# The relationship between social leisure time and health outcomes of immigrants 

## And the effect of social integration on the relationship between these two

Esmée Groen S4123379
e.m.groen.1@student.rug.nl
supervisor: Francesca Giardini, PhD

June 8th, 2022

SOBA313A

University of Groningen


#### Abstract

Immigrants constitute a big part of the Dutch population. It appears that immigrants often perceive their health as being worse than people with a Dutch background. The perceived health of immigrants also seems to be declining over the past years, while the perceived health of people with a Dutch background remains fairly stable. In this research, we were wondering if some of the factors known for contributing to a better health also had an impact on the health of immigrants in the Netherlands. The research question we were interested in answering is: What is the effect of social leisure time on the health outcomes of immigrants? We also were interested in studying whether social integration could have a mediating-effect on the relationship between social leisure time and health. We used multiple datasets from the Longitudinal Internet Studies for the Social Sciences (LISS) Immigrant Panel from the years 2012, 2013 and 2014. These datasets are the Health dataset, the Social Integration and Leisure dataset and the Background variables. The data were collected by CentERdata via paid online questionnaires that the respondents filled in every month. The population we were interested in studying were first- and second-generation immigrants who migrated from a (non-)Western country to the Netherlands. In total, our sample consisted of 655 respondents. We did a linear regression analysis to test our hypotheses. These were: (1) the more time is spent in social leisure time, the more positive one's health outcomes are and (2) the positive effect of social leisure time on the health outcomes of immigrants indeed is partly explained by social integration. We did not find much evidence for both hypotheses. The evidence we did find, is not enough to make hard conclusions and generalizations. This could be due to the composition of the dataset and because social leisure time is a broad concept, whereby this concept is hard to measure. Therefore, it is important for future research to dig into this subject more to see if more time spent in social leisure time indeed goes together with better health.


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## 1. Introduction

There are over four million immigrants in the Netherlands in 2021 (CBS, 2021). This is a percentage of almost $25 \%$ of the total Dutch population (CBS, 2021). Therefore, immigrants constitute a big part of the Dutch population and it is important to make them feel satisfied and healthy. For years (2015-2019), immigrants have perceived their health to be worse than people with a Dutch background. This is especially the case for non-Western immigrants (CBS, 2020). They less often perceive their health to be (very) good in comparison to people with a Dutch background (CBS, 2020). They also less often perceive their health in the years 2015 to 2019 to be (very) good than in the years 2005 to 2009 (CBS, 2020). It seems like the health of (non-Western) immigrants has been declining. Therefore, it is important to research the effects on health outcomes of immigrants, so that we can try to increase the health outcomes of immigrants.

In this thesis we want to research the effect of leisure time (specifically social leisure time) on the health outcomes of immigrants. A lot of things can be categorized under leisure time, such as playing a sport or going to a concert. Since leisure time is a very broad concept, we want to focus on social leisure time. Still, a lot of things can be categorized under social leisure time. Some examples are watching a movie with friends or going out to eat with a neighbor. We want to focus on immigrants in this research, because, as said above, they constitute a big part of the Dutch population and their health seems to decline. Immigrants can have trouble integrating in their new home country (Kim et al., 2018), such as dealing with new norms, trying to find a job and experiencing discrimination (Runge et. al, 2021). This can cause them to feel stressed and anxious, whereby their health outcomes can deteriorate (Runge et al., 2021). We also want to look further into the possible relationship between social leisure time, social integration and health outcomes, because social leisure time seems to have a positive relationship with social integration and social integration in its turn seems to have a positive relationship with health outcomes. An example is that participating in social leisure activities can lead to meeting new people from which new friendships can arise (Murad \& Versey, 2021). These friendships can give someone social support which in turn can lead to less stress, anxiety and depressive feelings (Kim et al., 2018). Limited research has been done about these relationships (especially for immigrants), so there is not yet a clear picture about how these relationships work. We hope to be able to give a clearer picture about this topic.

It is important to know which factors contribute to better health, because poor health can have multiple negative (economic) consequences for the individual, the family members of the individual and the society the individual is a part of. For example, people with poor health earn less money than healthy people, because they have extra costs such as medical spending out of their own pocket and loss in labor earnings due to reduced productivity (De Nardi, Paschenko, \& Porapakkarm, 2017; Zhang, Bansback, \& Anis, 2011). These so-called productivity losses are seen as indirect costs (Zhang, Bansback, \& Anis, 2011). There are also direct costs for the society, such as costs for medical care, employee sick leave and nursing home care (Gitter et al., 1993). Finally, there are also (economic) consequences for the family members of the individual with poor health. For example, younger family members who have older family members with mental health problems are more likely to develop mental and physical health problems themselves (Wilcox-Gök \& McNamee, 2010). They are also more likely to work and earn less due to productivity losses which could be caused by their own declining health and the stress they experience dealing with a family member with poor health (Wilcox-Gök \& McNamee, 2010).

Therefore, it is important to know which factors contribute to better health. One way to positively influence health outcomes of immigrants is to participate in (social) leisure activities (Kim et al., 2018). We will elaborate on this idea more in the next chapter. The research question we are interested in answering is: What is the effect of social leisure time on the health outcomes of immigrants?

The next chapter in this research is chapter two, which contains the theory. In this chapter we will give an overview of the already known insights of this topic. Chapter three is about the methods we have used in this research. In this chapter we will explain more about the dataset we have used. The next chapter is chapter four, which is the results chapter. In this chapter we will discuss the results we have found. The last chapter is chapter five, which is the conclusion and discussion of our research. We will explain more about our found results in this chapter and discuss whether the results we found were expected or remarkable. We will also discuss some limitations of our research in this chapter.

## 2. Theory

In this chapter we will discuss the theoretical aspects of this research. We will do this by giving theoretical aspects for (social) leisure time and social integration. We will end this chapter by giving some theoretical aspects for the variables we are using as control variables.

### 2.1 Leisure time

The research question, as mentioned in the introduction, is: What is the effect of social leisure time on the health outcomes of immigrants? It is important to define leisure time before moving on to the theoretical analyses. Leisure time is a broad concept and a lot of things can be defined as leisure time, such as playing a sport, watching a movie at the cinema and watching television. In this thesis we will focus on social leisure time. But what does social leisure time mean? In this thesis, social leisure time consists of two parts. These parts are leisure activities and social participation. Leisure activities are activities people undertake in their free time (Murad \& Versey, 2021). Social participation is about participating in activities where there is interaction with others outside the person's family (Murad \& Versey, 2021). Combining these two definitions will give a definition of social leisure time as "activities undertaken in people's free time where there is interaction with others outside the person's family". Examples of social leisure time are spending an evening with friends or participating in an activity organized by a religious group (e.g., a church). The reason we want to focus on social leisure time is because social leisure time is an important factor for determining health outcomes, especially for mental health outcomes. People who often participate in social leisure activities have less mental health problems (such as anxiety and depression) than people who do not often participate in social leisure activities (Timonen et al., 2021). This could be important especially for immigrants, since immigrants can experience a lot of stress and anxiety which can lead to more mental health problems. In the paragraph below, we will explain this further.

