Workbook

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The authors made the following contributions. Preston Lyons: Conceptualization, Writing - Original Draft Preparation, Writing - Working out of problems; Johannes Karl: Review and assistance of problems including R, RStudio, coding, computer and package issues..

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

Keywords: keywords

Word count: X

Workbook

Methods

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Participants

Material

Procedure

Data analysis

We used R (Version 4.0.4; R Core Team, 2021) and the R-packages *papaja* (Version 0.1.0.9997; Aust & Barth, 2020), and *tinylabels* (Version 0.2.0; Barth, 2021) for all our analyses.

Import Data

Question 1 ## Integer

```
## # A tibble: 4,126 x 6
##    HLTH.SleepHours Hours.Internet Hours.Exercise Hours.Work Hours.News
##              <dbl>          <dbl>          <dbl>      <dbl>      <dbl>
##  1               6             10             14         14          4
##  2               6              5             24          0          4
##  3               6             14              7         35          5
##  4               4             15             10         65          4
##  5               7              2              5         60          1
```

```
##  6              7              2              6         50          2
##  7              6              4              1         41          0
##  8              4              4              0         42          0
##  9              7             10              1          0          8
## 10              8             14              7          0          7
## # ... with 4,116 more rows, and 1 more variable: HoursCharity <dbl>

## tibble [4,126 x 68] (S3: tbl_df/tbl/data.frame)
##  $ Id                          : num [1:4126] 1 1 2 2 3 3 4 4 5 5 ...
##  $ Wave                        : Factor w/ 2 levels "2018","2019": 2 1 2 1 2 1 2 1 2 1
##  $ years                       : num [1:4126] 10.43 9.47 10.61 9.9 10.17 ...
##  $ Age                         : num [1:4126] 47 46 47 46 53 52 60 59 84 84 ...
##  $ Male                        : Factor w/ 2 levels "Male","Not_Male": 1 1 1 1 1 1 2 2
##  $ Gender                      : num [1:4126] 1 1 1 1 1 1 0 0 0 0 ...
##  $ Edu                         : num [1:4126] 3 3 7 7 4 4 8 7 7 7 ...
##  $ Partner                     : num [1:4126] 1 1 1 1 0 0 1 NA 0 0 ...
##  $ BornNZ                      : num [1:4126] 1 1 1 1 1 1 1 1 1 1 ...
##  $ Employed                    : num [1:4126] 1 0 1 1 1 1 1 NA 0 0 ...
##  $ BigDoms                     : Factor w/ 5 levels "Buddhist","Christian",..: 4 4 4 4
##  $ TSCORE                      : num [1:4126] 3869 3520 3936 3677 3774 ...
##  $ GenCohort                   : Factor w/ 5 levels "Gen Boombers: born >= 1946 & b.<
##  $ Religion.Church             : num [1:4126] 0 0 0 0 0 0 2 NA 0 0 ...
##  $ Religion.Believe.Cats       : num [1:4126] 4 4 1 1 1 1 1 NA 3 1 ...
##  $ Relid                       : num [1:4126] 0 0 0 0 0 0 7 7 2 2 ...
##  $ HLTH.Fatigue                : num [1:4126] 2 2 1 2 2 2 1 2 NA 1 ...
##  $ HLTH.SleepHours             : num [1:4126] 6 6 6 4 7 7 6 4 7 8 ...
##  $ HLTH.BMI                    : num [1:4126] 23.1 23.1 35.1 13.1 34 ...
##  $ HLTH.Weight                 : num [1:4126] 75 75 120 45 110 110 64 74 54.4 54.4 ...
```

```
