	(40-49 Gender0 Race11)	-	(50-59 Gender1 Race15)	-0.505328	0.1660	2143	-3.045
##	(50-59 Gender0 Race11)	-	(18-29 Gender1 Race11)	-0.392019	0.0982	2143	-3.994
##	(50-59 Gender0 Race11)	-	(30-39 Gender1 Race11)	-0.309594	0.0966	2143	-3.205
##	(50-59 Gender0 Race11)	-	(40-49 Gender1 Race11)	-0.182524	0.0973	2143	-1.875
##	(50-59 Gender0 Race11)	-	(50-59 Gender1 Race11)	-0.198758	0.0564	2143	-3.524
##	(50-59 Gender0 Race11)	-	(18-29 Gender0 Race12)	-0.380955	0.1531	2143	-2.488
##	(50-59 Gender0 Race11)	-	(30-39 Gender0 Race12)	-0.298530	0.1532	2143	-1.949
##	(50-59 Gender0 Race11)	-	(40-49 Gender0 Race12)	-0.171460	0.1530	2143	-1.121
##	(50-59 Gender0 Race11)	-	(50-59 Gender0 Race12)	-0.187693	0.1325	2143	-1.417
##	(50-59 Gender0 Race11)	-	(18-29 Gender1 Race12)	-0.579713	0.1633	2143	-3.550
##	(50-59 Gender0 Race11)	-	(30-39 Gender1 Race12)	-0.497287	0.1632	2143	-3.046
##	(50-59 Gender0 Race11)	-	(40-49 Gender1 Race12)	-0.370218	0.1635	2143	-2.264
##	(50-59 Gender0 Race11)	-	(50-59 Gender1 Race12)	-0.386451	0.1451	2143	-2.663
##	(50-59 Gender0 Race11)	-	(18-29 Gender0 Race13)	-0.616345	0.1380	2143	-4.466
##	(50-59 Gender0 Race11)	-	(30-39 Gender0 Race13)	-0.533920	0.1375	2143	-3.884
##	(50-59 Gender0 Race11)	-	(40-49 Gender0 Race13)	-0.406850	0.1372	2143	-2.965
##	(50-59 Gender0 Race11)	-	(50-59 Gender0 Race13)	-0.423084	0.1155	2143	-3.664
##	(50-59 Gender0 Race11)	-	(18-29 Gender1 Race13)	-0.815103	0.1516	2143	-5.376

##	(50-59 Gender0 Race11)	-	(30-39 Gender1 Race13)	-0.732678	0.1510	2143	-4.851
##	(50-59 Gender0 Race11)	-	(40-49 Gender1 Race13)	-0.605608	0.1513	2143	-4.002
##	(50-59 Gender0 Race11)	-	(50-59 Gender1 Race13)	-0.621842	0.1326	2143	-4.690
##	(50-59 Gender0 Race11)	-	(18-29 Gender0 Race14)	-0.555531	0.1210	2143	-4.591
##	(50-59 Gender0 Race11)	-	(30-39 Gender0 Race14)	-0.473106	0.1183	2143	-4.000
##	(50-59 Gender0 Race11)	-	(40-49 Gender0 Race14)	-0.346036	0.1169	2143	-2.959
##	(50-59 Gender0 Race11)	-	(50-59 Gender0 Race14)	-0.362270	0.0845	2143	-4.285
##	(50-59 Gender0 Race11)	-	(18-29 Gender1 Race14)	-0.754289	0.1332	2143	-5.662
##	(50-59 Gender0 Race11)	-	(30-39 Gender1 Race14)	-0.671864	0.1306	2143	-5.143
##	(50-59 Gender0 Race11)	-	(40-49 Gender1 Race14)	-0.544794	0.1300	2143	-4.190
##	(50-59 Gender0 Race11)	-	(50-59 Gender1 Race14)	-0.561028	0.1027	2143	-5.462
##	(50-59 Gender0 Race11)	-	(18-29 Gender0 Race15)	-0.483599	0.1516	2143	-3.190
##	(50-59 Gender0 Race11)	-	(30-39 Gender0 Race15)	-0.401173	0.1495	2143	-2.684
##	(50-59 Gender0 Race11)	-	(40-49 Gender0 Race15)	-0.274103	0.1512	2143	-1.813
##	(50-59 Gender0 Race11)	-	(50-59 Gender0 Race15)	-0.290337	0.1296	2143	-2.239
##	(50-59 Gender0 Race11)	-	(18-29 Gender1 Race15)	-0.682356	0.1623	2143	-4.203
##	(50-59 Gender0 Race11)	-	(30-39 Gender1 Race15)	-0.599931	0.1603	2143	-3.743
##	(50-59 Gender0 Race11)	-	(40-49 Gender1 Race15)	-0.472861	0.1623	2143	-2.913
##	(50-59 Gender0 Race11)	-	(50-59 Gender1 Race15)	-0.489095	0.1431	2143	-3.417
##	(18-29 Gender1 Race11)	-	(30-39 Gender1 Race11)	0.082425	0.0787	2143	1.047
##	(18-29 Gender1 Race11)	-	(40-49 Gender1 Race11)	0.209495	0.0791	2143	2.648
##	(18-29 Gender1 Race11)	-	(50-59 Gender1 Race11)	0.193261	0.0822	2143	2.352
##	(18-29 Gender1 Race11)	-	(18-29 Gender0 Race12)	0.011064	0.1428	2143	0.077
##	(18-29 Gender1 Race11)	-	(30-39 Gender0 Race12)	0.093490	0.1640	2143	0.570
##	(18-29 Gender1 Race11)	-	(40-49 Gender0 Race12)	0.220559	0.1636	2143	1.348
##	(18-29 Gender1 Race11)	-	(50-59 Gender0 Race12)	0.204326	0.1664	2143	1.228
##	(18-29 Gender1 Race11)	-	(18-29 Gender1 Race12)	-0.187693	0.1325	2143	-1.417
##	(18-29 Gender1 Race11)	-	(30-39 Gender1 Race12)	-0.105268	0.1550	2143	-0.679
##	(18-29 Gender1 Race11)	-	(40-49 Gender1 Race12)	0.021802	0.1551	2143	0.141
##	(18-29 Gender1 Race11)	-	(50-59 Gender1 Race12)	0.005568	0.1586	2143	0.035
##	(18-29 Gender1 Race11)	-	(18-29 Gender0 Race13)	-0.224326	0.1243	2143	-1.804
##	(18-29 Gender1 Race11)	-	(30-39 Gender0 Race13)	-0.141901	0.1476	2143	-0.961
##	(18-29 Gender1 Race11)	-	(40-49 Gender0 Race13)	-0.014831	0.1472	2143	-0.101
##	(18-29 Gender1 Race11)	-	(50-59 Gender0 Race13)	-0.031065	0.1515	2143	-0.205
##	(18-29 Gender1 Race11)	-	(18-29 Gender1 Race13)	-0.423084	0.1155	2143	-3.664
##	(18-29 Gender1 Race11)	-	(30-39 Gender1 Race13)	-0.340659	0.1402	2143	-2.430
##	(18-29 Gender1 Race11)	-	(40-49 Gender1 Race13)	-0.213589	0.1402	2143	-1.523
##	(18-29 Gender1 Race11)	-	(50-59 Gender1 Race13)	-0.229823	0.1454	2143	-1.581
##	(18-29 Gender1 Race11)	-	(18-29 Gender0 Race14)	-0.163512	0.1006	2143	-1.626
##	(18-29 Gender1 Race11)	-	(30-39 Gender0 Race14)	-0.081087	0.1263	2143	-0.642
##	(18-29 Gender1 Race11)	-	(40-49 Gender0 Race14)	0.045983	0.1247	2143	0.369
##	(18-29 Gender1 Race11)	-	(50-59 Gender0 Race14)	0.029749	0.1258	2143	0.237
##	(18-29 Gender1 Race11)	-	(18-29 Gender1 Race14)	-0.362270	0.0845	2143	-4.285
##	(18-29 Gender1 Race11)	-	(30-39 Gender1 Race14)	-0.279845	0.1139	2143	-2.458
##	(18-29 Gender1 Race11)	-	(40-49 Gender1 Race14)	-0.152775	0.1128	2143	-1.354
##	(18-29 Gender1 Race11)	-	(50-59 Gender1 Race14)	-0.169008	0.1147	2143	-1.473
##	(18-29 Gender1 Race11)	-	(18-29 Gender0 Race15)	-0.091579	0.1396	2143	-0.656
##	(18-29 Gender1 Race11)	-	(30-39 Gender0 Race15)	-0.009154	0.1592	2143	-0.057
##	(18-29 Gender1 Race11)	-	(40-49 Gender0 Race15)	0.117916	0.1606	2143	0.734
##	(18-29 Gender1 Race11)	-	(50-59 Gender0 Race15)	0.101682	0.1629	2143	0.624
##	(18-29 Gender1 Race11)	-	(18-29 Gender1 Race15)	-0.290337	0.1296	2143	-2.239
##	(18-29 Gender1 Race11)	-	(30-39 Gender1 Race15)	-0.207912	0.1505	2143	-1.382
##	(18-29 Gender1 Race11)	-	(40-49 Gender1 Race15)	-0.080842	0.1524	2143	-0.530
##	(18-29 Gender1 Race11)	-	(50-59 Gender1 Race15)	-0.097076	0.1554	2143	-0.625

##	(30-39 Gender1 Race11)	-	(40-49 Gender1 Race11)	0.127070	0.0776	2143	1.638
##	(30-39 Gender1 Race11)	-	(50-59 Gender1 Race11)	0.110836	0.0805	2143	1.377
##	(30-39 Gender1 Race11)	-	(18-29 Gender0 Race12)	-0.071361	0.1621	2143	-0.440
##	(30-39 Gender1 Race11)	-	(30-39 Gender0 Race12)	0.011064	0.1428	2143	0.077
##	(30-39 Gender1 Race11)	-	(40-49 Gender0 Race12)	0.138134	0.1619	2143	0.853
##	(30-39 Gender1 Race11)	-	(50-59 Gender0 Race12)	0.121901	0.1646	2143	0.740
##	(30-39 Gender1 Race11)	-	(18-29 Gender1 Race12)	-0.270119	0.1531	2143	-1.764
##	(30-39 Gender1 Race11)	-	(30-39 Gender1 Race12)	-0.187693	0.1325	2143	-1.417
##	(30-39 Gender1 Race11)	-	(40-49 Gender1 Race12)	-0.060623	0.1533	2143	-0.395
##	(30-39 Gender1 Race11)	-	(50-59 Gender1 Race12)	-0.076857	0.1568	2143	-0.490
##	(30-39 Gender1 Race11)	-	(18-29 Gender0 Race13)	-0.306751	0.1466	2143	-2.092
##	(30-39 Gender1 Race11)	-	(30-39 Gender0 Race13)	-0.224326	0.1243	2143	-1.804
##	(30-39 Gender1 Race11)	-	(40-49 Gender0 Race13)	-0.097256	0.1458	2143	-0.667
##	(30-39 Gender1 Race11)	-	(50-59 Gender0 