Participating in social leisure activities provides a feeling of purpose and meaning and is seen as a distraction from worries (Goodman et al., 2016). Participating in social leisure activities also corresponds with lower levels of anxiety and depression (Pondé \& Santana, 2000). These outcomes could have an extra positive effect for immigrants, because generally speaking, immigrants experience more stress and anxiety than natives, for example caused by having to deal with ethnic discrimination
(Runge et al., 2021; Schlaudt et al., 2020). Participating in social leisure activities can therefore be a good distraction from their worries, which can result in experiencing less anxiety. Experiencing less anxiety subsequently leads to more positive health outcomes. Furthermore, participating in social leisure activities can lead to social support (Chang et al., 2014; Iso-Ahola \& Park, 1996). This support can positively influence both physical and mental health through the reduction of stress (Kim et al., 2021; Chang et al., 2014; Iso-Ahola \& Park, 1996). It can also improve one's well-being, resulting in experiencing less loneliness by feeling like they belong and a reduction in depression (Kim et al., 2021; Chang et al., 2014). This leads to a better quality of life and therefore to better health outcomes (Kim et al., 2021), such as a reduced risk of heart attacks (Chang et al., 2014). According to the theory of stress buffering, social support can have a positive effect on health, because social support provides both psychological and material resources for people when dealing with high amounts of stress (Cohen, 2004). An example is someone listening to your problems or frustrations and helping to come up with a solution for these problems or frustrations. Stress can negatively influence health by strengthening behavioral coping responses that are harmful to health, such as smoking and drinking alcohol (Cohen, 2004; Franks et al., 1992). Stress can also negatively influence health by activating physiological systems, such as the sympathetic nervous system (Cohen, 2004). When this system is activated, you experience a fight-or-flight reaction, such as breathing heavier and increased blood pressure. When these types of systems are activated repeatedly or for a long time, people have a greater risk of developing physical and psychiatric disorders (Cohen, 2004). The factor in social support that works as a stress buffer is the belief that other people will help them when necessary (Cohen, 2004). This can lead to a solution for the problem, reducing the importance of the problem or giving a distraction from the problem (Cohen, 2004; Ross \& Mirowsky, 2002). This can strengthen one's belief to deal with certain (stressful or demanding) situations, such as having to adjust to a new culture as an immigrant. This belief can change one's thought about the situation in a positive way (Cohen, 2004; Franks et al., 1992; Ross \& Mirowsky, 2002). In this way, perceived stress is lowered, just like depression and anxiety (Cohen, 2004; Franks et al., 1992). Therefore, social support may lead to better health outcomes.

In summary, participating in social leisure activities has a positive effect on the health outcomes of immigrants by providing a feeling of purpose and meaning and by giving a distraction from people's worries. It also causes lower levels of anxiety, stress and depression, because people gain social support by participating in social leisure activities and they feel less lonely. This leads to a better quality of life and therefore better health outcomes. From these theoretical aspects the following hypothesis has
been formulated; (1) the more time is spent in social leisure time, the more positive one's health outcomes are.

### 2.2 Social integration

Integration, just like leisure time, is a broad concept which can contain many aspects. Therefore, we will use social integration as a combination of two definitions used in other research. Social integration refers to the process in which individuals learn and apply their capacities for connectedness and citizenship (Ware et al., 2007) by participating in multiple social relationships (Cohen, 2004). Connectedness is about building and keeping reciprocal interpersonal relationships which give access to resources and feeling part of a larger community (Ware et al., 2007).

Participating in leisure activities can lead to a smoother integration of immigrants (Murad \& Versey, 2021), because they gain cultural knowledge, develop new friendships, and have access to important resources that can help them adapt to a new cultural environment (Murad \& Versey, 2021; Kim et al., 2018). It can also help reduce stress, anxiety and depression (Kim et al., 2018). Integration is seen as a very important factor for determining (mental) health outcomes (Kamis \& Copeland, 2020). Being well socially integrated often leads to better health outcomes (Diwan \& Jonnalagadda, 2002). The reason for this is that integrating through participation in (social) leisure activities can have a positive effect on social inclusiveness, and it can encourage self-expression (Passmore, 2003). It can also lead to feeling like they belong and feeling connected to the host society (Kim et al., 2018). An example of this is participating in an activity a lot of people enjoy in a country. When we look at the Netherlands, an activity a lot of people enjoy here is going to a terrace; enjoying the sun and having a drink. This way, the person integrating gets to learn more about the things/activities most Dutch people like. This can result in feeling more connected to the host society. This has a positive effect on health outcomes. A model called the main-effect states that connectedness is beneficial and can lead to social integration (Cohen, 2004). It stimulates positive psychological states, such as having an identity and a positive selfworth resulting in better health (Cohen, 2004). Being well socially integrated can also lead to better health outcomes by being influenced to conform to normative health behaviors, such as exercising and eating healthy (Cohen, 2004). Social interaction through participating in social leisure activities can help people get to know what is expected of them in different types of roles (Cohen, 2004). People develop a set of values because of this, such as belonging, a positive self-worth and having an identity (Cohen,
2004). This way, people socially integrate in a society. Being better socially integrated reduces the intensity and duration of negative affective states (Cohen, 2004). This is believed to lead to less psychological despair, a greater stimulus to take care of oneself and a better immune function (Cohen, 2004), in other words; to better health outcomes. Therefore, participating in social leisure activities can lead to a better social integration and a better social integration leads to better health outcomes of immigrants.

In summary, social integration has a positive effect on the health outcomes of immigrants by providing cultural knowledge, developing new friendships and having access to important resources which can lead to a reduction in stress, anxiety and depression. Social integration also has a positive effect on social inclusiveness and it encourages self-expression. People feel like they belong and they feel connected to the host society. This also has a positive effect on health outcomes. People are being influenced through social integration to conform to normative health behaviors and they develop a set of values which gives them an identity. This leads to a reduction in intensity and duration of negative affective states which in turn leads to less psychological despair, a greater stimulus to take care of oneself and a better immune function. The sub-question in this thesis is: Does social integration have a mediating-effect on the positive relationship between leisure time and health outcomes of immigrants? From these theoretical aspects the following hypothesis has been formulated; (2) the positive effect of social leisure time on the health outcomes of immigrants indeed is partly explained by social integration.

### 2.3 Age, gender and income

We want to look into the possible effect of some variables on health outcomes. These variables are Age, Gender and Income. In the paragraphs below, we explain why we think they could have an influence on health outcomes of immigrants.

It is well-known that younger people, in general, have better health outcomes than older people (Jolanki, 2008). When we get older our physical and mental health often declines (Jolanki, 2008). However, more and more emphasis is placed on the belief that people can influence their own health by their own actions (Jolanki, 2008). As a result, this could mean that older people try more and more to get better health, while younger people probably do not yet try to achieve better health because their health is fine (Charles \& Walters, 2008). This could result in a smaller difference in health outcomes
between younger and older respondents. We still expect that younger respondents have better health outcomes than older respondents. To check our expectation, we will control for age.

Next on is the possible influence of gender. A popular belief is the thought that women have better health and therefore live longer than men (Charles \& Walters, 2008). Men would have to take more risks to be a 'real' man (Charles \& Walters, 2008). These risks are, for example, smoking and driving under the influence of alcohol or drugs. This could lead to worse health or even death (Charles \& Walters, 2008). Women are also thought to engage more in health-promoting behaviors than men (Charles \& Walters, 2008) and would therefore have better health outcomes than men. It is also believed that men have worse health outcomes because of our Western culture. A lot of men in the Western culture learn that talking about your (health) problems makes you vulnerable and would therefore be a sign of weakness (Charles \& Walters, 2008). This could lead to less check-ups at the doctor, which could lead to worse health outcomes. However, a lot of men exercise to stay attractive to others (Charles \& Walters, 2008) and we all know exercising is good for your health. We still expect women to have better health outcomes than men. To check our expectation, we will control for gender.

