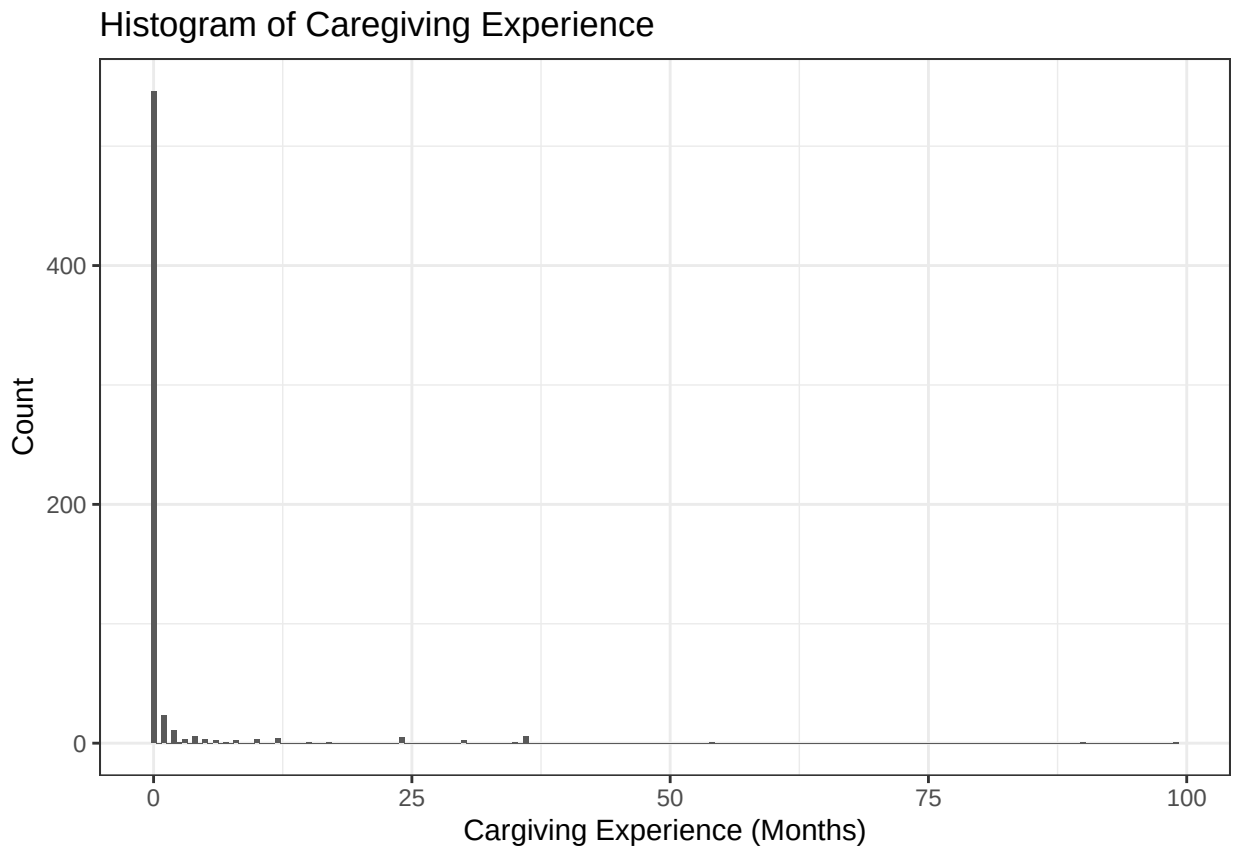
Resubmit Caregiving

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.