Race13)	-0.113490	0.1501	2143	-0.756
##	(30-39 Gender1 Race11)	-	(18-29 Gender1 Race13)	-0.505509	0.1393	2143	-3.629
##	(30-39 Gender1 Race11)	-	(30-39 Gender1 Race13)	-0.423084	0.1155	2143	-3.664
##	(30-39 Gender1 Race11)	-	(40-49 Gender1 Race13)	-0.296014	0.1389	2143	-2.131
##	(30-39 Gender1 Race11)	-	(50-59 Gender1 Race13)	-0.312248	0.1440	2143	-2.169
##	(30-39 Gender1 Race11)	-	(18-29 Gender0 Race14)	-0.245937	0.1291	2143	-1.906
##	(30-39 Gender1 Race11)	-	(30-39 Gender0 Race14)	-0.163512	0.1006	2143	-1.626
##	(30-39 Gender1 Race11)	-	(40-49 Gender0 Race14)	-0.036442	0.1252	2143	-0.291
##	(30-39 Gender1 Race11)	-	(50-59 Gender0 Race14)	-0.052676	0.1261	2143	-0.418
##	(30-39 Gender1 Race11)	-	(18-29 Gender1 Race14)	-0.444695	0.1171	2143	-3.797
##	(30-39 Gender1 Race11)	-	(30-39 Gender1 Race14)	-0.362270	0.0845	2143	-4.285
##	(30-39 Gender1 Race11)	-	(40-49 Gender1 Race14)	-0.235200	0.1134	2143	-2.074
##	(30-39 Gender1 Race11)	-	(50-59 Gender1 Race14)	-0.251434	0.1151	2143	-2.184
##	(30-39 Gender1 Race11)	-	(18-29 Gender0 Race15)	-0.174005	0.1613	2143	-1.079
##	(30-39 Gender1 Race11)	-	(30-39 Gender0 Race15)	-0.091579	0.1396	2143	-0.656
##	(30-39 Gender1 Race11)	-	(40-49 Gender0 Race15)	0.035491	0.1609	2143	0.221
##	(30-39 Gender1 Race11)	-	(50-59 Gender0 Race15)	0.019257	0.1631	2143	0.118
##	(30-39 Gender1 Race11)	-	(18-29 Gender1 Race15)	-0.372762	0.1529	2143	-2.438
##	(30-39 Gender1 Race11)	-	(30-39 Gender1 Race15)	-0.290337	0.1296	2143	-2.239
##	(30-39 Gender1 Race11)	-	(40-49 Gender1 Race15)	-0.163267	0.1528	2143	-1.068
##	(30-39 Gender1 Race11)	-	(50-59 Gender1 Race15)	-0.179501	0.1557	2143	-1.153
##	(40-49 Gender1 Race11)	-	(50-59 Gender1 Race11)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender1 Race11)	-	(18-29 Gender0 Race12)	-0.198431	0.1629	2143	-1.218
##	(40-49 Gender1 Race11)	-	(30-39 Gender0 Race12)	-0.116005	0.1631	2143	-0.711
##	(40-49 Gender1 Race11)	-	(40-49 Gender0 Race12)	0.011064	0.1428	2143	0.077
##	(40-49 Gender1 Race11)	-	(50-59 Gender0 Race12)	-0.005169	0.1652	2143	-0.031
##	(40-49 Gender1 Race11)	-	(18-29 Gender1 Race12)	-0.397188	0.1535	2143	-2.587
##	(40-49 Gender1 Race11)	-	(30-39 Gender1 Race12)	-0.314763	0.1537	2143	-2.048
##	(40-49 Gender1 Race11)	-	(40-49 Gender1 Race12)	-0.187693	0.1325	2143	-1.417
##	(40-49 Gender1 Race11)	-	(50-59 Gender1 Race12)	-0.203927	0.1569	2143	-1.299
##	(40-49 Gender1 Race11)	-	(18-29 Gender0 Race13)	-0.433821	0.1476	2143	-2.940
##	(40-49 Gender1 Race11)	-	(30-39 Gender0 Race13)	-0.351396	0.1473	2143	-2.386
##	(40-49 Gender1 Race11)	-	(40-49 Gender0 Race13)	-0.224326	0.1243	2143	-1.804
##	(40-49 Gender1 Race11)	-	(50-59 Gender0 Race13)	-0.240560	0.1507	2143	-1.596
##	(40-49 Gender1 Race11)	-	(18-29 Gender1 Race13)	-0.632579	0.1397	2143	-4.527
##	(40-49 Gender1 Race11)	-	(30-39 Gender1 Race13)	-0.550154	0.1393	2143	-3.949
##	(40-49 Gender1 Race11)	-	(40-49 Gender1 Race13)	-0.423084	0.1155	2143	-3.664
##	(40-49 Gender1 Race11)	-	(50-59 Gender1 Race13)	-0.439318	0.1441	2143	-3.048
##	(40-49 Gender1 Race11)	-	(18-29 Gender0 Race14)	-0.373007	0.1311	2143	-2.846
##	(40-49 Gender1 Race11)	-	(30-39 Gender0 Race14)	-0.290582	0.1288	2143	-2.256
##	(40-49 Gender1 Race11)	-	(40-49 Gender0 Race14)	-0.163512	0.1006	2143	-1.626

##	(40-49 Gender1 Race11)	-	(50-59 Gender0 Race14)	-0.179746	0.1278	2143	-1.406
##	(40-49 Gender1 Race11)	-	(18-29 Gender1 Race14)	-0.571765	0.1187	2143	-4.816
##	(40-49 Gender1 Race11)	-	(30-39 Gender1 Race14)	-0.489340	0.1161	2143	-4.215
##	(40-49 Gender1 Race11)	-	(40-49 Gender1 Race14)	-0.362270	0.0845	2143	-4.285
##	(40-49 Gender1 Race11)	-	(50-59 Gender1 Race14)	-0.378503	0.1164	2143	-3.251
##	(40-49 Gender1 Race11)	-	(18-29 Gender0 Race15)	-0.301074	0.1604	2143	-1.877
##	(40-49 Gender1 Race11)	-	(30-39 Gender0 Race15)	-0.218649	0.1586	2143	-1.379
##	(40-49 Gender1 Race11)	-	(40-49 Gender0 Race15)	-0.091579	0.1396	2143	-0.656
##	(40-49 Gender1 Race11)	-	(50-59 Gender0 Race15)	-0.107813	0.1619	2143	-0.666
##	(40-49 Gender1 Race11)	-	(18-29 Gender1 Race15)	-0.499832	0.1514	2143	-3.302
##	(40-49 Gender1 Race11)	-	(30-39 Gender1 Race15)	-0.417407	0.1493	2143	-2.795
##	(40-49 Gender1 Race11)	-	(40-49 Gender1 Race15)	-0.290337	0.1296	2143	-2.239
##	(40-49 Gender1 Race11)	-	(50-59 Gender1 Race15)	-0.306571	0.1539	2143	-1.992
##	(50-59 Gender1 Race11)	-	(18-29 Gender0 Race12)	-0.182197	0.1630	2143	-1.117
##	(50-59 Gender1 Race11)	-	(30-39 Gender0 Race12)	-0.099772	0.1632	2143	-0.611
##	(50-59 Gender1 Race11)	-	(40-49 Gender0 Race12)	0.027298	0.1625	2143	0.168
##	(50-59 Gender1 Race11)	-	(50-59 Gender0 Race12)	0.011064	0.1428	2143	0.077
##	(50-59 Gender1 Race11)	-	(18-29 Gender1 Race12)	-0.380955	0.1531	2143	-2.488
##	(50-59 Gender1 Race11)	-	(30-39 Gender1 Race12)	-0.298530	0.1532	2143	-1.949
##	(50-59 Gender1 Race11)	-	(40-49 Gender1 Race12)	-0.171460	0.1530	2143	-1.121
##	(50-59 Gender1 Race11)	-	(50-59 Gender1 Race12)	-0.187693	0.1325	2143	-1.417
##	(50-59 Gender1 Race11)	-	(18-29 Gender0 Race13)	-0.417588	0.1465	2143	-2.850
##	(50-59 Gender1 Race11)	-	(30-39 Gender0 Race13)	-0.335162	0.1461	2143	-2.294
##	(50-59 Gender1 Race11)	-	(40-49 Gender0 Race13)	-0.208093	0.1453	2143	-1.432
##	(50-59 Gender1 Race11)	-	(50-59 Gender0 Race13)	-0.224326	0.1243	2143	-1.804
##	(50-59 Gender1 Race11)	-	(18-29 Gender1 Race13)	-0.616345	0.1380	2143	-4.466
##	(50-59 Gender1 Race11)	-	(30-39 Gender1 Race13)	-0.533920	0.1375	2143	-3.884
##	(50-59 Gender1 Race11)	-	(40-49 Gender1 Race13)	-0.406850	0.1372	2143	-2.965
##	(50-59 Gender1 Race11)	-	(50-59 Gender1 Race13)	-0.423084	0.1155	2143	-3.664
##	(50-59 Gender1 Race11)	-	(18-29 Gender0 Race14)	-0.356774	0.1338	2143	-2.666
##	(50-59 Gender1 Race11)	-	(30-39 Gender0 Race14)	-0.274348	0.1315	2143	-2.087
##	(50-59 Gender1 Race11)	-	(40-49 Gender0 Race14)	-0.147279	0.1296	2143	-1.136
##	(50-59 Gender1 Race11)	-	(50-59 Gender0 Race14)	-0.163512	0.1006	2143	-1.626
##	(50-59 Gender1 Race11)	-	(18-29 Gender1 Race14)	-0.555531	0.1210	2143	-4.591
##	(50-59 Gender1 Race11)	-	(30-39 Gender1 Race14)	-0.473106	0.1183	2143	-4.000
##	(50-59 Gender1 Race11)	-	(40-49 Gender1 Race14)	-0.346036	0.1169	2143	-2.959
##	(50-59 Gender1 Race11)	-	(50-59 Gender1 Race14)	-0.362270	0.0845	2143	-4.285
##	(50-59 Gender1 Race11)	-	(18-29 Gender0 Race15)	-0.284841	0.1611	2143	-1.768
##	(50-59 Gender1 Race11)	-	(30-39 Gender0 Race15)	-0.202416	0.1592	2143	-1.271
##	(50-59 Gender1 Race11)	-	(40-49 Gender0 Race15)	-0.075346	0.1603	2143	-0.470
##	(50-59 Gender1 Race11)	-	(50-59 Gender0 Race15)	-0.091579	0.1396	2143	-0.656
##	(50-59 Gender1 Race11)	-	(18-29 Gender1 Race15)	-0.483599	0.1516	2143	-3.190
##	(50-59 Gender1 Race11)	-	(30-39 Gender1 Race15)	-0.401173	0.1495	2143	-2.684
##	(50-59 Gender1 Race11)	-	(40-49 Gender1 Race15)	-0.274103	0.1512	2143	-1.813
##	(50-59 Gender1 Race11)	-	(50-59 Gender1 Race15)	