Finally, we are going to discuss the possible influence of income. It is believed that, on average, people with a higher income have better health outcomes than people with a lower income (Subramanyam et al., 2009). This relationship goes step by step; people second from the bottom of income levels have better health outcomes than the people below, but worse health outcomes than the people above them (Subramanyam et al., 2009). There are multiple reasons for the fact that people with higher income have better health outcomes than people with lower income. One of the reasons is that people with higher income can buy more or better products for your health (Subramanyam et al., 2009). This can be medication, but also healthier foods or a gym membership. Another reason is that people with higher income often have a higher status in society. This leads to a feeling of security and therefore leads to less stress, etcetera (Subramanyam et al., 2009). People with lower income and thus a lower status experience stress and frustration more often (Subramanyam et al., 2009). This can lead to worse health outcomes, for example by enhancing unhealthy coping responses such as drinking and smoking (Subramanyam et al., 2009). Therefore, we expect that people with a higher income have better health outcomes than people with a lower income. To check our expectation, we will control for income.

From these theoretical aspects, we composed a conceptual model. The hypotheses in this research can be read from this model. As can be seen in the model below, we expect social leisure time to have a positive effect on the health outcomes of immigrants. We also expect that a part of this effect goes via social integration. The control variables are Gender, Age and Income.


Mediator

## 3. Methods

In this chapter the data of the LISS Immigrant Panel will be discussed first. After this, the procedure of questioning the respondents will be discussed. The measuring instruments will also be discussed together with the operationalization of this research. Finally, the analysis setup will be discussed.

### 3.1 Data

For this research we will be using multiple datasets from the Longitudinal Internet studies for the Social Sciences (LISS) Immigrant Panel from the years 2012, 2013 and 2014 from the Netherlands. This Immigrant Panel has been introduced since 2010 and was available until 2014. The Panel was introduced in addition to the LISS Panel and consisted of around 1,100 households (1,700 individuals). The main goals of the Immigrant project were to study the acculturation processes and the methods used in establishing an Internet panel for a sample of immigrant groups. The datasets that will be used are the Background variables (2012), the Health dataset (wave 2, 2013) and the Social Integration and Leisure dataset (wave 2, 2014). The percentage non-response of the Health dataset was 24,8\% (445 respondents) and the percentage non-response of the Social Integration and Leisure dataset was $25,4 \%$ (444 respondents). In total, 1343 respondents completed the Health dataset and 1270 respondents completed the Social Integration and Leisure dataset. It is important to state here that these percentages are about the total sample; thus, including a Dutch control group. This control group was used to check if there were any differences between the Dutch sample and the immigrant sample. We will not use this control group, so the non-response of the immigrant sample might look a little bit different. There are 53 respondents (4,9\%) in the immigrant sample (thus without the Dutch control group) who did not fill in the question about net monthly income.

The population we want to research are first- and second-generation immigrants who migrated from a Western or non-Western country to live in the Netherlands. The probability sample used in the LISS Immigrant Panel is accurate for the population we want to research, because the sample contains first- and second-generation immigrants who moved to the Netherlands. The sample also contains both Western and non-Western countries. This is an advantage as the sample becomes more representative for the immigrant group as a whole. The immigrants from non-Western countries that are included in the sample are immigrants from Moroccan, Turkish, Surinamese and Antillean origin. These are the four
major non-Western groups in the Netherlands, which creates a good representation of the non-Western immigrants that live in the Netherlands. The sample also contains a Western immigrant group of people of Indonesian origin and a smaller group of South African immigrants. A minor disadvantage is that three non-Western groups (of Moroccan-Dutch origin, Turkish-Dutch origin and other non-Western origin) have been slightly underrepresented in the LISS Immigrant Panel.

Not all respondents will be used in this research, because this research focuses on immigrants and the sample also contains a Dutch control group. Therefore, the Dutch control group will not be used in this research.

### 3.2 Procedure

The data was collected by CentERdata (Tilburg University, the Netherlands) via paid online questionnaires that were completed every month by the respondents. The respondents earned fifteen euros per hour. The samples from the used datasets contain respondents aged sixteen years and older and were drawn by Statistics Netherlands from the population register. There were two reminders sent to non-respondents.

Per household there was one contact person that filled in the household questionnaire and they also indicated which household members would like to participate in the panel. These respondents were asked to fill in a starting questionnaire and to fill out individual questionnaires. The respondents were given a simPC and Internet access if they did not have access to a computer and/or Internet. A problem the recruiters experienced was the language barrier between them and some of the respondents leading to an underrepresentation of some groups (Turkish-Dutch origin: 30 cases; other non-Western origin: 30 cases; Moroccan-Dutch origin: 22 cases). When there were no or limited language problems, the Moroccan and Turkish respondents were the respondents who dropped out more often than other groups. This problem was ought to be solved by sending the recruiters to their house asking if they would want to register as a panel member and if they could help with the registration. However, the overall response rate of these groups remained low. There was also an ought to find a solution for the non-response. This solution was that an IPod would be raffled among those who still wanted to join as a panel member. Due to this action, about $30 \%$ of the reached people registered as a panel member.

Most questions in the questionnaire are not really sensitive questions, so our prediction is that most respondents are willing to answer most questions truthfully. However, the question about net monthly income can be seen as a sensitive question. It could be possible that some of the respondents did not want to truthfully answer the question, but still wanted to fill something in. Therefore, some answers could be false. It is important to keep this in mind when interpreting the results. It could also be possible that some respondents want to present themselves more connected to others or more popular than they actually are. There are some questions about connectedness used in this research, so it is important to keep this in mind as well.

### 3.3 Operationalization

Missing answers of the variables are deleted from the used dataset, so that only respondents who answered the question will be included in the dataset. For an extensive operationalization, please see appendix 1 .

Health is a scale consisting of four items. These four items are General health, Health hindering daily activities, Health hindering social activities and Health hindering work. For the item General health, the respondents could answer with the following answer options: poor (1), moderate (2), good (3), very good (4) and excellent (5). For the items Health hindering daily activities, Health hindering social activities and Health hindering work, the respondents could answer with the following answer options: not at all (1), hardly (2), a bit (3), quite a lot (4) and very much (5). As you can see, the last three items are a bit illogical to interpret; a higher score on these items means more hindering and thus worse health. Because of this, these three items have been recoded so that a higher score means less hindering and thus better health. These four items have been added up and a mean has been calculated to compose a scale (Cronbach's Alpha $=0,868$ ). A higher score on the variable Health means better health.

Connectedness is a scale consisting of six items. These items are A sense of emptiness, Enough people to count on, Enough people to fully rely on, Enough people to feel closely connected, Miss having people around and Feeling deserted. For all six items the respondents could answer with the following answer options: yes (1), more or less (2) and no (3). Some items need to be recoded because some imply a positive feeling and some imply a negative feeling. Interpreting the variable Connectedness would
therefore be very hard. The items Enough people to count on, Enough people to fully rely on and Enough people to feel closely connected to have been recoded so that a higher score means a more positive outcome and thus more connectedness. The six items have been added up and a mean has been calculated to compose a scale (Cronbach's Alpha= 0,815 ). A higher score on the variable Connectedness means feeling more connected.

Satisfaction about leisure time is a scale consisting of two items. These items are Satisfaction about the amount of leisure time and Satisfaction about spending leisure time. For both items the respondents could answer with the following answer options: from not at all satisfied (0) to completely satisfied (10). The two items have been added up and a means has been calculated to compose a scale (Cronbach's Alpha= 0,626). A higher score on the variable Satisfaction about leisure time means being more satisfied about someone's leisure time.

Spending an evening is a scale consisting of three items. These items are Spending an evening with someone from the neighborhood, Spending an evening with friends outside of the neighborhood and Spending an evening with family (not counting household members). For the three items the respondents could answer with the following answer options: almost every day (1), once or twice a week (2), a few times per month (3), about once a month (4), a number of times per year (5), about once a year (6), never (7), don't know (8), not applicable (9). As you can see, the items are a bit illogical to interpret; a higher score means less spending an evening with someone else. Because of this, all three items have been recoded so that a higher score means spending an evening with someone else more often.

