

# Resubmit Caregiving

This document responds to some questions raised by reviewers during the review process. You will need to get the private metadata csv file from the BabbleCor authors (and our data) in order to reproduce these results.

The reviewers expressed surprise at the lack of significant results in the analysis of caregiving experience so we examined the issue further.

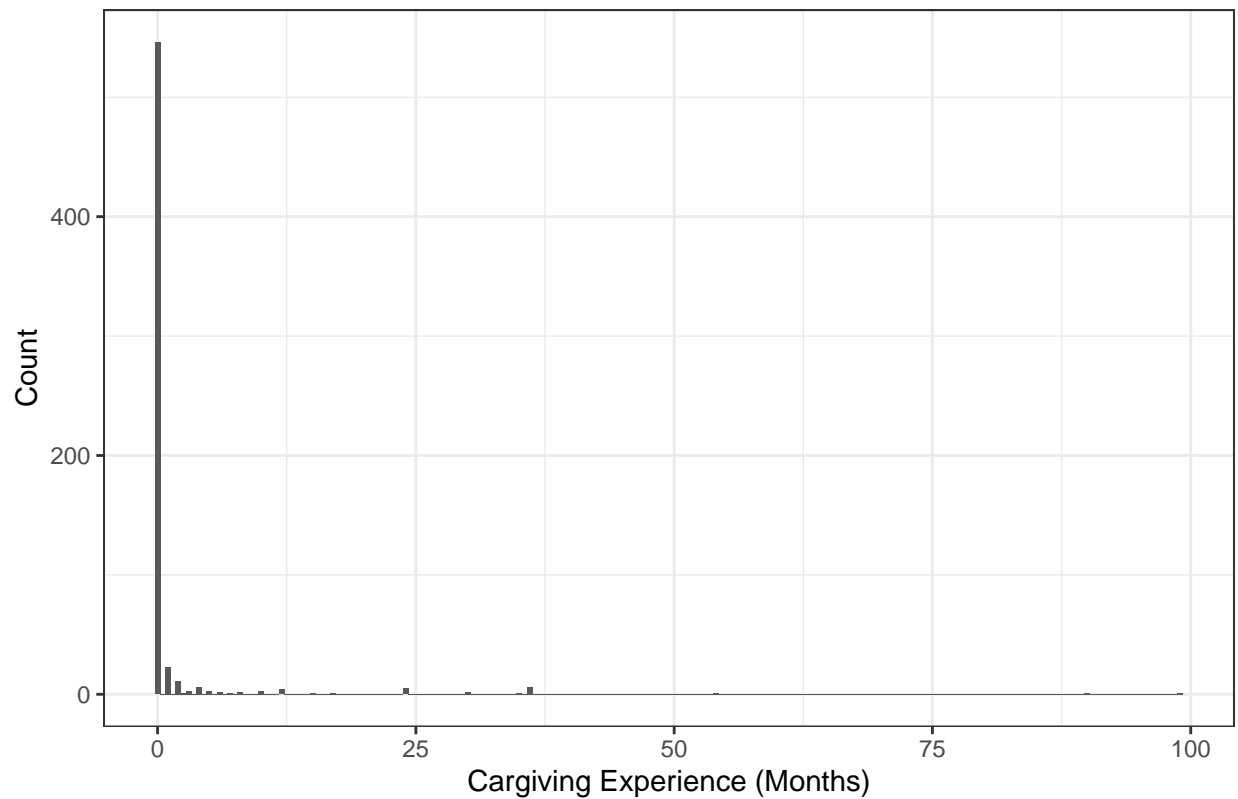
Firstly we present the distribution of caregiving and childcare experience reported by the participants. We also present another histogram eliminating those with 0 months experience.

```
sum_data <- read.csv(here::here("data","summarized_data.csv"))

ggplot(sum_data, aes(caregiver))+
  geom_histogram(binwidth = .5)+
  xlab("Cargiving Experience (Months)")+
  ylab("Count")+
  labs(title = "Histogram of Caregiving Experience")+
  theme_bw()
```

```
## Warning: Removed 2 rows containing non-finite values (stat_bin).
```

