

The relationship between the age of first marriage and age of respondent when parents divorced*

First author Shan Lin

Another author

21 March 2022

Abstract

First sentence. Second sentence. Third sentence. Fourth sentence.

1 Introduction

You can and should cross-reference sections and sub-sections. For instance, Section 2. R Markdown automatically makes the sections lower case and adds a dash to spaces to generate labels, for instance, Section 5.1.

2 Data

Our goal is to use GSS data to access population information about all persons who are 15 years old or older in Canada. The frame includes two parts, the telephone number available on Statistic Canada and the Address Register. There are about 86% of telephone numbers were linked to the Address Register and about 14% of telephone numbers were not linked to the Address Register. All of them were included in the survey frame. When we take telephone surveys if more than one telephone number is recorded, the first telephone number was considered according to the type of telephone number (landline telephone numbers first and cellular telephone numbers last). The minimum sample size for each stratum was required to ensure the diversity and range of samples. The target sample size is 20,000, but the actual sample size is 20,602.

The data were divided into 27 strata based on the geographic area, and then the simple random sampling without replacement was conducted for each stratum. During data collection, if a household did not include at least one person who is 15 years old or older, then the household does not have eligibility to be included in the sample. The data of the 2017 GSS is collected by computer-assisted telephone interviews (CATI), and respondents can choose one official language during the interviews. The telephone survey is a good method to collect useful information and avoid irrelevant answers. However, it is the key disadvantage that the telephone survey is a time-consuming and heavy workload.

We aimed to focus on the relationship between the age of respondents first marriage and the age of respondents when their parents' divorce. We download the 2017 GSS data from the website of the CHASS Data center. Because the data include a lot of variables which we are not interested, we did some data cleaning. We select 4 variables including `agemalc`, `famtype`, `apardivc`, and `sex`, which is related to the topic we are interested. The variable `agemalc` is the age of respondents first marriage, and we rename it called age. The variable `famtype` is the family type of the respondents, and we rename it called type. The variable `apardivc` is the age of the respondent when their parents' divorce, and we rename it called aged. The variable `sex` is the sex of respondents. If the answer of variable `sex` is 1, it means male, and if the answer of it is 2, it means female. We use the actual meaning to replace the numeric answer. Similarly, we used the actual meaning to replace the numeric answers of variable type. Thus, we can see the data more clearly.

*Code and data are available at: <https://github.com/skylar03/2022p3.git>.

3 Model

We fit a multiple linear regression to see the effects of sex, family type, and the age of respondents when their parents divorced on the age of respondents first marriage.

$$age = 22.458 + 3.212 * sexMale - 0.012 * aged + 0.382 * typeIF + 2.616 * typeLPF + 1.359 * typeN + 0.599 * typeSFC + 0.868 * typeSF \quad (1)$$

where:

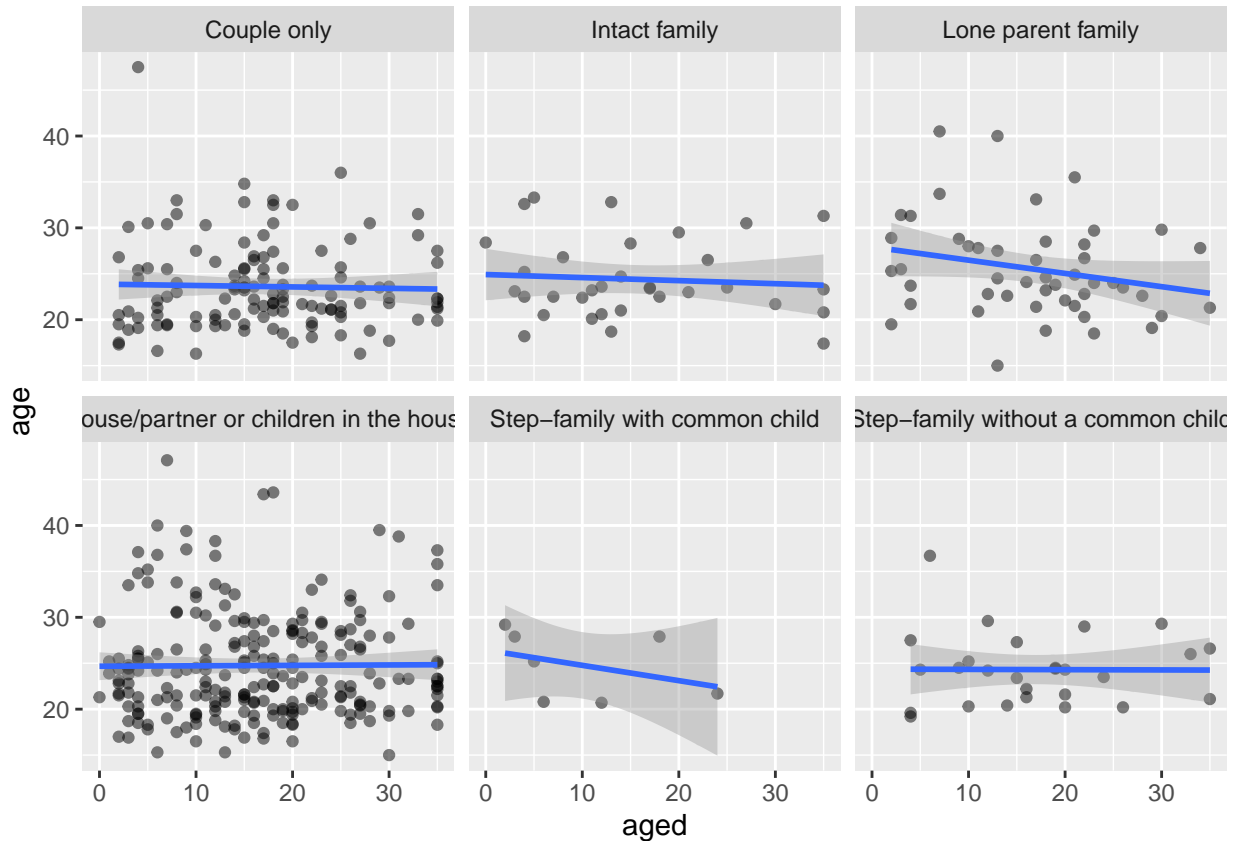
- typeIF means family type is Intact family
- typeLPF means family type is Lone parent family
- typeN means family type is No spouse/partner or children in the household
- typeSFC means family type is Step-family with common child
- typeSF means family type is Step-family without a common child

4 Results

From the multiple linear regression, we can see that the age of male respondents first marriage is about 3.212 years larger than female because the coefficient of sexMale is 3.212. The coefficient of aged is 0.012, so as one unit of the age of respondents when their parents divorced, the age of the respondent's first marriage decreases 0.012. Also, we can see the effect of a different family type of the respondent on the age of the respondent's first marriage. For couple only family type, the age of respondents' first marriage is smaller than other family types. The age of respondents' first marriage for intact family type is increasing by 0.382 than couple only family type. The first marriage age for lone-parent families is increasing by 2.616 than the couple-only family type. The first marriage age for no spouse/partner or children in the household is increasing by 1.359 than the couple only family type. The first marriage age for stepfamily with the common child is increasing by 0.599 than the couple only family type. The first marriage age for stepfamily without a common child is increasing by 0.868 than the couple-only family type.

From the graphs, for the lone parent family type and stepfamily with the common child the change of the age of the respondents' parent divorced increases has a larger impact on the age of respondents first marriage than other family types. Also, the graphs clearly show that the male respondents tend to get married later than female respondents.

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



```
## List of 93
## $ line                                :List of 6
## ..$ colour                          : chr "black"
## ..$ size                            : num 0.5
## ..$ linetype                        : num 1
## ..$ lineend                        : chr "butt"
## ..$ arrow                          : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ rect                                :List of 5
## ..$ fill                            : chr "white"
## ..$ colour                          : chr "black"
## ..$ size                            : num 0.5
## ..$ linetype                        : num 1
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ text                                :List of 11
## ..$ family                          : chr ""
## ..$ face                            : chr "plain"
## ..$ colour                          : chr "black"
## ..$ size                            : num 11
## ..$ hjust                           : num 0.5
## ..$ vjust                           : num 0.5
## ..$ angle                           : num 0
## ..$ lineheight                       : num 0.9
## ..$ margin                          : 'margin' num [1:4] 0points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
```

```

## ..$ debug          : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ title              : NULL
## $ aspect.ratio       : NULL
## $ axis.title         : NULL
## $ axis.title.x       :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL
## ..$ size             : NULL
## ..$ hjust           : NULL
## ..$ vjust           : num 1
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 2.75points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.top   :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL
## ..$ size             : NULL
## ..$ hjust           : NULL
## ..$ vjust           : num 0
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 0points 0points 2.75points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.bottom : NULL
## $ axis.title.y        :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL
## ..$ size             : NULL
## ..$ hjust           : NULL
## ..$ vjust           : num 1
## ..$ angle           : num 90
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 0points 2.75points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.y.left  : NULL
## $ axis.title.y.right :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL

