Feedback MTurk Study

Introduction

Load Data

```
d <- fread('Lungs_November+14,+2020_17.33.csv')
#head(d)
```

```
d_respondents_only <- d[ Status == "IP Address" , ]
#head(d_respondents_only)
```

```
#rename task phase questions
setnames(d_respondents_only,
         old = c('Q2', 'Q42'),
         new = c('Self_Reflect_Q1', 'Self_Reflect_Q2'))

setnames(d_respondents_only,
         old = c('Q69', 'Q89'),
         new = c('Control_Q1', 'Control_Q2'))

setnames(d_respondents_only,
         old = c('Q80', 'Q82', 'Q83', 'Q84', 'SC0', 'FL_6_DO'),
         new = c('Amazon_Turk_ID', 'Gender', 'Age_Range', 'Education_Level', 'Total_Score', 'Assignment

setnames(d_respondents_only,
         old = c('Q1', 'Q5', 'Q6', 'Q7', 'Q16', 'Q17', 'Q18', 'Q19', 'Q20', 'Q21',
                 'Q8', 'Q9', 'Q10', 'Q11', 'Q22', 'Q23', 'Q24', 'Q25', 'Q26', 'Q27',
                 'Q12', 'Q13', 'Q14', 'Q15', 'Q28', 'Q29', 'Q30', 'Q31', 'Q32', 'Q33'),
         new = c('Q1', 'Q2', 'Q3', 'Q4', 'Q5', 'Q6', 'Q7', 'Q8', 'Q9', 'Q10',
                 'Q11', 'Q12', 'Q13', 'Q14', 'Q15', 'Q16', 'Q17', 'Q18', 'Q19', 'Q20',
                 'Q21', 'Q22', 'Q23', 'Q24', 'Q25', 'Q26', 'Q27', 'Q28', 'Q29', 'Q30'))




d_respondents_only[ , c("Q1_Score", "Q2_Score", "Q3_Score", "Q4_Score", "Q5_Score",
                        "Q6_Score", "Q7_Score", "Q8_Score", "Q9_Score", "Q10_Score",
                        "Q11_Score", "Q12_Score", "Q13_Score", "Q14_Score", "Q15_Score",
                        "Q16_Score", "Q17_Score", "Q18_Score", "Q19_Score", "Q20_Score",
                        "Q21_Score", "Q22_Score", "Q23_Score", "Q24_Score", "Q25_Score", "Q26_Score",
                        "Q27_Score", "Q28_Score", "Q29_Score", "Q30_Score") :=
                    list(ifelse(Q1 == "Normal", 1, 0),
                         ifelse(Q2 == "Normal", 1, 0),
                         ifelse(Q3 == "Pneumonia", 1, 0),
                         ifelse(Q4 == "Pneumonia", 1, 0),
                         ifelse(Q5 == "Normal", 1, 0),
                         ifelse(Q6 == "Pneumonia", 1, 0),
```

```
                            ifelse(Q7 == "Pneumonia", 1, 0),
                            ifelse(Q8 == "Normal", 1, 0),
                            ifelse(Q9 == "Pneumonia", 1, 0),
                            ifelse(Q10 == "Normal", 1, 0),
                            ifelse(Q11 == "Pneumonia", 1, 0),
                            ifelse(Q12 == "Normal", 1, 0),
                            ifelse(Q13 == "Pneumonia", 1, 0),
                            ifelse(Q14 == "Pneumonia", 1, 0),
                            ifelse(Q15 == "Normal", 1, 0),
                            ifelse(Q16 == "Normal", 1, 0),
                            ifelse(Q17 == "Pneumonia", 1, 0),
                            ifelse(Q18 == "Normal", 1, 0),
                            ifelse(Q19 == "Pneumonia", 1, 0),
                            ifelse(Q20 == "Normal", 1, 0),
                            ifelse(Q21 == "Normal", 1, 0),
                            ifelse(Q22 == "Normal", 1, 0),
                            ifelse(Q23 == "Pneumonia", 1, 0),
                            ifelse(Q24 == "Normal", 1, 0),
                            ifelse(Q25 == "Pneumonia", 1, 0),
                            ifelse(Q26 == "Pneumonia", 1, 0),
                            ifelse(Q27 == "Pneumonia", 1, 0),
                            ifelse(Q28 == "Pneumonia", 1, 0),
                            ifelse(Q29 == "Normal", 1, 0),
                            ifelse(Q30 == "Normal", 1, 0))]

d_respondents_only[ , Assignment_Group := ifelse(Assignment == "FL_17", "Control",
                                          ifelse(Assignment == "FL_14", "Self-Reflect",
                                          ifelse(Assignment == "FL_15", "Medical Feedback",
                                          ifelse(Assignment == "FL_16", "Positive Images", "Negative Ima

d_respondents_only[ , c("TaskPhase1_Score", "TaskPhase2_Score", "TaskPhase3_Score") :=
                      list(sum(Q1_Score, Q2_Score, Q3_Score, Q4_Score, Q5_Score, Q6_Score, Q7_Score, Q8
                           sum(Q11_Score, Q12_Score, Q13_Score, Q14_Score, Q15_Score, Q16_Score, Q17_Sc
                           sum(Q21_Score, Q22_Score, Q23_Score, Q24_Score, Q25_Score, Q26_Score, Q27_Sc
                    by = Amazon_Turk_ID]

#head(d_respondents_only)
```

```
# ?register_google
# register_google(key = "AIzaSyCTk2a5vIEqcvgz9KmQmItoNF7J8_hiMMk")

#uses Google API to obtain location data based on longitude and latitude....dont use unless necessary f
# d_respondents_only[ , c("housenumber", "street", "city", "county", "state", "zip", "country") := revg
#
# #head(d_respondents_only)
#
#
# fwrite(d_respondents_only, file='datatable_clean_survey_responses.dta')

d_respondents <- fread('datatable_clean_survey_responses.dta')
#head(d_respondents)
```

```
#skip
```

```
# ?register_google
# register_google(key = "AIzaSyCTk2a5vIEqcvgz9KmQmItoNF7J8_hiMMk")
# ggmap_show_api_key()
#
#
# revgeocode(c(df$lon[1], df$lat[1]))
#
# d_respondents_only[ Q80 == "A1AC47WJLNW4G7", revgeocode(c(as.numeric(LocationLongitude)[1], as.numeri
# ?revgeocode
```

```
#remove duplicate Amazon Turk IDs
nrow(d_respondents)  #381 rows
```

```
## [1] 381
```

```
d_respondents <- d_respondents[ !duplicated(d_respondents$Amazon_Turk_ID) , ]  #378 rows
```

EDA

```
#some EDA

#d_respondents[ , table(state, country)]


table(d_respondents$state, d_respondents$country) %>%
        as.data.frame() %>%
        arrange(desc(Freq))
```

```
##                         Var1           Var2 Freq
## 1                  Tamil Nadu          India  120
## 2                  California  United States   82
## 3                    New York  United States   22
## 4                      Kansas  United States   21
## 5                       Texas  United States   16
## 6                     Florida  United States    9
## 7               Massachusetts  United States    7
## 8                    Michigan  United States    7
## 9                    Missouri  United States    6
## 10                Connecticut  United States    5
## 11                    Georgia  United States    5
## 12                    Indiana  United States    5
## 13                 New Jersey  United States    5
## 14                   Virginia  United States    5
## 15                   Illinois  United States    4
## 16             North Carolina  United States    4
## 17                     Kerala          India    3
## 18                Maharashtra          India    3
## 19                   Colorado  United States    3
## 20                   Kentucky  United States    3
## 21                   Maryland  United States    3
## 22                     Oregon  United States    3
## 23                    Ontario         Canada    2
## 24                    Alabama  United States    2
## 25                      Idaho  United States    2
```

```
