Helping Others to Help Yourself:
The Effect of Volunteering on Life Satisfaction and the Moderating Role of Employment Status

Bachelor Thesis Sociology SOBA313A

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Abstract

With 44% of the Dutch population doing voluntary work, volunteering seems to be a popular way to occupy one's leisure time (CBS, 2022). Prior research shows volunteering can benefit an individual's life satisfaction (Armstrong et al., 2020). Possible reasons for these benefits could be the gained psychological and social resources and time structure (Lin, Ye & Ensel, 1999; Goodman et al., 2016). However, since leisure time is often only a part of the hours in a day, it could be important to consider one's employment status as well. Especially since working possibly could benefit life satisfaction through the same reasons. Therefore, this bachelor thesis will try to answer the following question: *Are Dutch people who volunteer more satisfied than their peers? Is this explained by their employment status?* In this context, employment status refers to employment (performing paid work) and unemployment (not performing paid work). To answer this question, a multiple regression analysis has been performed using data from the LISS panel. The LISS panel is a representation of the Dutch population and collects longitudinal data from around 5000 households. The individual's subjective health, income, and age have been considered as controlling variables. The data showed no difference in estimated life satisfaction between those who volunteer and those who do not. The influence volunteering has on life satisfaction also does not differ between those who are employed and those who are not. Being employed does benefit life satisfaction, as well as subjective health, which has been found as an important determinant of life satisfaction.

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1. Introduction

Whether it is playing piano, spending time with friends, or participating in sports, leisure time is often the moment in the day for people to do something for themselves, and to relax. Kleiber & Nimrod (2009) define leisure time as ''preferred and enjoyable activities participated in during one's free time''. Next to sleep and work, leisure time is often a key component of someone's life. In the Netherlands, most people spend their free time with media or IT: around 19,6 hours a week (Sociaal en Cultureel Planbureau [SCP], 2019a). Another popular way to spend free time is by sharing time with others: around 8,2 hours a week (Sociaal en Cultureel Planbureau [SCP], 2019a). How this time is spent varies widely, from participating in a sports team or political party to attending church or being part of a cultural association. What these activities all have in common is that they can be found under the umbrella of social leisure. Research suggests spending free time with peers has increased benefits, compared to spending time alone (Chang et al., 2014). Social leisure enhances life in various ways: it directly increases social support, enriches the meaning of life, aids in stress recovery, and helps individuals overcome difficult life events like the loss of a loved one. This indicates social leisure is worth investigating.

Another way to spend free time socially is by volunteering. A big part of the Netherlands volunteers: around 44% of people do unpaid work (CBS, 2022). Wilson (2000) defines volunteering as ''any activity in which time is given freely to benefit another person, group, or cause'' (p. 215). However, in the past ten years, the number of volunteers in the Netherlands has decreased, from 51% in 2010 to 44% in 2020 (CBS, 2022). With this large amount of people volunteering, this raises the question: what motivates people to engage in volunteering? One explanation is that individuals often begin volunteering after being invited to do so (Musick and Wilson, 2003). Another explanation is that the decision to volunteer depends on personal characteristics; individuals with higher self-esteem or greater life satisfaction are more likely to volunteer (Thoits & Hewitt, 2001).

Volunteering is a phenomenon that is embedded in solidarity: helping others with the common goal of helping people and society (Cappelletti & Valtolina, 2015). Additionally, volunteering offers significant economic benefits, making it a valuable area of study and promotion. In the Netherlands, the current labor market is tight, with 144 vacancies for

every 100 unemployed people (CBS, 2024). Volunteering could be a viable solution to address this labor shortage.

Not only is volunteering a great way to help others, but it also seems to be a way to help yourself. Armstrong et al. (2020) found a link between volunteering and higher life satisfaction. Life satisfaction is part of the concept of *subjective well-being* (Pavot & Diener, 2008). Life satisfaction is defined as ''how satisfied someone is with life and the overall positivity with one's life at a given time'' (Roney & Soicher, 2021). The effect of volunteering on life satisfaction can be partly explained by the mechanisms of psychological resources and social resources (Lin, Ye & Ensel, 1999) and time structure (Goodman et al., 2016). These mechanisms found in prior research will be further elaborated in the next chapter, the theoretical framework.

However, volunteering opportunities can be constrained by someone's work situation. Working often occupies a large part of one's schedule: in the Dutch population this is approximately 27 hours a week (Sociaal en Cultureel Planbureau [SCP], 2019b). With employment possibly having the same benefits on life satisfaction as volunteering has, such as psychological resources, social resources, and time structure, the effect of volunteering could differ between groups with different employment statuses. Therefore, work status will be considered as a possible moderating factor for the effect of voluntary participation on life satisfaction. Different employment statuses taken into consideration in this research will be *employed* (performing paid work) and *unemployed*. To further deepen our knowledge on the topic of volunteering in relation to life satisfaction, this paper will try to answer the following question: *Are Dutch people who volunteer more satisfied than their peers? Is this explained by their employment status?* This will be analysed with a statistical analysis, using data from the LISS (Longitudinal Internet Studies for the Social Sciences) panel.

2. Theoretical Framework

This research is about the relation between volunteering and life satisfaction, and the role of someone's employment status. The process of how volunteering could improve life satisfaction will be explained through the two mechanisms of psychological and social resources by Lin, Ye, and Ensel (1999) and the mechanism of time structure (Goodman et al., 2016). Secondly, the possible role of the employment status will be discussed. The factors that could possibly influence life satisfaction, namely health, age, and income, are considered control variables and will be discussed afterward. The conceptual model of the research model is shown in Figure 1.
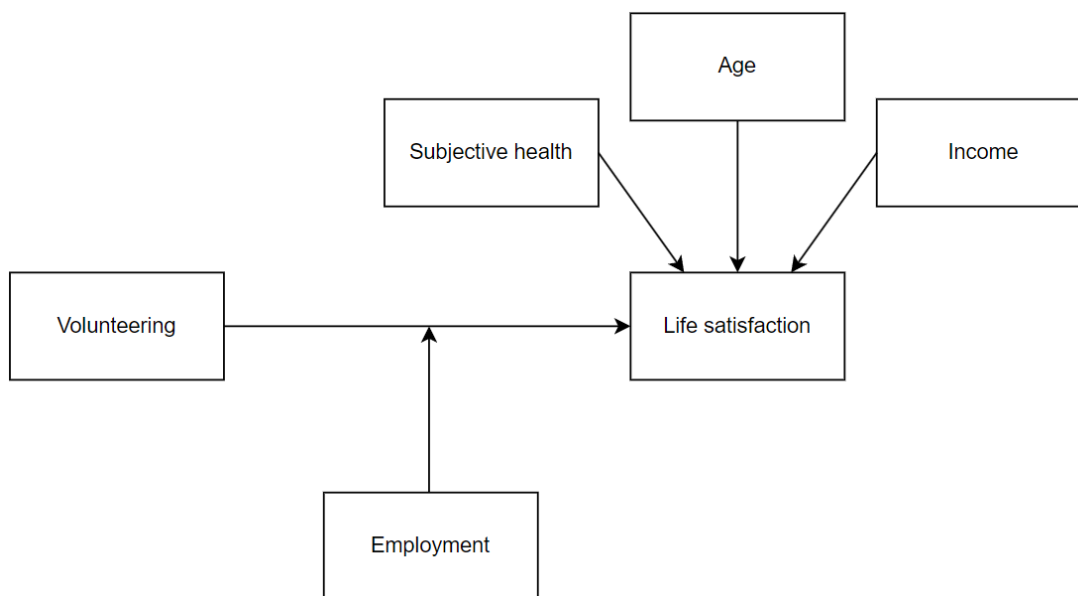
Figure 1: research model of the effect of volunteering on life satisfaction, the moderating role of employment, controlled for subjective health, income, and life satisfaction.

2.1 Volunteering and Life Satisfaction

Lin, Ye, and Ensel (1999) described the following two mechanisms that can help explain how volunteering can improve life satisfaction and overall well-being. The first type of mechanism is called *psychological resources*. Volunteering can provide psychological resources, such as improved self-esteem and a sense of purpose. According to this theory, volunteering makes people more self-assured, because of the recognition volunteers are rewarded. The idea of making the world a better place is seen as an important value (Musick and Wilson, 2003). Acting by this, positively affects the volunteers' perceptions of themselves and their abilities, thus gaining confidence. A higher self-esteem is strongly correlated with higher life

satisfaction (Diener & Diener, 1995). This gained confidence is a useful psychological resource in terms of counteracting negative feelings such as depression and anxiety. Moreover, volunteering could increase the feeling of mattering. Mattering, defined as the feeling of being important to others, is often positively related to life satisfaction (Paradisi et al., 2024). Paradisi et al. (2024) show, that mattering is needed in order to value the self and their importance in other's lives.

The second mechanism explained by Lin, Ye, and Ensel is the mechanism of *social resources*. The mechanism of social resources refers to the argument that well-being is linked to social integration. This refers to ''the amount of social interactions people have with others'' (Musick and Wilson, 2003). Frequent interactions with others can increase the chances of having meaningful connections. Volunteering is a good opportunity to be part of a community, since volunteering may promote opportunities to form new relationships. Examples of these communities could be a political party, sports club, or a trade union. People who volunteer tend to have more supportive social ties, compared to their peers who do not volunteer (Pilkington et al., 2012). This means people who volunteer are expected to receive a greater level of support from relatives, friends, and neighbors and more frequent positive social exchanges. Having more social interaction could improve life satisfaction since being part of a reciprocal and trustworthy network can improve these social resources (Putnam, 1993).

Another way volunteering could positively influence life satisfaction through the time structure it offers. Being part of a volunteering community or doing voluntary activities or in one's leisure time is a way of giving structure to the day. Having structure in time gives a sense of purpose, and productiveness and can therefore be rewarding, and therefore improve well-being. Moreover, being occupied can be a distraction from worries. Missing structure in daily life is linked to negative effects on overall well-being and could even lead to depressive symptoms (Goodman et al., 2016).

However, it is difficult to determine if there is a causal link between volunteering and life satisfaction. Even though people who volunteer seem to have a higher life satisfaction, people with a higher life satisfaction are also more likely to volunteer. Thoits and Hewitt's (2001) *personal well-being model* could give a possible explanation. In line with this model, people who volunteer are already more confident and have higher self-esteem compared to

those who do not volunteer. This reverse causality could appear when individuals with poor health do not volunteer, whereas those who are healthy, would. Yet, Armstrong et al. show evidence of causal long-term benefits of volunteering (2020). Using econometric measure techniques, this research shows both a causal effect between volunteering and health and volunteering and life satisfaction for those older than age 35.

No clear consensus about whether the number of hours participating in volunteering has an impact on life satisfaction has been found, but it does not seem to be of great influence. Whereas Thoits and Hewitt's (2001) research found the number of hours did not matter in predicting life satisfaction, other research showed a difference in life satisfaction, but only for the group that volunteered less than seven hours a week (Pilkington et al., 2012). Therefore, in this research, no difference will be made in the number of hours spent volunteering. The focus will be on the difference between volunteers and non-volunteers. This leads us to formulate the following hypothesis:

Hypothesis 1: *Individuals who volunteer are more satisfied with their lives than individuals who do not volunteer.*

2.2 Employment Status

Working often occupies a large part of one's schedule, in the Dutch population this is approximately 27 hours a week (Sociaal en Cultureel Planbureau [SCP], 2019b). As something taking up much time, this is an important variable to consider when thinking about how leisure time is spent. Especially since employment possibly has the same benefits on life satisfaction as volunteering has, such as psychological resources, social resources, and time structure, the effect of volunteering could differ between groups with different employment statuses. Volunteering for people with different employment statuses might not benefit life satisfaction as much as it does for others. To research the role of one's work situation in the relation between volunteering and life satisfaction, the distinction will be made between being employed (doing paid work), and being unemployed (not doing paid work.

However, even though volunteering seems to positively influence life satisfaction, not everyone volunteers. Time constraint is a possible explanation for why some volunteer and others do not: full-time workers have been found to volunteer less than part-time workers

(Wilson, 2000). However, this does not explain why the lowest rate of volunteering often are found for unemployed people (Wilson, 2000). A possible explanation is that work has an integrating role, that encourages activities such as volunteering (Erlinghagen, 2010). In the following paragraphs, possible relations between volunteering, life satisfaction, and the two different employment statuses will be discussed.

2.2.1 Employment

When making the comparison between voluntary work and paid work, similarities in how life satisfaction could be affected can be found. Another way to have psychological and social resources and to give your time a sense of structure, like volunteering, is through employment. Therefore, being employed might have a moderating effect on how volunteering could influence life satisfaction. Moreover, employment also benefits life satisfaction in multiple ways. A way to explain these benefits is through Jahoda's (1981) "Latent Deprivation Theory". This theory provides five mechanisms on how employment improves life satisfaction: Time structure, social contacts and shared experiences outside of family, motivation for participation in a collective purpose, improvement of personal identity, and work providing regular activity. The similarities between employment and volunteering can also be found in the Latent Deprivation Theory since volunteering could offer the same benefits as mentioned. Because of these clear similarities between performing paid and voluntary work, it could be expected that employment and volunteering benefit life satisfaction in the same way.

2.2.2 Unemployment

Whereas employment seems to be linked to improved well-being, the opposite has been found for unemployment. Unemployment could lead to a lack of sense of purpose, since there is no external goal that a job can offer. This lack of purpose has been linked to a decline in life satisfaction (Gedikli et al., 2022; Kamerāde & Bennett, 2017).