-0.290337	0.1296	2143	-2.239
##	(18-29 Gender0 Race12)	-	(30-39 Gender0 Race12)	0.082425	0.0787	2143	1.047
##	(18-29 Gender0 Race12)	-	(40-49 Gender0 Race12)	0.209495	0.0791	2143	2.648
##	(18-29 Gender0 Race12)	-	(50-59 Gender0 Race12)	0.193261	0.0822	2143	2.352
##	(18-29 Gender0 Race12)	-	(18-29 Gender1 Race12)	-0.198758	0.0564	2143	-3.524
##	(18-29 Gender0 Race12)	-	(30-39 Gender1 Race12)	-0.116333	0.0967	2143	-1.203
##	(18-29 Gender0 Race12)	-	(40-49 Gender1 Race12)	0.010737	0.0978	2143	0.110
##	(18-29 Gender0 Race12)	-	(50-59 Gender1 Race12)	-0.005496	0.1012	2143	-0.054
##	(18-29 Gender0 Race12)	-	(18-29 Gender0 Race13)	-0.235391	0.1380	2143	-1.705
##	(18-29 Gender0 Race12)	-	(30-39 Gender0 Race13)	-0.152965	0.1584	2143	-0.966

##	(18-29 Gender0 Race12)	-	(40-49 Gender0 Race13)	-0.025895	0.1586	2143	-0.163
##	(18-29 Gender0 Race12)	-	(50-59 Gender0 Race13)	-0.042129	0.1612	2143	-0.261
##	(18-29 Gender0 Race12)	-	(18-29 Gender1 Race13)	-0.434148	0.1515	2143	-2.865
##	(18-29 Gender0 Race12)	-	(30-39 Gender1 Race13)	-0.351723	0.1702	2143	-2.067
##	(18-29 Gender0 Race12)	-	(40-49 Gender1 Race13)	-0.224653	0.1708	2143	-1.315
##	(18-29 Gender0 Race12)	-	(50-59 Gender1 Race13)	-0.240887	0.1738	2143	-1.386
##	(18-29 Gender0 Race12)	-	(18-29 Gender0 Race14)	-0.174576	0.1141	2143	-1.530
##	(18-29 Gender0 Race12)	-	(30-39 Gender0 Race14)	-0.092151	0.1362	2143	-0.677
##	(18-29 Gender0 Race12)	-	(40-49 Gender0 Race14)	0.034919	0.1355	2143	0.258
##	(18-29 Gender0 Race12)	-	(50-59 Gender0 Race14)	0.018685	0.1348	2143	0.139
##	(18-29 Gender0 Race12)	-	(18-29 Gender1 Race14)	-0.373334	0.1268	2143	-2.943
##	(18-29 Gender0 Race12)	-	(30-39 Gender1 Race14)	-0.290909	0.1469	2143	-1.980
##	(18-29 Gender0 Race12)	-	(40-49 Gender1 Race14)	-0.163839	0.1468	2143	-1.116
##	(18-29 Gender0 Race12)	-	(50-59 Gender1 Race14)	-0.180073	0.1468	2143	-1.227
##	(18-29 Gender0 Race12)	-	(18-29 Gender0 Race15)	-0.102644	0.1503	2143	-0.683
##	(18-29 Gender0 Race12)	-	(30-39 Gender0 Race15)	-0.020219	0.1677	2143	-0.121
##	(18-29 Gender0 Race12)	-	(40-49 Gender0 Race15)	0.106851	0.1696	2143	0.630
##	(18-29 Gender0 Race12)	-	(50-59 Gender0 Race15)	0.090618	0.1705	2143	0.532
##	(18-29 Gender0 Race12)	-	(18-29 Gender1 Race15)	-0.301401	0.1610	2143	-1.872
##	(18-29 Gender0 Race12)	-	(30-39 Gender1 Race15)	-0.218976	0.1773	2143	-1.235
##	(18-29 Gender0 Race12)	-	(40-49 Gender1 Race15)	-0.091907	0.1795	2143	-0.512
##	(18-29 Gender0 Race12)	-	(50-59 Gender1 Race15)	-0.108140	0.1808	2143	-0.598
##	(30-39 Gender0 Race12)	-	(40-49 Gender0 Race12)	0.127070	0.0776	2143	1.638
##	(30-39 Gender0 Race12)	-	(50-59 Gender0 Race12)	0.110836	0.0805	2143	1.377
##	(30-39 Gender0 Race12)	-	(18-29 Gender1 Race12)	-0.281183	0.0970	2143	-2.900
##	(30-39 Gender0 Race12)	-	(30-39 Gender1 Race12)	-0.198758	0.0564	2143	-3.524
##	(30-39 Gender0 Race12)	-	(40-49 Gender1 Race12)	-0.071688	0.0967	2143	-0.741
##	(30-39 Gender0 Race12)	-	(50-59 Gender1 Race12)	-0.087921	0.0999	2143	-0.880
##	(30-39 Gender0 Race12)	-	(18-29 Gender0 Race13)	-0.317816	0.1594	2143	-1.993
##	(30-39 Gender0 Race12)	-	(30-39 Gender0 Race13)	-0.235391	0.1380	2143	-1.705
##	(30-39 Gender0 Race12)	-	(40-49 Gender0 Race13)	-0.108321	0.1583	2143	-0.684
##	(30-39 Gender0 Race12)	-	(50-59 Gender0 Race13)	-0.124554	0.1609	2143	-0.774
##	(30-39 Gender0 Race12)	-	(18-29 Gender1 Race13)	-0.516574	0.1713	2143	-3.015
##	(30-39 Gender0 Race12)	-	(30-39 Gender1 Race13)	-0.434148	0.1515	2143	-2.865
##	(30-39 Gender0 Race12)	-	(40-49 Gender1 Race13)	-0.307078	0.1707	2143	-1.799
##	(30-39 Gender0 Race12)	-	(50-59 Gender1 Race13)	-0.323312	0.1735	2143	-1.863
##	(30-39 Gender0 Race12)	-	(18-29 Gender0 Race14)	-0.257002	0.1410	2143	-1.822
##	(30-39 Gender0 Race12)	-	(30-39 Gender0 Race14)	-0.174576	0.1141	2143	-1.530
##	(30-39 Gender0 Race12)	-	(40-49 Gender0 Race14)	-0.047507	0.1371	2143	-0.347
##	(30-39 Gender0 Race12)	-	(50-59 Gender0 Race14)	-0.063740	0.1363	2143	-0.468
##	(30-39 Gender0 Race12)	-	(18-29 Gender1 Race14)	-0.455759	0.1516	2143	-3.007
##	(30-39 Gender0 Race12)	-	(30-39 Gender1 Race14)	-0.373334	0.1268	2143	-2.943
##	(30-39 Gender0 Race12)	-	(40-49 Gender1 Race14)	-0.246264	0.1483	2143	-1.660
##	(30-39 Gender0 Race12)	-	(50-59 Gender1 Race14)	-0.262498	0.1482	2143	-1.771
##	(30-39 Gender0 Race12)	-	(18-29 Gender0 Race15)	-0.185069	0.1716	2143	-1.079
##	(30-39 Gender0 Race12)	-	(30-39 Gender0 Race15)	-0.102644	0.1503	2143	-0.683
##	(30-39 Gender0 Race12)	-	(40-49 Gender0 Race15)	0.024426	0.1708	2143	0.143
##	(30-39 Gender0 Race12)	-	(50-59 Gender0 Race15)	0.008193	0.1716	2143	0.048
##	(30-39 Gender0 Race12)	-	(18-29 Gender1 Race15)	-0.383827	0.1811	2143	-2.119
##	(30-39 Gender0 Race12)	-	(30-39 Gender1 Race15)	-0.301401	0.1610	2143	-1.872
##	(30-39 Gender0 Race12)	-	(40-49 Gender1 Race15)	-0.174332	0.1808	2143	-0.964
##	(30-39 Gender0 Race12)	-	(50-59 Gender1 Race15)	-0.190565	0.1820	2143	-1.047
##	(40-49 Gender0 Race12)	-	(50-59 Gender0 Race12)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender0 Race12)	-	(18-29 Gender1 Race12)	-0.408253	0.0965	2143	-4.230

##	(40-49 Gender0 Race12)	-	(30-39 Gender1 Race12)	-0.325828	0.0951	2143	-3.426
##	(40-49 Gender0 Race12)	-	(40-49 Gender1 Race12)	-0.198758	0.0564	2143	-3.524
##	(40-49 Gender0 Race12)	-	(50-59 Gender1 Race12)	-0.214991	0.0991	2143	-2.169
##	(40-49 Gender0 Race12)	-	(18-29 Gender0 Race13)	-0.444886	0.1596	2143	-2.787
##	(40-49 Gender0 Race12)	-	(30-39 Gender0 Race13)	-0.362461	0.1584	2143	-2.289
##	(40-49 Gender0 Race12)	-	(40-49 Gender0 Race13)	-0.235391	0.1380	2143	-1.705
##	(40-49 Gender0 Race12)	-	(50-59 Gender0 Race13)	-0.251624	0.1609	2143	-1.564
##	(40-49 Gender0 Race12)	-	(18-29 Gender1 Race13)	-0.643644	0.1711	2143	-3.763
##	(40-49 Gender0 Race12)	-	(30-39 Gender1 Race13)	-0.561218	0.1698	2143	-3.305
##	(40-49 Gender0 Race12)	-	(40-49 Gender1 Race13)	-0.434148	0.1515	2143	-2.865
##	(40-49 Gender0 Race12)	-	(50-59 Gender1 Race13)	-0.450382	0.1731	2143	-2.602
##	(40-49 Gender0 Race12)	-	(18-29 Gender0 Race14)	-0.384072	0.1422	2143	-2.702
##	(40-49 Gender0 Race12)	-	(30-39 Gender0 Race14)	-0.301646	0.1389	2143	-2.171
##	(40-49 Gender0 Race12)	-	(40-49 Gender0 Race14)	-0.174576	0.1141	2143	-1.530
##	(40-49 Gender0 Race12)	-	(50-59 Gender0 Race14)	-0.190810	0.1372	2143	-1.391
##	(40-49 Gender0 Race12)	-	(18-29 Gender1 Race14)	-0.582829	0.1521	2143	-3.831
##	(40-49 Gender0 Race12)	-	(30-39 Gender1 Race14)	-0.500404	0.1490	2143	-3.358
##	(40-49 Gender0 Race12)	-	(40-49 Gender1 Race14)	-0.373334	0.1268	2143	-2.943
##	(40-49 Gender0 Race12)	-	(50-59 Gender1 Race14)	-0.389568	0.1485	2143	-2.623
##	(40-49 Gender0 Race12)	-	(18-29 Gender0 Race15)	-0.312139	0.1701	2143	-1.835
##	(40-49 Gender0 Race12)	-	(30-39 Gender0 Race15)	-0.229714	0.1674	2143	-1.372
##	(40-49 Gender0 Race12)	-	(40-49 Gender0 Race15)	-0.102644	