## 26                  Minnesota  United States    2
## 27                Mississippi  United States    2
## 28                     Nevada  United States    2
## 29                       Ohio  United States    2
## 30               Pennsylvania  United States    2
## 31                 Washington  United States    2
## 32             Qarku i Tiranës        Albania    1
## 33             Khulna Division     Bangladesh    1
## 34                      Bahia         Brazil    1
## 35                    Atacama          Chile    1
## 36  Provence-Alpes-Côte d'Azur         France    1
## 37     Departamento de Olancho       Honduras    1
## 38               Andhra Pradesh          India    1
## 39                    Karnataka          India    1
## 40                     Sardegna          Italy    1
## 41                      England United Kingdom    1
## 42                      Arizona  United States    1
## 43                         Iowa  United States    1
## 44                    Louisiana  United States    1
## 45                        Maine  United States    1
## 46                     Nebraska  United States    1
## 47                     Oklahoma  United States    1
## 48                South Carolina  United States    1
## 49                  South Dakota  United States    1
## 50                     Tennessee  United States    1
## 51                       Alabama        Albania    0
## 52               Andhra Pradesh        Albania    0
## 53                      Arizona        Albania    0
## 54                      Atacama        Albania    0
## 55                        Bahia        Albania    0
## 56                   California        Albania    0
## 57                     Colorado        Albania    0
## 58                  Connecticut        Albania    0
## 59     Departamento de Olancho        Albania    0
## 60                      England        Albania    0
## 61                      Florida        Albania    0
## 62                      Georgia        Albania    0
## 63                        Idaho        Albania    0
## 64                     Illinois        Albania    0
## 65                      Indiana        Albania    0
## 66                         Iowa        Albania    0
## 67                       Kansas        Albania    0
## 68                    Karnataka        Albania    0
## 69                     Kentucky        Albania    0
## 70                       Kerala        Albania    0
## 71               Khulna Division        Albania    0
## 72                    Louisiana        Albania    0
## 73                  Maharashtra        Albania    0
## 74                        Maine        Albania    0
## 75                     Maryland        Albania    0
## 76                Massachusetts        Albania    0
## 77                     Michigan        Albania    0
## 78                    Minnesota        Albania    0
## 79                  Mississippi        Albania    0
```

```
## 80                    Missouri        Albania    0
## 81                    Nebraska        Albania    0
## 82                      Nevada        Albania    0
## 83                  New Jersey        Albania    0
## 84                    New York        Albania    0
## 85                North Carolina        Albania    0
## 86                        Ohio        Albania    0
## 87                    Oklahoma        Albania    0
## 88                     Ontario        Albania    0
## 89                      Oregon        Albania    0
## 90                  Pennsylvania        Albania    0
## 91  Provence-Alpes-Côte d'Azur        Albania    0
## 92                     Sardegna        Albania    0
## 93                South Carolina        Albania    0
## 94                  South Dakota        Albania    0
## 95                    Tamil Nadu        Albania    0
## 96                     Tennessee        Albania    0
## 97                         Texas        Albania    0
## 98                      Virginia        Albania    0
## 99                    Washington        Albania    0
## 100                     Alabama     Bangladesh    0
## 101               Andhra Pradesh     Bangladesh    0
## 102                     Arizona     Bangladesh    0
## 103                     Atacama     Bangladesh    0
## 104                       Bahia     Bangladesh    0
## 105                  California     Bangladesh    0
## 106                    Colorado     Bangladesh    0
## 107                 Connecticut     Bangladesh    0
## 108    Departamento de Olancho     Bangladesh    0
## 109                     England     Bangladesh    0
## 110                     Florida     Bangladesh    0
## 111                     Georgia     Bangladesh    0
## 112                       Idaho     Bangladesh    0
## 113                    Illinois     Bangladesh    0
## 114                     Indiana     Bangladesh    0
## 115                        Iowa     Bangladesh    0
## 116                      Kansas     Bangladesh    0
## 117                   Karnataka     Bangladesh    0
## 118                    Kentucky     Bangladesh    0
## 119                      Kerala     Bangladesh    0
## 120                   Louisiana     Bangladesh    0
## 121                 Maharashtra     Bangladesh    0
## 122                       Maine     Bangladesh    0
## 123                    Maryland     Bangladesh    0
## 124                Massachusetts     Bangladesh    0
## 125                    Michigan     Bangladesh    0
## 126                   Minnesota     Bangladesh    0
## 127                 Mississippi     Bangladesh    0
## 128                    Missouri     Bangladesh    0
## 129                    Nebraska     Bangladesh    0
## 130                      Nevada     Bangladesh    0
## 131                  New Jersey     Bangladesh    0
## 132                    New York     Bangladesh    0
## 133               North Carolina     Bangladesh    0
```

```
## 134                     Ohio     Bangladesh    0
## 135                 Oklahoma     Bangladesh    0
## 136                  Ontario     Bangladesh    0
## 137                   Oregon     Bangladesh    0
## 138             Pennsylvania     Bangladesh    0
## 139 Provence-Alpes-Côte d'Azur     Bangladesh    0
## 140            Qarku i Tiranës     Bangladesh    0
## 141                 Sardegna     Bangladesh    0
## 142           South Carolina     Bangladesh    0
## 143             South Dakota     Bangladesh    0
## 144                Tamil Nadu     Bangladesh    0
## 145                Tennessee     Bangladesh    0
## 146                    Texas     Bangladesh    0
## 147                 Virginia     Bangladesh    0
## 148               Washington     Bangladesh    0
## 149                  Alabama         Brazil    0
## 150            Andhra Pradesh         Brazil    0
## 151                  Arizona         Brazil    0
## 152                  Atacama         Brazil    0
## 153               California         Brazil    0
## 154                 Colorado         Brazil    0
## 155              Connecticut         Brazil    0
## 156   Departamento de Olancho         Brazil    0
## 157                  England         Brazil    0
## 158                  Florida         Brazil    0
## 159                  Georgia         Brazil    0
## 160                    Idaho         Brazil    0
## 161                 Illinois         Brazil    0
## 162                  Indiana         Brazil    0
## 163                     Iowa         Brazil    0
## 164                   Kansas         Brazil    0
## 165                Karnataka         Brazil    