No longer having the time structure employment offers could also negatively affect overall well-being, and is even linked to depression (Goodman et al., 2016). Work is often something that is regular and occupies parts of the day. The lack of time structure due to unemployment has been found to be a cause of a decline in overall wellbeing (Martella & Maass, 2000). Therefore, the structure that volunteering can bring might not have the same

impact on the well-being of those who have a job compared to those who do not. The difference might be that those with paid work already have structure and therefore, do not benefit as much from the time structure volunteering brings.

Even though volunteering seems to have possible positive outcomes for those who are unemployed, this does not imply that all who are unemployed want to volunteer. The reasons why someone is unemployed might be the same reasons why someone might not benefit from volunteering. This is in line with Thoits and Hewitt's (2001) *personal well-being model*. For example, low mental health could be the reason for not being able to perform both paid and voluntary work. However, it has been found that those who volunteer during unemployment are found to experience higher overall well-being (Kamerāde & Bennett, 2017). This brings us to formulate the following hypothesis:

Hypothesis 2: The effect of volunteering differs between employed and unemployed people. Unemployed people are expected to experience a greater positive effect from volunteering than employed people.

2.3 Control Variables

This study aims to explain the effect of volunteering on life satisfaction. Recognizing that life satisfaction is complicated and can be influenced by numerous factors, the effect will be controlled for income, health, and age. By accounting for these variables, we aim to isolate the impact of volunteering.

2.3.1 Income

A factor that could be of major influence on somebodies' life satisfaction is income. Having too little income is linked to lower life satisfaction (Tauseef, 2021). Causes of this relation could be the stress of not being able to satisfy one's needs and negatively influence one's mental health by for example having the feeling of failure. Not being able to do things that make an individual happy and having bad mental health can lead to being less satisfied with life. On the other hand, having a higher income is linked to higher life satisfaction (Alloush & Wu, 2023). Being able to spend more, thus being able to afford things that make one happy, for example traveling or more luxurious leisure activities could improve how satisfied someone is with life.

However, the link between income and life satisfaction is not linear. As income increases, the effects it has on life satisfaction seem to decrease. This effect of individual income also decreases when a country has a higher GDP (Bonini, 2007). Prior research found the link between income and volunteering is unclear (Wilson, 2000). However, to isolate the effect of volunteering, income should be taken into account as a control variable.

2.3.2 Health

Another factor to consider when looking at life satisfaction is health. Health and overall well-being are closely connected (Lim, 2019). Having bad subjective health, being ill or chronically ill could strongly affect how satisfied an individual is with their life. When someone's health is too bad to practice one's hobbies or participate in other activities, this can decline life satisfaction. Illness also causes people to be in pain and therefore severely affecting the quality of life and life satisfaction (Strine et al., 2007).

However, according to Thoits and Hewitt's (2001) *personal well-being model*, this could lead to a form of self-selection in volunteering. Those with a better health could be the ones volunteering, since those with a worse health are not capable of volunteering. To account for this effect, health will be included as a control variable.

2.3.3 Age

A third variable that could impact life satisfaction is age. Different age categories hold different attitudes towards volunteering. For example, Vantilborgh (2013) et al. show that older people are more likely to value volunteering as they realise, they have less time to live and develop a need to make contributions and a stronger need to feel connected. Furthermore, Angelini et al. show that older people have a better self-esteem, which has been linked to a higher life satisfaction (2011). This suggests that older people are more satisfied with their life in general. To limit this effect, age will be used as a control variable.

3. Methods

3.1 Data from the LISS Panel

The data used in this research is secondary data coming from the LISS panel (Longitudinal Internet Studies for the Social Sciences) and is part of the LISS Core Study. The dataset contains around 5000 households, with in total around the 7500 individuals aged 16 and older. The data can be found in the LISS Data Archive and are free of charge for social and policy-relevant research (LISS Data, 2023c). The LISS Data Archive is managed by Dutch non-profit research institute Centerdata (Centerdata, 2024). The LISS Core Study provides longitudinal data on several topics: politics and values, economic situation, work and schooling, health, personality and religion and ethnicity (LISS Data, 2023b). The first wave of data has been conducted in 2007 and has been conducted each year ever since.

The LISS panel is invite-based only to create an accurate representation of the Dutch population. This has been done by drawing a random sample of 10,000 households from the population registers from Statistics Netherlands (Centraal Bureau Statistiek, CBS). Those included in the sample have been invited to participate in the panel with a participation rate of 48%. There have been seven sample refreshments since, to improve the representativeness of the panel (LISS Data, 2023a). Respondents without access to the internet are provided a loaned computer with a broadband connection.

In this research, the data used are from the thirteenth wave of the LISS Core Study. The following questionnaires have been used to collect the data for this research: Working and Schooling, Social Integration and Leisure, Health and Personality. The data are from 2020, except for the Personality questionnaire, with data gathered in 2021. For all surveys, between 6500 and 7000 people have been approached.

This research focuses on the Dutch population, and since the LISS panel accurately represents this demographic, no modifications in regards to representation to the dataset were necessary. The actual data used in this research contains only the cases with complete answers to the relevant questions. Cases with missing answers to one or more of the relevant questions cannot be used in the analysis and were therefore not selected. This results in a dataset with 4189 complete cases.

3.2 Research Design

The procedure of data collection by the LISS panel is done online. To include everyone that has been selected in the draw and prevent the otherwise occurring non-response for those without an internet connection, these households are provided with a broadband connection and a computer by the researchers. Every month, members of the LISS panel complete an online questionnaire. Filling in the questionnaire has a duration of approximately 60 minutes in total and the members receive a monetary reward.

3.3 Operationalization

To answer the research question, multiple questions have been used. In this paragraph, the questions and adaptions that have been done will be discussed. Firstly, the dependent variable *life satisfaction* will be discussed. Secondly, the variables of *employment status* and *volunteering* will be discussed. Lastly, the control variables *age, income,* and *health* will be discussed.

3.3.1 Life Satisfaction

The dependent variable *life satisfaction* can be found in the Personality questionnaire and is measured with the following question: *How satisfied are you with the life you lead at the moment?* (cp21m001). Respondents were given a scale of options from *not at all satisfied* (0) to *completely satisfied* (10) and *I don't know* (-9), classifying the variable as ordinal. However, this variable will be treated as a continuous one since there are enough answer categories that are also at equal distance to each other, making it possible to interpret values as continuing.

3.3.2 Volunteering

The independent variable to predict *life satisfaction* is volunteering. This has been recoded into a dummy variable that indicates if someone does volunteer work. The original question in the Social Integration and Leisure questionnaire that has been used is (cs20m003 - cs20m062) *We now list a number of organizations that you are free to join. Can you indicate, for each of the organizations listed, what applies to you at this moment or has applied to you over the past 12 months?* The possible answers were as follows: More than one answer possible 1 = no connection 2 = donated money 3 = participated in an activity 4 = member 5 = performed voluntary work. These could be answered into thirteen certain categories, a few

examples are a sports club, a cultural association, or hobby club, or a trade union. If the respondent answers *do voluntary work* (5) for one of these categories, the following questions in the LISS questionnaire will be coded (1) yes: cs20m007, cs20m012, cs20m017, cs20m022, cs20m027, cs20m032, cs20m527, cs20m037, cs20m042, cs20m047, cs20m052, cs20m057 and cs20m062. If all these questions added together is the value of 1 or more, the subject participates in at least one type of voluntary work. This has been recoded into (0) does not do voluntary work, (1) does voluntary work.

The choice has been made to operationalize volunteering as a dichotomous variable. This decision has been made because only around a quarter of the sample used in this research does voluntary work. More details about these specific numbers can be found in the *univariate statistics* paragraph in the results chapter 4. To only use this small section of the sample would eliminate possibly interesting information about the difference between volunteering or not volunteering and the section might have too little information about the differences in the amount of voluntary participation since too few respondents participate a lot.

3.3.3 Employment Status

The variable employment status will be treated as a moderating variable. This variable will exist out of two different statuses: being employed or unemployed. This will be operationalized as a dummy variable. Employment will be coded as *paid_employment*. This dummy will be created from the preloaded variable *primary occupation* (belbezig) which can be found in the Work and Schooling questionnaire (cw20m525) with the following answer categories: paid employment (1), works or assists in family business (2), autonomous professional, freelancer, or self-employed (3), job seeker following job loss (4), first-time job seeker (5), exempted from job seeking following job loss (6), attends school or is studying (7), takes care of the housekeeping (8), is pensioner ([voluntary] early retirement, old age pension scheme) (9), has (partial) work disability (10), performs unpaid work while retaining unemployment benefit (11), performs voluntary work (12), does something else (13), is too young to have an occupation (14). This will be recoded into the dummy variable *paid employment*. The original first category in *primary occupation* (1) will be *paid_employment* = 1. The other categories *primary occupation* (2 to 14) will be *paid_employment* = 0.

3.3.4 Control Variables Health, Age, and Income

The ordinal control variable Health measures the subjective health of the respondents. The representative question can be found in the Health questionnaire as *How would you describe your health, generally speaking?* (ch20m004), with the following answer options: *poor* (1), *moderate* (2), *good* (3), *very good* (4) and *excellent* (5).

The control variable Age is the age of the respondent in years. The ages in the dataset range from 16 to 103 and can be found in the codebook as *leeftijd*.

The control variable Income is the monthly net income of the respondent in euros. This can be found in the codebook as *nettoink_f*.

3.4 Analysis Plan

To answer the research question, the univariate and bivariate descriptives will be analyzed. Correlations between the continuous and ordinal variables will be calculated with Pearson's correlation. Correlations between dummy variables will be calculated with Cramer's V, using crosstabs. The following guidelines have been used to determine the strength of the correlation: 0,1 is a small correlation, 0,3 is a medium correlation and 0,5 is a large correlation. This is followed by a model evaluation in which the suitability of a linear model according to the linear regression assumptions will be discussed, outliers and multicollinearity will be investigated, and the model fit will be discussed. The hypotheses will be tested with a multiple linear regression. This will be done with multiple regression models in the statistics software SPSS. In the following paragraph, the steps of the regression analysis will be discussed. The complete analysis will be displayed in appendices 2 and 3.

Model 1 contains only the dependent variable *life satisfaction*, and the control variables *age, health,* and *income* as independent variables. To test the hypothesis about the main relation between *volunteering* and *life satisfaction* (hypothesis 1), model 2 will be used. In this model, the variable *volunteering* is added, next to the control variables and the dependent variable *life satisfaction*.

To test the possible role of employment status on life satisfaction (hypothesis 2), model 4 will be used. Model 4 contains the *control variables, volunteering, paid_employment*, and the interaction variable of employment status and volunteering (vol_x_paidemployment).

4. Results

4.1 Descriptive Statistics

Table 1 shows the univariate statistics of the continuous variables used in this research: *income, health, age*, and *life satisfaction*, and the percentages per category of the dummy variables *volunteering* and *paid employment*. This analysis shows the following information about the control variables. The variable income is shown to have a high variability (SD = 3431,84) with a mean of 1858,51 euros a month. This dispersion can also be seen in the high value of the maximum, being 146652 euros, while the third quartile is 2400 euros a month. The average age of the sample is around 55 years (SD = 17,87) with ages between 16 and 103 in the dataset. The third control variable health has a mean of 3,13 on a scale of five.

For the variable *volunteering,* it is shown that the majority of the sample, around three-quarters, does not participate in voluntary activities (76,5%), versus around a quarter that does participate in voluntary activities (23,5%). The variable *employment status* shows that less than half of the respondents does not perform paid work (41%).

Table 1: Descriptive statistics (mean, SD, minimum, maximum, Q1, Q2, Q3) of life satisfaction, volunteering, employment status, income, age and health, (n= 4189)

Variable	Mean (SD)	Minimum	Maximum	Q1	Q2	Q3
Life satisfaction (scale 10 items)	7,29 (1,469)	1	10	7,00	7,00	8,00
Volunteering						
No (0)	76,5%					
Yes (1)	23,5%					
Employment Status						
No paid work (0)	59%					
Paid work (1)	41%					
Income (netto a month in euros)	1858,51 (3431,837)	0	146652	1000,00	1750,00	2400,00
Age	54,95 (17,872)	16	103	41,00	58,00	69,00
Health (scale 5 items)	3,13 (,777)	1	5	3,00	3,00	4,00

The variable *life satisfaction* shows a mean of 7,29 (*SD* = 1,47) which shows that people on average are quite satisfied with their lives. With the first and second quartiles, both being 7 and the third being 8, the sample shows a left-skewed distribution. This shows that the majority of the sample is satisfied with their life.

Table 2: correlations between life satisfaction, volunteering, paid work, income, age and health

	1.	2.	3.	4.	5.	6.
1. Life satisfaction						
2. Volunteering	0,056**[a]					
3. Paid work	,043**[a]	-,042*[b]				
4. Income	,031*[a]	,036**[a]	,088*[a]			
5. Age	,117**[a]	,064**[a]	-,415**[a]	,077**[a]		
6. Health	,298**[a]	,049**[a]	,178**[a]	,008[a]	-,272**[a]	

** significant at $p < ,01$ * significant at $p < ,05$
[a] = Pearson's correlation [b] = Cramer's V

Table 2 shows the bivariate statistics of the continuous variables used in this research. This correlation has been measured using Pearson's correlation. The following guidelines have been used to determine the strength of the correlation: 0,1 is a small correlation, 0,3 is a medium correlation and 0,5 is a large correlation.