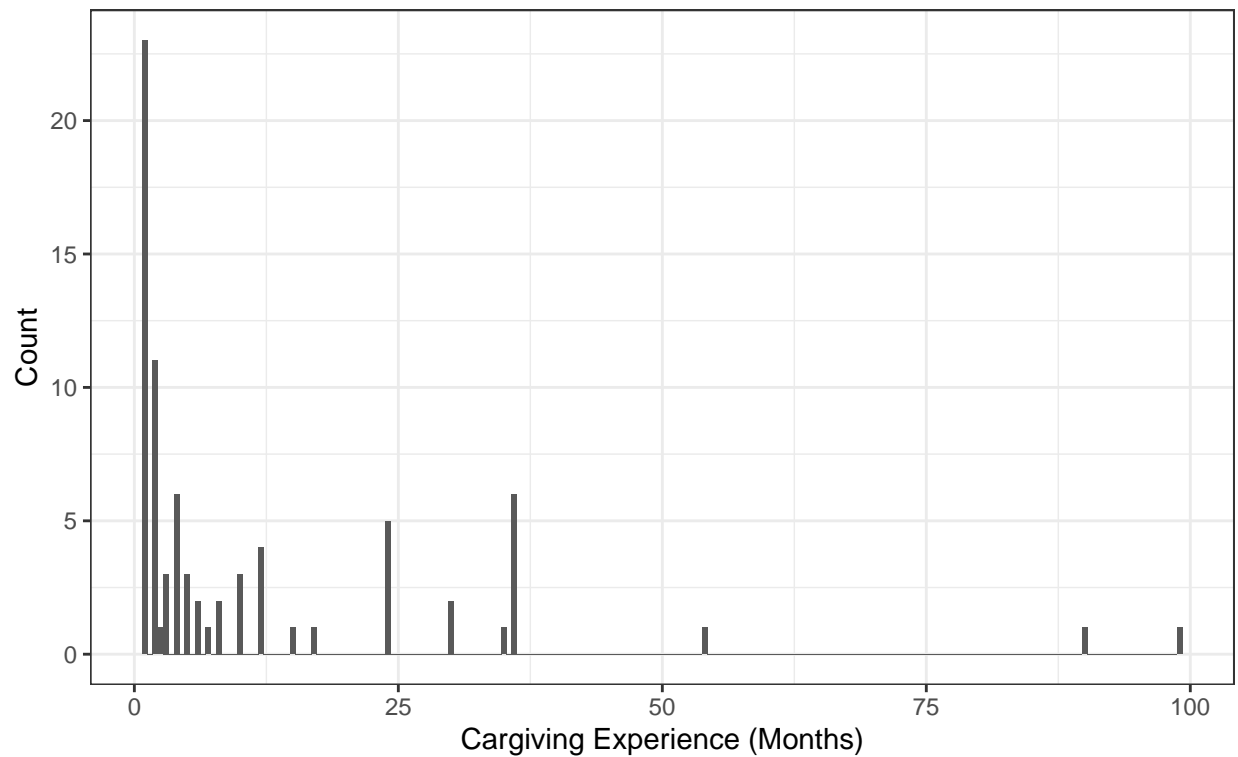
Histogram of Caregiving Experience



```
ggplot(subset(sum_data,sum_data$caregiver>0), aes(caregiver))+  
  geom_histogram(binwidth = .5)+  
  xlab("Cargiving Experience (Months)")+  
  ylab("Count")+  
  labs(title = "Histogram of Caregiving Experience",subtitle = "Those with 0 months removed")+  
  theme_bw()
```