The variables Participated in an activity of a cultural association or hobby club, Participated in an activity of a religious or church organization and Participated in an activity of a social society; an association for youth, pensioners/senior citizens, women; or friends' clubs have the answer options no (0) and yes (1). The variable Participated in voluntary work has the answer options yes (1) and no (2). The variable Satisfaction about social contacts has the answer options from not at all satisfied (0) to completely satisfied (10). The variable Age has been measured in years. The variable Gender is a dummy variable and has the answer options male (1) or female (0). The variable Income has been measured in Euros.

### 3.4 Analysis setup

The main goal of this research is to examine what the influence of social leisure time on the health outcomes of immigrants is. It will also be examined whether there is a mediating-effect. To do this, a linear regression analysis was used. First, the descriptive statistics have been looked at. Second, the assumptions for a linear regression analysis have been controlled to see if there was a violation of these assumptions. In total, four models have been estimated. First, model one has been estimated where health was the dependent variable. This first model consists only of the control variables. The control variables are Age, Gender and Income. The second model had the mediation as the dependent variable. Because our mediation consists of two variables, two models were estimated; model 2 a and model 2 b . Model 2a consists of the control variables and the predictors where Connectedness was the dependent variable. Model 2 b also consists of the control variables and the predictors, but the dependent variable here was Satisfaction about social contacts. The predictors are Satisfaction about leisure time, Participated in an activity of a cultural association or hobby club, Participated in an activity of a religious or church organization, Participated in an activity of a social society; an association for youth, pensioners/senior citizens, women; or friends' clubs, Voluntary work and Spending an evening. The third model consists of the control variables and the predictors where Health was the dependent variable. The fourth model consists of the control variables, the predictors and the mediating variable where Health was the dependent variable.

## 4. Results

In this chapter the results will be discussed. First, the descriptive statistics of the predictors and the dependent variable are given in table 1 below. Second, the association measures will be provided in table 2 . Third, the multivariate results will be discussed and the hypotheses will be statistically tested. This table will also give the fit of the model. Finally, the assumptions of a linear regression will be controlled for.

### 4.1 Descriptive statistics

In table 1 the descriptive statistics are given. It can be seen that the mean of Health is 3.82 on a scale ranging to 5 . This is quite a high mean, but the mode is higher, namely 4.50 . The mean of Connectedness is 2.56 on a scale ranging to 3 . This is a high mean. The mode is also very high, namely 3.00 . It can also be seen that the mean of Satisfaction about leisure time is 6.74 on a scale ranging to 10 . This is not a very high mean. The mean of Spending an evening is 8.37 on a scale ranging to 18 . This is a low to average mean. It can also be seen that the majority of the respondents does not participate in activities organized by a cultural association/hobby club, religious organization or social society/association. Most respondents also indicated they do not participate in voluntary work. The mean of Satisfaction about social contacts is 6.92 on a scale ranging to 10 . This is an average score. Finally, it can be seen that the mean of Income is 1609.96 Euros, but the mode is 0 Euros. It is noticeable that most of the standard deviations are quite high.

From these descriptives, we can make some interesting statements. The average respondent seems to have quite a good health, since the mean is 3.82 and the mode is 4.50 . It can also be concluded that the average respondent feels connected, since the mean is 2.56 and the mode is 3.00 . The average respondent does not seem to be very satisfied with their leisure time, since the mean is 6.74. The average respondent does also not seem to be very satisfied with their social contacts, since the mean is 6.92. The average respondent does not regularly spend an evening with friends/family/someone from their neighborhood. Lastly, we can conclude that the majority of the respondents earns nothing and therefore probably does not have a job, since the mode is 0 .

Table 1: Univariate description of the statistics

| Variable | Mean (standard deviation) | Minimum | Maximum | Mode | $N$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Health | 3.82 (0.91) | 1 | 5 | 4,50 | 662 |
| Connectedness | 2.56 (0.46) | 1 | 3 | 3,00 | 662 |
| Satisfaction about |  |  |  |  |  |
| leisure time | 6.74 (2.00) | 0 | 10 | 7,00 | 655 |
| Spending an evening | 8.37 (3.97) | 0 | 18 | 8,00 | 662 |
| Cultural |  |  |  |  | 662 |
| association/hobbyclub |  |  |  |  |  |
| $0=\mathrm{no}$ | 89.4\% |  |  |  | 662 |
| 1 - yes | 10.6\% |  |  |  |  |
| Religious organization | 90.9\% |  |  |  | 662 |
| $0=$ no | $9.1 \%$ |  |  |  |  |
| 1 = yes |  |  |  |  |  |
| Social society/ |  |  |  |  |  |
| association |  |  |  |  | 662 |
| $0=$ no | 93.8\% |  |  |  |  |
| 1 = yes | 6.2\% |  |  |  |  |
| Voluntary work |  |  |  | , | 662 |
| $1=\text { yes }$ | $\begin{aligned} & 17.2 \% \\ & 82.8 \% \end{aligned}$ |  |  |  |  |
| $2=$ no |  |  |  |  |  |
| Satisfaction about social contacts | 6.92 | 0 | 10 | 7,00 | 662 |
| Age | 48.19 (16.54) | 16 | 88 | 48 | 662 |
| Gender |  |  |  | 0 | 662 |
| $0=$ Male | 46.4\% |  |  |  |  |
| 1-Female | 53.6\% |  |  |  |  |
| Income | 1609.96 (3216.90) | 0 | 68.388 | 0 | 662 |

### 4.2 Association measures

Table 2 below shows the correlations between all variables. For all effects, nothing can yet be said about the direction of the correlation. Some correlations stand out. For example, the correlation between Satisfaction about leisure time and Satisfaction about social contacts is 0.50 and is significant ( $p<0.01$ ). This means that there is a fairly strong correlation between these two variables. The correlation between Connectedness and Satisfaction about social contacts is 0.61 and is also significant ( $p<0.01$ ) There is, therefore, also a fairly strong correlation between these variables. It is interesting to look at the correlations between Health and the variables associated with the mediator of Social integration. It is striking that none of the variables associated with Social integration (Connectedness and Satisfaction about social contacts) has a strong correlation with the variable Health. The strongest connection is between Health and Connectedness; this correlation is 0.29 and is significant ( $p<0.01$ ). Lastly, it is
noticeable that many correlations are low. This means that, in general, there is little or no correlation between the variables.

A t-test for means was used to look at the difference in means between Income and Gender. An interesting (but not completely surprising) result is that men have a higher mean (EUR 1786.68) than women (EUR 1457.13) on the variable Income. This means that men earn on average (over 300 euros) more per month than women.

Table 2: Table with association measures of all the variables in the research model