0
## 166                 Kentucky         Brazil    0
## 167                   Kerala         Brazil    0
## 168           Khulna Division         Brazil    0
## 169                Louisiana         Brazil    0
## 170              Maharashtra         Brazil    0
## 171                    Maine         Brazil    0
## 172                 Maryland         Brazil    0
## 173            Massachusetts         Brazil    0
## 174                 Michigan         Brazil    0
## 175                Minnesota         Brazil    0
## 176              Mississippi         Brazil    0
## 177                 Missouri         Brazil    0
## 178                 Nebraska         Brazil    0
## 179                   Nevada         Brazil    0
## 180               New Jersey         Brazil    0
## 181                 New York         Brazil    0
## 182           North Carolina         Brazil    0
## 183                     Ohio         Brazil    0
## 184                 Oklahoma         Brazil    0
## 185                  Ontario         Brazil    0
## 186                   Oregon         Brazil    0
## 187             Pennsylvania         Brazil    0
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## 188 Provence-Alpes-Côte d'Azur         Brazil    0
## 189             Qarku i Tiranës         Brazil    0
## 190                   Sardegna         Brazil    0
## 191              South Carolina         Brazil    0
## 192                South Dakota         Brazil    0
## 193                  Tamil Nadu         Brazil    0
## 194                   Tennessee         Brazil    0
## 195                       Texas         Brazil    0
## 196                    Virginia         Brazil    0
## 197                  Washington         Brazil    0
## 198                     Alabama         Canada    0
## 199               Andhra Pradesh         Canada    0
## 200                     Arizona         Canada    0
## 201                     Atacama         Canada    0
## 202                       Bahia         Canada    0
## 203                  California         Canada    0
## 204                    Colorado         Canada    0
## 205                 Connecticut         Canada    0
## 206    Departamento de Olancho         Canada    0
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## 210                       Idaho         Canada    0
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## 215                    Karnataka         Canada    0
## 216                    Kentucky         Canada    0
## 217                      Kerala         Canada    0
## 218             Khulna Division         Canada    0
## 219                   Louisiana         Canada    0
## 220                 Maharashtra         Canada    0
## 221                       Maine         Canada    0
## 222                    Maryland         Canada    0
## 223                Massachusetts         Canada    0
## 224                    Michigan         Canada    0
## 225                   Minnesota         Canada    0
## 226                 Mississippi         Canada    0
## 227                    Missouri         Canada    0
## 228                    Nebraska         Canada    0
## 229                      Nevada         Canada    0
## 230                  New Jersey         Canada    0
## 231                    New York         Canada    0
## 232               North Carolina         Canada    0
## 233                        Ohio         Canada    0
## 234                    Oklahoma         Canada    0
## 235                      Oregon         Canada    0
## 236                Pennsylvania         Canada    0
## 237 Provence-Alpes-Côte d'Azur         Canada    0
## 238             Qarku i Tiranës         Canada    0
## 239                   Sardegna         Canada    0
## 240              South Carolina         Canada    0
## 241                South Dakota         Canada    0
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## 242                 Tamil Nadu         Canada    0
## 243                  Tennessee         Canada    0
## 244                      Texas         Canada    0
## 245                   Virginia         Canada    0
## 246                 Washington         Canada    0
## 247                    Alabama          Chile    0
## 248              Andhra Pradesh          Chile    0
## 249                    Arizona          Chile    0
## 250                      Bahia          Chile    0
## 251                 California          Chile    0
## 252                   Colorado          Chile    0
## 253                Connecticut          Chile    0
## 254    Departamento de Olancho          Chile    0
## 255                    England          Chile    0
## 256                    Florida          Chile    0
## 257                    Georgia          Chile    0
## 258                      Idaho          Chile    0
## 259                   Illinois          Chile    0
## 260                    Indiana          Chile    0
## 261                       Iowa          Chile    0
## 262                     Kansas          Chile    0
## 263                  Karnataka          Chile    0
## 264                    Kentucky          Chile    0
## 265                     Kerala          Chile    0
## 266             Khulna Division          Chile    0
## 267                  Louisiana          Chile    0
## 268                Maharashtra          Chile    0
## 269                      Maine          Chile    0
## 270                   Maryland          Chile    0
## 271                Massachusetts          Chile    0
## 272                   Michigan          Chile    0
## 273                  Minnesota          Chile    0
## 274                Mississippi          Chile    0
## 275                   Missouri          Chile    0
## 276                   Nebraska          Chile    0
## 277                     Nevada          Chile    0
## 278                 New Jersey          Chile    0
## 279                   New York          Chile    0
## 280             North Carolina          Chile    0
## 281                       Ohio          Chile    0
## 282                   Oklahoma          Chile    0
## 283                    Ontario          Chile    0
## 284                     Oregon          Chile    0
## 285                Pennsylvania          Chile    0
## 286 Provence-Alpes-Côte d'Azur          Chile    0
## 287             Qarku i Tiranës          Chile    0
## 288                    Sardegna          Chile    0
## 289              South Carolina          Chile    0
## 290                South Dakota          Chile    0
## 291                 Tamil Nadu          Chile    0
## 292                  Tennessee          Chile    0
## 293                      Texas          Chile    0
## 294                   Virginia          Chile    0
## 295                 Washington          Chile    0
```

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## 296                  Alabama         France    0