Starting with the core variables, no strong correlation has been found between *life satisfaction* and *volunteering* (*r* = ,056). Between life satisfaction and the performance of paid work is also no correlation (*r* = ,043). There is also no correlation between volunteering and the performance of paid work (*r* = -,042). This correlation has been calculated with Cramer's V, since both variables are categorical. Since these variables are both dummies, there is no direction in this correlation.

Continuing with the correlations between the core variables and the control variables, *life satisfaction* has almost no correlation to *income* (*r* = ,031). A small positive correlation can be found between *life satisfaction* and *age* (*r* = ,117). This means an older age is correlated to being more satisfied with life. A medium correlation can be found between *life satisfaction* and *health* (*r* = ,298)*.* This indicates that individuals with a better health are also more satisfied with their life.

The core variable *volunteering* has almost no correlation to *income* (r = ,036), *age* (r = ,064) and *health* (r = ,049). The variable *paid work* has a small positive correlation to *income* (r = ,088). Income has a strong negative correlation to *age* (r = -,415). This indicates that an older age correlates with a lower income. A small to medium positive correlation can be found between *paid work* and *health* (r = ,178). This indicates that those who perform paid work are also healthier.

The correlations between the control variables are as follows: A quite small positive correlation can be found between *income* and *age* (r = ,077). No correlation is found between health and income (r = ,008). A medium negative correlation can be found between *age* and *health* (r = -,272). This indicates that an older age is correlated with a lesser health.

4.2 Model Evaluation

The estimated models to test the hypothesis are shown in Table 3. Model 1 only uses the control variables *age*, *income*, and *health* to estimate *life satisfaction.* In model 2, *volunteering* is added. In model 3, the variable *paid employment* is added*.* In model 4, the interaction variable of paid work with volunteering is added, to test the expected moderating role of the employment status. In the following paragraph, the quality of the models will be evaluated. The complete analysis of the model fit can be found in Appendix 3.

The fit of the models will be evaluated according to the R^2, $R_{adjusted}^2$ and F-change. To evaluate the model, the adjusted R^2 value is used since this corrects for the degrees of freedom. Starting with model 1, using only the control variables, the $R_{adjusted}^2$ is 0,130. This means the control variables can estimate 13% of the variance in life satisfaction in the sample data. Using the control variables, the model is better able to estimate the expected value on *life satisfaction* than using the null model, which estimates *life satisfaction* using only the estimated mean for *life satisfaction* ($F\text{-}change_{model\ 1}$ (3, 4185) = 210,065 p = < ,001).

Model 2 shows no significant improvement in estimating the value of *life satisfaction* by adding the variable *volunteering*. The $R_{adjusted}^2$ value for model 2 is almost the same for model 2 and the F-change shows that the addition of the variable *volunteering* does not any accuracy to the model in its ability to predict *life satisfaction* (R_a^2 = 0,131; $F\text{-}change_{model\ 2}$ (1, 4184) = 2,850 p = ,091).

Model 3 shows a significant improvement compared to model 2 ($F\text{-change}_{model\ 3}$ (1, 4183) = 27,070 p = < ,001). This shows the addition of *employment status,* which indicates if the respondent performs paid work, statistically significantly improves the predicted values on life satisfaction.

In model 4, the interaction variables have been added to investigate the expected moderator effect of the work situation on the effect of voluntary activity. However, the addition of the interaction does not have any added statistically significant value to the model ($F\text{-change}_{model\ 4}$ (1, 4182) = ,004 p = ,952).

Table 3: Regression model 1, model 2, model 3, model 4 with R^2, R_a^2 and F-change

	Model 1		Model 2		Model 3		Model 4		VIF
	b(SE)	p	b(SE)	p	b(SE)	p	b(SE)	p	
Constant	4,220 (,127)	< ,001	4,219 (,127)	< ,001	4,006 (,133)	< ,001	4,006 (,133)	< ,001	
Age	,017 (,001)	< ,001	,017 (,001)	< ,001	,020 (,001)	< ,001	,020 (,001)	< ,001	1,396
Income	,000 (,000)	,409	,000 (,000)	,438	,000 (,000)	,931	,000 (,000)	,931	1,185
Health	,672 (,028)	< ,001	,668 (,028)	< ,001	,658 (,028)	< ,001	,658 (,028)	<,001	1,100
Volunteering			,085 (,050)	,091	,092 (,050)	,067	,094 (0,64)	,140	1,642
Paid work					,248 (,048)	<,001	,250 (,053)	<,001	1,687
Volunteering x paid work							-,006 (,102)	,952	1,888
R^2	,362		,363		,370		,370		
R_a^2	,130		,131		,136		,136		
F-change (p)	210,065	<,001	2,850	,091	27,070	<,001	,004	,952	

The assumption control can be found in appendix 3. The following assumptions have been inspected: 1. The observations are independent of each other; 2. The relation between the independent variables and the dependent variable is linear; 3. The standard deviations of the residuals are constant (homoscedasticity); 4. The residuals are normally distributed. The first assumption has been violated, meaning the observations are not independent of each other. In this dataset, this is the case because the individuals can be part of the same household. The residuals of the dependent variable *life satisfaction* are not completely normally distributed to this variable is mildly violated. It is also difficult to determine if the relation between the independent variables and dependent variable is linear because of the large number of cases. The third assumption has not been violated. Since three of the four

assumptions have been violated, a stricter margin of error will be applied: the p-value will be deemed significant when its 0,025 or lower.

In appendix 3, the multicollinearity evaluation can be found. This evaluation shows no extreme interdependence between the variables.

The control for outliers can also be found in appendix 3. Outliers have been analyzed by looking at the ten cases with the highest values for Cook's distance, leverage, DFFIT, and standardized residuals. The analysis has been repeated without the outliers. The model without the outliers does not seem to differ too much from the original model that includes these cases. The R^2 and $R_{adjusted}^2$ of this model are slightly higher than model 4 but this results in only around 0,5% more explained variance ($R_{adjusted}^2$ without outliers = ,141; $R_{adjusted}^2$ model 4 = ,136). Since the outliers are still observed values, the choice has been made to retain them in the dataset.

4.3 Hypotheses Testing

Table 3 shows the results of the multiple regression analysis of model 1, model 2, model 3, and model 4, used to test the hypotheses. The hypotheses have been formulated out of relevant prior research which can be found in the theoretical framework in chapter 2. In the following paragraph, the results of the regression analysis will be discussed per hypothesis, starting with the effects of the control variables. For every effect that will be discussed, it is implied this is controlled for the other variables in the model. The dependent variable, life satisfaction, has a 10-point scale which should be taken into account when interpreting the found coefficients.

Model 1 shows how life satisfaction is predicted out of the three control variables *age, income,* and *health*. Age seems to have quite an effect on life satisfaction with *b* = 0,017 (*p* < ,001). This would imply that someone who is 30 years older would score half a point higher on the ten-point scale of life satisfaction. It is difficult to determine what the effect of income on life satisfaction is since this variable is reported in euros. This makes the estimated coefficient very small. However, the p-value of income is large, which means no proof has been found that shows income has a statistically significant effect on life satisfaction (*b* = < ,001 *p* = ,409). Health does seem to have a statistically significant effect on life satisfaction (*b* = ,672 *p* < ,001). This is a substantial effect, meaning that someone with poor subjective

health (response = 1) scores around 2,5 points lower on life satisfaction than someone with good subjective health (response = 5) on a ten-point scale.

The first hypothesis that has been tested is as follows: *Individuals who volunteer, are more satisfied with their life than individuals that do not volunteer.* This has been tested using model 2. The estimated coefficient of volunteering is *b* = ,085 (*p* = ,091). The data shows no proof to support the hypothesis. This means people who participate in volunteering are not more satisfied with their lives than those who do not volunteer.

In model 3, the variable *Employment status* has been added. This model shows the variable *paid work* has quite a large and statistically significant effect on *life satisfaction* (*b* = ,248 *p* < ,001). This shows those who perform paid work are expected to be generally more satisfied with their life than those who are unemployed.

The second hypothesis that has been tested is: that *the effect of volunteering differs between employed and unemployed people. Unemployed people are expected to experience a greater positive effect from volunteering than employed people*. To test this hypothesis, model 4 has been used. The effect of voluntary participation on life satisfaction between people with and without paid work has been tested with the interaction variable between volunteering and performing paid work (*vol_x_paidemployment)*. The estimated effect of this interaction variable is *b* = -,006 (*p* = ,952). To give an insight in what this coefficient means, with the equation $E_{life\ satisfaction} = constant + b_{age} + b_{health} +\ b_{income} + b_{volunteering} + b_{paid\ work} + b_{vol\_x\_paidemployment}$, the expected value of *life satisfaction* can be calculated.

This would mean the average respondent who does not perform paid work and does not volunteer would have the expected value of 7,267 On *life satisfaction*, since filling in the coefficients and average values in the equation gives $E_{life\ satisfaction} = 4{,}220 + 0{,}017 * 54{,}95 + 0{,}672 * 3{,}13 +\ 1854{,}51 * 0{,}000005 + {,}094 * 0 + 0{,}250 * 0 +\ -0{,}006 * 0 = 7{,}267$. Using this equation, the expected value for one who is unemployed but does perform voluntary work would be $E_{life\ satisfaction} = 4{,}220 + 0{,}017 * 54{,}95 + 0{,}672 * 3{,}13 +\ 1854{,}51 * 0{,}000005 + 0{,}094 * 1 + 0{,}250 * 0 +\ -0{,}006 * 0 = 7{,}361$, thus the difference in expected life satisfaction is 0,09. This difference on the ten-point scale of *life satisfaction* is nihil. For the category employment status, the expected value on life satisfaction for one who is employed and does not volunteer is 7,517 ($E_{life\ satisfaction} = 4{,}220 + 0{,}017 * 54{,}95 +$

$0,672 * 3,13 + 1854,51 * 0,000005 + ,094 * 0 + 0,250 * 1 + -0,006 * 0 = 7,517$) compared to 7,611 for those who both perform paid and voluntary work ($E_{life\ satisfaction} = 4,220 + 0,017 * 54,95 + 0,672 * 3,13 + 1854,51 * 0,000005 + ,094 * 1 + 0,250 * 1 + -0,006 * 1 = 7,611$). The moderator variable is found to be quite small and not statistically significant. Thus, for both groups, the effect of voluntary participation is the same.

5. Conclusion

The aim of this research has been to answer the following question: *Are Dutch people who volunteer more satisfied than their peers? Is this explained by their employment status?* To answer this question, a multiple regression analysis has been performed, using data by the LISS panel. In this chapter, the results of the analysis will be discussed in regard to the hypotheses. To conclude, the research question will be answered.

The first hypothesis read as follows: *Individuals who volunteer are more satisfied with their lives than individuals who do not volunteer.* The analysis revealed no proof in favor of the hypothesis, showing that volunteering does not impact life satisfaction. The results were not statistically significant, therefore no difference in life satisfaction was found between volunteers and non-volunteers.

The second hypothesis read as follows: *The effect of volunteering differs between employed and unemployed people. Unemployed people are expected to experience a greater positive effect from volunteering than employed people*. The expected moderating role of employment in the effect of volunteering on life satisfaction has been examined, but no proof in favor of the hypothesis has been found. No differences between the groups have been found. This means, that for people performing or not performing paid work, the effect of volunteering on life satisfaction is the same.

Other notable results are the effect of employment, and health on life satisfaction. As aligned with the theory, health is found to be an important determinant of life satisfaction. People who rate their own subjective health as excellent are expected to be around 2,5 points more satisfied with their life on a 10-point scale. Furthermore, the results showed that performing paid work benefits life satisfaction.

In conclusion, the research question can be answered as follows: Dutch people who volunteer are not more satisfied with their lives than people who do not volunteer. Neither does their employment status influence this role of volunteering in life satisfaction.

6. Discussion

In this chapter, the limitations and implications of the research and its findings will be discussed. The found results were not the same as prior research would have suggested. The theoretical framework would suggest volunteering has impact on life satisfaction. This has not been found in the analysis. The theory would also suggest employment status has a moderating effect on the relationship between volunteering and life satisfaction. The data could also not support this hypothesis. There are multiple possible explanations for these deviations from the existing theory.

The first possible explanation is that the examined theories are not sufficient in explaining the link between life satisfaction and volunteering. The three mechanisms used to explain the expected hypotheses are Lin, Ye, and Ensel's (1999) psychological resources and social resources mechanism and the mechanism of time management (Goodman et al., 2016). However, it could be argued that other important explaining mechanisms have not been taken into consideration. A plausible explanation is that life satisfaction stabilizes over time (Klement, 2021). This can be explained with the theory of adaption (Brickman et al., 1978). According to this theory, life satisfaction is a process that fluctuates. This process starts with a desire for change. When the need is met, this results in satisfaction. However, after a while people get accustomed to the change and the desire starts again. This effect has been found for volunteering before: when time passes, the positive effect of volunteering on life satisfaction stabilizes (Klement, 2021). More research is needed using longitudinal data, controlling for this stabilizing of life satisfaction.

