Trails Analysis

## Data Wrangling

design\_matrix <- read.csv("https://raw.githubusercontent.com/ryangifford/discrete\_choice\_experiment/master/Data/design\_matrix.csv") # importing the matrix design (see matrix design file)  
  
survey <- read.csv("https://raw.githubusercontent.com/ryangifford/discrete\_choice\_experiment/master/Data/Rexburg%20Trails\_CE.csv")# %>%   
 select(c1:c9, res, id) %>%   
 pivot\_longer(cols = starts\_with("c"), names\_to = "question\_num", values\_to = "Key")  
   
   
  
  
# importing the survey data, selecting the choice experiment questions + resident status + id,   
# making each observatoin an individual row. Key is block num, question num, and alt. num.   
  
#dat <- right\_join(design\_matrix, survey, by = "Key")  
  
  
#dat2 <- dat %>%   
 # mutate(I = str\_extract(dat$Key, "^.{2}")) %>%   
 # mutate(Chose = str\_sub(dat$Key, -1))  
  
dat <- read.csv("https://raw.githubusercontent.com/ryangifford/discrete\_choice\_experiment/master/Data/FinalData.csv")

<https://stats.idre.ucla.edu/r/dae/logit-regression/>

library(dfidx)  
  
  
dat <- dat %>%   
 filter(ID != 42 & ID !=44 & ID != 46 & ID != 65)  
  
  
  
MC <- dfidx(dat, idx = c("Case", "Alternative"), drop.index = FALSE)  
  
MC <- dfidx(dat, idx = c("Case", "Alternative"), alt.levels = c(1, 2, 3))  
  
  
  
ml.MC1 <- mlogit(Choice ~ Rail + Teton + Dirt + Gravel + Paved + Dist + Cost,   
 data = MC)  
  
  
mylogit <- glm(Choice ~ Rail + Teton + Dirt + Gravel + Paved + Dist + Cost,   
 data = MC, binomial(link = "logit"))  
  
summary(mylogit)  
  
  
  
mylogit <- gmnl(Choice ~ Rail + Teton + Dirt + Gravel + Dist + Paved+ Cost,   
 data = dat2)

## Plot

ggplot(newdata3, aes(x = gre, y = PredictedProb)) + geom\_ribbon(aes(ymin = LL,  
 ymax = UL, fill = rank), alpha = 0.2) + geom\_line(aes(colour = rank),  
 size = 1)

## Math Notations

## Tables

### Choice Attribute Table

#dat <- read.csv("C:\\Users\\Ryan\\Desktop\\Choice Experiment\\discrete\_choice\_experiment\\Data\\choices.csv")   
  
dat\_att <- read.csv("https://raw.githubusercontent.com/ryangifford/discrete\_choice\_experiment/master/Data/choices.csv") # this is a .csv with the all the attributes and levels  
  
  
  
flextable(dat\_att) %>% # this creates the table in word  
 align(part = "all") %>% # left align  
 set\_caption(caption = "Rail Trail") %>%   
 font(fontname = "Times New Roman", part = "all") %>%   
 fontsize(size = 12, part = "body") %>%   
 # add footer if you want  
 # add\_footer\_row(values = "\* p < 0.05. \*\* p < 0.01. \*\*\* p < 0.001.",   
 # colwidths = 4) %>%   
 theme\_booktabs() %>% # default theme  
 autofit() %>%   
 bg(i = c(1,3,5,7,9), bg = "#F7F7F7") %>%   
 hline(i = c(3,6)) %>%   
 vline(j = 2) %>%   
 add\_header\_row(  
 values = c("Rail Trail", "Teton Trail"),  
 colwidths = c(2, 2)) %>%   
 align(align = "center", part = "header") %>%   
 line\_spacing(space = .5, part = "all")