## 297            Andhra Pradesh         France    0
## 298                  Arizona         France    0
## 299                  Atacama         France    0
## 300                    Bahia         France    0
## 301               California         France    0
## 302                 Colorado         France    0
## 303              Connecticut         France    0
## 304  Departamento de Olancho         France    0
## 305                  England         France    0
## 306                  Florida         France    0
## 307                  Georgia         France    0
## 308                    Idaho         France    0
## 309                 Illinois         France    0
## 310                  Indiana         France    0
## 311                     Iowa         France    0
## 312                   Kansas         France    0
## 313                Karnataka         France    0
## 314                 Kentucky         France    0
## 315                   Kerala         France    0
## 316          Khulna Division         France    0
## 317                Louisiana         France    0
## 318              Maharashtra         France    0
## 319                    Maine         France    0
## 320                 Maryland         France    0
## 321            Massachusetts         France    0
## 322                 Michigan         France    0
## 323                Minnesota         France    0
## 324              Mississippi         France    0
## 325                 Missouri         France    0
## 326                 Nebraska         France    0
## 327                   Nevada         France    0
## 328               New Jersey         France    0
## 329                 New York         France    0
## 330           North Carolina         France    0
## 331                     Ohio         France    0
## 332                 Oklahoma         France    0
## 333                  Ontario         France    0
## 334                   Oregon         France    0
## 335             Pennsylvania         France    0
## 336          Qarku i Tiranës         France    0
## 337                 Sardegna         France    0
## 338           South Carolina         France    0
## 339             South Dakota         France    0
## 340                Tamil Nadu         France    0
## 341                Tennessee         France    0
## 342                    Texas         France    0
## 343                 Virginia         France    0
## 344               Washington         France    0
## 345                  Alabama       Honduras    0
## 346            Andhra Pradesh       Honduras    0
## 347                  Arizona       Honduras    0
## 348                  Atacama       Honduras    0
## 349                    Bahia       Honduras    0
```

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## 350                 California       Honduras    0
## 351                   Colorado       Honduras    0
## 352                Connecticut       Honduras    0
## 353                    England       Honduras    0
## 354                    Florida       Honduras    0
## 355                    Georgia       Honduras    0
## 356                      Idaho       Honduras    0
## 357                   Illinois       Honduras    0
## 358                    Indiana       Honduras    0
## 359                       Iowa       Honduras    0
## 360                     Kansas       Honduras    0
## 361                  Karnataka       Honduras    0
## 362                   Kentucky       Honduras    0
## 363                     Kerala       Honduras    0
## 364             Khulna Division       Honduras    0
## 365                  Louisiana       Honduras    0
## 366                Maharashtra       Honduras    0
## 367                      Maine       Honduras    0
## 368                   Maryland       Honduras    0
## 369              Massachusetts       Honduras    0
## 370                   Michigan       Honduras    0
## 371                  Minnesota       Honduras    0
## 372                Mississippi       Honduras    0
## 373                   Missouri       Honduras    0
## 374                   Nebraska       Honduras    0
## 375                     Nevada       Honduras    0
## 376                 New Jersey       Honduras    0
## 377                   New York       Honduras    0
## 378              North Carolina       Honduras    0
## 379                       Ohio       Honduras    0
## 380                   Oklahoma       Honduras    0
## 381                    Ontario       Honduras    0
## 382                     Oregon       Honduras    0
## 383                Pennsylvania       Honduras    0
## 384 Provence-Alpes-Côte d'Azur       Honduras    0
## 385             Qarku i Tiranës       Honduras    0
## 386                   Sardegna       Honduras    0
## 387              South Carolina       Honduras    0
## 388                South Dakota       Honduras    0
## 389                  Tamil Nadu       Honduras    0
## 390                   Tennessee       Honduras    0
## 391                       Texas       Honduras    0
## 392                    Virginia       Honduras    0
## 393                  Washington       Honduras    0
## 394                     Alabama          India    0
## 395                     Arizona          India    0
## 396                     Atacama          India    0
## 397                       Bahia          India    0
## 398                  California          India    0
## 399                    Colorado          India    0
## 400                 Connecticut          India    0
## 401    Departamento de Olancho          India    0
## 402                     England          India    0
## 403                     Florida          India    0
```

```
## 404                   Georgia          India    0
## 405                     Idaho          India    0
## 406                  Illinois          India    0
## 407                   Indiana          India    0
## 408                      Iowa          India    0
## 409                    Kansas          India    0
## 410                  Kentucky          India    0
## 411           Khulna Division          India    0
## 412                 Louisiana          India    0
## 413                     Maine          India    0
## 414                  Maryland          India    0
## 415             Massachusetts          India    0
## 416                  Michigan          India    0
## 417                 Minnesota          India    0
## 418               Mississippi          India    0
## 419                  Missouri          India    0
## 420                  Nebraska          India    0
## 421                    Nevada          India    0
## 422                New Jersey          India    0
## 423                  New York          India    0
## 424            North Carolina          India    0
## 425                      Ohio          India    0
## 426                  Oklahoma          India    0
## 427                   Ontario          India    0
## 428                    Oregon          India    0
## 429              Pennsylvania          India    0
## 430 Provence-Alpes-Côte d'Azur          India    0
## 431            Qarku i Tiranës          India    0
## 432                  Sardegna          India    0
## 433            South Carolina          India    0
## 434              South Dakota          India    0
## 435                 Tennessee          India    0
## 436                     Texas          India    0
## 437                  Virginia          India    0
## 438                Washington          India    0
## 439                   Alabama          Italy    0
## 440            Andhra Pradesh          Italy    0
## 441                   Arizona          Italy    0
## 442                   Atacama          Italy    0
## 443                     Bahia          Italy    0
## 444                California          Italy    0
## 445                  Colorado          Italy    0
## 446               Connecticut          Italy    0
## 447   Departamento de Olancho          Italy    0
## 448                   England          Italy    0
## 449                   Florida          Italy    0
## 450                   Georgia          Italy    0
## 451                     Idaho          Italy    0
## 452                  Illinois          Italy    0
## 453                   Indiana          Italy    0
## 454                      Iowa          Italy    0
## 455                    Kansas          Italy    0
## 456                 Karnataka          Italy    0
## 457                   Kentucky          Italy    0
```