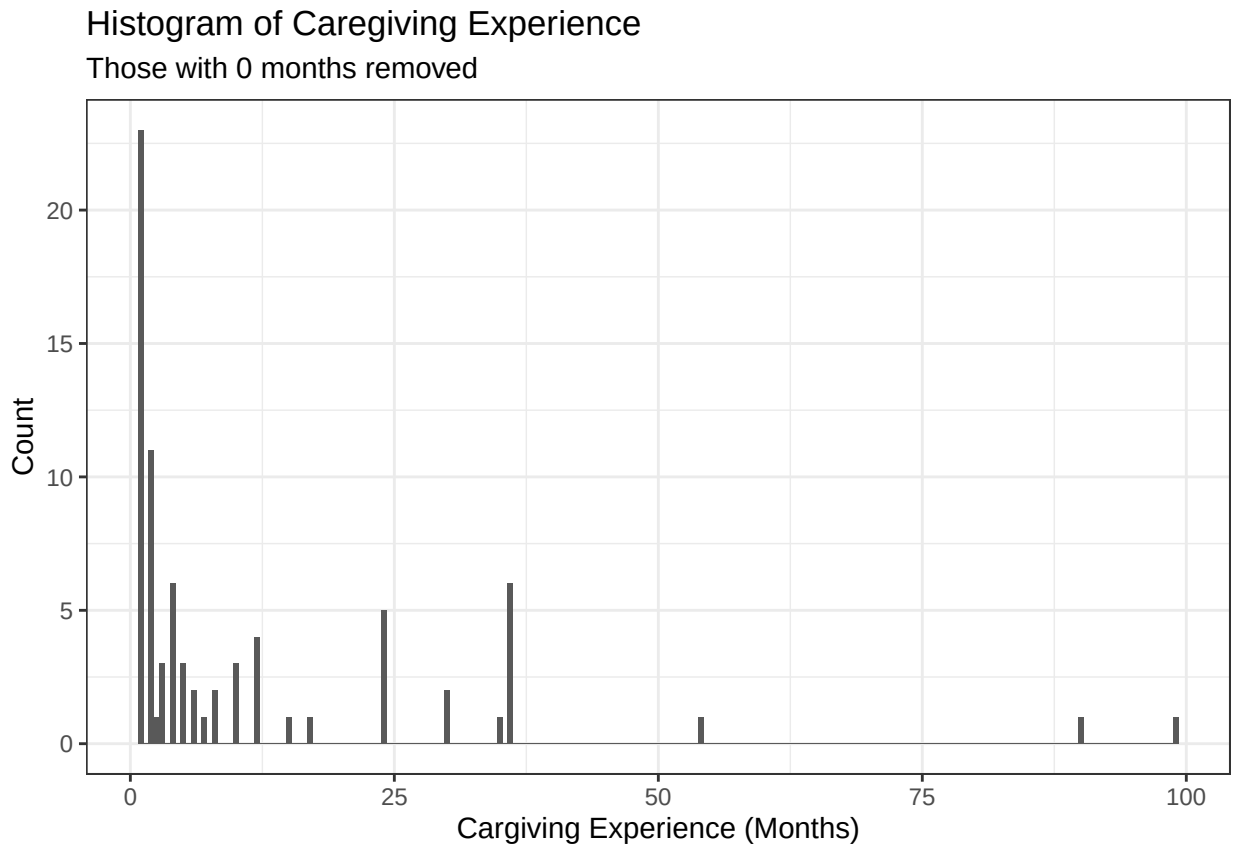
The reviewers expressed surprise at the lack of significant results in the analysis of caregiving experience so we examined the issue further.

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.

