

Final Project II - Exploring the GSS

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Introduction

The importance of money has forever remained undying to personal, national, and international wellbeing. In this data exploratory analysis, we focus on a person's wellbeing. We start with money, and see how something so materialistic can affect a person's happiness. Using 4 metrics, financial situation, financial satisfaction, financial assistance from government, and expectation for future financial situations, we show that overall, the financial conditions of people are becoming better than they were before. Upon this realization, we attempt to fit a linear model to predict the financial satisfaction in the future. We then project income levels across happiness levels to see if a particular income group is more happy than others.

In section II, we explore how some individuals justify suicide due to bankruptcy. We explore if this is somehow correlated to the financial satisfaction of individuals. Using limited data, we also try to see if happiness is related to the amount of people you know in a lifetime who have committed suicide.

In the third and final section, we look at happiness of a marriage and the happiness of a person, striving to draw a connection between those two.

I. Financial Well-being vs Overall Well-Being

Has financial wellbeing improved over these past few decades? If so, was it a result of the government's effort? To answer these questions, we use data from 4 different variables: *finalter*, *satfin*, *natfarey*, and *goodlife*.

- **Finalter:** During the last few years, has your financial situation been getting better, worse, or has it stayed the same?

- Possible responses: Better, Worse, Stayed Same
- **Satfin:** We are interested in how people are getting along financially these days. So far as you and your family are concerned, would you say that you are pretty well satisfied with your present financial situation, more or less satisfied, or not satisfied at all?
 - Possible responses: Pretty Well Satisfied, More or Less Satisfied, Not Satisfied at All
- **Natfarey:** We are faced with many problems in this country, none of which can be solved easily or inexpensively. I'm going to name some of these problems, and for each one I'd like you to tell me whether you think we're spending too much money on it, too little money, or about the right amount. Are we spending too much, too little, or about the right amount on government *assistance to the poor*?
 - Possible Responses: TOO LITTLE, ABOUT RIGHT, TOO MUCH
- **Goodlife:** The way things are in America, people like me and my family have a good chance of improving our standard of living – do you agree or disagree?
 - Possible Responses: Strongly Agree, Agree, Neither, Disagree, Strongly Disagree

To have a brief overview at the data, let's have a brief summary of the data.

| ## | natfarey | goodlife | satfin | finalter |
|-------------|----------|--------------|--------------|--------------|
| ## Min. | :1.00 | Min. :1.00 | Min. :1.00 | Min. :1.00 |
| ## 1st Qu.: | 1.00 | 1st Qu.:2.00 | 1st Qu.:1.00 | 1st Qu.:1.00 |
| ## Median | :1.00 | Median :2.00 | Median :2.00 | Median :2.00 |
| ## Mean | :1.44 | Mean :2.46 | Mean :1.97 | Mean :2.02 |
| ## 3rd Qu.: | 2.00 | 3rd Qu.:3.00 | 3rd Qu.:3.00 | 3rd Qu.:3.00 |
| ## Max. | :3.00 | Max. :5.00 | Max. :3.00 | Max. :3.00 |
| ## NA's | :43593 | NA's :44552 | NA's :4650 | NA's :4780 |

There are relatively large amounts of unavailable data, let's keep that in mind as we remove them.

| ## | natfarey | goodlife | satfin | finalter |
|-------------|----------|---------------|---------------|--------------|
| ## Min. | :1.000 | Min. :1.000 | Min. :1.000 | Min. :1.00 |
| ## 1st Qu.: | 1.000 | 1st Qu.:2.000 | 1st Qu.:1.000 | 1st Qu.:1.00 |
| ## Median | :1.000 | Median :2.000 | Median :2.000 | Median :2.00 |
| ## Mean | :1.443 | Mean :2.454 | Mean :1.971 | Mean :2.01 |
| ## 3rd Qu.: | 2.000 | 3rd Qu.:3.000 | 3rd Qu.:3.000 | 3rd Qu.:3.00 |
| ## Max. | :3.000 | Max. :5.000 | Max. :3.000 | Max. :3.00 |

After removing the NA values, the means of the 4 variables remained about the same, showing that these unknown values did not have too much of a large effect on any of the variables.