```
## 458                    Kerala          Italy    0
## 459            Khulna Division          Italy    0
## 460                 Louisiana          Italy    0
## 461               Maharashtra          Italy    0
## 462                     Maine          Italy    0
## 463                  Maryland          Italy    0
## 464             Massachusetts          Italy    0
## 465                  Michigan          Italy    0
## 466                 Minnesota          Italy    0
## 467               Mississippi          Italy    0
## 468                  Missouri          Italy    0
## 469                  Nebraska          Italy    0
## 470                    Nevada          Italy    0
## 471                New Jersey          Italy    0
## 472                  New York          Italy    0
## 473            North Carolina          Italy    0
## 474                      Ohio          Italy    0
## 475                  Oklahoma          Italy    0
## 476                   Ontario          Italy    0
## 477                    Oregon          Italy    0
## 478              Pennsylvania          Italy    0
## 479 Provence-Alpes-Côte d'Azur          Italy    0
## 480            Qarku i Tiranës          Italy    0
## 481             South Carolina          Italy    0
## 482               South Dakota          Italy    0
## 483                 Tamil Nadu          Italy    0
## 484                  Tennessee          Italy    0
## 485                      Texas          Italy    0
## 486                   Virginia          Italy    0
## 487                 Washington          Italy    0
## 488                    Alabama United Kingdom    0
## 489             Andhra Pradesh United Kingdom    0
## 490                    Arizona United Kingdom    0
## 491                    Atacama United Kingdom    0
## 492                      Bahia United Kingdom    0
## 493                 California United Kingdom    0
## 494                   Colorado United Kingdom    0
## 495                Connecticut United Kingdom    0
## 496    Departamento de Olancho United Kingdom    0
## 497                    Florida United Kingdom    0
## 498                    Georgia United Kingdom    0
## 499                      Idaho United Kingdom    0
## 500                   Illinois United Kingdom    0
## 501                    Indiana United Kingdom    0
## 502                       Iowa United Kingdom    0
## 503                     Kansas United Kingdom    0
## 504                   Karnataka United Kingdom    0
## 505                    Kentucky United Kingdom    0
## 506                      Kerala United Kingdom    0
## 507            Khulna Division United Kingdom    0
## 508                 Louisiana United Kingdom    0
## 509               Maharashtra United Kingdom    0
## 510                     Maine United Kingdom    0
## 511                  Maryland United Kingdom    0
```

```
## 512              Massachusetts United Kingdom    0
## 513                   Michigan United Kingdom    0
## 514                  Minnesota United Kingdom    0
## 515                Mississippi United Kingdom    0
## 516                   Missouri United Kingdom    0
## 517                   Nebraska United Kingdom    0
## 518                     Nevada United Kingdom    0
## 519                 New Jersey United Kingdom    0
## 520                   New York United Kingdom    0
## 521             North Carolina United Kingdom    0
## 522                       Ohio United Kingdom    0
## 523                   Oklahoma United Kingdom    0
## 524                    Ontario United Kingdom    0
## 525                     Oregon United Kingdom    0
## 526               Pennsylvania United Kingdom    0
## 527 Provence-Alpes-Côte d'Azur United Kingdom    0
## 528            Qarku i Tiranës United Kingdom    0
## 529                   Sardegna United Kingdom    0
## 530             South Carolina United Kingdom    0
## 531               South Dakota United Kingdom    0
## 532                 Tamil Nadu United Kingdom    0
## 533                  Tennessee United Kingdom    0
## 534                      Texas United Kingdom    0
## 535                   Virginia United Kingdom    0
## 536                 Washington United Kingdom    0
## 537             Andhra Pradesh  United States    0
## 538                    Atacama  United States    0
## 539                      Bahia  United States    0
## 540    Departamento de Olancho  United States    0
## 541                    England  United States    0
## 542                  Karnataka  United States    0
## 543                     Kerala  United States    0
## 544            Khulna Division  United States    0
## 545                Maharashtra  United States    0
## 546                    Ontario  United States    0
## 547 Provence-Alpes-Côte d'Azur  United States    0
## 548            Qarku i Tiranës  United States    0
## 549                   Sardegna  United States    0
## 550                 Tamil Nadu  United States    0
```

```
table(d_respondents$country) %>%
       as.data.frame() %>%
       arrange(desc(Freq))
```

```
##              Var1 Freq
## 1   United States  240
## 2           India  128
## 3          Canada    2
## 4         Albania    1
## 5      Bangladesh    1
## 6          Brazil    1
## 7           Chile    1
## 8          France    1
## 9        Honduras    1
## 10          Italy    1
```

```
## 11 United Kingdom    1
```

```
table(d_respondents$Total_Score) %>%
  as.data.frame() %>%
  arrange(desc(Var1))
```

```
##    Var1 Freq
## 1    27    1
## 2    26    1
## 3    25    4
## 4    24   13
## 5    23   15
## 6    22   16
## 7    21   23
## 8    20   27
## 9    19   21
## 10   18   32
## 11   17   40
## 12   16   40
## 13   15   46
## 14   14   31
## 15   13   19
## 16   12   19
## 17   11   13
## 18   10   13
## 19    9    3
## 20    8    1
```

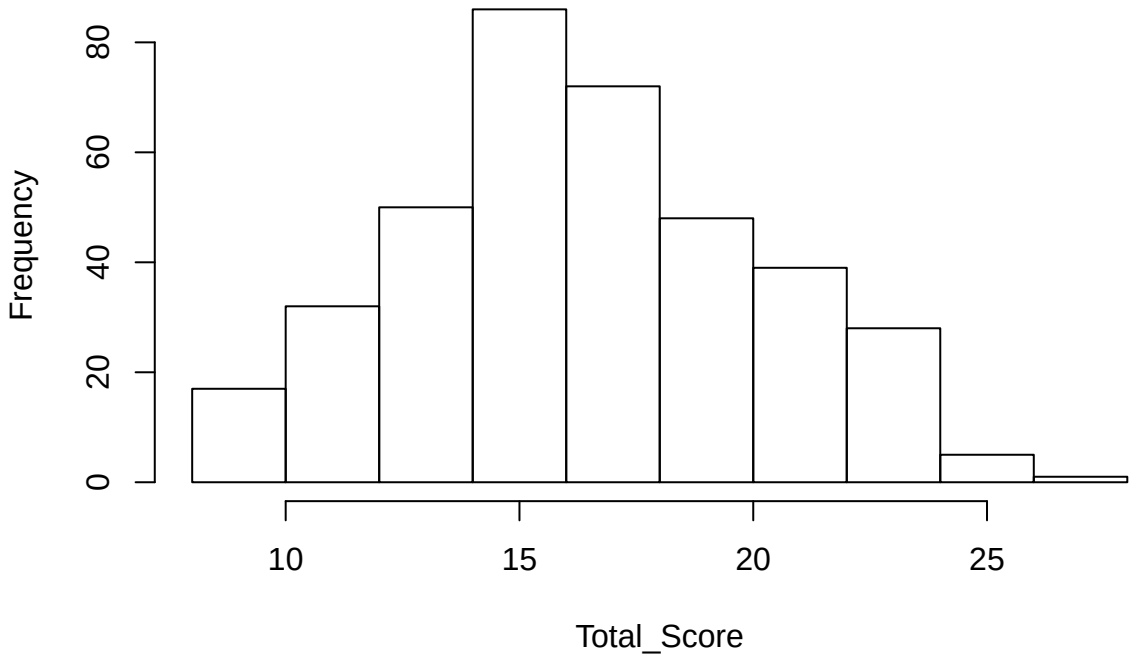
```
d_respondents %>%
  group_by(Assignment_Group) %>%
  summarise(mean = mean(Total_Score),
            count = n(),
            time_duration = mean(`Duration (in seconds)`))
```

```
## `summarise()` ungrouping output (override with `.groups` argument)
```