Another overlooked theoretical explanation could be the different effects volunteering has on different age categories. For example, for people 65 years old tend to volunteer more than those in younger categories (Anderson et al., 2014). Seniors were found to spend around 100 hours annually volunteering, compared to 35 to 80 hours annually for the younger generations. Different age groups also tend to have different motivations to volunteer. Younger people are tended to have more individualistic motivations such the gaining of career opportunities. Older people tend to have more altruistic motivations, such as giving back to the community (Fyffe & Wister, 2014). Therefore, the way they experience volunteering, and how satisfied it leaves them, could differ.

Other limitations in the research design can be found in the subjectivity of the variable *life satisfaction*. Life satisfaction is a subjective phenomenon and therefore difficult to measure. This implies issues in relation to construct validity since not all respondents might define satisfaction with life in the same way. This might affect the results by underestimating the influence of volunteering.

A different explanation can be found in the sample itself. Since the expected effect of volunteering has been found, but no statistical significance was shown, perhaps the proportion of people who volunteer was too small. The theory showed that 44% percent of the Dutch population participates in volunteering activities (CBS, 2022). In the dataset that has been collected from the LISS panel, only 23,5% percent volunteered. It is possible that since the sample is not representative of the population, the results might also deviate from those found in prior research.

A different possible issue with the sample is that the independent observations assumption has been violated since members of the LISS panel can be from the same household and therefore interact with each other. Violations in these assumptions could lead to a mismatch between the data and the used model.

With these limitations, further research about volunteering might be necessary. A different sample in which the proportion of volunteers and non-volunteers is more even could give more in-depth information on the mechanisms of volunteering. This might also give us insight into the effect of different amounts of hours volunteering or different types of voluntary activities. Even though most of the results of the analysis are not significant, the found results can still be of societal importance. Since life satisfaction is found to be an important determinant of well-being, improvement should be strived for. With more knowledge on the topic, policy writers could take this into consideration. Hopefully, effective policy could result in a more satisfied Dutch population.

References

Alloush, M., & Wu, S. (2023). Income Improves Subjective Well-Being: Evidence from South

    Africa. *Economic Development and Cultural Change*, *71*(2), 485–517.

    https://doi.org/10.1086/716056

Anderson, N., Damianakis, T., Kröger, E., Wagner, L. M., Dawson, D. R., Binns, M. A.,

    Bernstein, S., Caspi, E., & Cook, S. L. (2014). The benefits associated with volunteering

    among seniors: A critical review and recommendations for future research.

    Psychological Bulletin, *140*(6), 1505–1533. https://doi.org/10.1037/a0037610

Angelini, V., Cavapozzi, D., Corazzini, L., & Paccagnella, O. (2011). Age, health and life

    satisfaction among older Europeans. *Social Indicators Research*, *105*(2), 293–308.

    https://doi.org/10.1007/s11205-011-9882-x

Armstrong, C. D., Devlin, R. A., & Seifi, F. (2020). Doing good, feeling good: causal evidence

    from volunteers. *Review of Social Economy*, *80*(3), 336–358.

    https://doi.org/10.1080/00346764.2020.1761992

Bonini, A. N. (2007). Cross-National variation in individual life satisfaction: effects of national

    wealth, human development, and environmental conditions. *Social Indicators*

    Research, *87*(2), 223–236. https://doi.org/10.1007/s11205-007-9167-6

Brickman, P., Coates, D., & Janoff-Bulman, R. (1978). Lottery winners and accident victims: Is

    happiness relative? *Journal of Personality and Social Psychology*, *36*(8), 917–927.

    https://doi.org/10.1037/0022-3514.36.8.917

Cappelletti, P., & Valtolina, G. G. (2015). Building Citizenship through Volunteering.

    Immigration as a Resource for Social Cohesion. *The Diversity Value*, 141–172.

    https://publicatt.unicatt.it/handle/10807/67460

Centraal Bureau voor de Statistiek. (2022, October 18). Steeds minder mensen doen

    vrijwilligerswerk. *Centraal Bureau Voor De Statistiek*. https://www.cbs.nl/nl-

    nl/nieuws/2022/42/steeds-minder-mensen-doen-vrijwilligerswerk

Centraal Bureau voor de Statistiek. (2024). *Labour market dashboard*. Statistics Netherlands.

    https://www.cbs.nl/en-gb/visualisations/labour-market-dashboard

Chang, P. J., Wray, L. A., & Lin, Y. (2014). Social relationships, leisure activity, and health in

    older adults. *Health Psychology*, *33*(6), 516–523.

    https://doi.org/10.1037/hea0000051

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, *68*(4), 653–663. https://doi.org/10.1037/0022-3514.68.4.653

Erlinghagen, M. (2010). VOLUNTEERING AFTER RETIREMENT. *European Societies*, *12*(5), 603–625. https://doi.org/10.1080/14616691003716902

Filges, T., Siren, A. K., Fridberg, T., & Nielsen, B. C. V. (2020). Voluntary work for the physical and mental health of older volunteers: A systematic review. *Campbell Systematic Reviews*, *16*(4). https://doi.org/10.1002/cl2.1124

Fyffe, I., & Wister, A. V. (2014). Age differences in Olympic volunteering experiences: an examination of generativity and meaning in life. *Leisure Studies*, *35*(5), 638–651. https://doi.org/10.1080/02614367.2014.994554

Gedikli, C., Miraglia, M., Connolly, S., Bryan, M. L., & Watson, D. (2022). The relationship between unemployment and wellbeing: an updated meta-analysis of longitudinal evidence. *European Journal of Work and Organizational Psychology*, *32*(1), 128–144. https://doi.org/10.1080/1359432x.2022.2106855

Goodman, W., Geiger, A. M., & Wolf, J. M. (2016). Leisure activities are linked to mental health benefits by providing time structure: comparing employed, unemployed and homemakers. *Journal of Epidemiology and Community Health*, *71*(1), 4–11. https://doi.org/10.1136/jech-2016-207260

Hansson, I., Buratti, S., Thorvaldsson, V., Johansson, B., & Berg, A. I. (2017). Changes in life satisfaction in the retirement transition: interaction effects of transition type and individual resources. *Work, Aging and Retirement*, *4*(4), 352–366. https://doi.org/10.1093/workar/wax025

Jahoda, M. (1981). Work, employment, and unemployment: Values, theories, and approaches in social research. *American Psychologist*, *36*(2), 184–191. https://doi.org/10.1037/0003-066x.36.2.184

Kamerāde, D., & Bennett, M. (2017). Rewarding work: Cross-National differences in benefits, volunteering during unemployment, Well-Being and mental health. *Work, Employment and Society*, *32*(1), 38–56. https://doi.org/10.1177/0950017016686030

Kleiber, D. A., & Nimrod, G. (2009). 'I can't be very sad': constraint and adaptation in the leisure of a 'learning in retirement' group. *Leisure Studies*, *28*(1), 67–83. https://doi.org/10.1080/02614360802260820

Klement, J. (2021). Identifying stabilising effects on survey based life satisfaction using quasi-maximum likelihood estimation. *Journal of Happiness Studies*, *22*(8), 3611–3629. https://doi.org/10.1007/s10902-021-00376-3

Lim, S. S. (2019). The effects of chronic illness on aspirations and subjective wellbeing. *Journal of Happiness Studies*, *21*(5), 1771–1793. https://doi.org/10.1007/s10902-019-00156-0

Lin, N., Ye, X., & Ensel, W. M. (1999). Social Support and Depressed Mood: A Structural analysis. *Journal of Health and Social Behavior*, *40*(4), 344. https://doi.org/10.2307/2676330

LISS Data. (2023a, October 27). *Methodology - LISS panel*. LISS Panel. https://www.lissdata.nl/methodology

LISS Data. (2023b, November 9). *LISS Core Study - LISS panel*. LISS Panel. Retrieved March 29, 2024, from https://www.lissdata.nl/liss-core-study

LISS Data. (2023c, November 13). *How the archive works - LISS panel*. LISS Panel. Retrieved March 29, 2024, from https://www.lissdata.nl/how-it-works-archive

Martella, D., & Maass, A. (2000). Unemployment and life satisfaction: the moderating role of time structure and collectivism1. *Journal of Applied Social Psychology*, *30*(5), 1095–1108. https://doi.org/10.1111/j.1559-1816.2000.tb02512.x

Musick, M. A., & Wilson, J. F. (2003). Volunteering and depression: the role of psychological and social resources in different age groups. *Social Science & Medicine*, *56*(2), 259–269. https://doi.org/10.1016/s0277-9536(02)00025-4

Paradisi, M., Matera, C., & Nerini, A. (2024). Feeling important, feeling well. The Association Between Mattering and Well-being: A Meta-analysis study. *Journal of Happiness Studies*, *25*(1–2). https://doi.org/10.1007/s10902-024-00720-3

Pavot, W., & Diener, E. (2008). The Satisfaction With Life Scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology*, *3*(2), 137–152. https://doi.org/10.1080/17439760701756946

Pilkington, P. D., Windsor, T. D., & Crisp, D. A. (2012). Volunteering and Subjective Well-Being in Midlife and Older Adults: The role of Supportive Social Networks. *The Journals of Gerontology: Series B*, *67B*(2), 249–260. https://doi.org/10.1093/geronb/gbr154

Putnam, R. D., Leonardi, R., & Nonetti, R. Y. (1994). *Making democracy work*.

https://doi.org/10.2307/j.ctt7s8r7

Roney, C. R., & Soicher, H. M. (2021). Work and well-being: collective and individual self-concept, job commitment, citizenship behavior, and autonomy as predictors of overall life satisfaction. *The Journal of Social Psychology*, *162*(4), 423–434.

https://doi.org/10.1080/00224545.2021.1915230

Sociaal en Cultureel Planbureau [SCP]. (2019a, May 2). *Een week in kaart*.

https://digitaal.scp.nl/eenweekinkaart2/betaald-werk/

Sociaal en Cultureel Planbureau [SCP]. (2019b, May 2). *Vrije tijd*.

https://digitaal.scp.nl/eenweekinkaart2/vrije-tijd/

Strine, T. W., Chapman, D. P., Balluz, L., Moriarty, D. G., & Mokdad, A. H. (2007). The Associations Between Life Satisfaction and Health-related Quality of Life, Chronic Illness, and Health Behaviors among U.S. Community-dwelling Adults. *Journal of Community Health*, *33*(1), 40–50. https://doi.org/10.1007/s10900-007-9066-4

Tauseef, S. (2021). Can Money Buy Happiness? Subjective Wellbeing and Its Relationship with Income, Relative Income, Monetary and Non-monetary Poverty in Bangladesh. *Journal of Happiness Studies*, *23*(3), 1073–1098. https://doi.org/10.1007/s10902-021-00443-9

Thoits, P. A., & Hewitt, L. N. (2001). Volunteer work and Well-Being. *Journal of Health and Social Behavior*, *42*(2), 115. https://doi.org/10.2307/3090173

Vantilborgh, T., Bidee, J., Pepermans, R., Willems, J., Huybrechts, G., & Jegers, M. (2013). From "getting" to "giving": Exploring age-related differences in perceptions of and reactions to psychological contract balance. *European Journal of Work and Organizational Psychology*, *22*(3), 293–305.

https://doi.org/10.1080/1359432x.2012.721354

Wilson, J. F. (2000). Volunteering. *Annual Review of Sociology*, *26*(1), 215–240.

https://doi.org/10.1146/annurev.soc.26.1.215

Appendix 1 – The Sample and Adaptations

In this appendix, the original data from the LISS data archive and the adaptations done in this analysis will be described.

A.1 Life Satisfaction

A.1.1 Original Descriptive Statistics Life Satisfaction

The data directly used from the questionnaire has the answer option *I don't* know (-9). The following syntax is used to analyze the univariate descriptives of the variable *life satisfaction*.

```
FREQUENCIES VARIABLES=cp21m011
 /STATISTICS=STDDEV MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

Statistics

How satisfied are you with the lif

N	Valid	5362
	Missing	1433
Mean		6,98
Std. Deviation		2,522

How satisfied are you with the life you lead at the moment?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I don't know	83	1,2	1,5	1,5
	0 not at all satisfied	18	,3	,3	1,9
	1	12	,2	,2	2,1
	2	44	,6	,8	2,9
	3	91	1,3	1,7	4,6
	4	152	2,2	2,8	7,5
	5	272	4,0	5,1	12,5
	6	572	8,4	10,7	23,2
	7	1551	22,8	28,9	52,1
	8	1781	26,2	33,2	85,3
	9	579	8,5	10,8	96,1

Histogram

Mean = 6,98
Std. Dev. = 2,522
N = 5.362

How satisfied are you with the life you lead at the moment?
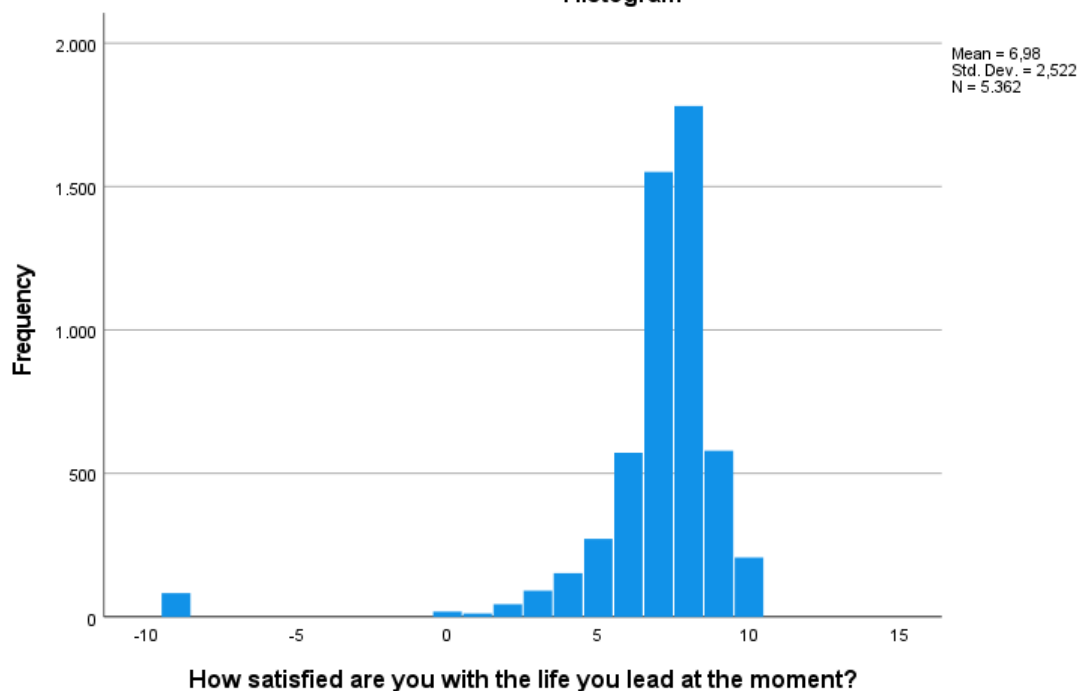
A.1.2 Alterations and adapted descriptive statistics Life Satisfaction

The following alterations have been made to filter out the cases with value -9 (*I don't know*), followed by the syntax to calculate the descriptive statistics.