After removing the NA values, we first start by unifying the scale of comparison across variables. Positive/numerically larger responses are given larger ranks. For instance, satfin (satisfaction with financial situation) has ranks 1, 2, 3. 1 being "Pretty well satisfied," 2 being "More or less satisfied", and 3 being "Not satisfied at all." After re-ordering, 3 is "Pretty well satisfied" and 1 is "Not satisfied at all."

```
## # A tibble: 6 x 4
## # Groups:   year, sumThatYear [6]
##   year sumThatYear      n propor
##   <dbl>      <dbl> <int>  <dbl>
## 1  1987         2138   964    2.22
```

```
## 2 1994      1949  905  2.15
## 3 1996      1943  905  2.15
## 4 1998      2096  914  2.29
## 5 2000      2088  910  2.29
## 6 2002      1004  459  2.19
```

Table: Mean Score for Financial Situation

```
## # A tibble: 6 x 4
## # Groups:   year, sumNatF [6]
##   year sumNatF    n proporNF
##   <dbl> <dbl> <int>    <dbl>
## 1 1987    1338   964     1.39
## 2 1994    1402   905     1.55
## 3 1996    1468   905     1.62
## 4 1998    1377   914     1.51
## 5 2000    1352   910     1.49
## 6 2002     665   459     1.45
```

Table: Mean Score for Financial Assistance

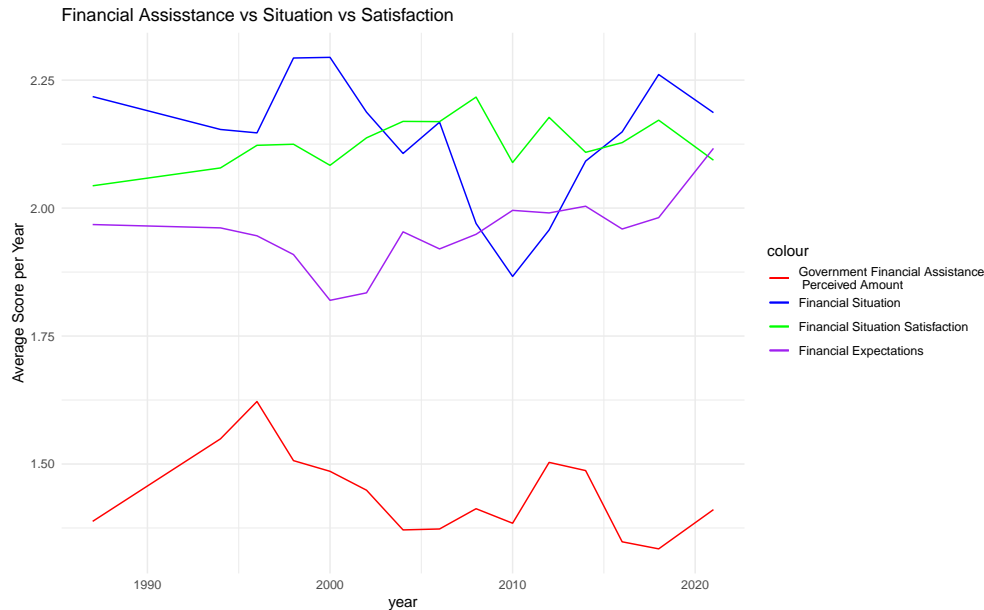
```
## # A tibble: 6 x 4
## # Groups:   year, sumSat [6]
##   year sumSat    n proporSat
##   <dbl> <dbl> <int>    <dbl>
## 1 1987    1970   964     2.04
## 2 1994    1881   905     2.08
## 3 1996    1921   905     2.12
## 4 1998    1942   914     2.12
## 5 2000    1896   910     2.08
## 6 2002     981   459     2.14
```

Table: Mean Score for Financial Satisfaction

```
## # A tibble: 6 x 4
## # Groups:   year, sumGood [6]
##   year sumGood    n proporGood
##   <dbl> <dbl> <int>    <dbl>
## 1 1987    1897   964     1.97
## 2 1994    1775   905     1.96
## 3 1996    1761   905     1.95
## 4 1998    1745   914     1.91
## 5 2000    1656   910     1.82
## 6 2002     842   459     1.83
```

Table: Mean Score for Financial Expectation

The following figure maps the reordered variables' average score(sum of scores/ number of responses) for each year.