```
## # A tibble: 5 x 4
##   Assignment_Group  mean count time_duration
##   <chr>            <dbl> <int>         <dbl>
## 1 Control           16.4    76          623.
## 2 Medical Feedback  17.6    76          646.
## 3 Negative Images   16.5    77          772.
## 4 Positive Images   17.0    76          514.
## 5 Self-Reflect      17.0    73          609.
```

```
#d_respondents[ , .(count = .N, avg = mean(Total_Score)), by=Assignment_Group] #same thing

d_respondents[ , hist(Total_Score)]
```




```
## $breaks
##  [1]  8 10 12 14 16 18 20 22 24 26 28
##
## $counts
##  [1] 17 32 50 86 72 48 39 28  5  1
##
## $density
##  [1] 0.022486772 0.042328042 0.066137566 0.113756614 0.095238095 0.063492063
##  [7] 0.051587302 0.037037037 0.006613757 0.001322751
##
## $mids
##  [1]  9 11 13 15 17 19 21 23 25 27
##
## $xname
## [1] "Total_Score"
##
## $equidist
## [1] TRUE
##
## attr(,"class")
## [1] "histogram"
```

```
tapply(d_respondents$Total_Score, d_respondents$Assignment_Group, summary)
```

```
## $Control
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    8.00   14.00   16.00   16.41   19.00   24.00
##
## $`Medical Feedback`
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
```

```
##   10.00   15.00   17.00   17.61   20.00   24.00
##
## $`Negative Images`
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    9.00   14.00   16.00   16.45   19.00   25.00
##
## $`Positive Images`
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    9.00   14.00   17.00   17.04   20.00   27.00
##
## $`Self-Reflect`
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    9.00   14.00   17.00   16.99   20.00   25.00
```

```
tapply(d_respondents$Total_Score, d_respondents$Assignment_Group, sd)
```

```
##          Control Medical Feedback  Negative Images  Positive Images
##         3.666707         3.417909         3.881622         3.930872
##     Self-Reflect
##         3.970352
```

```
d_respondents[ , sd(Total_Score)]
```

```
## [1] 3.783594
```

Randomization Check

```
#http://www.sthda.com/english/wiki/chi-square-goodness-of-fit-test-in-r

respondent_counts <- d_respondents[ , .(.N), keyby=Assignment_Group][,2]

respondent_counts_chisq_test <- chisq.test(respondent_counts, p=c(1/5, 1/5, 1/5, 1/5, 1/5))

respondent_counts_chisq_test
```

```
##
##  Chi-squared test for given probabilities
##
## data:  respondent_counts
## X-squared = 0.12169, df = 4, p-value = 0.9982
```

```
#p-value = 0.9982, which is greater than significance level of 0.05.
#We can conclude that the observed proportions are not significantly different from the expected propor
```

Covariate Balance Check

```
d_respondents %>%
  group_by(Assignment_Group) %>%
  summarise(num_respondents = n(),
            pre_treatment_avg = mean(TaskPhase1_Score),
            taskphase2_avg = mean(TaskPhase2_Score),
            taskphase3_avg = mean(TaskPhase3_Score))
```

```
## `summarise()` ungrouping output (override with `.groups` argument)
```

```
## # A tibble: 5 x 5
```

```
##   Assignment_Group num_respondents pre_treatment_a~ taskphase2_avg
##   <chr>                      <int>            <dbl>          <dbl>
## 1 Control                       76             5.95           4.55
## 2 Medical Feedback              76             6.41           5.32
## 3 Negative Images               77             5.71           4.91
## 4 Positive Images               76             6.16           5.13
## 5 Self-Reflect                  73             5.90           5.16
## # ... with 1 more variable: taskphase3_avg <dbl>
```

```
#check balance between age-range, education, age

d_respondents[ , table(Assignment_Group, Gender)]
```

```
##                   Gender
## Assignment_Group   Female Male
##   Control              27   49
##   Medical Feedback     31   45
##   Negative Images      31   46
##   Positive Images      31   45
##   Self-Reflect         30   43
```

```
d_respondents[ , table(Assignment_Group, Age_Range)]
```

```
##                   Age_Range
## Assignment_Group   18-24 25-34 35-44 45-54 55-64 Above 65
##   Control              5    39    14     8     9        1
##   Medical Feedback     5    40    16     7     6        2
##   Negative Images      4    41    16     9     7        0
##   Positive Images      4    34    21     6    11        0
##   Self-Reflect         4    37    10    12     9        1
```

```
d_respondents[ , table(Assignment_Group, Education_Level)]
```

```
##                   Education_Level
## Assignment_Group   Associate's degree Bachelor's degree High school
##   Control                           3                47           1
##   Medical Feedback                  0                59           1
##   Negative Images                   2                54           3
##   Positive Images                   4                50           0
##   Self-Reflect                      4                49           7
##                   Education_Level
## Assignment_Group   Master's degree and above Some high school Trade school
##   Control                                 22                2            1
##   Medical Feedback                        15                0            1
##   Negative Images                         14                1            3
##   Positive Images                         20                0            2
##   Self-Reflect                            12                0            1
```

```
#let's consider adding age bins and education bins

d_respondents[ Age_Range == "18-24", age_bin := 1]
d_respondents[ Age_Range == "25-34", age_bin := 2]
d_respondents[ Age_Range == "35-44", age_bin := 3]
d_respondents[ Age_Range == "45-54", age_bin := 4]
d_respondents[ Age_Range == "55-64", age_bin := 5]
d_respondents[ Age_Range == "Above 65", age_bin := 6]
```

```
d_respondents[ Education_Level == "Associate's degree", edu_bin := 1]
d_respondents[ Education_Level == "Bachelor's degree", edu_bin := 2]
d_respondents[ Education_Level == "High school", edu_bin := 3]
d_respondents[ Education_Level == "Master's degree and above", edu_bin := 4]