## Histogram of Caregiving Experience

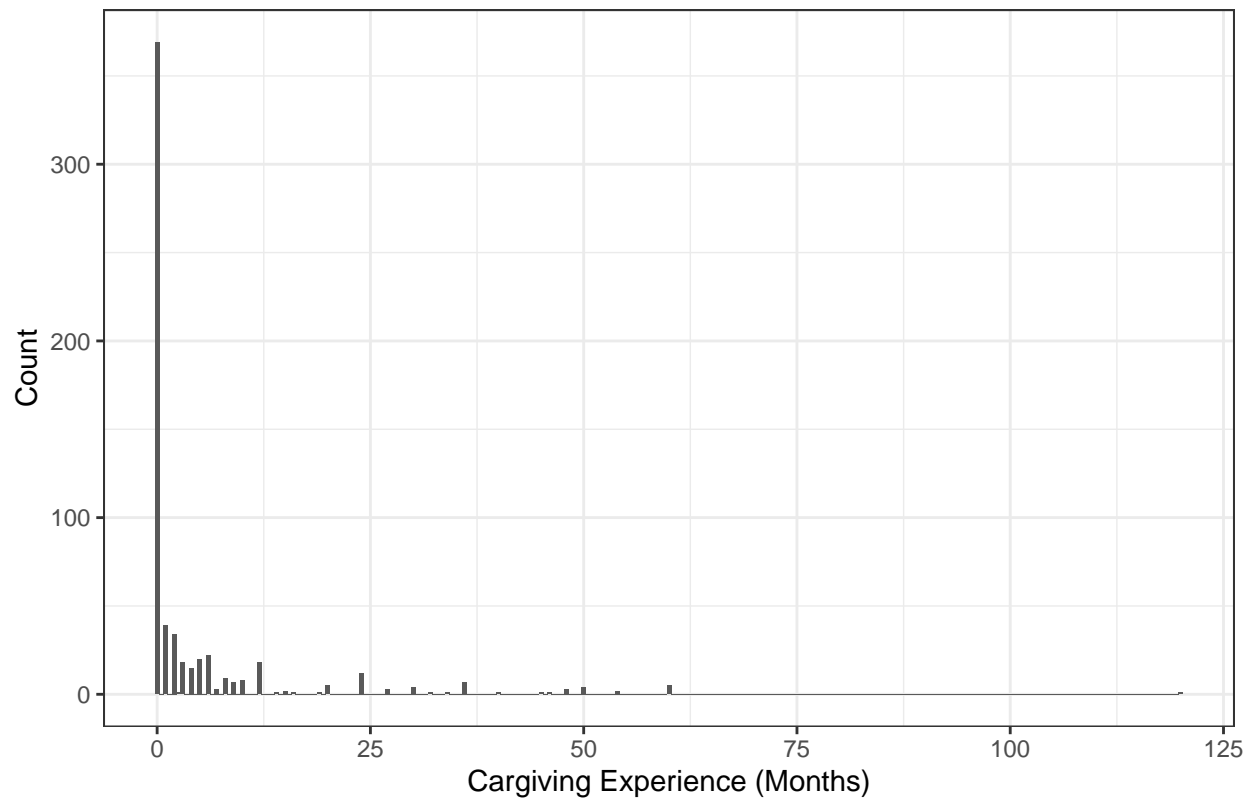
Those with 0 months removed



```
ggplot(sum_data, aes(childcare))+  
  geom_histogram(binwidth = .5)+  
  xlab("Cargiving Experience (Months)") +  
  ylab("Count") +  
  labs(title = "Histogram of Caregiving Experience") +  
  theme_bw()
```

```
## Warning: Removed 7 rows containing non-finite values (stat_bin).
```