```
USE ALL.
COMPUTE filter_$=(cp21m011  > 0).
VARIABLE LABELS filter_$ 'cp21m011  > 0 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.
FREQUENCIES VARIABLES=cp21m011
 /STATISTICS=STDDEV MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

Statistics

How satisfied are you with the lif

N	Valid	5261
	Missing	0
Mean		7,25
Std. Deviation		1,488

How satisfied are you with the life you lead at the moment?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	,2	,2	,2
	2	44	,8	,8	1,1
	3	91	1,7	1,7	2,8
	4	152	2,9	2,9	5,7
	5	272	5,2	5,2	10,9
	6	572	10,9	10,9	21,7
	7	1551	29,5	29,5	51,2
	8	1781	33,9	33,9	85,1
	9	579	11,0	11,0	96,1
	10 completely satisfied	207	3,9	3,9	100,0
	Total	5261	100,0	100,0	

Histogram

Mean = 7,25
Std. Dev. = 1,488
N = 5.261

How satisfied are you with the life you lead at the moment?
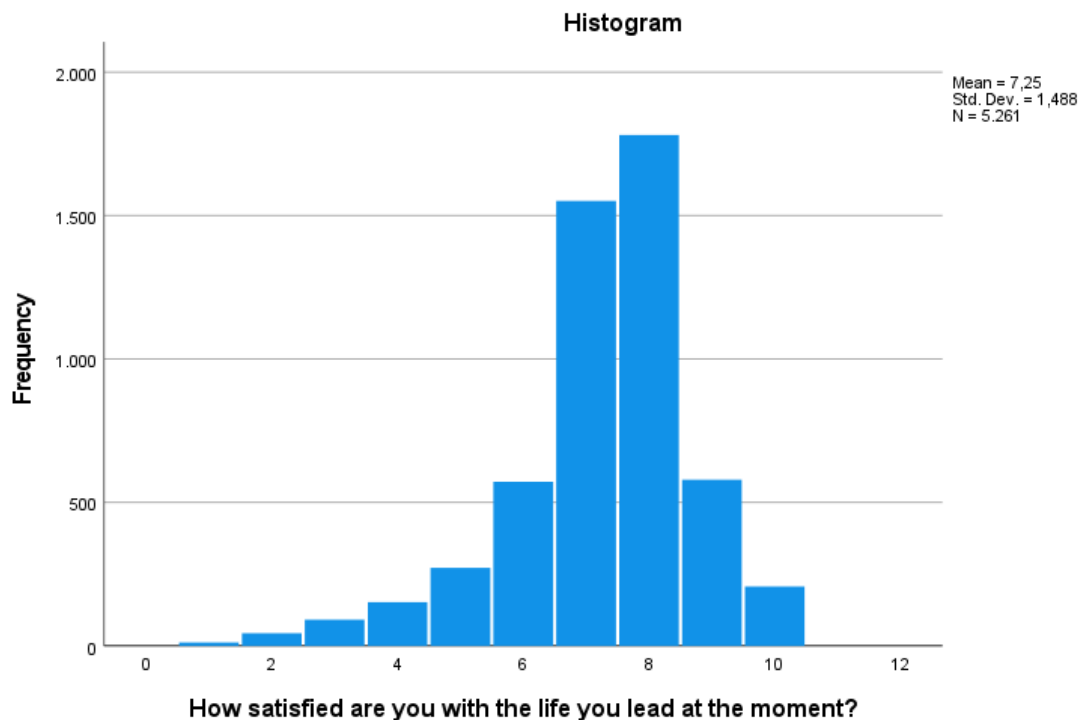
A.2 Employment Status

A.2.1 Original descriptive statistics Employment status

This dummy will be created from the preloaded variable *primary occupation* (belbezig) which can be found in the Work and Schooling questionnaire with the following answer categories: paid employment (1), works or assists in family business (2), autonomous professional, freelancer, or self-employed (3), job seeker following job loss (4), first-time job seeker (5), exempted from job seeking following job loss (6), attends school or is studying (7), takes care of the housekeeping (8), is pensioner ([voluntary] early retirement, old age pension scheme) (9), has (partial) work disability (10), performs unpaid work while retaining unemployment benefit (11), performs voluntary work (12), does something else (13), is too young to have an occupation (14).

The original frequencies of these variables are as follows:

```
FREQUENCIES VARIABLES=belbezig
 /STATISTICS=STDDEV MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

belbezig – *primary occupation:* paid employment (1), works or assists in family business (2), autonomous professional, freelancer, or self-employed (3), job seeker following job loss (4), first-time job seeker (5), exempted from job seeking following job loss (6), attends school or is studying (7), takes care of the housekeeping (8), is pensioner ([voluntary] early retirement, old age pension scheme) (9), has (partial) work disability (10), performs unpaid work while retaining unemployment benefit (11), performs voluntary work (12), does something else (13), is too young to have an occupation (14).

Statistics

Primary occupation

N	Valid	6795
	Missing	0
Mean		4,79
Std. Deviation		3,839

Primary occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Paid employment	3066	45,1	45,1	45,1
	Works or assists in family business	52	,8	,8	45,9
	Autonomous professional, freelancer, or self-employed	352	5,2	5,2	51,1
	Job seeker following job loss	119	1,8	1,8	52,8
	First-time job seeker	27	,4	,4	53,2
	Exempted from job seeking following job loss	24	,4	,4	53,6
	Attends school or is studying	634	9,3	9,3	62,9
	Takes care of the housekeeping	497	7,3	7,3	70,2
	Is pensioner ([voluntary] early retirement, old age pension scheme)	1529	22,5	22,5	92,7
	Has (partial) work disability	294	4,3	4,3	97,0
	Performs unpaid work while retaining unemployment benefit	18	,3	,3	97,3
	Performs voluntary work	121	1,8	1,8	99,1
	Does something else	62	,9	,9	100,0
	Total	6795	100,0	100,0	

Histogram

Mean = 4,79
Std. Dev. = 3,839
N = 6.795
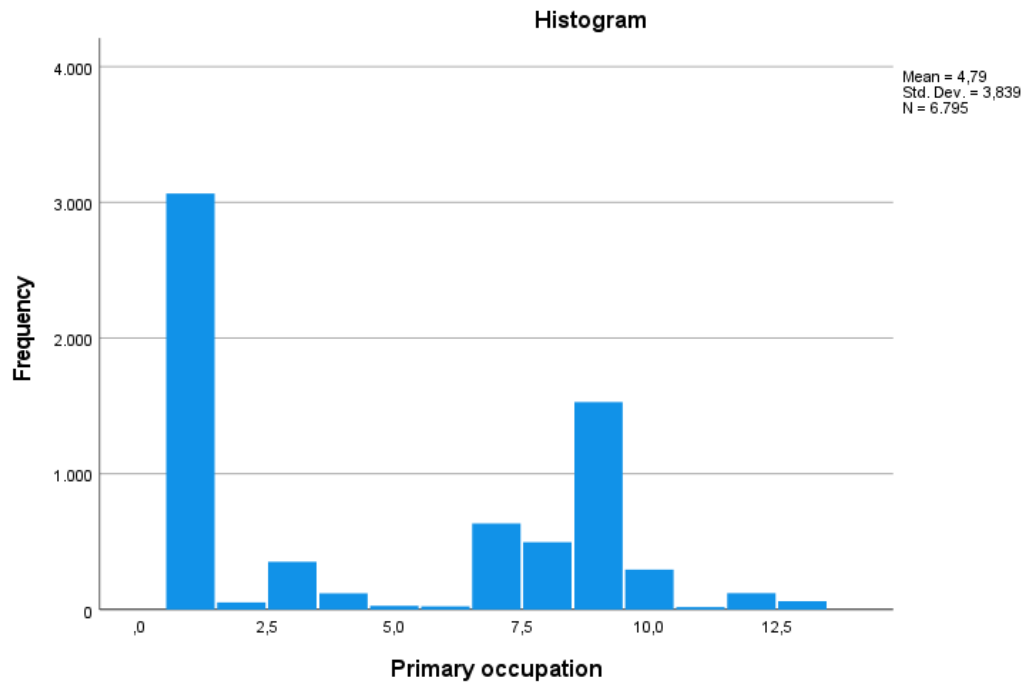
A.2.2 Alterations and Adapted Descriptive Statistics Employment Status

The variable Employment status has been computed into a dummy variable *paid_employment*. The original first category in *primary occupation* (1) will be *paid_employment* = 1. The other categories *primary occupation* (2 to 14) will be *paid_employment* = 0. The descriptive statistics have been calculated as follows:

```
RECODE belbezig (1=1) (2 THRU 14=0) INTO paid_employment.
EXECUTE.

FREQUENCIES VARIABLES=paid_employment
 /STATISTICS=STDDEV MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

Statistics

paid_employment

N	Valid	6795
	Missing	0
Mean		,4512
Std. Deviation		,49765

paid_employment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	3729	54,9	54,9	54,9
	1,00	3066	45,1	45,1	100,0
	Total	6795	100,0	100,0	

Histogram

Mean = ,45
Std. Dev. = ,498
N = 6.795
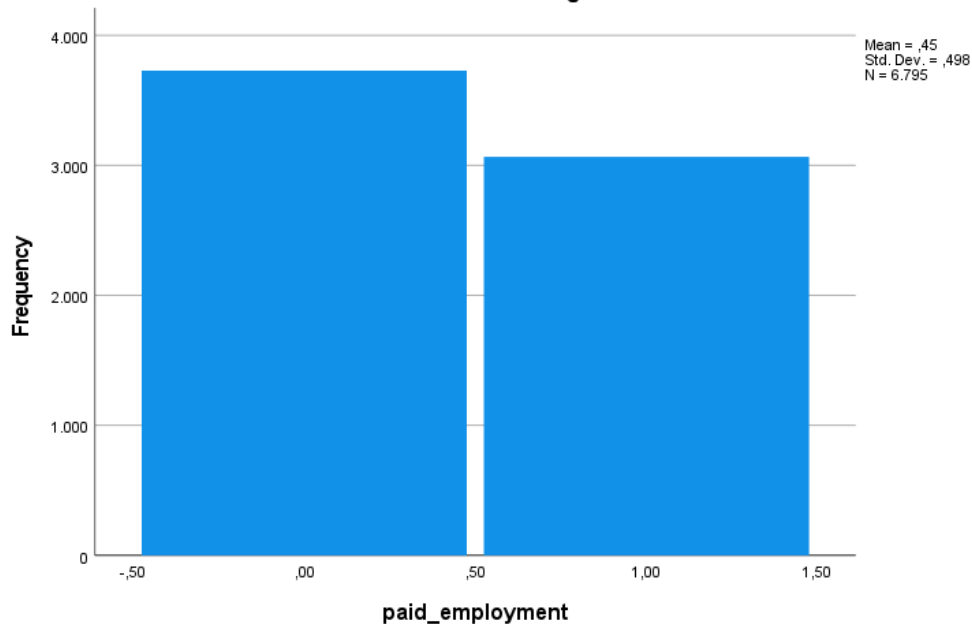
A.3 Volunteering

A.3.1 Original descriptive statistics Volunteering

The original question about doing volunteering work has been coded as multiple variables. The original question in the Social Integration and Leisure questionnaire that has been used is (cs20m003 - cs20m062) *We now list a number of organizations that you are free to join. Can you indicate, for each of the organizations listed, what applies to you at this moment or has applied to you over the past 12 months?* The possible answers were as follows: More than one answer possible 1 = no connection 2 = donated money 3 = participated in an activity 4 = member 5 = performed voluntary work. These could be answered into thirteen certain categories, a few examples are a sports club, a cultural association, or hobby club, or a trade union.