d_respondents[ Education_Level == "Some high school", edu_bin := 5]
d_respondents[ Education_Level == "Trade school", edu_bin := 6]

d_respondents[ Assignment_Group == "Control", assign_bin := 1]
d_respondents[ Assignment_Group == "Medical Feedback", assign_bin := 2]
d_respondents[ Assignment_Group == "Negative Images", assign_bin := 3]
d_respondents[ Assignment_Group == "Positive Images", assign_bin := 4]
d_respondents[ Assignment_Group == "Self-Reflect", assign_bin := 5]

#head(d_respondents)
```

```
d_respondents[ , Treatment_Dummy := ifelse(Assignment_Group != "Control", 1, 0)]
#head(d_respondents)
```

```
d_respondents[ Treatment_Dummy == 1, mean(Total_Score)] - d_respondents[ Treatment_Dummy == 0, mean(Tota
```

```
## [1] 0.6119728
```

```
sd(d_respondents$Total_Score)
```

```
## [1] 3.783594
```

```
d_respondents[ , lm(Total_Score ~ Education_Level)]
```

```
##
## Call:
## lm(formula = Total_Score ~ Education_Level)
##
## Coefficients:
##                                (Intercept)
##                                   19.15385
##         Education_LevelBachelor's degree
##                                   -2.48975
##               Education_LevelHigh school
##                                    0.09615
## Education_LevelMaster's degree and above
##                                   -2.34662
##          Education_LevelSome high school
##                                   -3.15385
##              Education_LevelTrade school
##                                   -0.65385
```

```
d_respondents[ , ivreg(Total_Score ~ Education_Level | Assignment_Group)]
```

```
## Warning in ivreg.fit(X, Y, Z, weights, offset, ...): more regressors than
## instruments
```

```
##
## Call:
## ivreg(formula = Total_Score ~ Education_Level | Assignment_Group)
##
## Coefficients:
##                                (Intercept)
```

```
##                                   5.097
##         Education_LevelBachelor's degree
##                                  11.909
##               Education_LevelHigh school
##                                  13.868
## Education_LevelMaster's degree and above
##                                  15.609
##          Education_LevelSome high school
##                                 -28.680
##              Education_LevelTrade school
##                                      NA
```

```
power.t.test( delta = 1.2, sd=3.78, sig.level = 0.05, power=0.8)
```

```
##
##      Two-sample t test power calculation
##
##               n = 156.7272
##           delta = 1.2
##              sd = 3.78
##       sig.level = 0.05
##           power = 0.8
##     alternative = two.sided
##
## NOTE: n is number in *each* group
```

Analysis

```
#does treatment have an effect on total score?

mod1 <- d_respondents[, lm(Total_Score ~ Treatment_Dummy)]
#summary(mod1)
#confint(mod1 )[2,]  #CI w/o RSE

mod1$vcovHC_ <- vcovHC(mod1)
stargazer(mod1, se = list(sqrt(diag(mod1$vcovHC_))), type='text')
```

```
##
## ================================================
##                         Dependent variable:
##                     ---------------------------
##                              Total_Score
## ------------------------------------------------
## Treatment_Dummy                0.612
##                               (0.477)
##
## Constant                     16.408***
##                               (0.423)
##
## ------------------------------------------------
## Observations                   378
## R2                            0.004
## Adjusted R2                   0.002
## Residual Std. Error      3.781 (df = 376)
```

```
## F Statistic             1.591 (df = 1; 376)
## ================================================
## Note:               *p<0.1; **p<0.05; ***p<0.01
```

```
#does treatment and pretreatment score have an effect on total score?

mod2 <- d_respondents[, lm(Total_Score ~ Treatment_Dummy + TaskPhase1_Score)]


mod2$vcovHC_ <- vcovHC(mod2)
stargazer(mod2, se = list(sqrt(diag(mod2$vcovHC_))), type='text')
```

```
##
## ================================================
##                         Dependent variable:
##                     ---------------------------
##                              Total_Score
## ------------------------------------------------
## Treatment_Dummy                0.476
##                               (0.325)
##
## TaskPhase1_Score             1.374***
##                               (0.111)
##
## Constant                     8.238***
##                               (0.708)
##
## ------------------------------------------------
## Observations                    378
## R2                             0.493
## Adjusted R2                    0.490
## Residual Std. Error       2.702 (df = 375)
## F Statistic          182.159*** (df = 2; 375)
## ================================================
## Note:               *p<0.1; **p<0.05; ***p<0.01
```

```
# does treatment have an effect on task phase 2 score?

mod3 <- d_respondents[, lm(TaskPhase2_Score ~ Treatment_Dummy)]


mod3$vcovHC_ <- vcovHC(mod3)
stargazer(mod3, se = list(sqrt(diag(mod3$vcovHC_))), type='text')
```

```
##
## ================================================
##                         Dependent variable:
##                     ---------------------------
##                           TaskPhase2_Score
## ------------------------------------------------
## Treatment_Dummy              0.577***
##                               (0.211)
##
## Constant                     4.553***
##                               (0.185)
##
```

```
## ------------------------------------------------
## Observations                     378
## R2                              0.018
## Adjusted R2                     0.015
## Residual Std. Error       1.736 (df = 376)
## F Statistic            6.699** (df = 1; 376)
## ================================================
## Note:                *p<0.1; **p<0.05; ***p<0.01
```

```
#does the treatment group have an effect on task phase 2 score?