## $ HLTH.Height                : num [1:4126] 1.8 1.8 1.85 1.85 1.8 1.8 1.58 1.58 1.6
## $ HomeOwner                  : num [1:4126] NA 1 NA 0 NA 1 NA NA NA 0 ...
## $ Pol.Orient                 : num [1:4126] 3 3 5 3 4 4 3 NA 4 4 ...
## $ PATRIOT                    : num [1:4126] 4.5 5 6.5 7 4 4 5.5 4 6.5 6 ...
## $ Env.SatNZEnvironment       : num [1:4126] 7 4 7 7 7 7 4 3 7 8 ...
## $ Env.MotorwaySpend          : num [1:4126] 5 5 3 5 4 4 4 6 5 6 ...
## $ Env.PubTransSubs           : num [1:4126] 5 6 5 5 4 4 7 6 4 6 ...
## $ Env.ClimateChgConcern      : num [1:4126] 6 6 7 7 4 4 6 NA 4 2 ...
## $ LIFEMEANING                : num [1:4126] 5 6.5 5 4.5 5.5 5.5 7 7 5 6 ...
## $ Hours.Internet             : num [1:4126] 10 5 14 15 2 2 4 4 10 14 ...
## $ Issue.GovtSurveillance     : num [1:4126] 3 1 3 3 4 4 1 2 4 3 ...
## $ Issue.RegulateAI           : num [1:4126] NA 1 NA 4 NA 4 NA 3 NA 4 ...
## $ Issue.IncomeRedistribution : num [1:4126] 3 2 4 4 2 4 7 6 4 3 ...
## $ Hours.Exercise             : num [1:4126] 14 24 7 10 5 6 1 0 1 7 ...
## $ Hours.Work                 : num [1:4126] 14 0 35 65 60 50 41 42 0 0 ...
## $ Hours.News                 : num [1:4126] 4 4 5 4 1 2 0 0 8 7 ...
## $ CONSCIENTIOUSNESS          : num [1:4126] 4.75 5.25 5.5 5.5 5 4.25 4.75 4.75 NA 5.
## $ EXTRAVERSION               : num [1:4126] 3.25 2.75 4.75 4 3.75 4.5 5.75 4.25 NA 4
## $ AGREEABLENESS              : num [1:4126] 4.5 5 5 6 5.75 5.25 5 5.25 NA 5 ...
## $ OPENNESS                   : num [1:4126] 6.5 7 4.25 4.25 6 6 5.75 6.25 NA 5 ...
## $ Religious                  : Factor w/ 2 levels "Not_Religious",..: 1 1 1 1 1 1 2
## $ Spiritual.Identification   : num [1:4126] NA 1 NA 5 NA 4 NA NA NA 2 ...
## $ Believe.God                : Factor w/ 2 levels "Believe God",..: 2 2 1 1 1 1 1 NA
## $ Believe.Spirit             : Factor w/ 2 levels "Believe Spirit",..: 2 2 1 1 1 1 1
## $ HoursCharity               : num [1:4126] 2 0 0 2 0 0 0 4 0 0 ...
## $ CharityDonate              : num [1:4126] 180 80 300 100 4200 3500 400 350 50 100
## $ Your.Personal.Relationships: num [1:4126] 7 6 2 2 8 8 10 10 9 9 ...
```

```
##  $ Your.Future.Security       : num [1:4126] 8 10 8 6 8 7 8 7 9 9 ...
##  $ Standard.Living            : num [1:4126] 7 8 8 6 8 8 10 10 9 9 ...
##  $ NZ.Economic.Situation      : num [1:4126] 7 4 2 6 5 6 7 5 7 8 ...
##  $ NZ.Social.Conditions       : num [1:4126] 7 7 2 6 5 5 2 0 9 7 ...
##  $ NZ.Business.Conditions     : num [1:4126] 7 8 2 6 5 5 6 5 9 7 ...
##  $ Emp.JobSecure              : num [1:4126] 7 NA 6 6 5 4 6 NA NA NA ...
##  $ Issue.Food.GMO             : num [1:4126] 1 2 5 5 4 4 7 7 1 4 ...
##  $ Env.SacMade                : logi [1:4126] NA NA NA NA NA NA ...
##  $ KESSLER6sum                : num [1:4126] 5 3 7 7 3 3 0 4 NA 2 ...
##  $ FeelHopeless               : Factor w/ 5 levels "None Of The Time",..: 1 1 2 1 1 1
##  $ FeelDepressed              : Factor w/ 5 levels "None Of The Time",..: 1 1 1 1 1 1
##  $ FeelRestless               : Factor w/ 5 levels "None Of The Time",..: 3 2 4 4 2 2
##  $ EverythingIsEffort         : Factor w/ 5 levels "None Of The Time",..: 2 2 2 3 2 2
##  $ FeelWorthless              : Factor w/ 5 levels "None Of The Time",..: 1 1 1 1 1 1
##  $ FeelNervous                : Factor w/ 5 levels "None Of The Time",..: 3 2 3 3 2 2
##  $ date                       : Date[1:4126], format: "2020-02-02" "2019-02-18" ...
##  $ Hours.Internet_int         : int [1:4126] 10 5 14 15 2 2 4 4 10 14 ...
##  $ Hours.Exercise_int         : int [1:4126] 14 24 7 10 5 6 1 0 1 7 ...
##  $ Hours.Work_int             : int [1:4126] 14 0 35 65 60 50 41 42 0 0 ...
##  $ Hours.News_int             : int [1:4126] 4 4 5 4 1 2 0 0 8 7 ...
##  $ HoursCharity_int           : int [1:4126] 2 0 0 2 0 0 0 4 0 0 ...
```