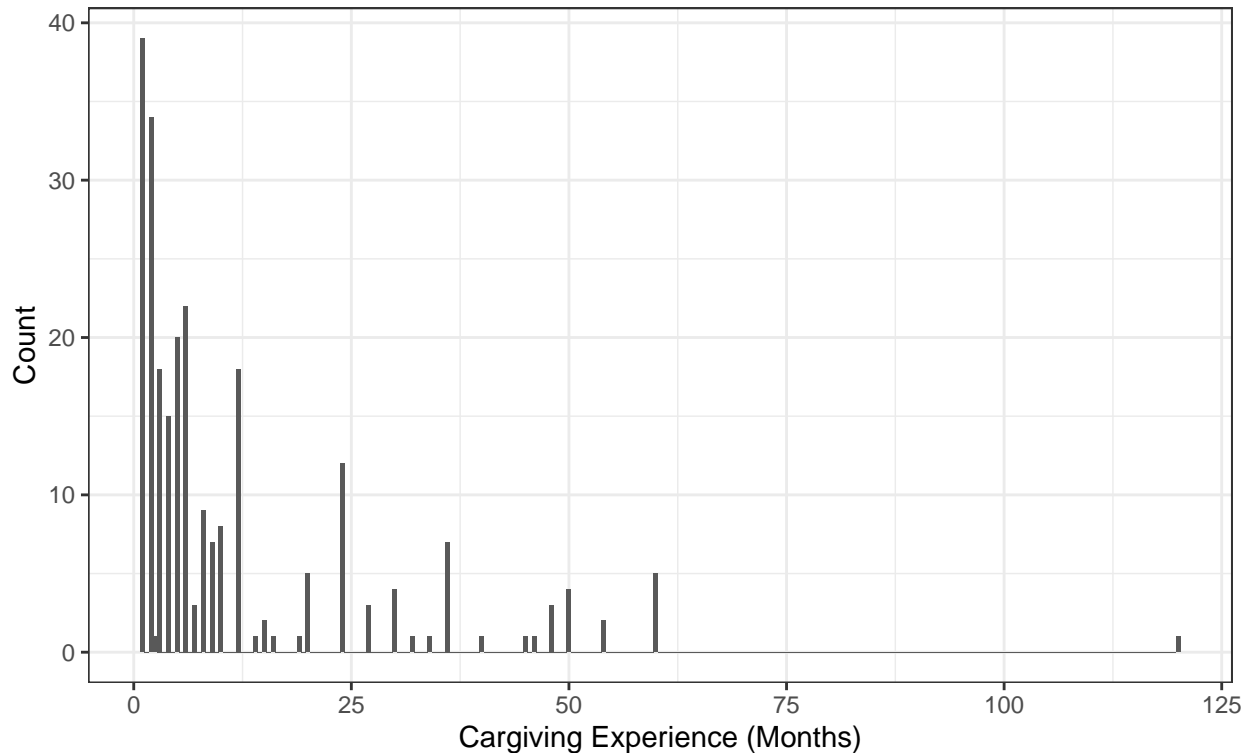
Histogram of Caregiving Experience



```
ggplot(subset(sum_data, sum_data$childcare > 0), aes(childcare)) +  
  geom_histogram(binwidth = .5) +  
  xlab("Cargiving Experience (Months)") +  
  ylab("Count") +  
  labs(title = "Histogram of Caregiving Experience", subtitle = "Those with 0 months removed") +  
  theme_bw()
```

## Histogram of Caregiving Experience

Those with 0 months removed



The above histograms confirm the reviewers suspicions that participants generally had little to no childcare or caregiving experience. So on the suggestion of the reviewers we performed a categorical split.

We analyzed the results with a binomial regression (to be analogous to the methods reported in the manuscript) to test whether there was a difference between those with some childcare or caregiving experience and those with none on any of the three main questions (whether participants could identify the Sex, Language, or Age of the infants). To be complete we ran every possible categorical split and found that none of them found significant results ( $\alpha = 0.01$ ) however there were some possible differences between those with some experience and none on the Age question ( $p < 0.05$ ) if we were to accept the common alpha rate.

```
# exclude the participants that we need to
sum_data <- read.csv(here::here("data", "summarized_data.csv"))
attention_exc<-unique(subset(sum_data,sum_data$n_attention_checks<=5)$subject_ID)
audio_exc<-unique(subset(sum_data,sum_data$n_audio_checks<=5)$subject_ID)
neglig_exc<-unique(subset(sum_data,sum_data$var_sex<=5 & sum_data$var_lang<=5 & sum_data$var_age<=5)$subject_ID)

# refactor the group so the order is correct in the graphs
d$stim_ageGroup<-factor(d$stim_ageGroup,levels = c("0-7", "8-18", "19-36"))

# exclude those who failed our attention check and audio check criteria
d <- d[d$subject_ID%in%attention_exc, ]
d <- d[d$subject_ID%in%audio_exc, ]
# exclude those who clicked the same button for an entire experimental phase
d <- d[d$subject_ID%in%neglig_exc, ]
# exclude those who responded other in gender and country
d <- d[d$gender %in% c("Female", "Male"), ]
```

```

d <- d[d$country %in% c("Canada", "USA"), ]
# exclude those who speak a language other than english
d <- d[d$eng_first == "Yes", ]
d <- d[d$know_corp_lang == "list()", ]

library(lme4)

## Loading required package: Matrix

##
## Attaching package: 'Matrix'

## The following objects are masked from 'package:tidyr':
##
##      expand, pack, unpack

# tested every level of the categorical split and found no significance (alpha = 0.01). Lowest p = 0.03
save<-rep(0,3*100)
for(i in 1:100){
  X<-i
  # define any experience as more than X
  d$anyExp<-(d$childcare>X | d$caregiver>X)
  # sex any experience categorical model instead of continuous variable
  model_AnyExp<- glmer(correct~1+anyExp+(1|subject_ID),
                        data = subset(d,
                                      d$gender%in%c("Male","Female") & d$phase=="Sex"),
                        family = binomial(link=logit))
  sum<-summary(model_AnyExp)
  #sum
  save[((i-1)*3)+1]<-sum$coefficients[2,4]
  # language any experience categorical model instead of continuous variable
  model_AnyExp<- glmer(correct~1+anyExp+(1|subject_ID),
                        data = subset(d,
                                      d$gender%in%c("Male","Female") & d$phase=="Language"),
                        family = binomial(link=logit))
  sum<-summary(model_AnyExp)
  save[((i-1)*3)+2]<-sum$coefficients[2,4]
  #sum
  # age any experience categorical model instead of continuous variable
  model_AnyExp<- glmer(correct~1+anyExp+(1|subject_ID),
                        data = subset(d,
                                      d$gender%in%c("Male","Female") & d$phase=="Age"),
                        family = binomial(link=logit))
  sum<-summary(model_AnyExp)
  save[((i-1)*3)+3]<-sum$coefficients[2,4]
  #print(sum)
}

## boundary (singular) fit: see ?isSingular

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```

[illegible]

[illegible]



[illegible]