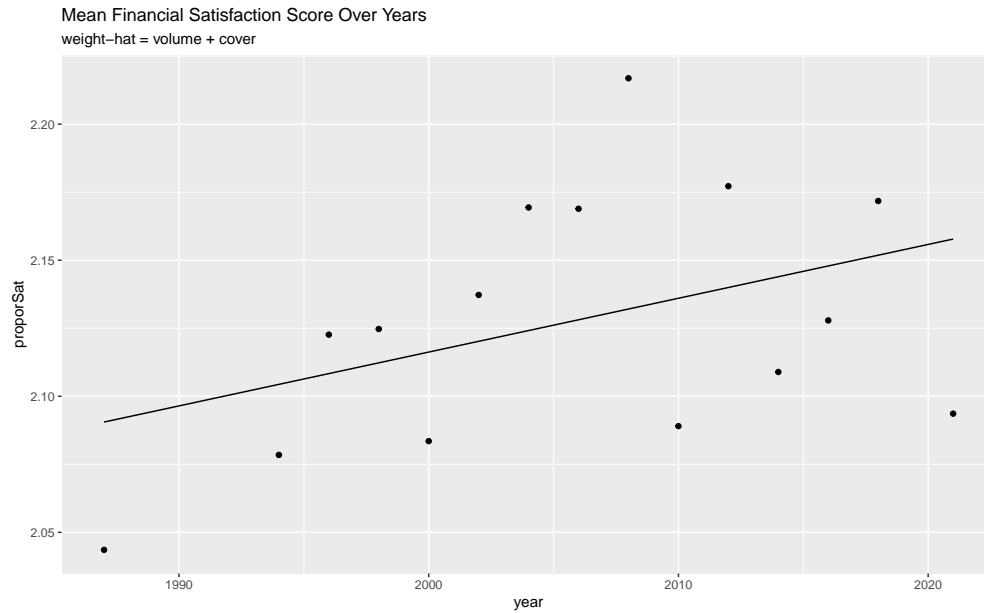
Figure

- **Government Financial Assistance:** Government financial assistance has basically always been perceived as too little. The highest score received was in the year 1996, when the Welfare Reform Act of 1996 was passed.
- **Financial Situation:** According to the respondents, the financial situation was the best at 1998 and 2000. However, reports say that 1998 global economic growth slowed down (<https://www.eestipank.ee/en/annual-report-1998-world-economy-and-financial-markets-1998>). In addition, the dotcom bubble burst and the 9/11 terrorist attack both occurred in year 2000, so the accuracy of the survey regarding this question may need further investigation. Meanwhile, in the year 2010, the financial situation had the lowest opinion, which might be the result of rising unemployment rate, or debt from other countries. Overall, of all variables, this has the most fluctuations.
- **Financial Situation Satisfaction:** It seems that most people are more or less well satisfied with their financial situation. And the slope of the line seems to be slightly positive, indication that the satisfaction has increased over the years.
- **Financial Situation Expectation:** While other variables have a scale from 1-3, this variable is caled from 1-5 (Strongly disagree-agree), so the graph actually shows that most people disagree or are neutral to the statement that they have a good chance of improving their standard of living.

It is safe to say that people's perception of the financial situation has fluctuated, but the financial satisfaction and expectation have risen over the years. In addition, most of the government's financial assistance isn't seen as adequate.