Question 2a ## Scale, Center, Transform

```
## # A tibble: 6 x 5
##   Pol.Orient   Age Pol.Orient1[,1] Pol.Orient2[,1] Age1[,1]
##        <dbl> <dbl>           <dbl>           <dbl>    <dbl>
## 1          3    47          -0.420          -0.582   -0.357
```

```
## 2          3    46          -0.420          -0.582   -0.457
## 3          5    47           1.02            1.42    -0.357
## 4          3    46          -0.420          -0.582   -0.457
## 5          4    53           0.301           0.418    0.243
## 6          4    52           0.301           0.418    0.143
```

Question 2b ## Data Wrangle

```
##        V1
##  Min.   :-0.70917
##  1st Qu.:-0.46046
##  Median :-0.21175
##  Mean   :-0.00897
##  3rd Qu.: 0.16131
##  Max.   : 9.23926
##  NA's   :57
```

```
## 2018 2019
## 2063    0
```

```
## # A tibble: 2,063 x 3
##    Hours.Exercise Wave  Hours.Exercise44[,1]
##             <dbl> <fct>                 <dbl>
##  1           24   2018                 2.28
##  2           10   2018                 0.534
##  3            6   2018                 0.0370
##  4            0   2018                -0.709
##  5            7   2018                 0.161
```

```
## 6             1   2018               -0.585
## 7             1   2018               -0.585
## 8             3   2018               -0.336
## 9             8   2018                0.286
## 10            5.5 2018               -0.0252
## # ... with 2,053 more rows
```

Question 3 ## Working with dates

```
## # A tibble: 607 x 3
##    day            n Year
##    <date>     <int> <fct>
##  1 2018-06-21   112 2018
##  2 2018-06-22    93 2018
##  3 2018-06-24    80 2018
##  4 2018-06-20    67 2018
##  5 2018-06-23    59 2018
##  6 2018-06-26    58 2018
##  7 2019-12-03    54 2019
##  8 2018-06-25    52 2018
##  9 2019-10-04    47 2019
## 10 2019-12-02    46 2019
## # ... with 597 more rows
```

Maxmimum for 2019: 54 Maximum for 2018: 112 based from the above summary and pulling the relevant dates out from it.

Question 4 ## Calculating dates and creating summaries

How many days are there between the date with the highest number of responses and the date with the second highest number of responses? Pulling the relevant data from the above summary: the answer is 1 day between these dates.

Bonus: Calculate difference between the number of responses on the highest response date and second highest response date? See below:

```
## [1] 19
```