```

```

## ..$ size      : NULL
## ..$ hjust     : NULL
## ..$ vjust     : num 0
## ..$ angle     : num -90
## ..$ lineheight : NULL
## ..$ margin    : 'margin' num [1:4] 0points 0points 0points 2.75points
## .. ..- attr(*, "unit")= int 8
## ..$ debug     : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text      :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : chr "grey30"
## ..$ size        : 'rel' num 0.8
## ..$ hjust       : NULL
## ..$ vjust       : NULL
## ..$ angle       : NULL
## ..$ lineheight  : NULL
## ..$ margin      : NULL
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x    :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : num 1
## ..$ angle       : NULL
## ..$ lineheight  : NULL
## ..$ margin      : 'margin' num [1:4] 2.2points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.top :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : num 0
## ..$ angle       : NULL
## ..$ lineheight  : NULL
## ..$ margin      : 'margin' num [1:4] 0points 0points 2.2points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.bottom : NULL
## $ axis.text.y        :List of 11
## ..$ family          : NULL

```

```

## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : num 1
## ..$ vjust         : NULL
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 2.2points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.y.left : NULL
## $ axis.text.y.right :List of 11
## ..$ family        : NULL
## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : num 0
## ..$ vjust         : NULL
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 0points 0points 2.2points
## .. ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.ticks       : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.ticks.x     : NULL
## $ axis.ticks.x.top : NULL
## $ axis.ticks.x.bottom : NULL
## $ axis.ticks.y     : NULL
## $ axis.ticks.y.left : NULL
## $ axis.ticks.y.right : NULL
## $ axis.ticks.length : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ axis.ticks.length.x : NULL
## $ axis.ticks.length.x.top : NULL
## $ axis.ticks.length.x.bottom : NULL
## $ axis.ticks.length.y : NULL
## $ axis.ticks.length.y.left : NULL
## $ axis.ticks.length.y.right : NULL
## $ axis.line         : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.line.x       : NULL
## $ axis.line.x.top   : NULL
## $ axis.line.x.bottom : NULL
## $ axis.line.y       : NULL
## $ axis.line.y.left  : NULL
## $ axis.line.y.right : NULL
## $ legend.background : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ legend.margin     : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points

```

```

##  .- attr(*, "unit")= int 8
##  $ legend.spacing          : 'simpleUnit' num 11points
##  .- attr(*, "unit")= int 8
##  $ legend.spacing.x       : NULL
##  $ legend.spacing.y       : NULL
##  $ legend.key              : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"
##  $ legend.key.size         : 'simpleUnit' num 1.2lines
##  .- attr(*, "unit")= int 3
##  $ legend.key.height       : NULL
##  $ legend.key.width        : NULL
##  $ legend.text              :List of 11
##  ..$ family                : NULL
##  ..$ face                  : NULL
##  ..$ colour                : NULL
##  ..$ size                  : 'rel' num 0.8
##  ..$ hjust                 : NULL
##  ..$ vjust                 : NULL
##  ..$ angle                 : NULL
##  ..$ lineheight            : NULL
##  ..$ margin                : NULL
##  ..$ debug                 : NULL
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_text" "element"
##  $ legend.text.align       : NULL
##  $ legend.title            :List of 11
##  ..$ family                : NULL
##  ..$ face                  : NULL
##  ..$ colour                : NULL
##  ..$ size                  : NULL
##  ..$ hjust                 : num 0
##  ..$ vjust                 : NULL
##  ..$ angle                 : NULL
##  ..$ lineheight            : NULL
##  ..$ margin                : NULL
##  ..$ debug                 : NULL
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_text" "element"
##  $ legend.title.align      : NULL
##  $ legend.position          : chr "right"
##  $ legend.direction         : NULL
##  $ legend.justification     : chr "center"
##  $ legend.box               : NULL
##  $ legend.box.just          : NULL
##  $ legend.box.margin        : 'margin' num [1:4] 0cm 0cm 0cm 0cm
##  .- attr(*, "unit")= int 1
##  $ legend.box.background    : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"
##  $ legend.box.spacing       : 'simpleUnit' num 11points
##  .- attr(*, "unit")= int 8
##  $ panel.background         : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"
##  $ panel.border             : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"