The following syntax has been used to examine the original frequencies of people who performed voluntary work, listed per organization.
FREQUENCIES VARIABLES=cs20m007 cs20m012 cs20m017 cs20m022 cs20m027 cs20m032 cs20m527 cs20m037 cs20m042 cs20m047 cs20m052 cs20m057 cs20m062
 /STATISTICS=STDDEV MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.

a sports club, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5468	80,5	91,9	91,9
	Yes	482	7,1	8,1	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

a cultural association or hobby club, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5688	83,7	95,6	95,6
	Yes	262	3,9	4,4	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

a trade union, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5921	87,1	99,5	99,5
	Yes	29	,4	,5	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

a business, professional or agrarian organization, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5884	86,6	98,9	98,9
	Yes	64	,9	1,1	100,0
	Total	5948	87,5	100,0	
Missing	System	847	12,5		
Total		6795	100,0		

a consumers organization or automobile club, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5937	87,4	99,8	99,8
	Yes	13	,2	,2	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

an organization for humanitarian aid or human rights, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5828	85,8	97,9	97,9
	Yes	122	1,8	2,1	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

an organization for migrants, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5868	86,4	98,6	98,6
	Yes	81	1,2	1,4	100,0
	Total	5949	87,5	100,0	
Missing	System	846	12,5		
Total		6795	100,0		

an organization for environmental protection, peace organization or animal right

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5875	86,5	98,7	98,7
	Yes	75	1,1	1,3	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

a religious or church organization, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5689	83,7	95,6	95,6
	Yes	261	3,8	4,4	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

a political party, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5920	87,1	99,5	99,5
	Yes	31	,5	,5	100,0
	Total	5951	87,6	100,0	
Missing	System	844	12,4		
Total		6795	100,0		

a science, education, teachers or parents association, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5806	85,4	97,6	97,6
	Yes	143	2,1	2,4	100,0
	Total	5949	87,5	100,0	
Missing	System	846	12,5		
Total		6795	100,0		

a social society; an association for youth, pensioners/senior citizens, women; o

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5810	85,5	97,6	97,6
	Yes	140	2,1	2,4	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

other organizations that you can freely join, performed voluntary work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5690	83,7	95,6	95,6
	Yes	260	3,8	4,4	100,0
	Total	5950	87,6	100,0	
Missing	System	845	12,4		
Total		6795	100,0		

A.3.2 Alterations and Adapted Descriptive Statistics Volunteering

The original question about doing volunteering work has been coded as multiple variables. The possible answers were as follows: More than one answer possible 1 = no connection 2 = donated money 3 = participated in an activity 4 = member 5 = performed voluntary work. If all these questions added together is the value of 1 or more, the subject participates in at least one type of voluntary work. If the respondent answers *do voluntary work* (5) for one of these categories, the following questions in the LISS questionnaire will be coded (1) yes: cs20m007, cs20m012, cs20m017, cs20m022, cs20m027, cs20m032, cs20m527, cs20m037, cs20m042, cs20m047, cs20m052, cs20m057 and cs20m062This has been recoded into (0) does not do voluntary work, (1) does voluntary work. To make this into a dummy variable, the following adaptions have been made:

```
COMPUTE volunteering_sum=cs20m007 + cs20m012 + cs20m017 + cs20m022 +
cs20m027+cs20m032 + cs20m527 + cs20m037 + cs20m042 + cs20m047 + cs20m052 +
cs20m057 + cs20m062.
EXECUTE.

RECODE volunteering_sum (0=0) (1 THRU 999=1) INTO volunteering.
EXECUTE.
```

Statistics

volunteering

N	Valid	5948
	Missing	847
Mean		,2329
Std. Deviation		,42268

volunteering

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	4563	67,2	76,7	76,7
	1,00	1385	20,4	23,3	100,0
	Total	5948	87,5	100,0	
Missing	System	847	12,5		
Total		6795	100,0		

Histogram

Mean = ,23
Std. Dev. = ,423
N = 5.948
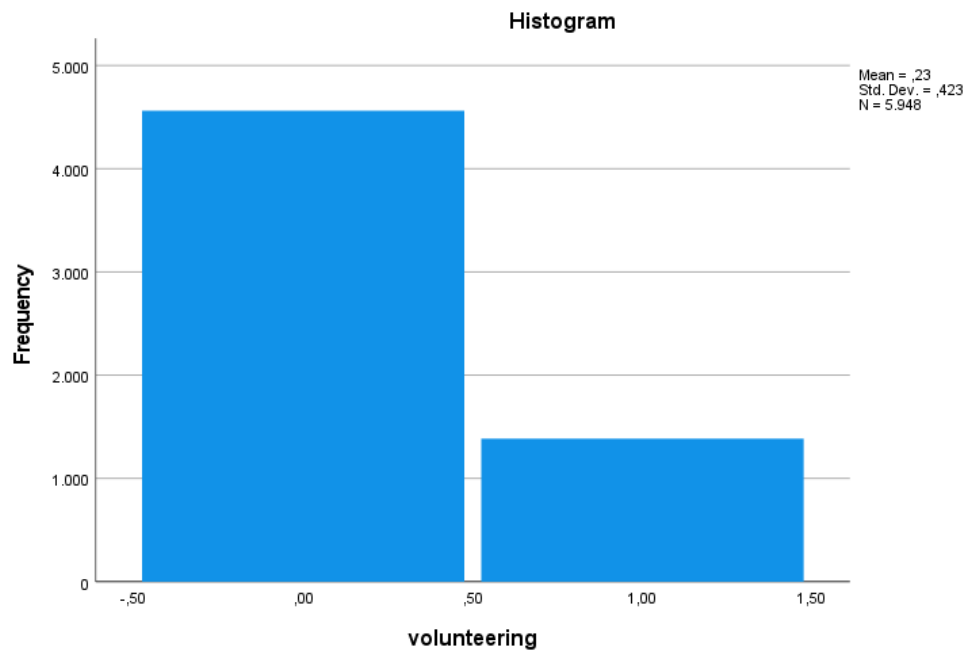
A.4 Health

To calculate the descriptive statistics of Health (ch20m004), the following syntax has been used:

```
FREQUENCIES VARIABLES=ch20m004
 /STATISTICS=STDDEV MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

Statistics

How would you describe your he

N	Valid	5730
	Missing	1065
Mean		3,14
Std. Deviation		,793

How would you describe your health, generally speaking?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	poor	89	1,3	1,6	1,6
	moderate	892	13,1	15,6	17,1
	good	3169	46,6	55,3	72,4
	very good	1283	18,9	22,4	94,8
	excellent	297	4,4	5,2	100,0
	Total	5730	84,3	100,0	
Missing	System	1065	15,7		
Total		6795	100,0		

Histogram

Mean = 3,14
Std. Dev. = ,793
N = 5.730

How would you describe your health, generally speaking?
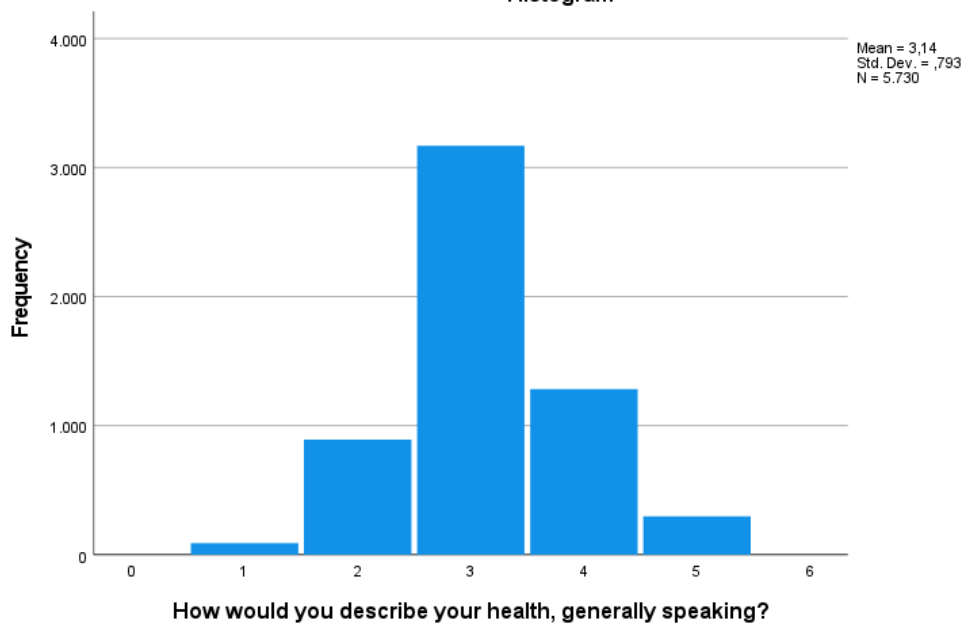
A.5 Age

To calculate the descriptive statistics of Age (leeftijd), the following syntax has been used:

```
FREQUENCIES VARIABLES=leeftijd
 /STATISTICS=STDDEV MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

Statistics

Age of the household member

N	Valid	6795
	Missing	0
Mean		50,41
Std. Deviation		18,827

Histogram

Mean = 50,41
Std. Dev. = 18,827
N = 6.795
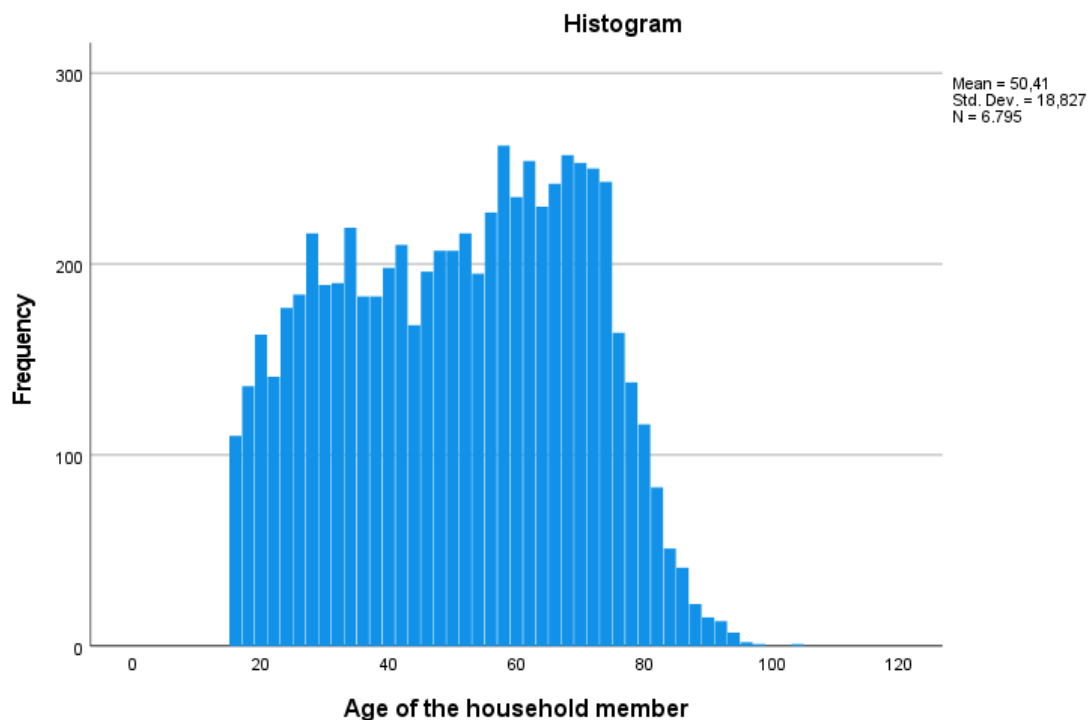
A.6 Income

To calculate the descriptive statistics of Income (nettoink_f), the following syntax has been used:

```
FREQUENCIES VARIABLES=nettoink_f
 /NTILES=4
 /STATISTICS=MINIMUM MAXIMUM MEAN
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

Statistics

Personal net monthly income in Euro

N	Valid	6454
	Missing	341
Mean		1805,89
Minimum		0
Maximum		146652
Percentiles	25	973,75
	50	1750,00
	75	2400,00

Histogram

Mean = 1805,89
Std. Dev. = 3289,599
N = 6.454

Personal net monthly income in Euros, imputed
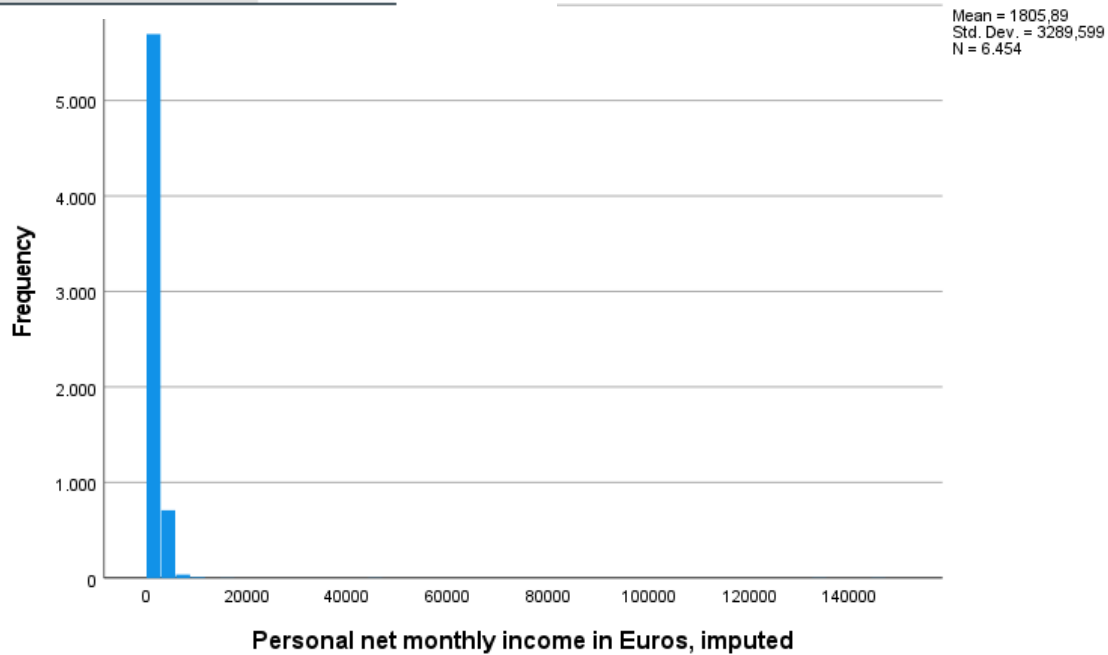
A.7 Descriptive statistics of the used dataset

For the data analysis, all cases with missing data on the relevant questions have been deleted. To do this, a dummy variable (obs) has been created that distinguishes the complete and incomplete cases. Afterward, the descriptive statistics of the complete cases have been calculated. This has been done as follows:

```
REGRESSION
 /MISSING LISTWISE
 /STATISTICS COEFF OUTS R ANOVA
 /CRITERIA=PIN(.05) POUT(.10)
 /NOORIGIN
 /DEPENDENT cp21m011
 /METHOD=ENTER volunteering paid_employment nettoink_f leeftijd ch20m004
 /SAVE RESID.