0.1503	2143	-0.683
##	(40-49 Gender0 Race12)	-	(50-59 Gender0 Race15)	-0.118877	0.1699	2143	-0.700
##	(40-49 Gender0 Race12)	-	(18-29 Gender1 Race15)	-0.510897	0.1793	2143	-2.850
##	(40-49 Gender0 Race12)	-	(30-39 Gender1 Race15)	-0.428471	0.1767	2143	-2.425
##	(40-49 Gender0 Race12)	-	(40-49 Gender1 Race15)	-0.301401	0.1610	2143	-1.872
##	(40-49 Gender0 Race12)	-	(50-59 Gender1 Race15)	-0.317635	0.1799	2143	-1.765
##	(50-59 Gender0 Race12)	-	(18-29 Gender1 Race12)	-0.392019	0.0982	2143	-3.994
##	(50-59 Gender0 Race12)	-	(30-39 Gender1 Race12)	-0.309594	0.0966	2143	-3.205
##	(50-59 Gender0 Race12)	-	(40-49 Gender1 Race12)	-0.182524	0.0973	2143	-1.875
##	(50-59 Gender0 Race12)	-	(50-59 Gender1 Race12)	-0.198758	0.0564	2143	-3.524
##	(50-59 Gender0 Race12)	-	(18-29 Gender0 Race13)	-0.428652	0.1601	2143	-2.678
##	(50-59 Gender0 Race12)	-	(30-39 Gender0 Race13)	-0.346227	0.1587	2143	-2.182
##	(50-59 Gender0 Race12)	-	(40-49 Gender0 Race13)	-0.219157	0.1586	2143	-1.381
##	(50-59 Gender0 Race12)	-	(50-59 Gender0 Race13)	-0.235391	0.1380	2143	-1.705
##	(50-59 Gender0 Race12)	-	(18-29 Gender1 Race13)	-0.627410	0.1710	2143	-3.670
##	(50-59 Gender0 Race12)	-	(30-39 Gender1 Race13)	-0.544985	0.1696	2143	-3.214
##	(50-59 Gender0 Race12)	-	(40-49 Gender1 Race13)	-0.417915	0.1700	2143	-2.458
##	(50-59 Gender0 Race12)	-	(50-59 Gender1 Race13)	-0.434148	0.1515	2143	-2.865
##	(50-59 Gender0 Race12)	-	(18-29 Gender0 Race14)	-0.367838	0.1462	2143	-2.516
##	(50-59 Gender0 Race12)	-	(30-39 Gender0 Race14)	-0.285413	0.1429	2143	-1.997
##	(50-59 Gender0 Race12)	-	(40-49 Gender0 Race14)	-0.158343	0.1420	2143	-1.115
##	(50-59 Gender0 Race12)	-	(50-59 Gender0 Race14)	-0.174576	0.1141	2143	-1.530
##	(50-59 Gender0 Race12)	-	(18-29 Gender1 Race14)	-0.566596	0.1554	2143	-3.647
##	(50-59 Gender0 Race12)	-	(30-39 Gender1 Race14)	-0.484171	0.1522	2143	-3.181
##	(50-59 Gender0 Race12)	-	(40-49 Gender1 Race14)	-0.357101	0.1518	2143	-2.352
##	(50-59 Gender0 Race12)	-	(50-59 Gender1 Race14)	-0.373334	0.1268	2143	-2.943
##	(50-59 Gender0 Race12)	-	(18-29 Gender0 Race15)	-0.295905	0.1721	2143	-1.719
##	(50-59 Gender0 Race12)	-	(30-39 Gender0 Race15)	-0.213480	0.1694	2143	-1.261
##	(50-59 Gender0 Race12)	-	(40-49 Gender0 Race15)	-0.086410	0.1710	2143	-0.505
##	(50-59 Gender0 Race12)	-	(50-59 Gender0 Race15)	-0.102644	0.1503	2143	-0.683
##	(50-59 Gender0 Race12)	-	(18-29 Gender1 Race15)	-0.494663	0.1807	2143	-2.737
##	(50-59 Gender0 Race12)	-	(30-39 Gender1 Race15)	-0.412238	0.1780	2143	-2.316
##	(50-59 Gender0 Race12)	-	(40-49 Gender1 Race15)	-0.285168	0.1800	2143	-1.584

##	(50-59 Gender0 Race12)	-	(50-59 Gender1 Race15)	-0.301401	0.1610	2143	-1.872
##	(18-29 Gender1 Race12)	-	(30-39 Gender1 Race12)	0.082425	0.0787	2143	1.047
##	(18-29 Gender1 Race12)	-	(40-49 Gender1 Race12)	0.209495	0.0791	2143	2.648
##	(18-29 Gender1 Race12)	-	(50-59 Gender1 Race12)	0.193261	0.0822	2143	2.352
##	(18-29 Gender1 Race12)	-	(18-29 Gender0 Race13)	-0.036633	0.1467	2143	-0.250
##	(18-29 Gender1 Race12)	-	(30-39 Gender0 Race13)	0.045792	0.1660	2143	0.276
##	(18-29 Gender1 Race12)	-	(40-49 Gender0 Race13)	0.172862	0.1658	2143	1.043
##	(18-29 Gender1 Race12)	-	(50-59 Gender0 Race13)	0.156629	0.1678	2143	0.934
##	(18-29 Gender1 Race12)	-	(18-29 Gender1 Race13)	-0.235391	0.1380	2143	-1.705
##	(18-29 Gender1 Race12)	-	(30-39 Gender1 Race13)	-0.152965	0.1584	2143	-0.966
##	(18-29 Gender1 Race12)	-	(40-49 Gender1 Race13)	-0.025895	0.1586	2143	-0.163
##	(18-29 Gender1 Race12)	-	(50-59 Gender1 Race13)	-0.042129	0.1612	2143	-0.261
##	(18-29 Gender1 Race12)	-	(18-29 Gender0 Race14)	0.024181	0.1278	2143	0.189
##	(18-29 Gender1 Race12)	-	(30-39 Gender0 Race14)	0.106607	0.1479	2143	0.721
##	(18-29 Gender1 Race12)	-	(40-49 Gender0 Race14)	0.233676	0.1467	2143	1.592
##	(18-29 Gender1 Race12)	-	(50-59 Gender0 Race14)	0.217443	0.1455	2143	1.494
##	(18-29 Gender1 Race12)	-	(18-29 Gender1 Race14)	-0.174576	0.1141	2143	-1.530
##	(18-29 Gender1 Race12)	-	(30-39 Gender1 Race14)	-0.092151	0.1362	2143	-0.677
##	(18-29 Gender1 Race12)	-	(40-49 Gender1 Race14)	0.034919	0.1355	2143	0.258
##	(18-29 Gender1 Race12)	-	(50-59 Gender1 Race14)	0.018685	0.1348	2143	0.139
##	(18-29 Gender1 Race12)	-	(18-29 Gender0 Race15)	0.096114	0.1600	2143	0.601
##	(18-29 Gender1 Race12)	-	(30-39 Gender0 Race15)	0.178539	0.1766	2143	1.011
##	(18-29 Gender1 Race12)	-	(40-49 Gender0 Race15)	0.305609	0.1779	2143	1.717
##	(18-29 Gender1 Race12)	-	(50-59 Gender0 Race15)	0.289376	0.1783	2143	1.623
##	(18-29 Gender1 Race12)	-	(18-29 Gender1 Race15)	-0.102644	0.1503	2143	-0.683
##	(18-29 Gender1 Race12)	-	(30-39 Gender1 Race15)	-0.020219	0.1677	2143	-0.121
##	(18-29 Gender1 Race12)	-	(40-49 Gender1 Race15)	0.106851	0.1696	2143	0.630
##	(18-29 Gender1 Race12)	-	(50-59 Gender1 Race15)	0.090618	0.1705	2143	0.532
##	(30-39 Gender1 Race12)	-	(40-49 Gender1 Race12)	0.127070	0.0776	2143	1.638
##	(30-39 Gender1 Race12)	-	(50-59 Gender1 Race12)	0.110836	0.0805	2143	1.377
##	(30-39 Gender1 Race12)	-	(18-29 Gender0 Race13)	-0.119058	0.1669	2143	-0.713
##	(30-39 Gender1 Race12)	-	(30-39 Gender0 Race13)	-0.036633	0.1467	2143	-0.250
##	(30-39 Gender1 Race12)	-	(40-49 Gender0 Race13)	0.090437	0.1655	2143	0.547
##	(30-39 Gender1 Race12)	-	(50-59 Gender0 Race13)	0.074204	0.1674	2143	0.443
##	(30-39 Gender1 Race12)	-	(18-29 Gender1 Race13)	-0.317816	0.1594	2143	-1.993
##	(30-39 Gender1 Race12)	-	(30-39 Gender1 Race13)	-0.235391	0.1380	2143	-1.705
##	(30-39 Gender1 Race12)	-	(40-49 Gender1 Race13)	-0.108321	0.1583	2143	-0.684
##	(30-39 Gender1 Race12)	-	(50-59 Gender1 Race13)	-0.124554	0.1609	2143	-0.774
##	(30-39 Gender1 Race12)	-	(18-29 Gender0 Race14)	-0.058244	0.1522	2143	-0.383
##	(30-39 Gender1 Race12)	-	(30-39 Gender0 Race14)	0.024181	0.1278	2143	0.189
##	(30-39 Gender1 Race12)	-	(40-49 Gender0 Race14)	0.151251	0.1481	2143	1.021
##	(30-39 Gender1 Race12)	-	(50-59 Gender0 Race14)	0.135018	0.1468	2143	0.920
##	(30-39 Gender1 Race12)	-	(18-29 Gender1 Race14)	-0.257002	0.1410	2143	-1.822
##	(30-39 Gender1 Race12)	-	(30-39 Gender1 Race14)	-0.174576	0.1141	2143	-1.530
##	(30-39 Gender1 Race12)	-	(40-49 Gender1 Race14)	-0.047507	0.1371	2143	-0.347
##	(30-39 Gender1 Race12)	-	(50-59 Gender1 Race14)	-0.063740	0.1363	2143	-0.468
##	(30-39 Gender1 Race12)	-	(18-29 Gender0 Race15)	0.013689	0.1801	2143	0.076
##	(30-39 Gender1 Race12)	-	(30-39 Gender0 Race15)	0.096114	0.1600	2143	0.601
##	(30-39 Gender1 Race12)	-	(40-49 Gender0 Race15)	0.223184	0.1790	2143	1.247
##	(30-39 Gender1 Race12)	-	(50-59 Gender0 Race15)	0.206950	0.1793	2143	1.154
##	(30-39 Gender1 Race12)	-	(18-29 Gender1 Race15)	-0.185069	0.1716	2143	-1.079
##	(30-39 Gender1 Race12)	-	(30-39 Gender1 Race15)	-0.102644	0.1503	2143	-0.683
##	(30-39 Gender1 Race12)	-	(40-49 Gender1 Race15)	0.024426	0.1708	2143	0.143
##	(30-39 Gender1 Race12)	-	(50-59 Gender1 Race15)	