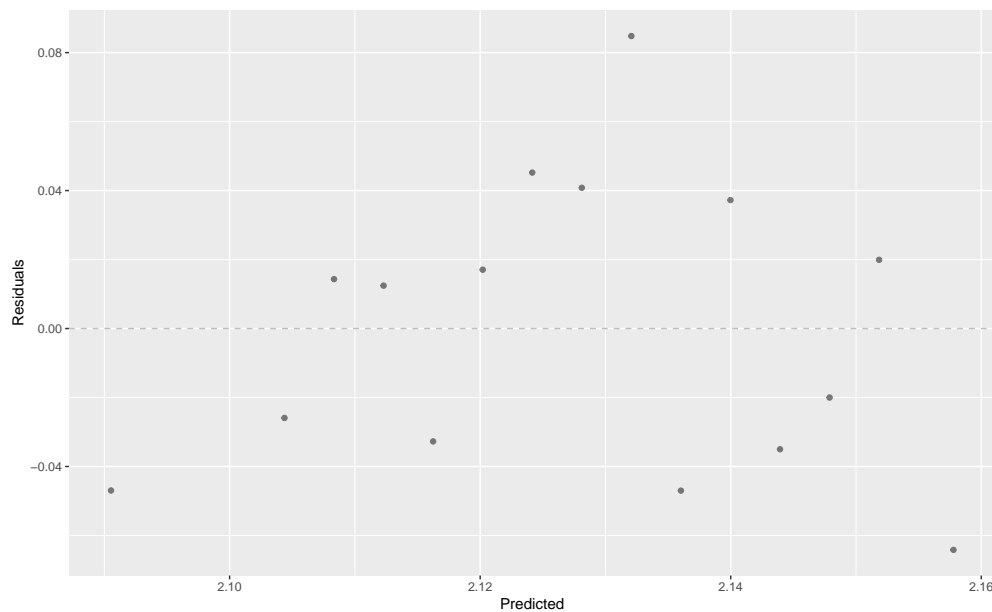
After noticing a slight linear relationship between financial situation satisfaction and years, we might be interested in testing if a linear model is fit to predict the satisfaction in the future.

```
## # A tibble: 2 x 5
##   term      estimate std.error statistic p.value
##   <chr>      <dbl>    <dbl>    <dbl>   <dbl>
## 1 (Intercept) -1.84      2.44     -0.754  0.464
## 2 year         0.00198  0.00122    1.63   0.128
```



Figure

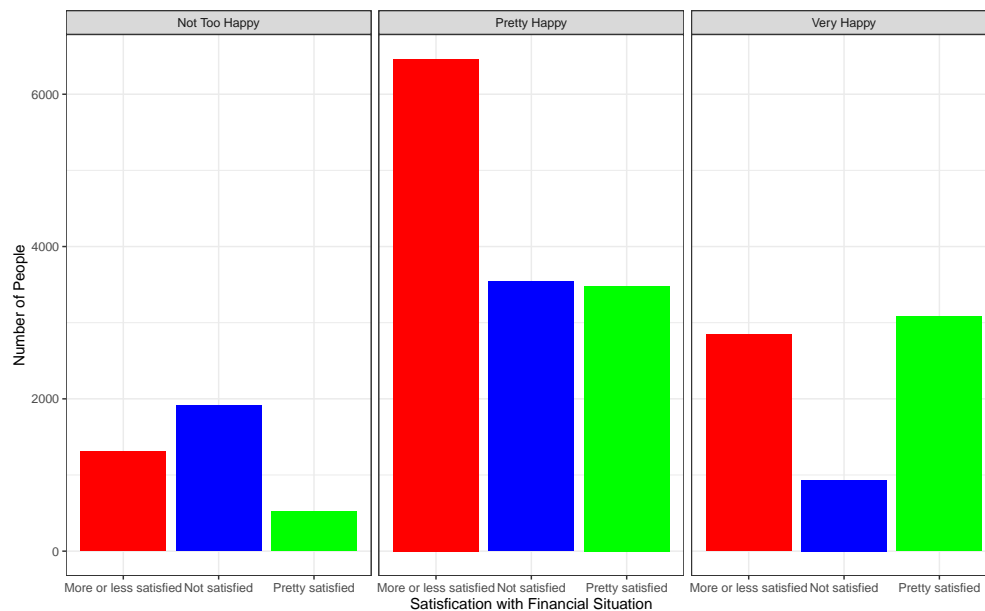
We can see that a linear model may not be the best fit for this data, as some points seem to be very distant from the line. To graphically view how good the linear model is, we can create a residuals plot.



The residuals plot should ideally have points scattered all around, with no specific pattern. However, Quadrant I (upper left-hand corner) seems to have a small number of dots. Evidently, a linear model is unsuitable for this data. Although financial satisfaction can increase ever year, the scale is the same, so the largest score one can achieve is still 3.