```

```

## $ panel.spacing          : 'simpleUnit' num 5.5points
## ..- attr(*, "unit")= int 8
## $ panel.spacing.x       : NULL
## $ panel.spacing.y       : NULL
## $ panel.grid             :List of 6
## ..$ colour              : chr "grey92"
## ..$ size                 : NULL
## ..$ linetype             : NULL
## ..$ lineend              : NULL
## ..$ arrow                : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major       : NULL
## $ panel.grid.minor       :List of 6
## ..$ colour              : NULL
## ..$ size                 : 'rel' num 0.5
## ..$ linetype             : NULL
## ..$ lineend              : NULL
## ..$ arrow                : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major.x     : NULL
## $ panel.grid.major.y     : NULL
## $ panel.grid.minor.x     : NULL
## $ panel.grid.minor.y     : NULL
## $ panel.ontop             : logi FALSE
## $ plot.background        : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ plot.title             :List of 11
## ..$ family              : NULL
## ..$ face                 : NULL
## ..$ colour              : NULL
## ..$ size                 : 'rel' num 1.2
## ..$ hjust                : num 0
## ..$ vjust                : num 1
## ..$ angle                : NULL
## ..$ lineheight           : NULL
## ..$ margin               : 'margin' num [1:4] 0points 0points 5.5points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug                : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.title.position    : chr "panel"
## $ plot.subtitle          :List of 11
## ..$ family              : NULL
## ..$ face                 : NULL
## ..$ colour              : NULL
## ..$ size                 : NULL
## ..$ hjust                : num 0
## ..$ vjust                : num 1
## ..$ angle                : NULL
## ..$ lineheight           : NULL
## ..$ margin               : 'margin' num [1:4] 0points 0points 5.5points 0points
## .. ..- attr(*, "unit")= int 8