0.008193	0.1716	2143	0.048

##	(40-49 Gender1 Race12)	-	(50-59 Gender1 Race12)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender1 Race12)	-	(18-29 Gender0 Race13)	-0.246128	0.1676	2143	-1.469
##	(40-49 Gender1 Race12)	-	(30-39 Gender0 Race13)	-0.163703	0.1664	2143	-0.984
##	(40-49 Gender1 Race12)	-	(40-49 Gender0 Race13)	-0.036633	0.1467	2143	-0.250
##	(40-49 Gender1 Race12)	-	(50-59 Gender0 Race13)	-0.052866	0.1678	2143	-0.315
##	(40-49 Gender1 Race12)	-	(18-29 Gender1 Race13)	-0.444886	0.1596	2143	-2.787
##	(40-49 Gender1 Race12)	-	(30-39 Gender1 Race13)	-0.362461	0.1584	2143	-2.289
##	(40-49 Gender1 Race12)	-	(40-49 Gender1 Race13)	-0.235391	0.1380	2143	-1.705
##	(40-49 Gender1 Race12)	-	(50-59 Gender1 Race13)	-0.251624	0.1609	2143	-1.564
##	(40-49 Gender1 Race12)	-	(18-29 Gender0 Race14)	-0.185314	0.1537	2143	-1.205
##	(40-49 Gender1 Race12)	-	(30-39 Gender0 Race14)	-0.102889	0.1508	2143	-0.682
##	(40-49 Gender1 Race12)	-	(40-49 Gender0 Race14)	0.024181	0.1278	2143	0.189
##	(40-49 Gender1 Race12)	-	(50-59 Gender0 Race14)	0.007948	0.1481	2143	0.054
##	(40-49 Gender1 Race12)	-	(18-29 Gender1 Race14)	-0.384072	0.1422	2143	-2.702
##	(40-49 Gender1 Race12)	-	(30-39 Gender1 Race14)	-0.301646	0.1389	2143	-2.171
##	(40-49 Gender1 Race12)	-	(40-49 Gender1 Race14)	-0.174576	0.1141	2143	-1.530
##	(40-49 Gender1 Race12)	-	(50-59 Gender1 Race14)	-0.190810	0.1372	2143	-1.391
##	(40-49 Gender1 Race12)	-	(18-29 Gender0 Race15)	-0.113381	0.1791	2143	-0.633
##	(40-49 Gender1 Race12)	-	(30-39 Gender0 Race15)	-0.030956	0.1767	2143	-0.175
##	(40-49 Gender1 Race12)	-	(40-49 Gender0 Race15)	0.096114	0.1600	2143	0.601
##	(40-49 Gender1 Race12)	-	(50-59 Gender0 Race15)	0.079880	0.1781	2143	0.449
##	(40-49 Gender1 Race12)	-	(18-29 Gender1 Race15)	-0.312139	0.1701	2143	-1.835
##	(40-49 Gender1 Race12)	-	(30-39 Gender1 Race15)	-0.229714	0.1674	2143	-1.372
##	(40-49 Gender1 Race12)	-	(40-49 Gender1 Race15)	-0.102644	0.1503	2143	-0.683
##	(40-49 Gender1 Race12)	-	(50-59 Gender1 Race15)	-0.118877	0.1699	2143	-0.700
##	(50-59 Gender1 Race12)	-	(18-29 Gender0 Race13)	-0.229894	0.1685	2143	-1.365
##	(50-59 Gender1 Race12)	-	(30-39 Gender0 Race13)	-0.147469	0.1672	2143	-0.882
##	(50-59 Gender1 Race12)	-	(40-49 Gender0 Race13)	-0.020399	0.1667	2143	-0.122
##	(50-59 Gender1 Race12)	-	(50-59 Gender0 Race13)	-0.036633	0.1467	2143	-0.250
##	(50-59 Gender1 Race12)	-	(18-29 Gender1 Race13)	-0.428652	0.1601	2143	-2.678
##	(50-59 Gender1 Race12)	-	(30-39 Gender1 Race13)	-0.346227	0.1587	2143	-2.182
##	(50-59 Gender1 Race12)	-	(40-49 Gender1 Race13)	-0.219157	0.1586	2143	-1.381
##	(50-59 Gender1 Race12)	-	(50-59 Gender1 Race13)	-0.235391	0.1380	2143	-1.705
##	(50-59 Gender1 Race12)	-	(18-29 Gender0 Race14)	-0.169080	0.1580	2143	-1.070
##	(50-59 Gender1 Race12)	-	(30-39 Gender0 Race14)	-0.086655	0.1551	2143	-0.559
##	(50-59 Gender1 Race12)	-	(40-49 Gender0 Race14)	0.040415	0.1537	2143	0.263
##	(50-59 Gender1 Race12)	-	(50-59 Gender0 Race14)	0.024181	0.1278	2143	0.189
##	(50-59 Gender1 Race12)	-	(18-29 Gender1 Race14)	-0.367838	0.1462	2143	-2.516
##	(50-59 Gender1 Race12)	-	(30-39 Gender1 Race14)	-0.285413	0.1429	2143	-1.997
##	(50-59 Gender1 Race12)	-	(40-49 Gender1 Race14)	-0.158343	0.1420	2143	-1.115
##	(50-59 Gender1 Race12)	-	(50-59 Gender1 Race14)	-0.174576	0.1141	2143	-1.530
##	(50-59 Gender1 Race12)	-	(18-29 Gender0 Race15)	-0.097147	0.1815	2143	-0.535
##	(50-59 Gender1 Race12)	-	(30-39 Gender0 Race15)	-0.014722	0.1790	2143	-0.082
##	(50-59 Gender1 Race12)	-	(40-49 Gender0 Race15)	0.112348	0.1801	2143	0.624
##	(50-59 Gender1 Race12)	-	(50-59 Gender0 Race15)	0.096114	0.1600	2143	0.601
##	(50-59 Gender1 Race12)	-	(18-29 Gender1 Race15)	-0.295905	0.1721	2143	-1.719
##	(50-59 Gender1 Race12)	-	(30-39 Gender1 Race15)	-0.213480	0.1694	2143	-1.261
##	(50-59 Gender1 Race12)	-	(40-49 Gender1 Race15)	-0.086410	0.1710	2143	-0.505
##	(50-59 Gender1 Race12)	-	(50-59 Gender1 Race15)	-0.102644	0.1503	2143	-0.683
##	(18-29 Gender0 Race13)	-	(30-39 Gender0 Race13)	0.082425	0.0787	2143	1.047
##	(18-29 Gender0 Race13)	-	(40-49 Gender0 Race13)	0.209495	0.0791	2143	2.648
##	(18-29 Gender0 Race13)	-	(50-59 Gender0 Race13)	0.193261	0.0822	2143	2.352
##	(18-29 Gender0 Race13)	-	(18-29 Gender1 Race13)	-0.198758	0.0564	2143	-3.524
##	(18-29 Gender0 Race13)	-	(30-39 Gender1 Race13)	-0.116333	0.0967	2143	-1.203

##	(18-29 Gender0 Race13)	-	(40-49 Gender1 Race13)	0.010737	0.0978	2143	0.110
##	(18-29 Gender0 Race13)	-	(50-59 Gender1 Race13)	-0.005496	0.1012	2143	-0.054
##	(18-29 Gender0 Race13)	-	(18-29 Gender0 Race14)	0.060814	0.0938	2143	0.649
##	(18-29 Gender0 Race13)	-	(30-39 Gender0 Race14)	0.143239	0.1204	2143	1.190
##	(18-29 Gender0 Race13)	-	(40-49 Gender0 Race14)	0.270309	0.1196	2143	2.261
##	(18-29 Gender0 Race13)	-	(50-59 Gender0 Race14)	0.254076	0.1173	2143	2.166
##	(18-29 Gender0 Race13)	-	(18-29 Gender1 Race14)	-0.137944	0.1055	2143	-1.307
##	(18-29 Gender0 Race13)	-	(30-39 Gender1 Race14)	-0.055518	0.1296	2143	-0.428
##	(18-29 Gender0 Race13)	-	(40-49 Gender1 Race14)	0.071551	0.1295	2143	0.553
##	(18-29 Gender0 Race13)	-	(50-59 Gender1 Race14)	0.055318	0.1281	2143	0.432
##	(18-29 Gender0 Race13)	-	(18-29 Gender0 Race15)	0.132747	0.1353	2143	0.981
##	(18-29 Gender0 Race13)	-	(30-39 Gender0 Race15)	0.215172	0.1549	2143	1.389
##	(18-29 Gender0 Race13)	-	(40-49 Gender0 Race15)	0.342242	0.1570	2143	2.180
##	(18-29 Gender0 Race13)	-	(50-59 Gender0 Race15)	0.326008	0.1568	2143	2.079
##	(18-29 Gender0 Race13)	-	(18-29 Gender1 Race15)	-0.066011	0.1446	2143	-0.456
##	(18-29 Gender0 Race13)	-	(30-39 Gender1 Race15)	0.016414	0.1631	2143	0.101
##	(18-29 Gender0 Race13)	-	(40-49 Gender1 Race15)	0.143484	0.1655	2143	0.867
##	(18-29 Gender0 Race13)	-	(50-59 Gender1 Race15)	0.127250	0.1659	2143	0.767
##	(30-39 Gender0 Race13)	-	(40-49 Gender0 Race13)	0.127070	0.0776	2143	1.638
##	(30-39 Gender0 Race13)	-	(50-59 Gender0 Race13)	0.110836	0.0805	2143	1.377
##	(30-39 Gender0 Race13)	-	(18-29 Gender1 Race13)	-0.281183	0.0970	2143	-2.900
##	(30-39 Gender0 Race13)	-	(30-39 Gender1 Race13)	-0.198758	0.0564	2143	-3.524
##	(30-39 Gender0 Race13)	-	(40-49 Gender1 Race13)	-0.071688	0.0967	2143	-0.741
##	(30-39 Gender0 Race13)	-	(50-59 Gender1 Race13)	-0.087921	0.0999	2143	-0.880
##	(30-39 Gender0 Race13)	-	(18-29 Gender0 Race14)	-0.021611	0.1244	2143	-0.174
##	(30-39 Gender0 Race13)	-	(30-39 Gender0 Race14)	0.060814	0.0938	2143	0.649
##	(30-39 Gender0 Race13)	-	(40-49 Gender0 Race14)	0.187884	0.1206	2143	1.557
##	(30-39 Gender0 Race13)	-	(50-59 Gender0 Race14)	0.171650	0.1183	2143	1.452
##	(30-39 Gender0 Race13)	-	(18-29 Gender1 Race14)	-0.220369	0.1336	2143	-1.649
##	(30-39 Gender0 Race13)	-	(30-39 Gender1 Race14)	-0.137944	0.1055	2143	-1.307
##	(30-39 Gender0 Race13)	-	(40-49 Gender1 Race14)	-0.010874	0.1306	2143	-0.083
##	(30-39 Gender0 Race13)	