mod4 <- d_respondents[, lm(TaskPhase2_Score ~ as.factor(Assignment_Group))]


mod4$vcovHC_ <- vcovHC(mod4)
stargazer(mod4, se = list(sqrt(diag(mod4$vcovHC_))), type='text')
```

```
##
## ===============================================================================
##                                                  Dependent variable:
##                                              ---------------------------
##                                                     TaskPhase2_Score
## -------------------------------------------------------------------------------
## as.factor(Assignment_Group)Medical Feedback           0.763***
##                                                        (0.291)
##
## as.factor(Assignment_Group)Negative Images             0.356
##                                                        (0.254)
##
## as.factor(Assignment_Group)Positive Images             0.579**
##                                                        (0.286)
##
## as.factor(Assignment_Group)Self-Reflect                0.612**
##                                                        (0.272)
##
## Constant                                              4.553***
##                                                        (0.185)
##
## -------------------------------------------------------------------------------
## Observations                                             378
## R2                                                      0.023
## Adjusted R2                                             0.013
## Residual Std. Error                               1.738 (df = 373)
## F Statistic                                     2.206* (df = 4; 373)
## ===============================================================================
## Note:                                          *p<0.1; **p<0.05; ***p<0.01
```

```
# Do you think that there are features of the data that might systematically predict that people will r

mod5 <- d_respondents[, lm(TaskPhase2_Score ~ Treatment_Dummy + as.factor(assign_bin) +
                             Treatment_Dummy * as.factor(assign_bin))]


mod5$vcovHC_ <- vcovHC(mod5)
stargazer(mod5, se = list(sqrt(diag(mod5$vcovHC_))), type='text')
```

```
##
## ===================================================================
##                                          Dependent variable:
##                                      ---------------------------
##                                            TaskPhase2_Score
## -------------------------------------------------------------------
## Treatment_Dummy                                0.612**
##                                                (0.272)
##
## as.factor(assign_bin)2                          0.151
##                                                (0.301)
##
## as.factor(assign_bin)3                         -0.255
##                                                (0.264)
##
## as.factor(assign_bin)4                         -0.033
##                                                (0.296)
##
## as.factor(assign_bin)5
##
##
## Treatment_Dummy:as.factor(assign_bin)2
##
##
## Treatment_Dummy:as.factor(assign_bin)3
##
##
## Treatment_Dummy:as.factor(assign_bin)4
##
##
## Treatment_Dummy:as.factor(assign_bin)5
##
##
## Constant                                      4.553***
##                                                (0.185)
##
## -------------------------------------------------------------------
## Observations                                     378
## R2                                              0.023
## Adjusted R2                                     0.013
## Residual Std. Error                       1.738 (df = 373)
## F Statistic                              2.206* (df = 4; 373)
## ===================================================================
## Note:                                  *p<0.1; **p<0.05; ***p<0.01
```

Task Phase 3 Analysis

```r
# test final task and treatment
get_robust_se <- function(model){
  # Get robust SE for use in stargazer
  vcov <- vcovHC(model)
  return(sqrt(diag(vcov)))
}
```

```r
mod_task3_a <- d_respondents[, lm(TaskPhase3_Score ~ Treatment_Dummy)]
mod_task3_b <- d_respondents[, lm(TaskPhase3_Score ~ Treatment_Dummy +
                                    TaskPhase1_Score + as.factor(Gender) + as.factor(Education_Level) +

stargazer(mod_task3_a,
          mod_task3_b,
          se = list(get_robust_se(mod_task3_a),get_robust_se(mod_task3_b)),
          omit = c("Education_Level","Age_Range"),
          add.lines = list(c('Education Fixed Effects', 'No','Yes'),
                           c('Age Fixed Effects','No','Yes')),
          type='text')
```

```
##
## ===============================================================
##                                   Dependent variable:
##                           ------------------------------------
##                                    TaskPhase3_Score
##                                (1)                  (2)
## ---------------------------------------------------------------
## Treatment_Dummy               0.115                0.106
##                              (0.184)              (0.187)
##
## TaskPhase1_Score                                  0.213***
##                                                   (0.064)
##
## as.factor(Gender)Male                             -0.011
##                                                   (0.165)
##
## Constant                    5.316***             4.508***
##                              (0.156)              (0.753)
##
## ---------------------------------------------------------------
## Education Fixed Effects         No                   Yes
## Age Fixed Effects               No                   Yes
## Observations                    378                  378
## R2                             0.001                0.100
## Adjusted R2                   -0.002                0.068
## Residual Std. Error      1.638 (df = 376)     1.580 (df = 364)
## F Statistic            0.298 (df = 1; 376) 3.102*** (df = 13; 364)
## ===============================================================
## Note:                                  *p<0.1; **p<0.05; ***p<0.01
```

```r
mod_task3_c <- d_respondents[, lm(TaskPhase3_Score ~ as.factor(Assignment_Group))]
mod_task3_d <- d_respondents[, lm(TaskPhase3_Score ~ as.factor(Assignment_Group) +
                                    TaskPhase1_Score + as.factor(Gender) + as.factor(Education_Level) +

stargazer(mod_task3_c,
          mod_task3_d,
          se = list(get_robust_se(mod_task3_c),get_robust_se(mod_task3_d)),
          omit = c("Education_Level","Age_Range"),
          add.lines = list(c('Education Fixed Effects', 'No','Yes'),
                           c('Age Fixed Effects','No','Yes')),
          type='text')
```

```
##
## ================================================================================================
##                                                          Dependent variable:
##                                                 ---------------------------------------
##                                                              TaskPhase3_Score
##                                                       (1)                    (2)
## ------------------------------------------------------------------------------------------------
## as.factor(Assignment_Group)Medical Feedback          0.368                  0.252
##                                                     (0.264)                (0.255)
##
## as.factor(Assignment_Group)Negative Images          -0.043                  0.035
##                                                     (0.257)                (0.254)
##
## as.factor(Assignment_Group)Positive Images          0.026                  0.058
##                                                     (0.238)                (0.240)
##
## as.factor(Assignment_Group)Self-Reflect             0.109                  0.083
##                                                     (0.245)                (0.257)
##
## TaskPhase1_Score                                                           0.208***
##                                                                            (0.062)
##
## as.factor(Gender)Male                                                      -0.009
##                                                                            (0.166)
##
## Constant                                           5.316***               4.568***
##                                                     (0.156)                (0.743)
##
## ------------------------------------------------------------------------------------------------
## Education Fixed Effects                               No                     Yes
## Age Fixed Effects                                     No                     Yes
## Observations                                          378                    378
## R2                                                   0.008                  0.102
## Adjusted R2                                         -0.003                  0.062
## Residual Std. Error                          1.638 (df = 373)       1.585 (df = 361)
## F Statistic                                 0.764 (df = 4; 373) 2.559*** (df = 16; 361)
## ================================================================================================
## Note:                                                          *p<0.1; **p<0.05; ***p<0.01
```

```
# qmplot(LocationLongitude, LocationLatitude, data = d_respondents, geom = "blank",
#   zoom = 1, maptype = "toner-background", darken = .7, legend = "topleft")
# # ) +
# #   stat_density_2d(aes(fill = ..level..), geom = "polygon", alpha = .3, color = NA) +
# #   scale_fill_gradient2("Robbery\nPropensity", low = "white", mid = "yellow", high = "red", midpoint
#
# d_respondents[ , qmplot(LocationLongitude, LocationLatitude, geom="blank", zoom = 1)]
```