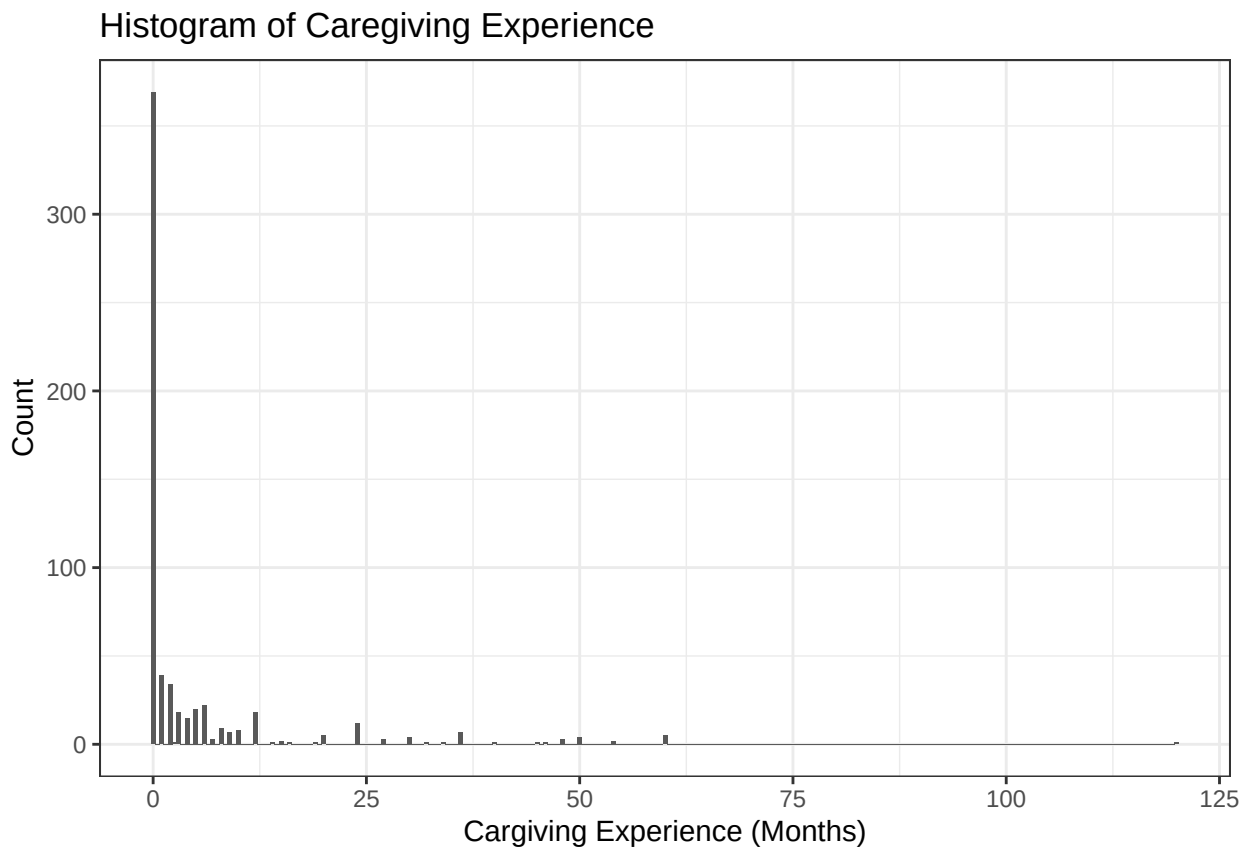
```
sum_data <- read.csv(here::here("data","summarized_data.csv"))

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



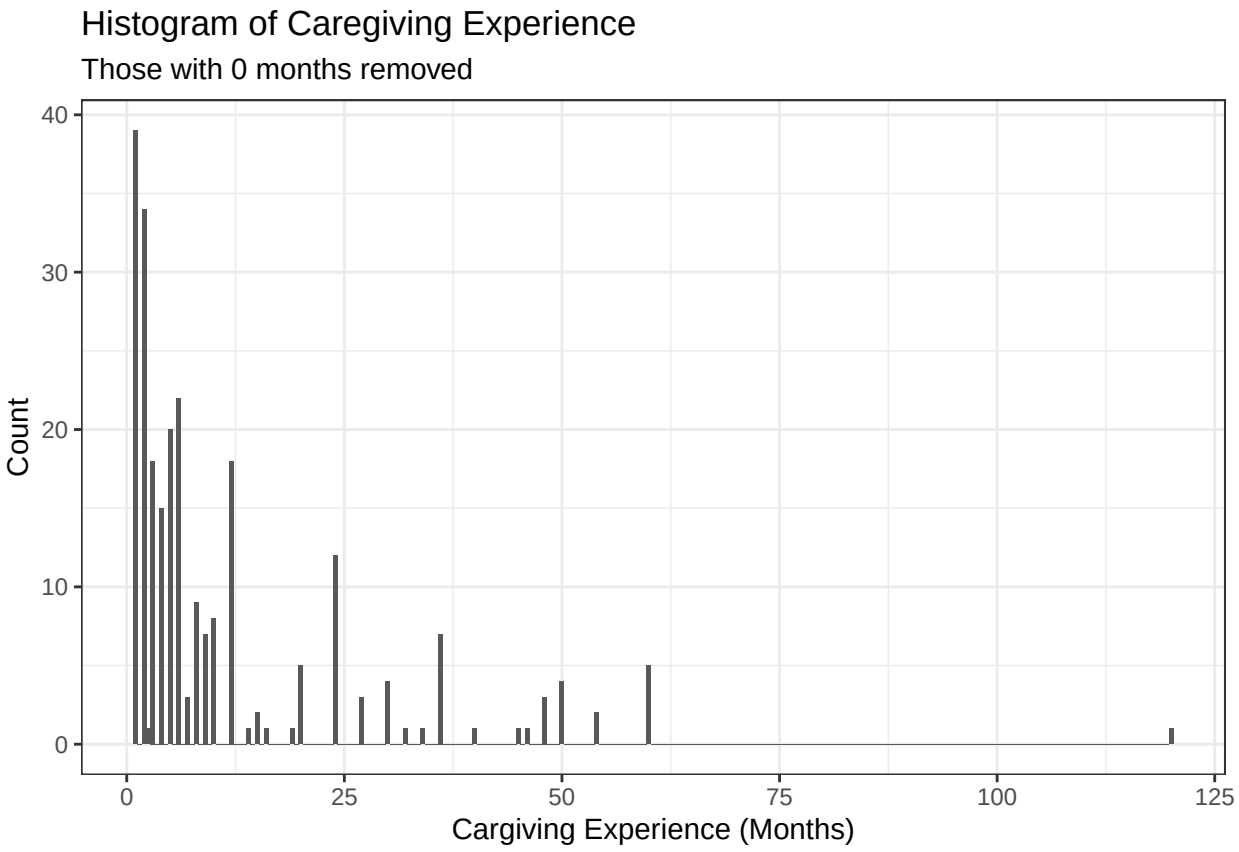
```r
ggplot(subset(sum_data,sum_data$caregiver>0), aes(caregiver))+
  geom_histogram(binwidth = .5)+
  xlab("Cargiving Experience (Months)")+
  ylab("Count")+
  labs(title = "Histogram of Caregiving Experience",subtitle = "Those with 0 months removed")+
  theme_bw()
```




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