-	(50-59 Gender1 Race14)	-0.027107	0.1290	2143	-0.210
##	(30-39 Gender0 Race13)	-	(18-29 Gender0 Race15)	0.050322	0.1581	2143	0.318
##	(30-39 Gender0 Race13)	-	(30-39 Gender0 Race15)	0.132747	0.1353	2143	0.981
##	(30-39 Gender0 Race13)	-	(40-49 Gender0 Race15)	0.259817	0.1578	2143	1.647
##	(30-39 Gender0 Race13)	-	(50-59 Gender0 Race15)	0.243583	0.1575	2143	1.546
##	(30-39 Gender0 Race13)	-	(18-29 Gender1 Race15)	-0.148436	0.1662	2143	-0.893
##	(30-39 Gender0 Race13)	-	(30-39 Gender1 Race15)	-0.066011	0.1446	2143	-0.456
##	(30-39 Gender0 Race13)	-	(40-49 Gender1 Race15)	0.061059	0.1663	2143	0.367
##	(30-39 Gender0 Race13)	-	(50-59 Gender1 Race15)	0.044825	0.1666	2143	0.269
##	(40-49 Gender0 Race13)	-	(50-59 Gender0 Race13)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender0 Race13)	-	(18-29 Gender1 Race13)	-0.408253	0.0965	2143	-4.230
##	(40-49 Gender0 Race13)	-	(30-39 Gender1 Race13)	-0.325828	0.0951	2143	-3.426
##	(40-49 Gender0 Race13)	-	(40-49 Gender1 Race13)	-0.198758	0.0564	2143	-3.524
##	(40-49 Gender0 Race13)	-	(50-59 Gender1 Race13)	-0.214991	0.0991	2143	-2.169
##	(40-49 Gender0 Race13)	-	(18-29 Gender0 Race14)	-0.148681	0.1257	2143	-1.183
##	(40-49 Gender0 Race13)	-	(30-39 Gender0 Race14)	-0.066256	0.1227	2143	-0.540
##	(40-49 Gender0 Race13)	-	(40-49 Gender0 Race14)	0.060814	0.0938	2143	0.649
##	(40-49 Gender0 Race13)	-	(50-59 Gender0 Race14)	0.044581	0.1193	2143	0.374
##	(40-49 Gender0 Race13)	-	(18-29 Gender1 Race14)	-0.347439	0.1342	2143	-2.588
##	(40-49 Gender0 Race13)	-	(30-39 Gender1 Race14)	-0.265014	0.1313	2143	-2.018
##	(40-49 Gender0 Race13)	-	(40-49 Gender1 Race14)	-0.137944	0.1055	2143	-1.307
##	(40-49 Gender0 Race13)	-	(50-59 Gender1 Race14)	-0.154177	0.1294	2143	-1.192
##	(40-49 Gender0 Race13)	-	(18-29 Gender0 Race15)	-0.076748	0.1564	2143	-0.491

##	(40-49 Gender0 Race13)	-	(30-39 Gender0 Race15)	0.005677	0.1541	2143	0.037
##	(40-49 Gender0 Race13)	-	(40-49 Gender0 Race15)	0.132747	0.1353	2143	0.981
##	(40-49 Gender0 Race13)	-	(50-59 Gender0 Race15)	0.116513	0.1556	2143	0.749
##	(40-49 Gender0 Race13)	-	(18-29 Gender1 Race15)	-0.275506	0.1642	2143	-1.678
##	(40-49 Gender0 Race13)	-	(30-39 Gender1 Race15)	-0.193081	0.1619	2143	-1.193
##	(40-49 Gender0 Race13)	-	(40-49 Gender1 Race15)	-0.066011	0.1446	2143	-0.456
##	(40-49 Gender0 Race13)	-	(50-59 Gender1 Race15)	-0.082244	0.1643	2143	-0.500
##	(50-59 Gender0 Race13)	-	(18-29 Gender1 Race13)	-0.392019	0.0982	2143	-3.994
##	(50-59 Gender0 Race13)	-	(30-39 Gender1 Race13)	-0.309594	0.0966	2143	-3.205
##	(50-59 Gender0 Race13)	-	(40-49 Gender1 Race13)	-0.182524	0.0973	2143	-1.875
##	(50-59 Gender0 Race13)	-	(50-59 Gender1 Race13)	-0.198758	0.0564	2143	-3.524
##	(50-59 Gender0 Race13)	-	(18-29 Gender0 Race14)	-0.132447	0.1316	2143	-1.006
##	(50-59 Gender0 Race13)	-	(30-39 Gender0 Race14)	-0.050022	0.1287	2143	-0.389
##	(50-59 Gender0 Race13)	-	(40-49 Gender0 Race14)	0.077048	0.1276	2143	0.604
##	(50-59 Gender0 Race13)	-	(50-59 Gender0 Race14)	0.060814	0.0938	2143	0.649
##	(50-59 Gender0 Race13)	-	(18-29 Gender1 Race14)	-0.331205	0.1392	2143	-2.380
##	(50-59 Gender0 Race13)	-	(30-39 Gender1 Race14)	-0.248780	0.1363	2143	-1.826
##	(50-59 Gender0 Race13)	-	(40-49 Gender1 Race14)	-0.121710	0.1358	2143	-0.896
##	(50-59 Gender0 Race13)	-	(50-59 Gender1 Race14)	-0.137944	0.1055	2143	-1.307
##	(50-59 Gender0 Race13)	-	(18-29 Gender0 Race15)	-0.060515	0.1597	2143	-0.379
##	(50-59 Gender0 Race13)	-	(30-39 Gender0 Race15)	0.021911	0.1573	2143	0.139
##	(50-59 Gender0 Race13)	-	(40-49 Gender0 Race15)	0.148980	0.1591	2143	0.936
##	(50-59 Gender0 Race13)	-	(50-59 Gender0 Race15)	0.132747	0.1353	2143	0.981
##	(50-59 Gender0 Race13)	-	(18-29 Gender1 Race15)	-0.259272	0.1668	2143	-1.554
##	(50-59 Gender0 Race13)	-	(30-39 Gender1 Race15)	-0.176847	0.1644	2143	-1.076
##	(50-59 Gender0 Race13)	-	(40-49 Gender1 Race15)	-0.049777	0.1666	2143	-0.299
##	(50-59 Gender0 Race13)	-	(50-59 Gender1 Race15)	-0.066011	0.1446	2143	-0.456
##	(18-29 Gender1 Race13)	-	(30-39 Gender1 Race13)	0.082425	0.0787	2143	1.047
##	(18-29 Gender1 Race13)	-	(40-49 Gender1 Race13)	0.209495	0.0791	2143	2.648
##	(18-29 Gender1 Race13)	-	(50-59 Gender1 Race13)	0.193261	0.0822	2143	2.352
##	(18-29 Gender1 Race13)	-	(18-29 Gender0 Race14)	0.259572	0.1132	2143	2.293
##	(18-29 Gender1 Race13)	-	(30-39 Gender0 Race14)	0.341997	0.1361	2143	2.512
##	(18-29 Gender1 Race13)	-	(40-49 Gender0 Race14)	0.469067	0.1349	2143	3.478
##	(18-29 Gender1 Race13)	-	(50-59 Gender0 Race14)	0.452833	0.1322	2143	3.425
##	(18-29 Gender1 Race13)	-	(18-29 Gender1 Race14)	0.060814	0.0938	2143	0.649
##	(18-29 Gender1 Race13)	-	(30-39 Gender1 Race14)	0.143239	0.1204	2143	1.190
##	(18-29 Gender1 Race13)	-	(40-49 Gender1 Race14)	0.270309	0.1196	2143	2.261
##	(18-29 Gender1 Race13)	-	(50-59 Gender1 Race14)	0.254076	0.1173	2143	2.166
##	(18-29 Gender1 Race13)	-	(18-29 Gender0 Race15)	0.331505	0.1485	2143	2.232
##	(18-29 Gender1 Race13)	-	(30-39 Gender0 Race15)	0.413930	0.1667	2143	2.483
##	(18-29 Gender1 Race13)	-	(40-49 Gender0 Race15)	0.541000	0.1681	2143	3.218
##	(18-29 Gender1 Race13)	-	(50-59 Gender0 Race15)	0.524766	0.1675	2143	3.134
##	(18-29 Gender1 Race13)	-	(18-29 Gender1 Race15)	0.132747	0.1353	2143	0.981
##	(18-29 Gender1 Race13)	-	(30-39 Gender1 Race15)	0.215172	0.1549	2143	1.389
##	(18-29 Gender1 Race13)	-	(40-49 Gender1 Race15)	0.342242	0.1570	2143	2.180
##	(18-29 Gender1 Race13)	-	(50-59 Gender1 Race15)	0.326008	0.1568	2143	2.079
##	(30-39 Gender1 Race13)	-	(40-49 Gender1 Race13)	0.127070	0.0776	2143	1.638
##	(30-39 Gender1 Race13)	-	(50-59 Gender1 Race13)	0.110836	0.0805	2143	1.377
##	(30-39 Gender1 Race13)	-	(18-29 Gender0 Race14)	0.177147	0.1396	2143	1.269
##	(30-39 Gender1 Race13)	-	(30-39 Gender0 Race14)	0.259572	0.1132	2143	2.293
##	(30-39 Gender1 Race13)	-	(40-49 Gender0 Race14)	0.386642	0.1357	2143	2.848
##	(30-39 Gender1 Race13)	-	(50-59 Gender0 Race14)	0.370408	0.1330	2143	2.786
##	(30-39 Gender1 Race13)	-	(18-29 Gender1 Race14)	-0.021611	0.1244	2143	-0.174
##	(30-39 Gender1 Race13)	-	(30-39 Gender1 Race14)	0.060814	0.0938	2143	0.649

##	(30-39 Gender1 Race13)	-	(40-49 Gender1 Race14)	0.187884	0.1206	2143	1.557
##	(30-39 Gender1 Race13)	-	(50-59 Gender1 Race14)	0.171650	0.1183	2143	1.452
##	(30-39 Gender1 Race13)	-	(18-29 Gender0 Race15)	0.249080	0.1694	2143	1.470
##	(30-39 Gender1 Race13)	-	(30-39 Gender0 Race15)	0.331505	0.1485	2143	2.232
##	(30-39 Gender1 Race13)	-	(40-49 Gender0 Race15)	0.458575	0.1688	2143	2.717
##	(30-39 Gender1 Race13)	-	(50-59 Gender0 Race15)	0.442341	0.1680	2143	2.633
##	(30-39 Gender1 Race13)	-	(18-29 Gender1 Race15)	0.050322	0.1581	2143	0.318
##	(30-39 Gender1 Race13)	-	(30-39 Gender1 Race15)	0.132747	0.1353	2143	0.981
##	(30-39 Gender1 Race13)	-	(40-49 Gender1 Race15)	0.259817	0.1578	2143	1.647
##	(30-39 Gender1 Race13)	-	(50-59 Gender1 