Rail Trail

| Rail Trail | | Teton Trail | |
| --- | --- | --- | --- |
| Attributes | Levels | Attributes.1 | Levels.1 |
| Length (miles) | 0.36 | Length (miles) | 0.49 |
|  | 0.89 |  | 1.68 |
|  | 1.06 |  | 3.09 |
| Cost ($) | 20 | Cost ($) | 26 |
|  | 48 |  | 91 |
|  | 57 |  | 167 |
| Surface | Dirt | Surface | Dirt |
|  | Crushed Stone |  | Crushed Stone |
|  | Asphalt |  | Asphalt |

### Coding Table

dat\_key <- read.csv("https://raw.githubusercontent.com/ryangifford/discrete\_choice\_experiment/master/Data/Coding%20Key.csv") # this is a .csv with the all the attributes and levels  
  
  
  
flextable(dat\_key) %>% # this creates the table in word  
 align(part = "all") %>% # left align  
 set\_caption(caption = "Rail Trail") %>%   
 font(fontname = "Times New Roman", part = "all") %>%   
 fontsize(size = 12, part = "body") %>%   
 # add footer if you want  
 # add\_footer\_row(values = "\* p < 0.05. \*\* p < 0.01. \*\*\* p < 0.001.",   
 # colwidths = 4) %>%   
 theme\_booktabs() %>% # default theme  
 autofit() %>%   
 bg(i = c(1,3,5,7,9,11,13,15,17,19,21,23,25,27,29), bg = "#F7F7F7") %>%   
 hline(i = c(3,9,11,17)) %>%   
 vline(j = c(1,2,3,4,5)) %>%   
 align(align = "center", part = "header") %>%   
 line\_spacing(space = .5, part = "all")

Rail Trail

| Demographic.Variable | Mean | Std..Dev. | Coding | X..of.Sample | N |
| --- | --- | --- | --- | --- | --- |
| Resident Status |  |  | 1 = Full Time Rexburg Resident | 38.81 | 67 |
|  |  |  | 2 = BYU-Idaho Student | 49.25 |  |
|  |  |  | 3 = Other | 11.94 |  |
| Age in years | 1.92 | 1.24 | 1 = 18-24 | 53.85 | 65 |
|  |  |  | 2 = 25-34 | 20.00 |  |
|  |  |  | 3 = 35-44 | 10.77 |  |
|  |  |  | 4 = 45-54 | 12.31 |  |
|  |  |  | 5 = 55-64 | 1.54 |  |
|  |  |  | 6 = 65+ | 1.54 |  |
| Gender | 0.64 | 0.48 | 0 = Male | 34.82 | 67 |
|  |  |  | 1 = Female | 64.18 |  |
| Education (Highest Level) | 4.03 | 1.14 | 1 = Less than High School | 1.49 | 67 |
|  |  |  | 2 = High School/GED | 43.28 |  |
|  |  |  | 3 = Some College | 16.42 |  |
|  |  |  | 4 = Associates | 31.34 |  |
|  |  |  | 5 = Bachelors | 5.97 |  |
|  |  |  | 6 = Doctorate | 1.49 |  |
| Gross Annual Income | 4.48 | 3.80 | 1 = Less than $10,000 | 25.40 | 63 |
|  |  |  | 2 = $10,000 - $19,999 | 22.22 |  |
|  |  |  | 3 = $20,000 - $29,999 | 9.52 |  |
|  |  |  | 4 = $30,000 - $39,999 | 9.52 |  |
|  |  |  | 5 = $40,000 - $49,999 | 4.76 |  |
|  |  |  | 6 = $50,000 - $59,999 | 0.00 |  |
|  |  |  | 7 = $60,000 - $69,999 | 1.59 |  |
|  |  |  | 8 = $70,000 - $79,999 | 4.76 |  |
|  |  |  | 9 = $80,000 - $89,999 | 3.17 |  |
|  |  |  | 10 = $90,000 - $99,999 | 4.76 |  |
|  |  |  | 11 = $100,000 - $149,999 | 9.52 |  |
|  |  |  | 12 = More than $150,000 | 4.76 |  |