```



```

## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption      :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : NULL
## ..$ size            : 'rel' num 0.8
## ..$ hjust           : num 1
## ..$ vjust           : num 1
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 5.5points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption.position : chr "panel"
## $ plot.tag            :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : NULL
## ..$ size            : 'rel' num 1.2
## ..$ hjust           : num 0.5
## ..$ vjust           : num 0.5
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : NULL
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.tag.position    : chr "topleft"
## $ plot.margin          : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
## ..- attr(*, "unit")= int 8
## $ strip.background     : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ strip.background.x   : NULL
## $ strip.background.y   : NULL
## $ strip.placement      : chr "inside"
## $ strip.text           :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : chr "grey10"
## ..$ size            : 'rel' num 0.8
## ..$ hjust           : NULL
## ..$ vjust           : NULL
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 4.4points 4.4points 4.4points 4.4points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.text.x         : NULL

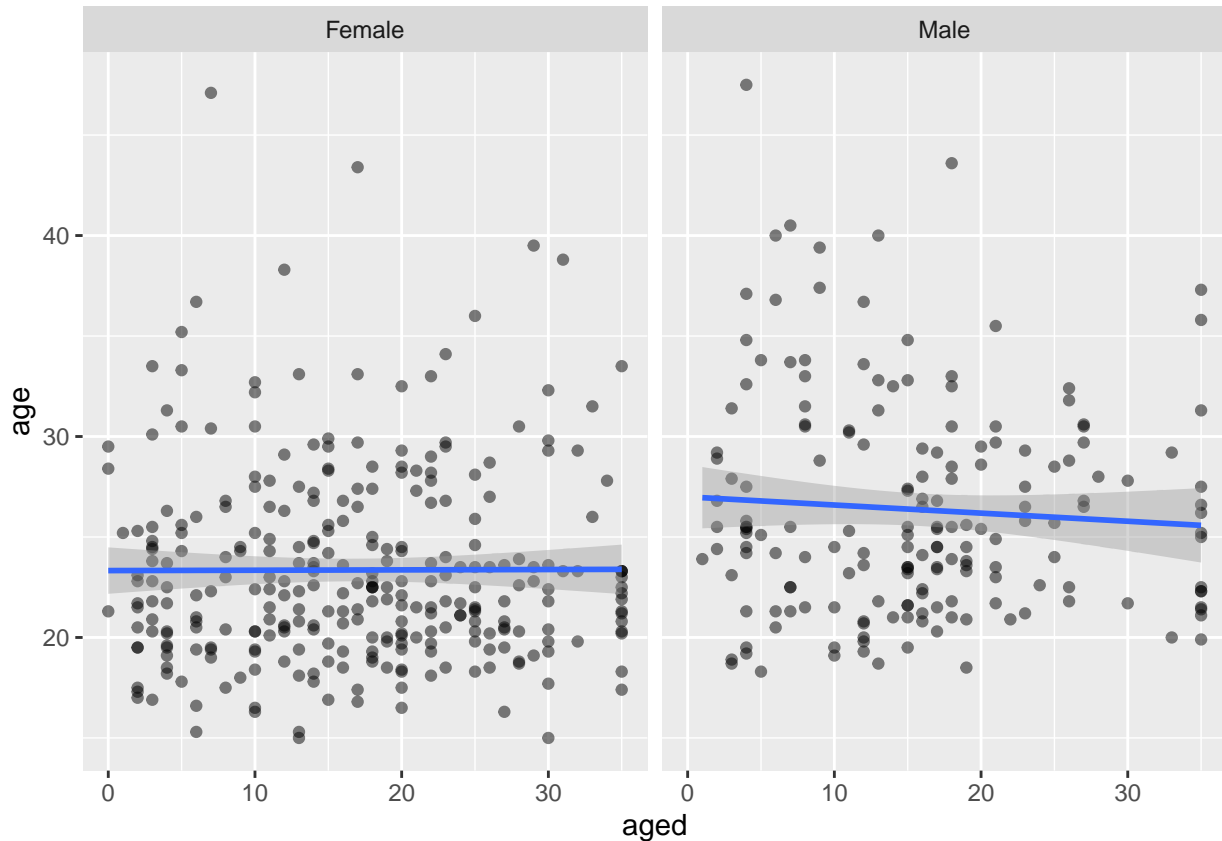
```

```

## $ strip.text.y :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : NULL
## ..$ hjust : NULL
## ..$ vjust : NULL
## ..$ angle : num -90
## ..$ lineheight : NULL
## ..$ margin : NULL
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.switch.pad.grid : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.switch.pad.wrap : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.text.y.left :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : NULL
## ..$ hjust : NULL
## ..$ vjust : NULL
## ..$ angle : num 90
## ..$ lineheight : NULL
## ..$ margin : NULL
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## - attr(*, "class")= chr [1:2] "theme" "gg"
## - attr(*, "complete")= logi TRUE
## - attr(*, "validate")= logi TRUE

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

```



```
## List of 93
## $ line :List of 6
## ..$ colour : chr "black"
## ..$ size : num 0.5
## ..$ linetype : num 1
## ..$ lineend : chr "butt"
## ..$ arrow : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ rect :List of 5
## ..$ fill : chr "white"
## ..$ colour : chr "black"
## ..$ size : num 0.5
## ..$ linetype : num 1
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ text :List of 11
## ..$ family : chr ""
## ..$ face : chr "plain"
## ..$ colour : chr "black"
## ..$ size : num 11
## ..$ hjust : num 0.5
## ..$ vjust : num 0.5
## ..$ angle : num 0
## ..$ lineheight : num 0.9
## ..$ margin : 'margin' num [1:4] 0points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
```

```

## ..$ debug          : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ title              : NULL
## $ aspect.ratio       : NULL
## $ axis.title         : NULL
## $ axis.title.x       :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL
## ..$ size            : NULL
## ..$ hjust           : NULL
## ..$ vjust           : num 1
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 2.75points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.top   :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL
## ..$ size            : NULL
## ..$ hjust           : NULL
## ..$ vjust           : num 0
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 0points 0points 2.75points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.bottom : NULL
## $ axis.title.y        :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL
## ..$ size            : NULL
## ..$ hjust           : NULL
## ..$ vjust           : num 1
## ..$ angle           : num 90
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 0points 2.75points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.y.left  : NULL
## $ axis.title.y.right :List of 11
## ..$ family          : NULL
## ..$ face             : NULL
## ..$ colour          : NULL