Race15)	0.243583	0.1575	2143	1.546
##	(40-49 Gender1 Race13)	-	(50-59 Gender1 Race13)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender1 Race13)	-	(18-29 Gender0 Race14)	0.050077	0.1413	2143	0.354
##	(40-49 Gender1 Race13)	-	(30-39 Gender0 Race14)	0.132502	0.1387	2143	0.955
##	(40-49 Gender1 Race13)	-	(40-49 Gender0 Race14)	0.259572	0.1132	2143	2.293
##	(40-49 Gender1 Race13)	-	(50-59 Gender0 Race14)	0.243338	0.1345	2143	1.810
##	(40-49 Gender1 Race13)	-	(18-29 Gender1 Race14)	-0.148681	0.1257	2143	-1.183
##	(40-49 Gender1 Race13)	-	(30-39 Gender1 Race14)	-0.066256	0.1227	2143	-0.540
##	(40-49 Gender1 Race13)	-	(40-49 Gender1 Race14)	0.060814	0.0938	2143	0.649
##	(40-49 Gender1 Race13)	-	(50-59 Gender1 Race14)	0.044581	0.1193	2143	0.374
##	(40-49 Gender1 Race13)	-	(18-29 Gender0 Race15)	0.122010	0.1684	2143	0.725
##	(40-49 Gender1 Race13)	-	(30-39 Gender0 Race15)	0.204435	0.1663	2143	1.230
##	(40-49 Gender1 Race13)	-	(40-49 Gender0 Race15)	0.331505	0.1485	2143	2.232
##	(40-49 Gender1 Race13)	-	(50-59 Gender0 Race15)	0.315271	0.1667	2143	1.891
##	(40-49 Gender1 Race13)	-	(18-29 Gender1 Race15)	-0.076748	0.1564	2143	-0.491
##	(40-49 Gender1 Race13)	-	(30-39 Gender1 Race15)	0.005677	0.1541	2143	0.037
##	(40-49 Gender1 Race13)	-	(40-49 Gender1 Race15)	0.132747	0.1353	2143	0.981
##	(40-49 Gender1 Race13)	-	(50-59 Gender1 Race15)	0.116513	0.1556	2143	0.749
##	(50-59 Gender1 Race13)	-	(18-29 Gender0 Race14)	0.066310	0.1471	2143	0.451
##	(50-59 Gender1 Race13)	-	(30-39 Gender0 Race14)	0.148736	0.1446	2143	1.029
##	(50-59 Gender1 Race13)	-	(40-49 Gender0 Race14)	0.275805	0.1431	2143	1.927
##	(50-59 Gender1 Race13)	-	(50-59 Gender0 Race14)	0.259572	0.1132	2143	2.293
##	(50-59 Gender1 Race13)	-	(18-29 Gender1 Race14)	-0.132447	0.1316	2143	-1.006
##	(50-59 Gender1 Race13)	-	(30-39 Gender1 Race14)	-0.050022	0.1287	2143	-0.389
##	(50-59 Gender1 Race13)	-	(40-49 Gender1 Race14)	0.077048	0.1276	2143	0.604
##	(50-59 Gender1 Race13)	-	(50-59 Gender1 Race14)	0.060814	0.0938	2143	0.649
##	(50-59 Gender1 Race13)	-	(18-29 Gender0 Race15)	0.138243	0.1719	2143	0.804
##	(50-59 Gender1 Race13)	-	(30-39 Gender0 Race15)	0.220668	0.1698	2143	1.300
##	(50-59 Gender1 Race13)	-	(40-49 Gender0 Race15)	0.347738	0.1710	2143	2.034
##	(50-59 Gender1 Race13)	-	(50-59 Gender0 Race15)	0.331505	0.1485	2143	2.232
##	(50-59 Gender1 Race13)	-	(18-29 Gender1 Race15)	-0.060515	0.1597	2143	-0.379
##	(50-59 Gender1 Race13)	-	(30-39 Gender1 Race15)	0.021911	0.1573	2143	0.139
##	(50-59 Gender1 Race13)	-	(40-49 Gender1 Race15)	0.148980	0.1591	2143	0.936
##	(50-59 Gender1 Race13)	-	(50-59 Gender1 Race15)	0.132747	0.1353	2143	0.981
##	(18-29 Gender0 Race14)	-	(30-39 Gender0 Race14)	0.082425	0.0787	2143	1.047
##	(18-29 Gender0 Race14)	-	(40-49 Gender0 Race14)	0.209495	0.0791	2143	2.648
##	(18-29 Gender0 Race14)	-	(50-59 Gender0 Race14)	0.193261	0.0822	2143	2.352
##	(18-29 Gender0 Race14)	-	(18-29 Gender1 Race14)	-0.198758	0.0564	2143	-3.524
##	(18-29 Gender0 Race14)	-	(30-39 Gender1 Race14)	-0.116333	0.0967	2143	-1.203
##	(18-29 Gender0 Race14)	-	(40-49 Gender1 Race14)	0.010737	0.0978	2143	0.110
##	(18-29 Gender0 Race14)	-	(50-59 Gender1 Race14)	-0.005496	0.1012	2143	-0.054
##	(18-29 Gender0 Race14)	-	(18-29 Gender0 Race15)	0.071933	0.1108	2143	0.649
##	(18-29 Gender0 Race14)	-	(30-39 Gender0 Race15)	0.154358	0.1359	2143	1.136
##	(18-29 Gender0 Race14)	-	(40-49 Gender0 Race15)	0.281428	0.1392	2143	2.022
##	(18-29 Gender0 Race14)	-	(50-59 Gender0 Race15)	0.265194	0.1427	2143	1.859

##	(18-29 Gender0 Race14)	-	(18-29 Gender1 Race15)	-0.126825	0.1254	2143	-1.011
##	(18-29 Gender0 Race14)	-	(30-39 Gender1 Race15)	-0.044400	0.1480	2143	-0.300
##	(18-29 Gender0 Race14)	-	(40-49 Gender1 Race15)	0.082670	0.1515	2143	0.546
##	(18-29 Gender0 Race14)	-	(50-59 Gender1 Race15)	0.066436	0.1553	2143	0.428
##	(30-39 Gender0 Race14)	-	(40-49 Gender0 Race14)	0.127070	0.0776	2143	1.638
##	(30-39 Gender0 Race14)	-	(50-59 Gender0 Race14)	0.110836	0.0805	2143	1.377
##	(30-39 Gender0 Race14)	-	(18-29 Gender1 Race14)	-0.281183	0.0970	2143	-2.900
##	(30-39 Gender0 Race14)	-	(30-39 Gender1 Race14)	-0.198758	0.0564	2143	-3.524
##	(30-39 Gender0 Race14)	-	(40-49 Gender1 Race14)	-0.071688	0.0967	2143	-0.741
##	(30-39 Gender0 Race14)	-	(50-59 Gender1 Race14)	-0.087921	0.0999	2143	-0.880
##	(30-39 Gender0 Race14)	-	(18-29 Gender0 Race15)	-0.010492	0.1359	2143	-0.077
##	(30-39 Gender0 Race14)	-	(30-39 Gender0 Race15)	0.071933	0.1108	2143	0.649
##	(30-39 Gender0 Race14)	-	(40-49 Gender0 Race15)	0.199003	0.1383	2143	1.439
##	(30-39 Gender0 Race14)	-	(50-59 Gender0 Race15)	0.182769	0.1417	2143	1.290
##	(30-39 Gender0 Race14)	-	(18-29 Gender1 Race15)	-0.209250	0.1481	2143	-1.413
##	(30-39 Gender0 Race14)	-	(30-39 Gender1 Race15)	-0.126825	0.1254	2143	-1.011
##	(30-39 Gender0 Race14)	-	(40-49 Gender1 Race15)	0.000245	0.1508	2143	0.002
##	(30-39 Gender0 Race14)	-	(50-59 Gender1 Race15)	-0.015989	0.1544	2143	-0.104
##	(40-49 Gender0 Race14)	-	(50-59 Gender0 Race14)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender0 Race14)	-	(18-29 Gender1 Race14)	-0.408253	0.0965	2143	-4.230
##	(40-49 Gender0 Race14)	-	(30-39 Gender1 Race14)	-0.325828	0.0951	2143	-3.426
##	(40-49 Gender0 Race14)	-	(40-49 Gender1 Race14)	-0.198758	0.0564	2143	-3.524
##	(40-49 Gender0 Race14)	-	(50-59 Gender1 Race14)	-0.214991	0.0991	2143	-2.169
##	(40-49 Gender0 Race14)	-	(18-29 Gender0 Race15)	-0.137562	0.1330	2143	-1.034
##	(40-49 Gender0 Race14)	-	(30-39 Gender0 Race15)	-0.055137	0.1321	2143	-0.417
##	(40-49 Gender0 Race14)	-	(40-49 Gender0 Race15)	0.071933	0.1108	2143	0.649
##	(40-49 Gender0 Race14)	-	(50-59 Gender0 Race15)	0.055699	0.1386	2143	0.402
##	(40-49 Gender0 Race14)	-	(18-29 Gender1 Race15)	-0.336320	0.1450	2143	-2.320
##	(40-49 Gender0 Race14)	-	(30-39 Gender1 Race15)	-0.253895	0.1441	2143	-1.762
##	(40-49 Gender0 Race14)	-	(40-49 Gender1 Race15)	-0.126825	0.1254	2143	-1.011
##	(40-49 Gender0 Race14)	-	(50-59 Gender1 Race15)	-0.143059	0.1512	2143	-0.946
##	(50-59 Gender0 Race14)	-	(18-29 Gender1 Race14)	-0.392019	0.0982	2143	-3.994
##	(50-59 Gender0 Race14)	-	(30-39 Gender1 Race14)	-0.309594	0.0966	2143	-3.205
##	(50-59 Gender0 Race14)	-	(40-49 Gender1 Race14)	-0.182524	0.0973	2143	-1.875
##	(50-59 Gender0 Race14)	-	(50-59 Gender1 Race14)	-0.198758	0.0564	2143	-3.524
##	(50-59 Gender0 Race14)	-	(18-29 Gender0 Race15)	-0.121329	0.1331	2143	-0.912
##	(50-59 Gender0 Race14)	-	(30-39 Gender0 Race15)	-0.038904	0.1320	2143	-0.295
##	(50-59 Gender0 Race14)	-	(40-49 Gender0 Race15)	0.088166	0.1351	2143	0.652
##	(50-59 Gender0 Race14)	-	(50-59 Gender0 Race15)	0.071933	0.1108	2143	0.649
##	(50-59 Gender0 Race14)	-	(18-29 Gender1 Race15)	-0.320086	0.1444	2143	-2.216
##	(50-59 Gender0 Race14)	-	(30-39 Gender1 Race15)	-0.237661	0.1434	2143	-1.657
##	(50-59 Gender0 Race14)	-	(40-49 