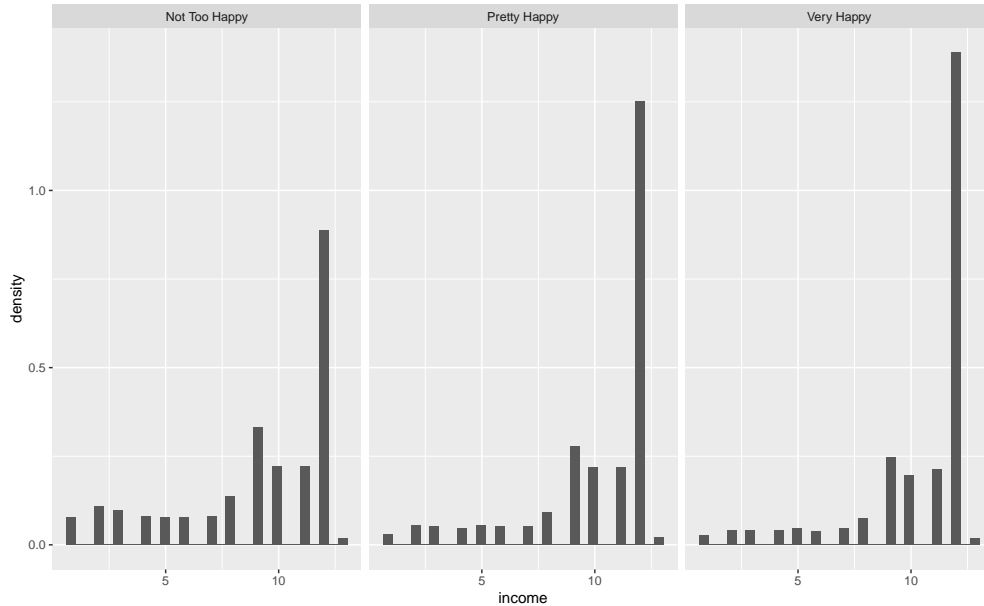
Now that we understand the trends of the financial status over the years, let's see if there is any correlation between general happiness and financial satisfaction.

```
## # A tibble: 6 x 14
##   year    goodlife    happy    natfarey finalter    satfin suinum
##   <dbl>    <dbl+lbl> <dbl+lb>    <dbl+lbl> <dbl+lb> <dbl+l>    <dbl>
## 1  1987 4 [disagree] 2 [pret~ NA(i)      1 [bett~ 2 [mor~    NA
## 2  1987 4 [disagree] 2 [pret~      1 [too~ 2 [wors~ 2 [mor~    NA
## 3  1987 4 [disagree] 2 [pret~      1 [too~ 3 [stay~ 2 [mor~    NA
## 4  1987 4 [disagree] 3 [not ~      1 [too~ 3 [stay~ 2 [mor~    NA
## 5  1987 2 [agree]    2 [pret~ NA(i)      1 [bett~ 2 [mor~    NA
## 6  1987 2 [agree]    3 [not ~      1 [too~ 3 [stay~ 2 [mor~    NA
## # ... with 7 more variables: suicide2 <dbl+lbl>,
## #   income <dbl+lbl>, hapmar <dbl+lbl>, divorce <dbl+lbl>,
## #   Satfin <chr>, Goodlife <dbl>, Happy <chr>
```



We see that those who are more happy tend to be more satisfied with their financial situation, giving us evidence that there is correlation between financial satisfaction and general happiness.

To verify if income levels have the same impact on general happiness as does financial satisfaction, let's create a histogram.