|  | 1. | 2. | 3. | 4.5 | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. Health | - |  |  |  |  |  |  |  |  |  |  |  |
| 2. Connectedness | **0,29* | - |  |  |  |  |  |  |  |  |  |  |
| 3. Satisfaction about | ** $0,13^{\text {a }}$ | ** $0,35^{3}$ | - |  |  |  |  |  |  |  |  |  |
| leisure time |  |  |  |  |  |  |  |  |  |  |  |  |
| 4. Spending an evening | **0,13 ${ }^{\text {a }}$ | **0,36 ${ }^{\text {a }}$ | * $0,09^{3}$ | - |  |  |  |  |  |  |  |  |
| 5. Cultural association/ |  |  |  |  |  |  |  |  |  |  |  |  |
| hobbyclub | 0,04 | 0,00 | 0,03 * | **0,11 ${ }^{\text {c }}$ | - |  |  |  |  |  |  |  |
| 6. Religious organization | 0,00 | 0,00d | 0,06 ${ }^{\text {c }}$ | * $0,08{ }^{\text {c }}$ * | ** $0,11^{\text {b }}$ | - |  |  |  |  |  |  |
| 7. Social society/ |  |  |  |  |  |  |  |  |  |  |  |  |
| association | 0,00 ${ }^{\text {c }}$ | 0,03 ${ }^{\text {c }}$ | 0,00 | ${ }^{*} 0,09{ }^{\text {c }}$ ** | ${ }^{* *} 0,26^{\text {b }}$ | **0,18 ${ }^{\text {b }}$ | - |  |  |  |  |  |
| 8. Voluntary work | 0,00 | 0,08 | **0,13 ${ }^{\text {c }}$ | c 0,03 ${ }^{\text {c }}$ | 0,06 ${ }^{\text {b }}$ | 0,03 ${ }^{\text {b }}$ | 0,05 ${ }^{\text {b }}$ | - |  |  |  |  |
| 9. Satisfaction about |  |  |  |  |  |  |  |  |  |  |  |  |
| social contacts | **0,27 ${ }^{\text {e }}$ | **0,61 ${ }^{\text {c }}$ | **0,50 ${ }^{\text {c }}$ | c **0,30 ${ }^{\text {c }}$ | c $0,10^{\text {b }}$ | 0,10 ${ }^{\text {b }}$ | 0,11 ${ }^{\text {b }}$ | 0,15 ${ }^{\text {b }}$ | - |  |  |  |
| 10. Age | **-0,17 ${ }^{\text {a }}$ | $0,02^{\text {a }}$ | ${ }^{* *} 0,34{ }^{\text {a }}$ | **-0,19 ${ }^{\text {a }}$ | 3 $0,0{ }^{\text {c }}$ | 0,06 ${ }^{\text {c }}$ | 0,03 ${ }^{\text {c }}$ | *0,08 ${ }^{\text {c }}$ | 0,13 ${ }^{\text {c }}$ | - |  |  |
| 11. Gender | $-0,05^{\text {a }}$ | 0,01 ${ }^{\text {a }}$ | $-0,05^{\text {a }}$ | $-0,02^{\text {a }}$ | $0,01{ }^{\text {b }}$ | 0,02 ${ }^{\text {c }}$ | 0,08 | 0,06 ${ }^{\text {c }}$ | 0,33 ${ }^{\text {c }}$ | 0,05 ${ }^{\text {a }}$ | - |  |
| 12. Income | -0,06 ${ }^{\text {a }}$ | *0,093 | * $0,10^{3}$ | $-0,04^{3}$ | 0,03 ${ }^{\text {c }}$ | 0,00 | 0,03 ${ }^{\text {c }}$ | 0,03 ${ }^{\text {c }}$ | 0,09*** | 0,18 ${ }^{3}$ | -0,05 ${ }^{\text {a }}$ | - |

[^0]
### 4.3 Multivariate results

Table 3 below shows the multivariate results obtained by a linear regression analysis. The results will be discussed underneath the table.

Table 3: parameters from the regression analysis with the dependent variable Health and the mediation

|  | Model 1 |  | Model $2 a$ <br> Connectednes | Satisfa | Model 2b <br> tion social con |  | Model 3 |  | Model 4 |  | VIF |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $b(S E)$ | $p$ | $b(S E)$ | $p$ | $b(S E)$ | $p$ | $b(S E)$ | $p$ | $b(S E)$ | $p$ |  |
| Constante | 4,32 (0,12) | <0,001 | 1,83 (0,12) | <0,001 | 3,36 (0,44) | <0,001 | 3,63 (0,25) | <0,001 | 2,70 (0,29) | <0,001 |  |
| Age | -0,67(0,11) | <0,001 | $-0,00(0,00)$ | 0,166 | $-0,01(0,00)$ | 0,116 | $-0,01(0,00)$ | <0,001 | $-0,01(0,00)$ | <0,001 | 1,22 |
| Income | $\begin{aligned} & 2,68 \mathrm{E}-5 \\ & (0,00) \end{aligned}$ | 0,014 | $\begin{aligned} & 1,12 \mathrm{E}-5 \\ & (0,00) \end{aligned}$ | 0,024 | $\begin{aligned} & 2,06 \mathrm{E}-5 \\ & (0,00) \end{aligned}$ | 0,276 | $\begin{aligned} & 2,44 \mathrm{E}-5 \\ & (0,00) \end{aligned}$ | 0,023 | $\begin{aligned} & 1,87 \mathrm{E}-5 \\ & (0,00) \end{aligned}$ | 0,074 | 1,05 |
| Gender | -0,10(0,07) | 0,141 | 0,03 (0,03) | 0,303 | 0,29 (0,12) | 0,018 | $-0,09(0,07)$ | 0,215 | $-0,10(0,07)$ | 0,124 | 1,03 |
| Cultural association |  |  | $-0,07(0,06)$ | 0,202 | $-0,15(0,20)$ | 0,477 | -0,18(0,12) | 0,126 | -0,14 (0,11) | 0,208 | 1,10 |
| Religious organization |  |  | -0,01 (0,06) | 0,905 | -0,04 (0,21) | 0,862 | $-0,02(0,12)$ | 0,852 | -0,02 (0,12) | 0,872 | 1,05 |
| Social society |  |  | -0,01 (0,07) | 0,864 | 0,39 (0,26) | 0,141 | -0,03 (0,15) | 0,823 | -0,03 (0,14) | 0,837 | 1,12 |
| Voluntary work |  |  | -0,03 (0,04) | 0,435 | -0,01 (0,16) | 0,537 | 0,06 (0,09) | 0,519 | 0,08(0,09) | 0,393 | 1,03 |
| Satisfaction leisure time |  |  | 0,08 (0,01) | <0,001 | 0,45 (0,03) | <0,001 | 0,09 (0,02) | <0,001 | 0,05 (0,02) | 0,015 | 1,54 |
| Spending an evening |  |  | 0,04 (0,00) | <0,001 | 0,01 (0,02) | <0,001 | 0,02 (0,01) | 0,098 | -0,00 (0,01) | 0,654 | 1,28 |
| Connectedness |  |  |  |  |  |  |  |  | 0,49 (0,09) | <0,001 | 1,67 |
| Satisfaction social contacts |  |  |  |  |  |  |  |  | 0,01 (0,03) | 0,792 | 1,83 |
| $R^{2}$ adjusted | 0,04 |  | 0,23 |  | 0,30 |  | 0,07 |  | 0,12 |  |  |
| FChange/p | 9,06 | <0,001 |  |  |  |  | 5,41 | <0,001 | 18,78 | <0,001 |  |
| N | 655 |  | 655 |  | 655 |  | 655 |  | 655 |  |  |

First of all, it is important to look at the modelfit. For this, the $\mathrm{R}^{2}$ adjusted values are used that can be found in table 3. This value for model 1 is 0.04 . This is a very low value and means that model 1 can explain 4\% of the variance in Health. The $R^{2}$ adjusted for model 2a is 0.23 and means that model 2a can
explain $23 \%$ of the variance in Connectedness. In model $2 b$, the $R^{2}$ is adjusted 0.30 . Model $2 b$ can therefore explain $30 \%$ of the variance in Satisfaction about social contacts. The $R^{2}$ adjusted for model 3 is 0.07 ; model 3 can explain $7 \%$ of the variance in Health. The $R^{2}$ adjusted for model 4 is 0.12 . Model 4 can therefore explain $12 \%$ of the variance in Health. It is especially important to look at the $R^{2}$ adjusted of model 4, as the hypotheses are tested with this model. The $R^{2}$ adjusted of model 4 has increased compared to model 3 ; from $4 \%$ explained variance to $12 \%$ explained variance. This means that the addition of the mediation explains more variance. It is also important to look at the F Change values for the modelfit. These values are shown in table 3. The F Change value for model 1 is 9.06 ( $p<0.001$; $d f=3,651$ ). The $F$ Change value for model 3 is 5.41 ( $p<0.001 ; d f=6,645$ ) and for model 4 this value is 18.78 ( $p<0.001$; $\mathrm{df}=2,643$ ). It can be seen that the effects on Health are significant for each model and the value for model 4 has increased compared to the value for models 1 and 3 . The explanatory variables can therefore predict Health better with model 4 than with models 1 and 3 . In conclusion, it can be said that the modelfit is reasonable. Not much variance is explained by models 1,3 and 4 . Models 2 a and $2 b$ do explain a fair amount of variance. The F Change value for model 4 is larger than for the other models, which means that model 4 can predict Health better than model 1 and model 3 .