Question 5 ## Working with date intervals

```
## [1] 302.8338
```

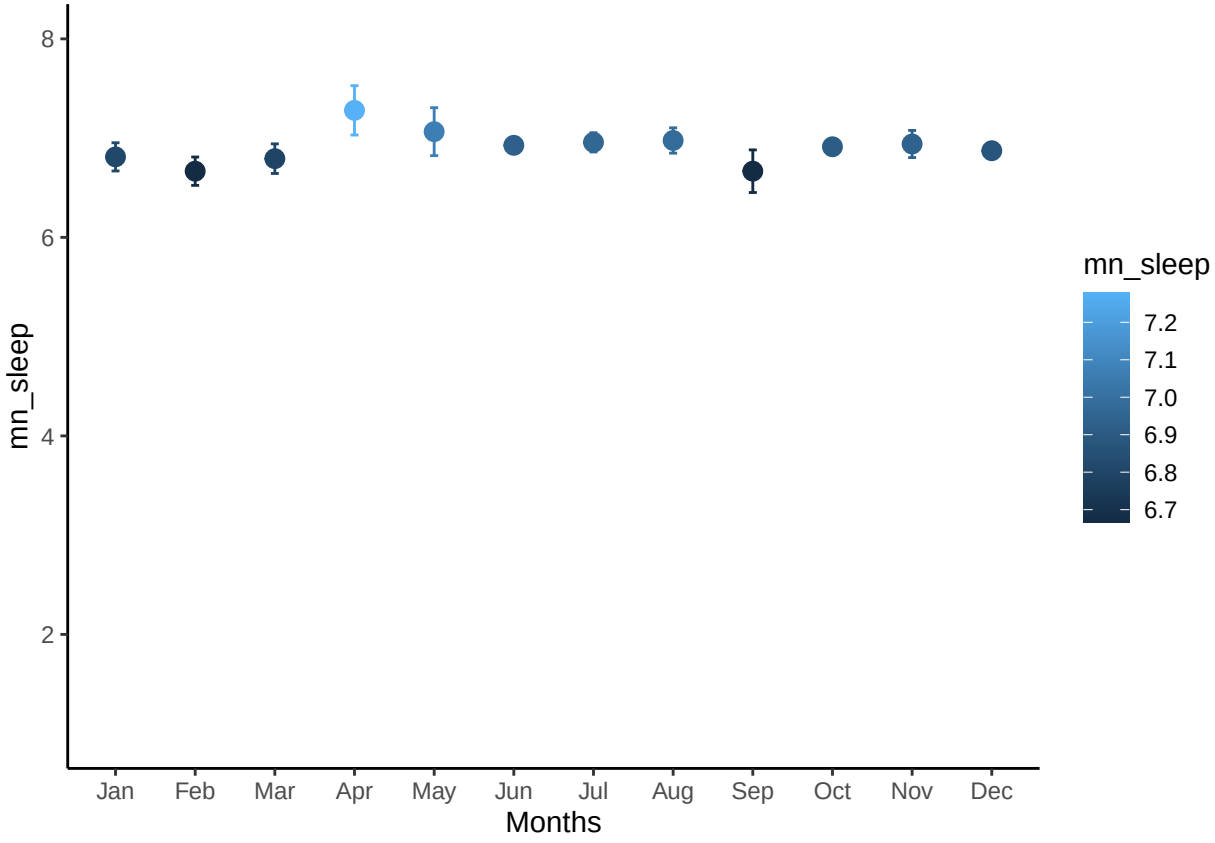
Question 6 ## Create an ordered factor from numerical data

```
##
##      Non-attendance Moderate attendance Frequent attendance                <NA>
##                3366                 493                 158                 109
```

*Make sure to re-level the factor so that the ordinal ranking moves from lowest to highest - because the factors are already leveled correctly, no re-leveling is required - re-leveling could otherwise be done with the re-level function

Question 7a ## Make a summary table

Question 7b ## Make a summary graph



Comment:

Let me have a think!

Briefly explain why some intervals are wider than others.

Question 8 ## Correlation graph

```
## Parameter          | FeelNervous | FeelWorthless | EverythingIsEffort | FeelRestless
## ------------------------------------------------------------------------------------
## FeelHopeless       |    -0.29*** |          0.02 |           -0.22*** |     -0.33***
## FeelDepressed      |    -0.26*** |     -6.78e-03 |           -0.17*** |     -0.30***
## FeelRestless       |    -0.14*** |      -0.29*** |           -0.22*** |
## EverythingIsEffort |    -0.30*** |      -0.21*** |                    |
## FeelWorthless      |    -0.21*** |               |                    |

## # Correlation Matrix (pearson-method)
```

```
##
## Parameter          | FeelNervous | FeelWorthless | EverythingIsEffort | FeelRestless
## ------------------------------------------------------------------------------------
## FeelHopeless       |     0.43*** |       0.65*** |            0.52*** |      0.43***
## FeelDepressed      |     0.38*** |       0.67*** |            0.49*** |      0.38***
## FeelRestless       |     0.46*** |       0.39*** |            0.46*** |
## EverythingIsEffort |     0.42*** |       0.47*** |                    |
## FeelWorthless      |     0.40*** |               |                    |
##
## p-value adjustment method: Holm (1979)
```

What do you find most interesting about this plot? The strong correlations present between feeling worthless, depressed, and hopeless.

**Discuss further, note the plot doesn't show me everything that's going on here people halp!

Can't see the strength of the "FeelWorthless" to "FeelDepressed" correlation

Question 9 ## Create a blank papaja report

Question 10 ## Patchwork

Use the patchwork library to create a figure with two plots on top of each other. Use the tag_levels function to index each of the two plots. The graphs should describe some dimension of the truncated nz dataset.

Results

Discussion

References

Aust, F., & Barth, M. (2020). *papaja: Prepare reproducible APA journal articles with R Markdown*. Retrieved from https://github.com/crsh/papaja

Barth, M. (2021). *tinylabels: Lightweight variable labels*. Retrieved from https://github.com/mariusbarth/tinylabels

R Core Team. (2021). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/

Table 1

Average Number of Hours of Sleep by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
6.810909	6.666667	6.792891	7.279487	7.064935	6.927352	6.957458	6.976087	6.666667	6.912846	6.940741	6.872973