```
res<-matrix(save,ncol = 3,byrow = T)
colnames(res)<-c("Sex","Language","Age")
library(knitr)
kable(res, caption = "P-values of the 'any experience' variable for each level of categorical split")
```

| Sex       | Language  | Age       |
|-----------|-----------|-----------|
| 0.8007009 | 0.1850204 | 0.0670175 |
| 0.9250128 | 0.3296211 | 0.0275031 |
| 0.8146576 | 0.3154694 | 0.0360715 |
| 0.9186090 | 0.4117875 | 0.2699939 |
| 0.6836257 | 0.3328680 | 0.4454759 |
| 0.4655121 | 0.3163088 | 0.1556792 |
| 0.4355853 | 0.3193341 | 0.1558797 |
| 0.1825173 | 0.2319293 | 0.1559068 |

| Sex       | Language  | Age       |
|-----------|-----------|-----------|
| 0.1062740 | 0.3722618 | 0.2030916 |
| 0.0996266 | 0.4256780 | 0.1141601 |
| 0.0996266 | 0.4256780 | 0.1141601 |
| 0.0840850 | 0.2238272 | 0.0799090 |
| 0.0840850 | 0.2238272 | 0.0799090 |
| 0.1247012 | 0.1528120 | 0.1031587 |
| 0.1802053 | 0.1923520 | 0.0643844 |
| 0.1802053 | 0.1923520 | 0.0643844 |
| 0.2536313 | 0.2069137 | 0.0697231 |
| 0.2536313 | 0.2069137 | 0.0697231 |
| 0.2536313 | 0.2069137 | 0.0697231 |
| 0.2723626 | 0.5216081 | 0.1623041 |
| 0.2723626 | 0.5216081 | 0.1623041 |
| 0.2723626 | 0.5216081 | 0.1623041 |
| 0.2723626 | 0.5216081 | 0.1623041 |
| 0.6776475 | 0.2463460 | 0.1878151 |
| 0.6776475 | 0.2463460 | 0.1878151 |
| 0.6776475 | 0.2463460 | 0.1878151 |
| 0.9009777 | 0.1506993 | 0.2814658 |
| 0.9009777 | 0.1506993 | 0.2814658 |
| 0.9009777 | 0.1506993 | 0.2814658 |
| 0.6939601 | 0.3596954 | 0.4445275 |
| 0.6939601 | 0.3596954 | 0.4445275 |
| 0.8049001 | 0.4551124 | 0.2931571 |
| 0.8049001 | 0.4551124 | 0.2931571 |
| 0.9741897 | 0.5671711 | 0.3171858 |
| 0.8478373 | 0.2213201 | 0.3432094 |
| 0.6915898 | 0.2523403 | 0.2079597 |
| 0.6915898 | 0.2523403 | 0.2079597 |
| 0.6915898 | 0.2523403 | 0.2079597 |
| 0.6915898 | 0.2523403 | 0.2079597 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.7795707 | 0.0905760 | 0.2902258 |
| 0.8029727 | 0.4630920 | 0.1678869 |
| 0.8029727 | 0.4630920 | 0.1678869 |
| 0.6145334 | 0.6962165 | 0.0718686 |
| 0.6145334 | 0.6962165 | 0.0718686 |
| 0.6145334 | 0.6962165 | 0.0718686 |
| 0.6145334 | 0.6962165 | 0.0718686 |
| 0.4872865 | 0.6915355 | 0.0738487 |
| 0.4872865 | 0.6915355 | 0.0738487 |
| 0.4872865 | 0.6915355 | 0.0738487 |
| 0.4872865 | 0.6915355 | 0.0738487 |
| 0.4872865 | 0.6915355 | 0.0738487 |
| 0.4872865 | 0.6915355 | 0.0738487 |
| 0.8886418 | 0.8221377 | 0.8185048 |