Model 4 is used to analyze the effects of the predictors and the mediation. The first hypothesis that will be tested is the following: (1) the more time is spent in social leisure time, the more positive one's health outcomes are. This hypothesis is tested via a linear regression analysis. Table 3 shows some results for this hypothesis that stand out. The first thing to notice is that the coefficient of the variables (belonging to social leisure time) Cultural association/hobby club, Religious organization and Social society/association is negative. This means that the health of people who participate in an activity organized by these organizations is worse than the health of people who do not participate in these activities. The (insignificant) effect of Cultural association/hobby club is the largest here; the coefficient is $-0.14(p=0.208)$. This means that people who participate in an activity score on average 0.14 lower on Health than people who do not participate in an activity, controlled for the influence of the other variables. The maximum increase for Cultural association on the Health scale, which runs from 1-5, is -$0.28(-0.14 \times 2)$. Therefore, the effect of Cultural association on Health is quite small. Thus, participating in an activity does not seem to go hand in hand with better health, but somewhat with worse health. A second result is that the coefficients of the variables Voluntary work ( $b=0.08$ ) and Spending an evening ( $b=-0.00$ ) are also very small and insignificant ( $p=0.393$ and $p=0.654$ ). The effects (controlled for the influence of the other variables) of Voluntary work and Spending an evening on Health are therefore really small, so it seems that these two variables do not seem to go hand in hand with better health. A
third result is that the coefficient of the variable Satisfaction about leisure time is small and significant ( $b=0.05 ; p=0.015$ ). People who are more satisfied about their leisure time score on average 0.05 higher on Health than people who are less satisfied with their leisure time, controlled for the influence of the other variables. The maximum increase for Satisfaction about leisure time on the Health scale, which runs from 1-5, is 0.5 ( $0.05 \times 10$ ). This is quite an effect. Thus, Satisfaction about leisure time only seems to go hand in hand with better health if we compare people who are not at all satisfied to people who are completely satisfied. In conclusion, the results do not seem to support the first hypothesis.

The second hypothesis that will be tested is the following: (2) the positive effect of social leisure time on the health outcomes of immigrants indeed is partly explained by social integration. This hypothesis is tested via a linear regression analysis. Table 3 shows some results for this hypothesis that stand out. One result is the quite large coefficient of Connectedness ( $b=0.49 ; p<0.001$ ). People who score higher on this variable and therefore feel more connected (and less lonely) score on average 0.49 higher on Health than people who score lower, controlled for the influence of the other variables. This effect is significant. The maximum increase for Connectedness on the Health scale that runs from 1-5 is 1.47 ( $0.49 \times 3$ ). The effect of Connectedness on Health is therefore large. This means that a greater sense of belonging seems to go hand in hand with better health. A second result is that the coefficient of Satisfaction about social contacts is really small, namely 0.01 . This effect is insignificant ( $p=0.792$ ). People who are more satisfied about their social contacts score on average 0.01 higher on Health than people who are less satisfied about their social contacts, controlled for the influence of the other variables. The maximum increase for Satisfaction about social contacts on the Health scale that runs from 1-5 is $0.10(0.01 \times 10)$. This is a small effect. The effect of Satisfaction about social contacts on Health is therefore really small. Thus, Satisfaction about social contacts does not seems to go hand in hand with better health. Another result is that most of the coefficients of the predictors in model 4 have become smaller compared to the coefficients of the predictors in model 3 . This means that there could be a mediating effect of social integration on the health outcomes of immigrants. However, the differences between the coefficients are very small and the coefficients are not significant. In conclusion, the results do not really support the second hypothesis. If there is a mediating effect, the effect is mainly due to Connectedness and not to Satisfaction about social contacts.

It is interesting to look at the effect of the control variables. In table 3 (model 4) it can be seen that the effect of Age is almost non-existent; the coefficient is -0.01 . However, this effect applies when someone is only one year older. It is more interesting to look at the effect when we, say, look at a ten-
year difference. Then, the effect of Age is $-0.10(-0.01 \times 10)$. This means that people who are ten years older score on average 0.10 lower on Health than people who are ten years younger, controlled for the influence of the other variables. This effect is rather small and significant ( $p<0.001$ ). The effect of Income is really small; 0.0000187 . This effect applies when someone earns one Euro more, so this effect is quite irrelevant. It is more interesting to look at the effect when someone earns 1000 Euros more. The effect of Income is then 0.0187 ( $0.0000187 \times 1000$ ). This means that people who earn 1000 Euros more score on average 0.02 higher on Health than people who earn 1000 Euros less, controlled for the influence of the other variables. This is still a really small effect and it is also an insignificant effect ( $p=0.074$ ). However, this effect does not have to be linear since earning 1000 Euros more can have a different impact on someone's life. For example, if someone earns 1500 Euros per month, earning 1000 Euros more probably has quite an impact. But if someone earns 9000 Euros per month, earning 1000 Euros more probably does not change a lot for that person. Since the average income in this research is 1609.96 Euros, earning 1000 Euros more probably does have an impact on someone's life and therefore on someone's health. Lastly, the effect of Gender on Health is -0.010 . This means that men (from 0 female to 1 male) score on average 0.01 lower on Health than women. This is also a really small and insignificant effect ( $p=0.124$ ). As a conclusion we can say that Age somewhat has an (significant) effect on Health.

### 4.4 Assumptions

It is important to control the assumptions belonging to a linear regression analysis, because we need to know if our conclusions are valid. The first assumption to control for is the assumption of normality. Normality means that the residuals of the variable are normally distributed. Histogram 1 in appendix 3 shows that the distribution is not normally distributed. Overall, the distribution appears to be skewed to the left. The PP-plot in appendix 3 also shows this trend. The assumption of normality thus seems to be violated. The second assumption to control for is the assumption of independence of the observations. This means that the used sample is random and therefore very similar to the population. Since some of the respondents are from the same household, they could be influenced by one another when answering the questions. Therefore, the independence of observations cannot be fully guaranteed. Thus, it is possible that this assumption is violated. The third assumption to control for is the assumption of homoscedasticity. This means that there is a constant conditional standard deviation. The variance of Health would be the same for each value. The scatterplot in appendix 3 shows that the distribution of
the residuals remains approximately the same. Thus, the variance appears to be approximately equal for each group. There are some outliers, but the overall trend appears to be the same. The assumption of homoscedasticity therefore does not appear to have been violated. The fourth assumption to control for is the assumption of linearity (straight line). This means that the mean of the residuals is zero for any set of x's; there is therefore a linear relationship between the independent variables. The scatterplot in appendix 3 it can be seen that the mean of the residuals is not around the zero line; the mean falls below zero. Therefore, the assumption appears to have been violated. However, this violation is not extreme.