### Regression Output

dat\_reg <- read.csv("https://raw.githubusercontent.com/ryangifford/discrete\_choice\_experiment/master/Data/regression%20output%20table.csv") # this is a .csv with the all the attributes and levels  
  
  
  
flextable(dat\_reg) %>% # this creates the table in word  
 align(part = "all") %>% # left align  
 set\_caption(caption = "Rail Trail") %>%   
 font(fontname = "Times New Roman", part = "all") %>%   
 fontsize(size = 12, part = "body") %>%   
 # add footer if you want  
 # add\_footer\_row(values = "\* p < 0.05. \*\* p < 0.01. \*\*\* p < 0.001.",   
 # colwidths = 4) %>%   
 theme\_booktabs() %>% # default theme  
 autofit() %>%   
 bg(i = c(1,3,5,7,9,11,13,15), bg = "#F7F7F7") %>%   
 hline(i = 14) %>%   
 vline(j = c(1,2,3)) %>%   
 align(align = "center", part = "header") %>%   
 line\_spacing(space = .5, part = "all")

Rail Trail

| Independent.variable | Joined | Community | Student |
| --- | --- | --- | --- |
| Rail | 1.104 | 0.883 | 1.056 |
|  | 0.520 | 0.852 | 0.736 |
| Teton | 1.581 | 1.667 | 1.493 |
|  | 0.474 | 0.766 | 0.674 |
| Dirt | -0.438 | -0.558 | -0.399 |
|  | 0.384 | 0.628 | 0.549 |
| Gravel | -0.474 | -0.686 | -0.535 |
|  | 0.373 | 0.646 | 0.489 |
| Paved | 0.160 | -0.111 | 0.140 |
|  | 0.426 | 0.686 | 0.603 |
| Distance | 0.231 | 0.293 | 0.166 |
|  | 0.079 | 0.104 | 0.127 |
| Cost | -0.002 | -0.002 | -0.001 |
|  | 0.001 | 0.002 | 0.002 |
| Log likelihood | -561.00 | -218.070 | -283.210 |
| Observations | 1,794 | 696.000 | 885.000 |

dat\_wtp <- read.csv("https://raw.githubusercontent.com/ryangifford/discrete\_choice\_experiment/master/Data/regression%20output%20table%20wtp.csv") # this is a .csv with the all the attributes and levels  
  
  
  
flextable(dat\_wtp) %>% # this creates the table in word  
 align(part = "all") %>% # left align  
 set\_caption(caption = "Rail Trail") %>%   
 font(fontname = "Times New Roman", part = "all") %>%   
 fontsize(size = 12, part = "body") %>%   
 # add footer if you want  
 # add\_footer\_row(values = "\* p < 0.05. \*\* p < 0.01. \*\*\* p < 0.001.",   
 # colwidths = 4) %>%   
 theme\_booktabs() %>% # default theme  
 autofit() %>%   
 bg(i = c(1,3,5,7,9), bg = "#F7F7F7") %>%   
 hline(i = 8) %>%   
 vline(j = c(1,2,3)) %>%   
 align(align = "center", part = "header") %>%   
 line\_spacing(space = .5, part = "all")

Rail Trail

| MWTP.for. | Joined | Community | Student |
| --- | --- | --- | --- |
| Dirt | -242.732 | -266.445 | -368.665 |
|  | 240.842 | 381.122 | 664.384 |
| Gravel | -262.888 | -327.286 | -493.632 |
|  | 250.712 | 437.622 | 820.133 |
| Paved | 88.526 | -52.946 | 128.930 |
|  | 264.330 | 315.984 | 683.889 |
| Distance | 128.301 | 139.863 | 153.703 |
|  | 104.901 | 163.920 | 305.895 |
| Observations | 1,794 | 696.000 | 885.000 |