```

```

## ..$ size      : NULL
## ..$ hjust     : NULL
## ..$ vjust     : num 0
## ..$ angle     : num -90
## ..$ lineheight : NULL
## ..$ margin    : 'margin' num [1:4] 0points 0points 0points 2.75points
## .. ..- attr(*, "unit")= int 8
## ..$ debug     : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text      :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : chr "grey30"
## ..$ size        : 'rel' num 0.8
## ..$ hjust       : NULL
## ..$ vjust       : NULL
## ..$ angle       : NULL
## ..$ lineheight  : NULL
## ..$ margin      : NULL
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x    :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : num 1
## ..$ angle       : NULL
## ..$ lineheight  : NULL
## ..$ margin      : 'margin' num [1:4] 2.2points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.top :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : num 0
## ..$ angle       : NULL
## ..$ lineheight  : NULL
## ..$ margin      : 'margin' num [1:4] 0points 0points 2.2points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.bottom : NULL
## $ axis.text.y        :List of 11
## ..$ family          : NULL

```

```

## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : num 1
## ..$ vjust         : NULL
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 2.2points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.y.left : NULL
## $ axis.text.y.right :List of 11
## ..$ family        : NULL
## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : num 0
## ..$ vjust         : NULL
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 0points 0points 2.2points
## .. ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.ticks       : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.ticks.x     : NULL
## $ axis.ticks.x.top  : NULL
## $ axis.ticks.x.bottom : NULL
## $ axis.ticks.y     : NULL
## $ axis.ticks.y.left : NULL
## $ axis.ticks.y.right : NULL
## $ axis.ticks.length : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ axis.ticks.length.x : NULL
## $ axis.ticks.length.x.top : NULL
## $ axis.ticks.length.x.bottom: NULL
## $ axis.ticks.length.y : NULL
## $ axis.ticks.length.y.left : NULL
## $ axis.ticks.length.y.right : NULL
## $ axis.line         : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.line.x       : NULL
## $ axis.line.x.top   : NULL
## $ axis.line.x.bottom : NULL
## $ axis.line.y       : NULL
## $ axis.line.y.left  : NULL
## $ axis.line.y.right : NULL
## $ legend.background : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ legend.margin     : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points

```

```

##  .- attr(*, "unit")= int 8
##  $ legend.spacing          : 'simpleUnit' num 11points
##  .- attr(*, "unit")= int 8
##  $ legend.spacing.x        : NULL
##  $ legend.spacing.y        : NULL
##  $ legend.key               : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"
##  $ legend.key.size          : 'simpleUnit' num 1.2lines
##  .- attr(*, "unit")= int 3
##  $ legend.key.height        : NULL
##  $ legend.key.width         : NULL
##  $ legend.text              :List of 11
##  ..$ family                 : NULL
##  ..$ face                   : NULL
##  ..$ colour                  : NULL
##  ..$ size                    : 'rel' num 0.8
##  ..$ hjust                   : NULL
##  ..$ vjust                   : NULL
##  ..$ angle                   : NULL
##  ..$ lineheight              : NULL
##  ..$ margin                  : NULL
##  ..$ debug                   : NULL
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_text" "element"
##  $ legend.text.align         : NULL
##  $ legend.title              :List of 11
##  ..$ family                 : NULL
##  ..$ face                   : NULL
##  ..$ colour                  : NULL
##  ..$ size                    : NULL
##  ..$ hjust                   : num 0
##  ..$ vjust                   : NULL
##  ..$ angle                   : NULL
##  ..$ lineheight              : NULL
##  ..$ margin                  : NULL
##  ..$ debug                   : NULL
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_text" "element"
##  $ legend.title.align        : NULL
##  $ legend.position            : chr "right"
##  $ legend.direction           : NULL
##  $ legend.justification       : chr "center"
##  $ legend.box                 : NULL
##  $ legend.box.just            : NULL
##  $ legend.box.margin          : 'margin' num [1:4] 0cm 0cm 0cm 0cm
##  .- attr(*, "unit")= int 1
##  $ legend.box.background      : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"
##  $ legend.box.spacing         : 'simpleUnit' num 11points
##  .- attr(*, "unit")= int 8
##  $ panel.background           : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"
##  $ panel.border               : list()
##  .- attr(*, "class")= chr [1:2] "element_blank" "element"