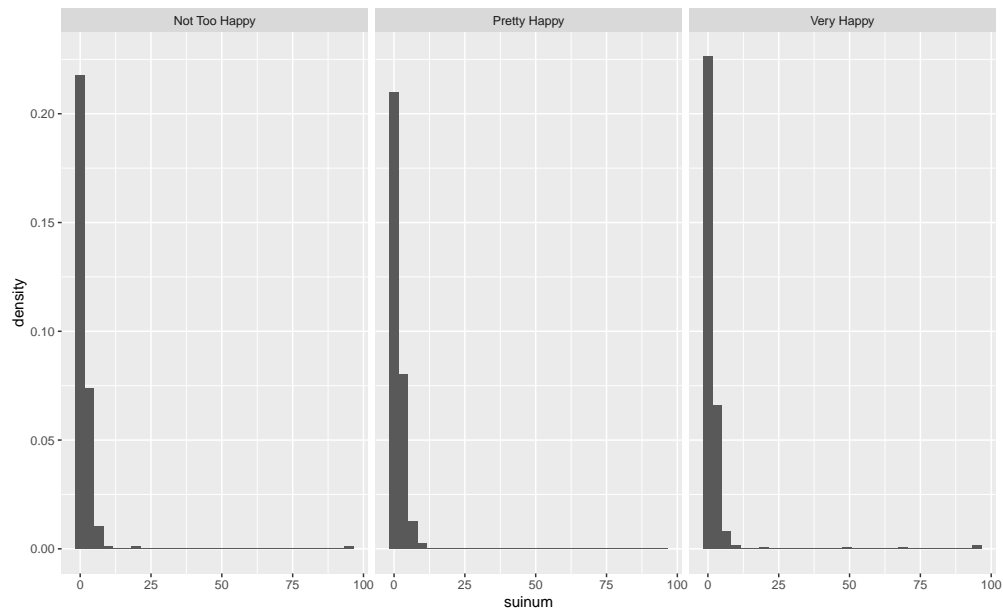
This graph does not provide any interesting results whatsoever as the income levels are almost identical across all happiness levels. Perhaps this is due to sampling error (i.e., the survey happened to interview those who are of the same income level) or other errors that we don't know of.

II. Justification of Suicide & Financial Situation

We continue around the topic economics and finance's impact. In this section, we explore the impact of financial situations on justification of suicide. Before we proceed, however, we might want to see the correlation of happiness and suicide.

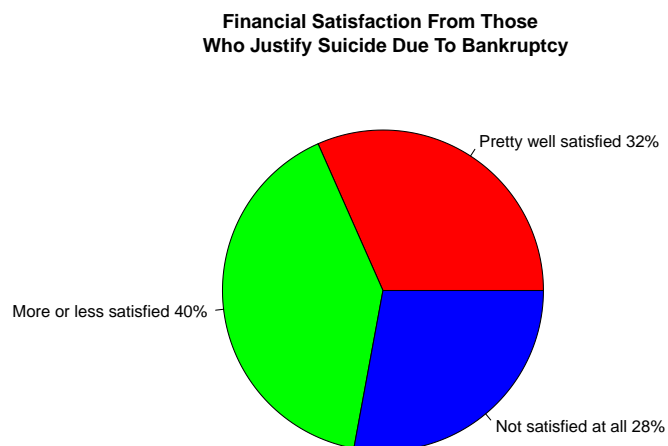
The amount of information on suicide in the dataset is rather limited. Suinum is a variable in the GSS survey that asks respondents for the number of people that the respondent personally knows that have committed suicide. The highest is 9 people and the lowest is 0. However, this variable is only available for the year 2016, so we will only delve into the happiness level of respondents in 2016.

As seen below, most respondents reportedly don't know many people that have committed suicide in their life. Therefore, this variable seems to only have a little impact on the happiness level of individuals.

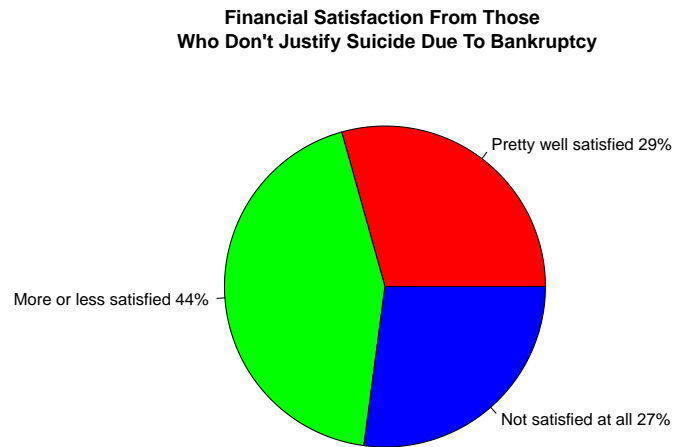


```
## # A tibble: 6 x 4
## # Groups:   year, sumSat [6]
##   year sumSat    n proporSat
##   <dbl> <dbl> <int>    <dbl>
## 1  1977   2813  1498     1.88
## 2  1978   2885  1518     1.90
## 3  1982   3739  1809     2.07
## 4  1983   3147  1563     2.01
## 5  1985   2944  1498     1.97
## 6  1986   2862  1455     1.97
```

First, let's see the financial satisfaction distribution for those who think suicide due to bankruptcy is reasonable.