```
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()
```



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$var_age<=5)$su

# 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"), ]
```

```r
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)
# 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)
}
res<-matrix(save,ncol = 3,byrow = T)
res<-cbind(c(1:100),res)
colnames(res)<-c("Split at", "Sex","Language","Age")
library(knitr)
kable(res, caption = "P-values of the 'any experience' variable for each level of categorical split")
```

Table 1: P-values of the 'any experience' variable for each level of categorical split

Split at	Sex	Language	Age
1	0.8007009	0.1850204	0.0670175
2	0.9250128	0.3296211	0.0275031
3	0.8146576	0.3154694	0.0360715
4	0.9186090	0.4117875	0.2699939
5	0.6836257	0.3328680	0.4454759
6	0.4655121	0.3163088	0.1556792

Split at	Sex	Language	Age
7	0.4355853	0.3193341	0.1558797
8	0.1825173	0.2319293	0.1559068
9	0.1062740	0.3722618	0.2030916
10	0.0996266	0.4256780	0.1141601
11	0.0996266	0.4256780	0.1141601
12	0.0840850	0.2238272	0.0799090
13	0.0840850	0.2238272	0.0799090
14	0.1247012	0.1528120	0.1031587
15	0.1802053	0.1923520	0.0643844
16	0.1802053	0.1923520	0.0643844
17	0.2536313	0.2069137	0.0697231
18	0.2536313	0.2069137	0.0697231
19	0.2536313	0.2069137	0.0697231
20	0.2723626	0.5216081	0.1623041
21	0.2723626	0.5216081	0.1623041
22	0.2723626	0.5216081	0.1623041
23	0.2723626	0.5216081	0.1623041
24	0.6776475	0.2463460	0.1878151
25	0.6776475	0.2463460	0.1878151
26	0.6776475	0.2463460	0.1878151
27	0.9009777	0.1506993	0.2814658
28	0.9009777	0.1506993	0.2814658
29	0.9009777	0.1506993	0.2814658
30	0.6939601	0.3596954	0.4445275
31	0.6939601	0.3596954	0.4445275
32	0.8049001	0.4551124	0.2931571
33	0.8049001	0.4551124	0.2931571
34	0.9741897	0.5671711	0.3171858
35	0.8478373	0.2213201	0.3432094
36	0.6915898	0.2523403	0.2079597
37	0.6915898	0.2523403	0.2079597
38	0.6915898	0.2523403	0.2079597
39	0.6915898	0.2523403	0.2079597
40	0.7795707	0.0905760	0.2902258
41	0.7795707	0.0905760	0.2902258
42	0.7795707	0.0905760	0.2902258
43	0.7795707	0.0905760	0.2902258
44	0.7795707	0.0905760	0.2902258
45	0.7795707	0.0905760	0.2902258
46	0.7795707	0.0905760	0.2902258
47	0.7795707	0.0905760	0.2902258
48	0.8029727	0.4630920	0.1678869
49	0.8029727	0.4630920	0.1678869
50	0.6145334	0.6962165	0.0718686
51	0.6145334	0.6962165	0.0718686
52	0.6145334	0.6962165	0.0718686
53	0.6145334	0.6962165	0.0718686
54	0.4872865	0.6915355	0.0738487
55	0.4872865	0.6915355	0.0738487
56	0.4872865	0.6915355	0.0738487
57	0.4872865	0.6915355	0.0738487
58	0.4872865	0.6915355	0.0738487