```

```

## $ panel.spacing          : 'simpleUnit' num 5.5points
## ..- attr(*, "unit")= int 8
## $ panel.spacing.x       : NULL
## $ panel.spacing.y       : NULL
## $ panel.grid             :List of 6
## ..$ colour              : chr "grey92"
## ..$ size                : NULL
## ..$ linetype            : NULL
## ..$ lineend             : NULL
## ..$ arrow               : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major       : NULL
## $ panel.grid.minor       :List of 6
## ..$ colour              : NULL
## ..$ size                : 'rel' num 0.5
## ..$ linetype            : NULL
## ..$ lineend             : NULL
## ..$ arrow               : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major.x    : NULL
## $ panel.grid.major.y    : NULL
## $ panel.grid.minor.x    : NULL
## $ panel.grid.minor.y    : NULL
## $ panel.ontop           : logi FALSE
## $ plot.background       : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ plot.title            :List of 11
## ..$ family              : NULL
## ..$ face                : NULL
## ..$ colour              : NULL
## ..$ size                : 'rel' num 1.2
## ..$ hjust               : num 0
## ..$ vjust               : num 1
## ..$ angle               : NULL
## ..$ lineheight          : NULL
## ..$ margin              : 'margin' num [1:4] 0points 0points 5.5points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug               : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.title.position   : chr "panel"
## $ plot.subtitle         :List of 11
## ..$ family              : NULL
## ..$ face                : NULL
## ..$ colour              : NULL
## ..$ size                : NULL
## ..$ hjust               : num 0
## ..$ vjust               : num 1
## ..$ angle               : NULL
## ..$ lineheight          : NULL
## ..$ margin              : 'margin' num [1:4] 0points 0points 5.5points 0points
## .. ..- attr(*, "unit")= int 8

```



```

## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption      :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : NULL
## ..$ size            : 'rel' num 0.8
## ..$ hjust          : num 1
## ..$ vjust          : num 1
## ..$ angle          : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 5.5points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption.position : chr "panel"
## $ plot.tag            :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : NULL
## ..$ size            : 'rel' num 1.2
## ..$ hjust          : num 0.5
## ..$ vjust          : num 0.5
## ..$ angle          : NULL
## ..$ lineheight      : NULL
## ..$ margin          : NULL
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.tag.position    : chr "topleft"
## $ plot.margin          : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
## ..- attr(*, "unit")= int 8
## $ strip.background     : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ strip.background.x   : NULL
## $ strip.background.y   : NULL
## $ strip.placement      : chr "inside"
## $ strip.text           :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : chr "grey10"
## ..$ size            : 'rel' num 0.8
## ..$ hjust          : NULL
## ..$ vjust          : NULL
## ..$ angle          : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 4.4points 4.4points 4.4points 4.4points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.text.x         : NULL

```

```

## $ strip.text.y :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : NULL
## ..$ angle       : num -90
## ..$ lineheight  : NULL
## ..$ margin      : NULL
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.switch.pad.grid : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.switch.pad.wrap : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.text.y.left :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : NULL
## ..$ angle       : num 90
## ..$ lineheight  : NULL
## ..$ margin      : NULL
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## - attr(*, "class")= chr [1:2] "theme" "gg"
## - attr(*, "complete")= logi TRUE
## - attr(*, "validate")= logi TRUE

```

5 Discussion

5.1 First discussion point

If my paper were 10 pages, then should be be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

5.2 Second discussion point

5.3 Third discussion point

5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

Appendix

.1 Survey

A Additional details

B References

- R Core Team (2020) Wickham et al. (2019) Wickham and Miller (2021)
- R Core Team. 2020. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Golemund, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. <https://doi.org/10.21105/joss.01686>.
- Wickham, Hadley, and Evan Miller. 2021. *Haven: Import and Export 'SPSS', 'Stata' and 'SAS' Files*.