It is also important to check if there are any outliers and if multicollinearity occurs. To check for multicollinearity, the VIF-values are used. Table 3 above shows that none of the VIF-values is a cause for concern, as none of the values is greater than four. Thus, there appears to be little or no multicollinearity. To check for any outliers the standardized residuals, the leverage, the Cook's Distance, the DFFIT and the DFBETA are used. In total, there are 29 possible outliers found. For the Cook's Distance, the leverage, the DFBETA and the DFFIT, our criterium was that the outliers violated the limit value of at least three of these four measurements. However, for the standardized residuals outliers we had another criterium; we looked if the standardized residuals outliers had a low score on Health. These cases are seen as the outliers for the standardized residuals. The outliers have been removed from the dataset and a linear regression was run again to see what effect the outliers had on Health. The skewness of the variable Health became somewhat less skew. However, Health is still not completely normally distributed. Most effects of the variables on Health became larger, but most of the effects are still insignificant. For a more detailed description, we refer to appendix 3 .

## 5. Conclusion and discussion

In this research we were interested in the relationship between social leisure time and health outcomes of immigrants. As said in the introduction, the health of immigrants in the Netherlands is perceived as less good than the health of people with a Dutch background. It also appears that the health of immigrants has been declining for over the past years. Since immigrants are a big part of the Dutch population, it is important to research factors that contribute to a better health. Social leisure time is seen as such a factor. Our expectation was that social leisure time would have a positive effect on the health outcomes of immigrants. We also expected that part of this relationship was due to social integration, since social integration can contribute to a better health. In this chapter we will discuss the results for both hypotheses and give some limitations about our research.

The first hypothesis was: the more time is spent in social leisure time, the more positive one's health outcomes are. The results for cultural association/hobby club, religious organization and social society/association imply a negative effect on Health. This would mean that the health of people who participate in an activity organized by these organizations is worse than the health of people who do not participate in these activities. Especially cultural association/hobby club seems to imply this. This is a very remarkable result as it goes against the theories we used. The theories stated that people who often participate in social leisure activities have less mental health problems than people who do not often participate in social leisure activities. Since immigrants can experience a lot of stress and anxiety, which can lead to more mental health problems, we expected that this theory would especially apply to immigrants. Participating in social leisure activities could also provide a feeling of purpose and meaning and could be a distraction from worries. Furthermore, participating in social leisure activities could lead to social support, which can positively influence both physical and mental health through the reduction of stress. However, we did not find these results. We also expected that participating in voluntary work and spending an evening with somebody outside the person's family would go together with a better health. This does not seem to be the case since the relationship with health is really small. Being satisfied about leisure time seems to have a small relationship with health, but this relationship is too small to say anything interesting about it. As a conclusion we can say that the results do not seem to support the first hypothesis. This implies that social leisure time is not a strong determinant for health outcomes of immigrants in the Netherlands.

The second hypothesis was: the positive effect of social leisure time on the health outcomes of immigrants indeed is partly explained by social integration. The result for being more satisfied about leisure time does not seem to go together with better health. However, feeling more connected to others does seem to go together with better health. It can be seen that there might be a mediating effect of social integration on health, although this effect seems small. This mediating effect would then be caused by connectedness and less by satisfaction about social contacts. This is quite remarkable as it goes against the theories we used. The theories stated that integrating through participation in social leisure activities could have a positive effect on social inclusiveness and developing new friendships. This could lead to less stress, anxiety and depression. This is why we expected that if people are more satisfied with their social contacts, they would feel more socially included and they would have qualitative better friendships, which would in turn lead to less stress, anxiety and depression. As a conclusion we can say that the results do seem to support the second hypothesis, but only for connectedness and less for satisfaction about social contacts. There also seems to be a mediating effect, but this effect is too small to state this finding as a hard result. This implies that social integration could be a determinant for health outcomes of immigrants in the Netherlands.

The results of the control variables were also somewhat remarkable. A result we expected was that when people get older, their health gets worse. Another result we expected was that women have better health than men. However, these results were smaller than we expected. A result which we found remarkable is that when people earn 1000 Euros more, their health barely gets better. This is a remarkable result, since our used theory stated that people with higher income often have better health. However, as said in the results, this effect does not have to be linear. Therefore, the effect could be larger for people who earn less than for people who earn more.

When we look at the results that are interesting for this research, we have to take into account that some of the assumptions have been violated. Therefore, we need to be careful about the conclusions we make. Being more satisfied about one's leisure time does seem to go together with better health, although it is a small effect. As expected, age seems to go together with health; meaning that older people have on average worse health than younger people. Lastly, we feel like we can say with more confidence that feeling more connected to others (and thus feeling less lonely) does seem to go together with better health. This last result seems to have the biggest influence on health in this research.

In this paragraph we will discuss some limitations of the research. At the same time, some suggestions for future research and some recommendations will be made. One limitation of this research is that some of the assumptions (normality, linearity and probably also independency) have been violated, whereby we cannot make hard generalized conclusions. We can however say that the data let us believe that mostly feeling connected seems to have an effect on health outcomes. Therefore, it is important to research this further with a more normally distributed dataset. Another limitation is that there were a lot of people who did not participate in an activity organized by the organizations used in this research. Therefore, the results for these variables might be other than they are in reality. It could be that because there were few people who had actually participated in activities, the results found in the theory we used were harder to recreate. Therefore, the effects could be smaller than they would be when there were a lot of people who had participated in activities. It is important for future research to have enough respondents who did participate in these kinds of activities to see whether more social leisure time goes together with better health. It is also important for future research to test if there is a relationship between satisfaction about social contacts and health. We expected a positive relationship between these two, but our result was that the effect is rather small. A reason for this result could be that the average respondent is already not very satisfied with their social contacts, whereby it was more difficult to recreate the result our used theory stated. It is important for future research to include people who are (very) satisfied with their social contacts. We expected that income would have a greater impact on health outcomes. We stated that people with higher income are able to buy more and better products for their health. They also often have a higher status in society which could lead to a feeling of security. This feeling could reduce stress, anxiety, etcetera. One reason for this contradicting result could be that this theory does not apply to immigrants, since they can still experience a lot of stress, frustration and anxiety by adjusting to a new culture or because immigrants are rarely among high status people. A last point we want to make, is that the (somewhat weak) results we found may be due to the fact that social leisure time is a broad concept to study. The dataset we worked with may have not covered the whole aspect of social leisure time. Therefore, it is important for future research to think about what social leisure time is in a very broad way.

When these points are taken into consideration, we hope that future research will be able to give more insights about this important topic.

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## Appendix 1: overview of the statistics of the variables

## Health

| Syntax original variables |
| :--- |
| FREQUENCIES VARIABLES=ek13b004 ek13b015 |
| ek13b016 ek13b017 |
| /STATISTICS=MEAN STDDEV RANGE MINIMUM |
| MAXIMUM MODE |
| /HISTOGRAM |

Syntax recoding
RECODE ek13b015 ek13b016
ek13b017 (1=5) $(2=4)(3=3)$
$(4=2)(5=1)$ INTO
ek13b015_new ek13b016_new
ek13b017_new.

## Syntax scale

COMPUTE
Gezondheid=MEAN(ek13b004,ek 13b015_new,ek13b016_new,ek 13b017_new).

EXECUTE.