Gender1 Race15)	-0.110591	0.1468	2143	-0.753
##	(50-59 Gender0 Race14)	-	(50-59 Gender1 Race15)	-0.126825	0.1254	2143	-1.011
##	(18-29 Gender1 Race14)	-	(30-39 Gender1 Race14)	0.082425	0.0787	2143	1.047
##	(18-29 Gender1 Race14)	-	(40-49 Gender1 Race14)	0.209495	0.0791	2143	2.648
##	(18-29 Gender1 Race14)	-	(50-59 Gender1 Race14)	0.193261	0.0822	2143	2.352
##	(18-29 Gender1 Race14)	-	(18-29 Gender0 Race15)	0.270691	0.1232	2143	2.197
##	(18-29 Gender1 Race14)	-	(30-39 Gender0 Race15)	0.353116	0.1463	2143	2.413
##	(18-29 Gender1 Race14)	-	(40-49 Gender0 Race15)	0.480186	0.1489	2143	3.226
##	(18-29 Gender1 Race14)	-	(50-59 Gender0 Race15)	0.463952	0.1515	2143	3.062
##	(18-29 Gender1 Race14)	-	(18-29 Gender1 Race15)	0.071933	0.1108	2143	0.649
##	(18-29 Gender1 Race14)	-	(30-39 Gender1 Race15)	0.154358	0.1359	2143	1.136
##	(18-29 Gender1 Race14)	-	(40-49 Gender1 Race15)	0.281428	0.1392	2143	2.022
##	(18-29 Gender1 Race14)	-	(50-59 Gender1 Race15)	0.265194	0.1427	2143	1.859

##	(30-39 Gender1 Race14)	-	(40-49 Gender1 Race14)	0.127070	0.0776	2143	1.638
##	(30-39 Gender1 Race14)	-	(50-59 Gender1 Race14)	0.110836	0.0805	2143	1.377
##	(30-39 Gender1 Race14)	-	(18-29 Gender0 Race15)	0.188265	0.1461	2143	1.289
##	(30-39 Gender1 Race14)	-	(30-39 Gender0 Race15)	0.270691	0.1232	2143	2.197
##	(30-39 Gender1 Race14)	-	(40-49 Gender0 Race15)	0.397761	0.1479	2143	2.689
##	(30-39 Gender1 Race14)	-	(50-59 Gender0 Race15)	0.381527	0.1505	2143	2.535
##	(30-39 Gender1 Race14)	-	(18-29 Gender1 Race15)	-0.010492	0.1359	2143	-0.077
##	(30-39 Gender1 Race14)	-	(30-39 Gender1 Race15)	0.071933	0.1108	2143	0.649
##	(30-39 Gender1 Race14)	-	(40-49 Gender1 Race15)	0.199003	0.1383	2143	1.439
##	(30-39 Gender1 Race14)	-	(50-59 Gender1 Race15)	0.182769	0.1417	2143	1.290
##	(40-49 Gender1 Race14)	-	(50-59 Gender1 Race14)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender1 Race14)	-	(18-29 Gender0 Race15)	0.061195	0.1440	2143	0.425
##	(40-49 Gender1 Race14)	-	(30-39 Gender0 Race15)	0.143621	0.1433	2143	1.003
##	(40-49 Gender1 Race14)	-	(40-49 Gender0 Race15)	0.270691	0.1232	2143	2.197
##	(40-49 Gender1 Race14)	-	(50-59 Gender0 Race15)	0.254457	0.1482	2143	1.717
##	(40-49 Gender1 Race14)	-	(18-29 Gender1 Race15)	-0.137562	0.1330	2143	-1.034
##	(40-49 Gender1 Race14)	-	(30-39 Gender1 Race15)	-0.055137	0.1321	2143	-0.417
##	(40-49 Gender1 Race14)	-	(40-49 Gender1 Race15)	0.071933	0.1108	2143	0.649
##	(40-49 Gender1 Race14)	-	(50-59 Gender1 Race15)	0.055699	0.1386	2143	0.402
##	(50-59 Gender1 Race14)	-	(18-29 Gender0 Race15)	0.077429	0.1446	2143	0.535
##	(50-59 Gender1 Race14)	-	(30-39 Gender0 Race15)	0.159854	0.1438	2143	1.112
##	(50-59 Gender1 Race14)	-	(40-49 Gender0 Race15)	0.286924	0.1461	2143	1.964
##	(50-59 Gender1 Race14)	-	(50-59 Gender0 Race15)	0.270691	0.1232	2143	2.197
##	(50-59 Gender1 Race14)	-	(18-29 Gender1 Race15)	-0.121329	0.1331	2143	-0.912
##	(50-59 Gender1 Race14)	-	(30-39 Gender1 Race15)	-0.038904	0.1320	2143	-0.295
##	(50-59 Gender1 Race14)	-	(40-49 Gender1 Race15)	0.088166	0.1351	2143	0.652
##	(50-59 Gender1 Race14)	-	(50-59 Gender1 Race15)	0.071933	0.1108	2143	0.649
##	(18-29 Gender0 Race15)	-	(30-39 Gender0 Race15)	0.082425	0.0787	2143	1.047
##	(18-29 Gender0 Race15)	-	(40-49 Gender0 Race15)	0.209495	0.0791	2143	2.648
##	(18-29 Gender0 Race15)	-	(50-59 Gender0 Race15)	0.193261	0.0822	2143	2.352
##	(18-29 Gender0 Race15)	-	(18-29 Gender1 Race15)	-0.198758	0.0564	2143	-3.524
##	(18-29 Gender0 Race15)	-	(30-39 Gender1 Race15)	-0.116333	0.0967	2143	-1.203
##	(18-29 Gender0 Race15)	-	(40-49 Gender1 Race15)	0.010737	0.0978	2143	0.110
##	(18-29 Gender0 Race15)	-	(50-59 Gender1 Race15)	-0.005496	0.1012	2143	-0.054
##	(30-39 Gender0 Race15)	-	(40-49 Gender0 Race15)	0.127070	0.0776	2143	1.638
##	(30-39 Gender0 Race15)	-	(50-59 Gender0 Race15)	0.110836	0.0805	2143	1.377
##	(30-39 Gender0 Race15)	-	(18-29 Gender1 Race15)	-0.281183	0.0970	2143	-2.900
##	(30-39 Gender0 Race15)	-	(30-39 Gender1 Race15)	-0.198758	0.0564	2143	-3.524
##	(30-39 Gender0 Race15)	-	(40-49 Gender1 Race15)	-0.071688	0.0967	2143	-0.741
##	(30-39 Gender0 Race15)	-	(50-59 Gender1 Race15)	-0.087921	0.0999	2143	-0.880
##	(40-49 Gender0 Race15)	-	(50-59 Gender0 Race15)	-0.016234	0.0804	2143	-0.202
##	(40-49 Gender0 Race15)	-	(18-29 Gender1 Race15)	-0.408253	0.0965	2143	-4.230
##	(40-49 Gender0 Race15)	-	(30-39 Gender1 Race15)	-0.325828	0.0951	2143	-3.426
##	(40-49 Gender0 Race15)	-	(40-49 Gender1 Race15)	-0.198758	0.0564	2143	-3.524
##	(40-49 Gender0 Race15)	-	(50-59 Gender1 Race15)	-0.214991	0.0991	2143	-2.169
##	(50-59 Gender0 Race15)	-	(18-29 Gender1 Race15)	-0.392019	0.0982	2143	-3.994
##	(50-59 Gender0 Race15)	-	(30-39 Gender1 Race15)	-0.309594	0.0966	2143	-3.205
##	(50-59 Gender0 Race15)	-	(40-49 Gender1 Race15)	-0.182524	0.0973	2143	-1.875
##	(50-59 Gender0 Race15)	-	(50-59 Gender1 Race15)	-0.198758	0.0564	2143	-3.524
##	(18-29 Gender1 Race15)	-	(30-39 Gender1 Race15)	0.082425	0.0787	2143	1.047
##	(18-29 Gender1 Race15)	-	(40-49 Gender1 Race15)	0.209495	0.0791	2143	2.648
##	(18-29 Gender1 Race15)	-	(50-59 Gender1 Race15)	0.193261	0.0822	2143	2.352
##	(30-39 Gender1 Race15)	-	(40-49 Gender1 Race15)	0.127070	0.0776	2143	1.638
##	(30-39 Gender1 Race15)	-	(50-59 Gender1 Race15)	0.110836	0.0805	2143	1.377


```

## (40-49 Gender1 Race15) - (50-59 Gender1 Race15) -0.016234 0.0804 2143 -0.202
## p.value
## 1.0000
## 0.8028
## 0.9458
## 0.1603
## 1.0000
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## 1.0000
## 1.0000
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## 0.7927
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## 0.1062
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## 0.0020
## 0.1753
## 0.7947
## 0.7842
## 0.0114
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## 1.0000
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## 0.0825
## 0.7230
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## 0.2135
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## 0.9999
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## 0.6054
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##	0.9972
##	1.0000
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##	0.1486
##	0.4800
##	0.9675
##	0.7927
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##	0.1062
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##	0.3637
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##	1.0000
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##	0.1118
##	0.3708
##	0.9458
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## 0.9458
## 0.1603
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## 0.6054
## 0.1603
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## 0.0142
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##
## P value adjustment: tukey method for comparing a family of 40 estimates

```