```

t<-t.test(p_cor_lang~anyExp,data = sum_data)
save[i+1,3]<-t$p.value
t<-t.test(p_cor_age~anyExp,data = sum_data)
save[i+1,4]<-t$p.value
}
save[,1]<-0:98
colnames(save)<-c("Split at","Sex","Language","Age")
kable(save, caption = "P-values of the t-test comparing accuracy for each level of categorical split")

```

Table 2: P-values of the t-test comparing accuracy for each level of categorical split

| Split at | Sex       | Language  | Age       |
|----------|-----------|-----------|-----------|
| 0        | 0.9309985 | 0.1546893 | 0.1334642 |
| 1        | 0.9470181 | 0.1529483 | 0.0149907 |
| 2        | 0.7394774 | 0.2668417 | 0.0096177 |
| 3        | 0.8142115 | 0.1727400 | 0.0175585 |
| 4        | 0.7477454 | 0.1865080 | 0.1633329 |
| 5        | 0.7520960 | 0.1004364 | 0.1672084 |
| 6        | 0.9074525 | 0.1694340 | 0.0523652 |
| 7        | 0.8879201 | 0.2101362 | 0.0351753 |
| 8        | 0.4279134 | 0.2206671 | 0.0149084 |
| 9        | 0.3532821 | 0.3155907 | 0.0232774 |
| 10       | 0.2526453 | 0.3848458 | 0.0041886 |
| 11       | 0.2526453 | 0.3848458 | 0.0041886 |
| 12       | 0.3364908 | 0.2378019 | 0.0016360 |
| 13       | 0.3364908 | 0.2378019 | 0.0016360 |
| 14       | 0.4400035 | 0.1754488 | 0.0024377 |
| 15       | 0.4511205 | 0.2286395 | 0.0042096 |
| 16       | 0.3500756 | 0.2203104 | 0.0037373 |
| 17       | 0.4625017 | 0.2391310 | 0.0043774 |
| 18       | 0.4625017 | 0.2391310 | 0.0043774 |
| 19       | 0.4625017 | 0.2391310 | 0.0043774 |
| 20       | 0.5869513 | 0.5928513 | 0.0152264 |
| 21       | 0.5869513 | 0.5928513 | 0.0152264 |
| 22       | 0.5869513 | 0.5928513 | 0.0152264 |
| 23       | 0.5869513 | 0.5928513 | 0.0152264 |
| 24       | 0.8243453 | 0.2884245 | 0.0790811 |
| 25       | 0.8243453 | 0.2884245 | 0.0790811 |
| 26       | 0.8243453 | 0.2884245 | 0.0790811 |
| 27       | 0.9339524 | 0.1924959 | 0.1387671 |
| 28       | 0.9339524 | 0.1924959 | 0.1387671 |
| 29       | 0.9339524 | 0.1924959 | 0.1387671 |
| 30       | 0.8988359 | 0.3494474 | 0.1847954 |
| 31       | 0.8988359 | 0.3494474 | 0.1847954 |
| 32       | 0.9749452 | 0.4325171 | 0.0861446 |
| 33       | 0.9749452 | 0.4325171 | 0.0861446 |
| 34       | 0.7362809 | 0.5275952 | 0.1015122 |
| 35       | 0.6093346 | 0.1875733 | 0.1190780 |
| 36       | 0.7640171 | 0.3917026 | 0.1843987 |
| 37       | 0.7640171 | 0.3917026 | 0.1843987 |
| 38       | 0.7640171 | 0.3917026 | 0.1843987 |
| 39       | 0.7640171 | 0.3917026 | 0.1843987 |

| Split at | Sex       | Language  | Age       |
|----------|-----------|-----------|-----------|
| 40       | 0.8613307 | 0.1634518 | 0.2803452 |
| 41       | 0.8613307 | 0.1634518 | 0.2803452 |
| 42       | 0.8613307 | 0.1634518 | 0.2803452 |
| 43       | 0.8613307 | 0.1634518 | 0.2803452 |