RECODE RES_1 (SYSMIS=0) (ELSE=1) INTO obs.
EXECUTE.
```

```
USE ALL.
COMPUTE filter_$=(obs =  1).
VARIABLE LABELS filter_$ 'obs =  1 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.
```

```
FREQUENCIES VARIABLES=nettoink_f leeftijd cp21m011 ch20m004
 /STATISTICS=STDDEV MEAN MINIMUM MAXIMUM
 /HISTOGRAM
 /ORDER=ANALYSIS.
```

Statistics

		Personal net monthly income in Euros, imputed	Age of the household member	How satisfied are you with the life you lead at the moment?	How would you describe your health, generally speaking?
N	Valid	4189	4189	4189	4189
	Missing	0	0	0	0
Mean		1858,51	54,95	7,29	3,13
Std. Deviation		3431,837	17,872	1,469	,777
Minimum		0	16	1	1
Maximum		146652	103	10	5

Appendix 2 – Statistics and Model Estimation

This appendix shows the syntax and output used for the statistical analyses. First, the univariate statistics have been calculated, followed by the bivariate statistics and the multivariate regression analyses. The syntax and output will be explained per step.

A.2.1 Univariate Statistics

To investigate the univariate statistics, the observed cases have been selected using the following filter:

```
USE ALL.
COMPUTE filter_$=(obs =  1).
VARIABLE LABELS filter_$ 'obs =  1 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.
```

The five-number summary and percentages of the amount of people volunteering and performing paid work as main occupation have been calculated with the following syntax:

```
FREQUENCIES VARIABLES=nettoink_f leeftijd cp21m011 ch20m004
  /FORMAT=NOTABLE
  /NTILES=4
  /STATISTICS=MINIMUM MAXIMUM MEAN STDDEV
  /ORDER=ANALYSIS.
FREQUENCIES VARIABLES=volunteering paid_employment
  /ORDER=ANALYSIS.
```

This computed the following output:

Statistics

		Personal net monthly income in Euros, imputed	Age of the household member	How satisfied are you with the life you lead at the moment?	How would you describe your health, generally speaking?
N	Valid	4189	4189	4189	4189
	Missing	0	0	0	0
Mean		1858,51	54,95	7,29	3,13
Std. Deviation		3431,837	17,872	1,469	,777
Minimum		0	16	1	1
Maximum		146652	103	10	5
Percentiles	25	1000,00	41,00	7,00	3,00
	50	1750,00	58,00	7,00	3,00
	75	2400,00	69,00	8,00	4,00

volunteering

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	3204	76,5	76,5	76,5
	1,00	985	23,5	23,5	100,0
	Total	4189	100,0	100,0	

paid_employment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	2472	59,0	59,0	59,0
	1,00	1717	41,0	41,0	100,0
	Total	4189	100,0	100,0	

A.2.2 Bivariate Statistics

To investigate the bivariate statistics, both correlations (for the continuous variables) and t-tests for different groups (for dummy variables) have been calculated. The following syntax has been used:

```
CORRELATIONS
 /VARIABLES=nettoink_f leeftijd ch20m004 cp21m011 volunteering paid_employment
 /PRINT=TWOTAIL NOSIG FULL
 /MISSING=PAIRWISE.
T-TEST GROUPS=paid_employment (0 1)
 /MISSING=ANALYSIS
 /VARIABLES= nettoink_f leeftijd ch20m004 cp21m011 volunteering.
```

This resulted in the following output:

Group Statistics

	paid_employment	N	Mean	Std. Deviation	Std. Error Mean
Personal net monthly income in Euros, imputed	,00	2472	1606,24	4382,821	88,151
	1,00	1717	2221,72	927,006	22,372
Age of the household member	,00	2472	61,12	18,584	,374
	1,00	1717	46,06	12,179	,294
How would you describe your health, generally speaking?	,00	2472	3,01	,768	,015
	1,00	1717	3,30	,759	,018
How satisfied are you with the life you lead at the moment?	,00	2472	7,24	1,564	,031
	1,00	1717	7,37	1,317	,032
volunteering	,00	2472	,2500	,43310	,00871
	1,00	1717	,2137	,41007	,00990

Correlations

		Personal net monthly income in Euros, imputed	Age of the household member	How would you describe your health, generally speaking?	How satisfied are you with the life you lead at the moment?	volunteering	paid_employment
Personal net monthly income in Euros, imputed	Pearson Correlation	1	,077**	,008	,031*	,036*	,088**
	Sig. (2-tailed)		<,001	,601	,043	,019	<,001
	N	4189	4189	4189	4189	4189	4189
Age of the household member	Pearson Correlation	,077**	1	-,272**	,117**	,064**	-,415**
	Sig. (2-tailed)	<,001		<,001	<,001	<,001	<,001
	N	4189	4189	4189	4189	4189	4189
How would you describe your health, generally speaking?	Pearson Correlation	,008	-,272**	1	,298**	,049**	,178**
	Sig. (2-tailed)	,601	<,001		<,001	,001	<,001
	N	4189	4189	4189	4189	4189	4189
How satisfied are you with the life you lead at the moment?	Pearson Correlation	,031*	,117**	,298**	1	,056**	,043**
	Sig. (2-tailed)	,043	<,001	<,001		<,001	,005
	N	4189	4189	4189	4189	4189	4189
volunteering	Pearson Correlation	,036*	,064**	,049**	,056**	1	-,042**
	Sig. (2-tailed)	,019	<,001	,001	<,001		,006
	N	4189	4189	4189	4189	4189	4189
paid_employment	Pearson Correlation	,088**	-,415**	,178**	,043**	-,042**	1
	Sig. (2-tailed)	<,001	<,001	<,001	,005	,006	
	N	4189	4189	4189	4189	4189	4189

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Personal net monthly income in Euros, imputed	Cohen's d	3418,866	-,180	-,242	-,118
	Hedges' correction	3419,479	-,180	-,242	-,118
	Glass's delta	927,006	-,664	-,729	-,598
Age of the household member	Cohen's d	16,267	,926	,861	,991
	Hedges' correction	16,270	,926	,861	,990
	Glass's delta	12,179	1,237	1,162	1,311
How would you describe your health, generally speaking?	Cohen's d	,764	-,368	-,430	-,306
	Hedges' correction	,765	-,368	-,430	-,306
	Glass's delta	,759	-,371	-,434	-,308
How satisfied are you with the life you lead at the moment?	Cohen's d	1,468	-,088	-,149	-,026
	Hedges' correction	1,468	-,088	-,149	-,026
	Glass's delta	1,317	-,098	-,159	-,036
volunteering	Cohen's d	,42381	,086	,024	,147
	Hedges' correction	,42389	,086	,024	,147
	Glass's delta	,41007	,088	,027	,150

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Independent Samples Test

		Levene's Test for Equality of Variances F	Levene's Test for Equality of Variances Sig.	t-test for Equality of Means t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper
Personal net monthly income in Euros, imputed	Equal variances assumed	11,486	<,001	-5,730	4187	<,001	<,001	-615,489	107,406	-826,061	-404,916
	Equal variances not assumed			-6,768	2782,928	<,001	<,001	-615,489	90,946	-793,817	-437,160
Age of the household member	Equal variances assumed	186,073	<,001	29,473	4187	<,001	<,001	15,061	,511	14,060	16,063
	Equal variances not assumed			31,676	4173,688	<,001	<,001	15,061	,475	14,129	15,994
How would you describe your health, generally speaking?	Equal variances assumed	46,516	<,001	-11,723	4187	<,001	<,001	-,282	,024	-,329	-,234
	Equal variances not assumed			-11,747	3717,721	<,001	<,001	-,282	,024	-,329	-,235
How satisfied are you with the life you lead at the moment?	Equal variances assumed	34,634	<,001	-2,787	4187	,003	,005	-,129	,046	-,219	-,038
	Equal variances not assumed			-2,874	4035,256	,002	,004	-,129	,045	-,216	-,041
volunteering	Equal variances assumed	30,479	<,001	2,723	4187	,003	,006	,03626	,01331	,01015	,06236
	Equal variances not assumed			2,750	3814,859	,003	,006	,03626	,01318	,01041	,06210

To calculate the correlations between dummy variables, Cramer's V has been calculated using crosstabs. The following syntax has been used to calculate the following output:

```
CROSSTABS
 /TABLES=volunteering BY paid_employment
 /FORMAT=AVALUE TABLES
 /STATISTICS=PHI
 /CELLS=COUNT
 /COUNT ROUND CELL.
```

volunteering * paid_employment Crosstabulation

Count

		paid_employment		Total
		,00	1,00	
volunteering	,00	1854	1350	3204
	1,00	618	367	985
Total		2472	1717	4189

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-,042	,007
	Cramer's V	,042	,007
N of Valid Cases		4189	

A.2.3 Multiple Regression

To examine the expected moderating effect of employment status, an interaction variable has been made. This has been done with the following syntax:

```
COMPUTE vol_x_paidemployment=paid_employment * volunteering.
EXECUTE.
```

With this interaction variable, the regression analysis has been performed using the following syntax and gave the following output:

```
REGRESSION
 /MISSING LISTWISE
 /STATISTICS COEFF OUTS R ANOVA CHANGE
 /CRITERIA=PIN(.05) POUT(.10)
 /NOORIGIN
 /DEPENDENT cp21m011
 /METHOD=ENTER leeftijd nettoink_f ch20m004
 /METHOD=ENTER leeftijd nettoink_f ch20m004 volunteering
 /METHOD=ENTER leeftijd nettoink_f ch20m004 paid_employment
 /METHOD=ENTER leeftijd nettoink_f ch20m004 volunteering paid_employment
vol_x_paidemployment.
```

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,362[a]	,131	,130	1,370	,131	210,065	3	4185	<,001
2	,363[b]	,131	,131	1,370	,001	2,850	1	4184	,091
3	,370[c]	,137	,136	1,365	,006	27,070	1	4183	<,001
4	,370[d]	,137	,136	1,365	,000	,004	1	4182	,952

a. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member

b. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering

c. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering, paid_employment

d. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering, paid_employment, vol_x_paidemployment

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1182,513	3	394,171	210,065	<,001[b]
	Residual	7852,820	4185	1,876		
	Total	9035,333	4188			
2	Regression	1187,859	4	296,965	158,331	<,001[c]
	Residual	7847,474	4184	1,876		
	Total	9035,333	4188			
3	Regression	1238,316	5	247,663	132,868	<,001[d]
	Residual	7797,017	4183	1,864		
	Total	9035,333	4188			
4	Regression	1238,323	6	206,387	110,698	<,001[e]
	Residual	7797,010	4182	1,864		
	Total	9035,333	4188			

a. Dependent Variable: How satisfied are you with the life you lead at the moment?

b. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member

c. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering

d. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering, paid_employment

e. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering, paid_employment, vol_x_paidemployment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4,220	,127		33,217	<,001
	Age of the household member	,017	,001	,212	14,124	<,001
	Personal net monthly income in Euros, imputed	5,108E-6	,000	,012	,825	,409
	How would you describe your health, generally speaking?	,672	,028	,355	23,713	<,001
2	(Constant)	4,219	,127		33,223	<,001
	Age of the household member	,017	,001	,210	13,954	<,001
	Personal net monthly income in Euros, imputed	4,800E-6	,000	,011	,775	,438
	How would you describe your health, generally speaking?	,668	,028	,354	23,548	<,001
	volunteering	,085	,050	,024	1,688	,091
3	(Constant)	4,006	,133		30,109	<,001
	Age of the household member	,020	,001	,244	14,915	<,001
	Personal net monthly income in Euros, imputed	5,407E-7	,000	,001	,087	,931
	How would you describe your health, generally speaking?	,658	,028	,348	23,177	<,001
	volunteering	,092	,050	,026	1,832	,067
	paid_employment	,248	,048	,083	5,203	<,001
4	(Constant)	4,006	,133		30,054	<,001
	Age of the household member	,020	,001	,244	14,913	<,001
	Personal net monthly income in Euros, imputed	5,383E-7	,000	,001	,086	,931
	How would you describe your health, generally speaking?	,658	,028	,348	23,164	<,001
	volunteering	,094	,064	,027	1,476	,140
	paid_employment	,250	,053	,084	4,690	<,001
	vol_x_paidemployment	-,006	,102	-,001	-,060	,952

a. Dependent Variable: How satisfied are you with the life you lead at the moment?

Appendix 3 – Model Diagnostics

In this appendix, the complete analysis of the model evaluation will be presented.

A.3.1 Assumption Control

When performing a linear regression analysis, there are four assumptions that should be met, to conclude the model fits the data. These are the following: 1. The observations are independent of each other; 2. The relation between the independent variables and the dependent variable is linear; 3. The standard deviations of the residuals are constant (homoscedasticity); 4. The residuals are normally distributed. To test these assumptions, the following syntax is used:

```
REGRESSION
 /DESCRIPTIVES MEAN STDDEV CORR SIG N
 /MISSING LISTWISE
 /STATISTICS COEFF OUTS R ANOVA
 /CRITERIA=PIN(.05) POUT(.10)
 /NOORIGIN
 /DEPENDENT cp21m011
 /METHOD=ENTER leeftijd nettoink_f ch20m004 volunteering paid_employment
vol_x_paidemployment
 /PARTIALPLOT ALL
 /SCATTERPLOT=(*SRESID ,*SDRESID) (*ZPRED ,*ZRESID)
 /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)
 /SAVE COOK LEVER ZRESID SRESID DFBETA DFFIT.
```

A.3.1.1 Independent Observations

The data, derived from the LISS panel is part of a longitudinal research. The sample has been drawn using probability sampling, to reduce dependency between cases. However, since some respondents are from the same household, this assumption is violated. A more elaborate explanation of the sampling methods can be found in the methods chapter (chapter 3).

A.3.1.2 Linear Relation between Dependent and Independent Variables

The linear relation between the dependent variable *life satisfaction* and the independent variables can be investigated by looking at the residual plot. In the figure shown below, ten distinct lines can be seen. This is because the corresponding question in the questionnaire

has ten answer categories. It is difficult to determine if there are systematic deviations because of the large number of respondents. It is not possible to determine from the image whether the dots are stacked on top of each other.

Scatterplot
**Dependent Variable: How satisfied are you with the life you lead at the moment?**
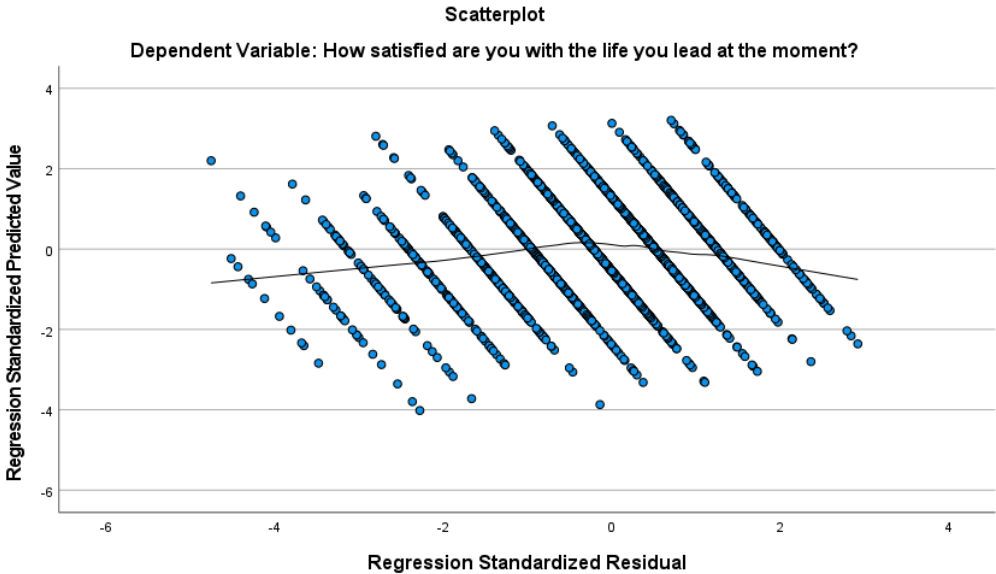
A.3.1.3 Constant standard deviations of the residuals

This assumption has also been inspected using above figure. For the standard deviation of the residuals to be constant, the distance from the residuals to the 0-value should be constant. The scatterplot shows no strong deviations, meaning this assumption also has been met.

A.3.1.4 Normally Distributed Residuals

The assumption of normally distributed residuals of the variable *life satisfaction* has been inspected using the probability plot and the histogram of said variable shown below. This assumption has been met when the bars in the histogram align with the drawn black line and the dots in the probability plot line up with the drawn black line. In the histogram, some bars stick out above the drawn line, meaning the assumption has been violated. This violation can be seen in the PP-plot as well since the dots are S-shaped around the black line. However, most of the cases still fall in the bell-shape and the dots still align quite well with the black line, the assumption has not been greatly violated.
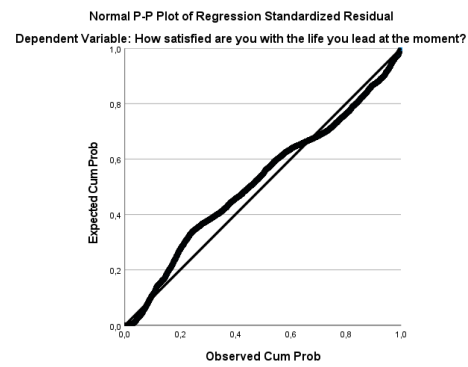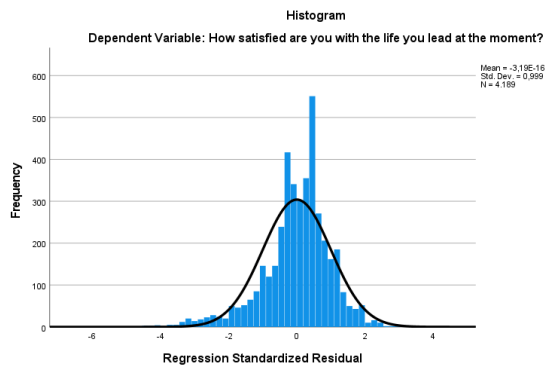
A.3.2 Outliers

Outliers have been analysed by looking at the cases with the highest values for Cook's distance, leverage, DFFIT and the standardized residuals. These values have been calculated with the syntax used above. These values have been analysed and the ten cases with the highest values on one or more of the diagnostics have been displayed in the table shown below.

Case-id	Cook's distance	Leverage	Standardized residual	DFFIT
854346	1,37903	,42919	-3,58133	-2,78006
821415	,1,05698	,43738	3,08351	2,45699
863526	,01434	,04305	-1,48948	-,09000
875107	,00675	,00264	-4,04820	-,01592
835452	,00229	,00213	2,59744	, ,00843
837182	,00234	,00190	-2,77014	-,00808
803099	,00227	,00243	2,43873	,00890
831494	,00046	,00193	-1,21580	-,00360
805908	,00664	,00181	-4,75490	-,01334
893008	,00000	,00351	,00613	,00003

The rule of thumb when evaluating Cook's distance is that cases with a value higher than $\frac{4}{n}$ can be considered as outliers. With the *n* being 4189, this value would be 0,000954. Almost all cases in the table are considered outliers regarding Cook's distance.

When analyzing leverage, the rule of thumb is $\frac{2p}{n}$, with *p* being the number of parameters in the model. In this case, this value would be geval (2*8)/4189 = 0,00382. Considering this, almost all cases in the above table are outliers.

DFFit measures the expected value with and without the case in the model. These values are quite high for the first two cases in the table (cases 854346 and 821415). To investigate how much impact these cases have, the analysis has been re-executed.

This has been done with the following syntax:

```
RECODE nomem_encr (854346=1) (821415=1) (863526=1) (875107=1) (835452=1)
(837182=1) (803099=1) (831494=1) (805908=1) (893008=1) (ELSE=0) INTO outliers_.
EXECUTE.
*making filter both observed and no outlier.
IF  ((outliers_ = 0) & (obs = 1)) outliers_obs=outliers_ = 0 & obs = 1.
EXECUTE.

USE ALL.
COMPUTE filter_$=(outliers_obs = 1).
VARIABLE LABELS filter_$ 'outliers_obs = 1 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.

REGRESSION
 /MISSING LISTWISE
 /STATISTICS COEFF OUTS R ANOVA CHANGE
 /CRITERIA=PIN(.05) POUT(.10)
 /NOORIGIN
 /DEPENDENT cp21m011
 /METHOD=ENTER leeftijd nettoink_f ch20m004
 /METHOD=ENTER leeftijd nettoink_f ch20m004 volunteering
 /METHOD=ENTER leeftijd nettoink_f ch20m004 paid_employment
 /METHOD=ENTER leeftijd nettoink_f ch20m004 volunteering paid_employment
vol_x_paidemployment.
```

The output has been reported below. The model without the outliers does not seem to differ too much from the original model that includes these cases. The R^2 and $R_{adjusted}^2$ of this model are slightly higher than model 4 but this results in only 0,5% more explained variance ($R_{adjusted}^2{}_{without\ outliers}$ = ,141; $R_{adjusted}^2{}_{model\ 4}$ = ,136). Since the outliers are still observed values, the choice has been made to retain them in the dataset.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
					Change Statistics				
1	,368[a]	,136	,135	1,359	,136	218,564	3	4176	<,001
2	,369[b]	,136	,135	1,358	,001	2,984	1	4175	,084
3	,376[c]	,141	,140	1,355	,005	24,314	1	4174	<,001
4	,376[d]	,141	,140	1,355	,000	,000	1	4173	,989

a. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member

b. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering

c. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering, paid_employment

d. Predictors: (Constant), How would you describe your health, generally speaking?, Personal net monthly income in Euros, imputed, Age of the household member, volunteering, paid_employment, vol_x_paidemployment

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4,175	,126		33,007	<,001
	Age of the household member	,017	,001	,210	13,866	<,001
	Personal net monthly income in Euros, imputed	4,154E-5	,000	,038	2,634	,008
	How would you describe your health, generally speaking?	,671	,028	,356	23,688	<,001
2	(Constant)	4,175	,126		33,019	<,001
	Age of the household member	,017	,001	,208	13,711	<,001
	Personal net monthly income in Euros, imputed	4,032E-5	,000	,037	2,554	,011
	How would you describe your health, generally speaking?	,668	,028	,354	23,530	<,001
	volunteering	,086	,050	,025	1,727	,084
3	(Constant)	3,974	,133		29,985	<,001
	Age of the household member	,020	,001	,246	14,501	<,001
	Personal net monthly income in Euros, imputed	1,065E-5	,000	,010	,632	,527
	How would you describe your health, generally speaking?	,662	,028	,351	23,374	<,001
	volunteering	,096	,050	,028	1,928	,054
	paid_employment	,248	,050	,083	4,931	<,001
4	(Constant)	3,974	,133		29,936	<,001
	Age of the household member	,020	,001	,246	14,499	<,001
	Personal net monthly income in Euros, imputed	1,065E-5	,000	,010	,632	,527
	How would you describe your health, generally speaking?	,662	,028	,351	23,362	<,001
	volunteering	,097	,063	,028	1,522	,128
	paid_employment	,248	,055	,084	4,484	<,001
	vol_x_paidemployment	-,001	,102	,000	-,013	,989

a. Dependent Variable: How satisfied are you with the life you lead at the moment?

A.3.3 Multicollinearity

To measure the multicollinearity, the Variance Inflation Factor (VIF-score) will be examined. The VIF-score is the ratio of how many times the variance increases as result of the dependence of variables in the model. The rule of thumb for the VIF-score in the social sciences is 4. This means that if the VIF-score is 4, the variance is 4 times as big, thus the standard deviations are two times as big. This could cause issues when generalizing the sample to the population due to too large standard deviations. The VIF-scores of model 4 have been displayed in table 3 in the results chapter. These values have been calculated with the following syntax and resulted in the following output:

```
REGRESSION
 /MISSING LISTWISE
 /STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOL
 /CRITERIA=PIN(.05) POUT(.10)
 /NOORIGIN
 /DEPENDENT cp21m011
 /METHOD=ENTER leeftijd nettoink_f ch20m004 volunteering paid_employment
vol_x_paidemployment.
```

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	3,974	,133		29,936	<,001		
	Age of the household member	,020	,001	,246	14,499	<,001	,716	1,396
	Personal net monthly income in Euros, imputed	1,065E-5	,000	,010	,632	,527	,844	1,185
	How would you describe your health, generally speaking?	,662	,028	,351	23,362	<,001	,909	1,100
	volunteering	,097	,063	,028	1,522	,128	,609	1,642
	paid_employment	,248	,055	,084	4,484	<,001	,593	1,687
	vol_x_paidemployment	-,001	,102	,000	-,013	,989	,530	1,888

a. Dependent Variable: How satisfied are you with the life you lead at the moment?

The VIF-scores do not pass the score of 4 which indicates interdependence between variables does not seem to be an issue in the model fit.