Split at	Sex	Language	Age
59	0.4872865	0.6915355	0.0738487
60	0.8886418	0.8221377	0.8185048
61	0.8886418	0.8221377	0.8185048
62	0.8886418	0.8221377	0.8185048
63	0.8886418	0.8221377	0.8185048
64	0.8886418	0.8221377	0.8185048
65	0.8886418	0.8221377	0.8185048
66	0.8886418	0.8221377	0.8185048
67	0.8886418	0.8221377	0.8185048
68	0.8886418	0.8221377	0.8185048
69	0.8886418	0.8221377	0.8185048
70	0.8886418	0.8221377	0.8185048
71	0.8886418	0.8221377	0.8185048
72	0.8886418	0.8221377	0.8185048
73	0.8886418	0.8221377	0.8185048
74	0.8886418	0.8221377	0.8185048
75	0.8886418	0.8221377	0.8185048
76	0.8886418	0.8221377	0.8185048
77	0.8886418	0.8221377	0.8185048
78	0.8886418	0.8221377	0.8185048
79	0.8886418	0.8221377	0.8185048
80	0.8886418	0.8221377	0.8185048
81	0.8886418	0.8221377	0.8185048
82	0.8886418	0.8221377	0.8185048
83	0.8886418	0.8221377	0.8185048
84	0.8886418	0.8221377	0.8185048
85	0.8886418	0.8221377	0.8185048
86	0.8886418	0.8221377	0.8185048
87	0.8886418	0.8221377	0.8185048
88	0.8886418	0.8221377	0.8185048
89	0.8886418	0.8221377	0.8185048
90	0.8886418	0.8221377	0.8185048
91	0.8886418	0.8221377	0.8185048
92	0.8886418	0.8221377	0.8185048
93	0.8886418	0.8221377	0.8185048
94	0.8886418	0.8221377	0.8185048
95	0.8886418	0.8221377	0.8185048
96	0.8886418	0.8221377	0.8185048
97	0.8886418	0.8221377	0.8185048
98	0.8886418	0.8221377	0.8185048
99	0.8886418	0.8221377	0.8185048
100	0.8886418	0.8221377	0.8185048

After running the logistic regression we decided to run a simpler analysis by comparing participants average accuracy between groups with some and "no" experience in the same way as before with using a Welch's t-test. Results indicate that there is some difference between those with some childcare or caregiving experience and those with none in identifying the age of infants.

```
save<-matrix(0,nrow = 99,ncol = 4)
for(i in 0:98){
  X<-i
  sum_data$anyExp<-(sum_data$childcare>X | sum_data$caregiver>X)
```

```
  t<-t.test(p_cor_sex~anyExp,data = sum_data)
  save[i+1,2]<-t$p.value
  t<-t.test(p_cor_lang~anyExp,data = sum_data)
  save[i+1,3]<-t$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

Split at	Sex	Language	Age
38	0.7640171	0.3917026	0.1843987
39	0.7640171	0.3917026	0.1843987
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

Split at	Sex	Language	Age
90	0.5763110	0.6151332	0.3207643
91	0.5763110	0.6151332	0.3207643
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