| 44       | 0.8613307 | 0.1634518 | 0.2803452 |
| 45       | 0.7037604 | 0.1079421 | 0.4134030 |
| 46       | 0.6775714 | 0.0372634 | 0.4803454 |
| 47       | 0.6775714 | 0.0372634 | 0.4803454 |
| 48       | 0.7031885 | 0.2239476 | 0.3315749 |
| 49       | 0.7031885 | 0.2239476 | 0.3315749 |
| 50       | 0.4941436 | 0.1879942 | 0.1382848 |
| 51       | 0.4941436 | 0.1879942 | 0.1382848 |
| 52       | 0.4941436 | 0.1879942 | 0.1382848 |
| 53       | 0.4941436 | 0.1879942 | 0.1382848 |
| 54       | 0.4108437 | 0.2243558 | 0.2094049 |
| 55       | 0.4108437 | 0.2243558 | 0.2094049 |
| 56       | 0.4108437 | 0.2243558 | 0.2094049 |
| 57       | 0.4108437 | 0.2243558 | 0.2094049 |
| 58       | 0.4108437 | 0.2243558 | 0.2094049 |
| 59       | 0.4108437 | 0.2243558 | 0.2094049 |
| 60       | 0.5763110 | 0.6151332 | 0.3207643 |
| 61       | 0.5763110 | 0.6151332 | 0.3207643 |
| 62       | 0.5763110 | 0.6151332 | 0.3207643 |
| 63       | 0.5763110 | 0.6151332 | 0.3207643 |
| 64       | 0.5763110 | 0.6151332 | 0.3207643 |
| 65       | 0.5763110 | 0.6151332 | 0.3207643 |
| 66       | 0.5763110 | 0.6151332 | 0.3207643 |
| 67       | 0.5763110 | 0.6151332 | 0.3207643 |
| 68       | 0.5763110 | 0.6151332 | 0.3207643 |
| 69       | 0.5763110 | 0.6151332 | 0.3207643 |
| 70       | 0.5763110 | 0.6151332 | 0.3207643 |
| 71       | 0.5763110 | 0.6151332 | 0.3207643 |
| 72       | 0.5763110 | 0.6151332 | 0.3207643 |
| 73       | 0.5763110 | 0.6151332 | 0.3207643 |
| 74       | 0.5763110 | 0.6151332 | 0.3207643 |
| 75       | 0.5763110 | 0.6151332 | 0.3207643 |
| 76       | 0.5763110 | 0.6151332 | 0.3207643 |
| 77       | 0.5763110 | 0.6151332 | 0.3207643 |
| 78       | 0.5763110 | 0.6151332 | 0.3207643 |
| 79       | 0.5763110 | 0.6151332 | 0.3207643 |
| 80       | 0.5763110 | 0.6151332 | 0.3207643 |
| 81       | 0.5763110 | 0.6151332 | 0.3207643 |
| 82       | 0.5763110 | 0.6151332 | 0.3207643 |
| 83       | 0.5763110 | 0.6151332 | 0.3207643 |
| 84       | 0.5763110 | 0.6151332 | 0.3207643 |
| 85       | 0.5763110 | 0.6151332 | 0.3207643 |
| 86       | 0.5763110 | 0.6151332 | 0.3207643 |
| 87       | 0.5763110 | 0.6151332 | 0.3207643 |
| 88       | 0.5763110 | 0.6151332 | 0.3207643 |
| 89       | 0.5763110 | 0.6151332 | 0.3207643 |
| 90       | 0.5763110 | 0.6151332 | 0.3207643 |
| 91       | 0.5763110 | 0.6151332 | 0.3207643 |

| Split at | Sex       | Language  | Age       |
|----------|-----------|-----------|-----------|
| 92       | 0.5763110 | 0.6151332 | 0.3207643 |
| 93       | 0.5763110 | 0.6151332 | 0.3207643 |
| 94       | 0.5763110 | 0.6151332 | 0.3207643 |
| 95       | 0.5763110 | 0.6151332 | 0.3207643 |
| 96       | 0.5763110 | 0.6151332 | 0.3207643 |
| 97       | 0.5763110 | 0.6151332 | 0.3207643 |
| 98       | 0.5763110 | 0.6151332 | 0.3207643 |