It seems, surprisingly, that most of the respondents who justified suicide are doing fine financially.

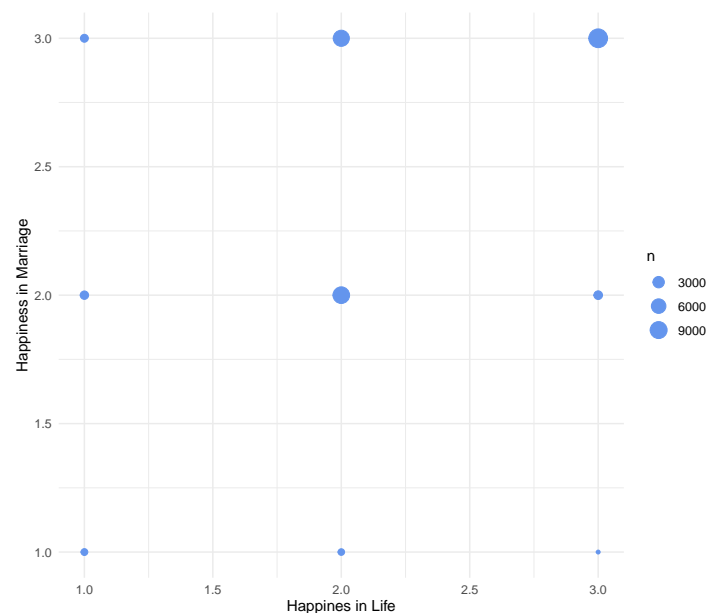


As seen above, even for those who don't justify suicide, the proportion is rather similar. Consequently, we actually cannot say that financial satisfaction affects one's opinion on the legitimacy of suicide as a result of bankruptcy.

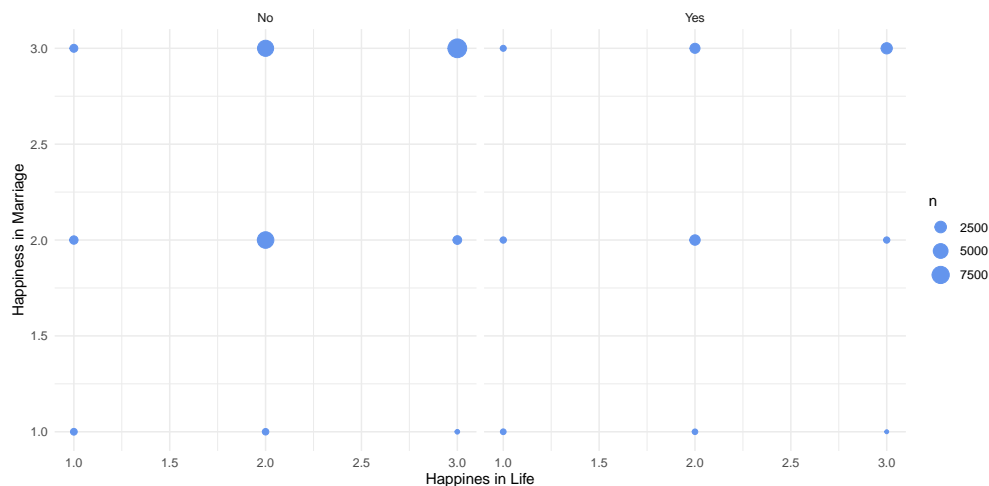
III. Happy

Next, we take a quick look at happiness to see if happiness in marriage is related to general happiness in life. Using a bubbleplot, we can see that the larger the bubble, the stronger the relationship between variables.

As shown below, the happiness in life and the happiness in marriage have a strong relationship with each other.



For further investigation, we take into account the affect of divorce on individuals. Those who have been divorced (“Yes”), have smaller bubbles and are less happy.



IV. Conclusion

The findings of this analysis show that financial wellbeing has improved ever so slightly throughout the years, and that happiness is somewhat related to financial satisfaction. In addition, justification of suicide (due to bankruptcy) seems to have no correlation with financial satisfaction. Meanwhile, due to limited data, number of people one knows that have committed suicide has little relationship with one’s happiness. Lastly, happiness in a relationship is related to one’s general happiness in life.

The most important message that we can take out of this is: financial stability and financial satisfaction is essential to one’s happiness level.