In the tables and figures below, we first began by giving the statistics, frequencies and histograms of the original variables and ended with the statistics, frequencies and histogram of the final variable;

Health. This way, a comparison can be made between

| Syntax Health |
| :--- |
| FREQUENCIES VARIABLES=Health |
| /STATISTICS=STDDEV RANGE |
| MINIMUM MAXIMUM MEAN |
| MODE |
| /HISTOGRAM |

## Syntax Cronbach's Alpha

RELIABILITY
/VARIABLES=ek13b004
ek13b015_new ek13b016_new ek13b017_new
/SCALE('ALL VARIABLES') ALL

## Statistics

ek13b004 How would you describe your health, generally speaking?

| N | Valid | 888 |
| :--- | ---: | ---: |
|  | Missing | 192 |
| Mean | 3,07 |  |
| Mode | 3 |  |
| Std. Deviation | , 874 |  |
| Range | 4 |  |
| Minimum | 1 |  |
| Maximum | 5 |  |

## Statistics

| ek13b015 To what extent did your physical health or emotional |  |  |
| :---: | :---: | :---: |
| problems hinder your daily activities |  |  |
| over the past month? |  |  |
| N | Valid | 885 |
|  | Missing | 195 |
| Me |  | 1,91 |
| Mo |  | 1 |
|  | ation | 1,115 |
| Ran |  | 4 |
|  |  | 1 |
| Maximum |  | 5 |

## Statistics

ek13b016 To what extent did your
physical health or emotional
problems hinder your social activities
over the past month?

| N | Valid | 885 |
| :--- | :--- | ---: |
|  | Missing | 195 |
| Mean | 1,93 |  |
| Mode | 1 |  |
| Std. Deviation | 1,127 |  |
| Range | 4 |  |
| Minimum | 5 |  |
| Maximum | 1 |  |

## Statistics

ek13b017 To what extent did your
physical health or emotional
problems hinder your work over the past month?

| N | Valid |
| :--- | ---: |
|  | Missing |
| Mean | 885 |
| Mode | 195 |
| Std. Deviation | 1,05 |
| Range | 1,169 |
| Minimum | 4 |
| Maximum | 5 |

## Statistics

## Health

| N | Valid | 662 |
| :--- | ---: | ---: |
|  | Missing | 0 |
| Mean | 3,8184 |  |
| Mode | 4,50 |  |
| Std. Deviation | 4,90810 |  |
| Range | 1,00 |  |
| Minimum | 5,00 |  |
| Maximum |  |  |

ek13b004 How would you describe your health, generally speaking?

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | Poor | 31 | 2,9 | 3,5 | 3,5 |
|  | Moderate | 157 | 14,5 | 17,7 | 21,2 |
|  | Good | 473 | 43,8 | 53,3 | 74,4 |
|  | very good | 169 | 15,6 | 19,0 | 93,5 |
|  | Excellent | 58 | 5,4 | 6,5 | 100,0 |
|  | Total | 888 | 82,2 | 100,0 |  |
| Missing | System | 192 | 17,8 |  |  |
| Total |  | 1080 | 100,0 |  |  | groningen

ek13b015 To what extent did your physical health or emotional problems hinder your daily activities over the past month?

|  |  |  | Cumulative <br> Percent |  |  |
| :--- | :--- | ---: | ---: | ---: | ---: |
| Valid | Frequency | Percent | Valid Percent | not at all | 457 |
|  | Hardly | 172 | 15,9 | 51,6 | 51,6 |
|  | a bit | 153 | 14,2 | 19,4 | 71,1 |
|  | quite a lot | 86 | 8,0 | 17,3 | 88,4 |
|  | very much | 17 | 1,6 | 1,9 | 100,0 |
| Total | 885 | 81,9 | 100,0 |  |  |
| Missing | System | 195 | 18,1 |  | 98,1 |
| Total |  | 1080 | 100,0 |  |  |

ek13b016 To what extent did your physical health or emotional problems hinder your social activities over the past month?

|  |  |  | Cumulative <br> Percent |  |  |
| :--- | :--- | ---: | ---: | ---: | ---: |
|  | Falid | not at all | 446 | 41,3 | 50,4 |
|  | hardly | 175 | 16,2 | 19,8 | 50,4 |
|  | a bit | 165 | 15,3 | 18,6 | 70,2 |
|  | quite a lot | 75 | 6,9 | 88,8 |  |
|  | very much | 24 | 2,2 | 2,7 | 100,0 |
|  | Total | 885 | 81,9 | 100,0 |  |
| Missing | System | 195 | 18,1 |  | 97,3 |
| Total |  | 1080 | 100,0 |  |  |

ek13b017 To what extent did your physical health or emotional problems
hinder your work over the past month?

|  |  |  | Cumulative <br> Percent |  |
| :--- | ---: | ---: | ---: | ---: |
| Valid | Frequency | Percent | Valid Percent all | 401 |
|  | Hardly | 187 | 17,3 | 45,3 |
|  | a bit | 181 | 16,8 | 21,1 |


|  |  | Health |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 1,00 | 2 | ,3 | ,3 | ,3 |
|  | 1,25 | 7 | 1,1 | 1,1 | 1,4 |
|  | 1,50 | 4 | ,6 | ,6 | 2,0 |
|  | 1,75 | 8 | 1,2 | 1,2 | 3,2 |
|  | 2,00 | 17 | 2,6 | 2,6 | 5,7 |
|  | 2,25 | 22 | 3,3 | 3,3 | 9,1 |
|  | 2,50 | 20 | 3,0 | 3,0 | 12,1 |
|  | 2,75 | 30 | 4,5 | 4,5 | 16,6 |
|  | 3,00 | 47 | 7,1 | 7,1 | 23,7 |
|  | 3,25 | 34 | 5,1 | 5,1 | 28,9 |
|  | 3,50 | 45 | 6,8 | 6,8 | 35,6 |
|  | 3,75 | 67 | 10,1 | 10,1 | 45,8 |


| 4,00 | 37 | 5,6 | 5,6 | 51,4 |
| ---: | ---: | ---: | ---: | ---: |
| 4,25 | 56 | 8,5 | 8,5 | 59,8 |
| 4,50 | 151 | 22,8 | 22,8 | 82,6 |
| 4,75 | 79 | 11,9 | 11,9 | 94,6 |
| 5,00 | 36 | 5,4 | 5,4 | 100,0 |
| Total | 662 | 100,0 | 100,0 |  |




ek13b016 To what extent did your physical health or emotional problems hinder your social activities over the past month?



As can be seen in the histogram above, the distribution of the variable Health is skew. The mean is 3.79 and is quite high since the scale is from 1 to 5 . Health was measured by taking the mean of four items. These items are General health, Health hindering daily activities, Health hindering social activities and Health hindering work. The last three items have been recoded so that a higher score means less hindering and thus better Health. A higher score on the variable Health means better health.

The item General health had the following question: How would you describe your Health, generally speaking? The answer options were poor (1), moderate (2), good (3), very good (4) and excellent (5). The item Health hindering daily activities had the following question: To what extent did your physical Health or emotional problems hinder your daily activities over the past month, for instance in going for a walk, walking upstairs, dressing yourself, washing yourself, visiting the toilet? The answer options were not at all (5), hardly (4), a bit (3), quite a lot (2) and very much (1). The item Health hindering social activities had the following question: To what extent did your physical Health or emotional problems hinder your social activities over the past month, such as visiting friends and acquaintances? The answer options were not at all (5), hardly (4), a bit (3), quite a lot (2) and very much (1). The item Health hindering work had the following question: To what extent did your physical Health or emotional problems hinder your work over the past month, for instance in your job, the housekeeping, or in school? The answer options were not at all (5), hardly (4), a bit (3), quite a lot (2) and very much (1). The last three items have been recoded so that a higher score means more hindering and thus worse Health. These four items have been added up and a mean has been calculated to compose a scale (Cronbach's Alpha= 0,868 ).

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Connectedness

```
Syntax original variables
FREQUENCIES VARIABLES=fb14b307 fb14b308
fb14b309 fb14b310 fb14b311 fb14b312
    /STATISTICS=MEAN STDDEV RANGE MINIMUM
MAXIMUM MODE
    /HISTOGRAM
```

| Syntax Connectedness |
| :--- |
| FREQUENCIES |
| VARIABLES=Connectedness |
| /STATISTICS=STDDEV RANGE |
| MINIMUM MAXIMUM MEAN |
| MODE |
| /HISTOGRAM |


| Syntax recoding |
| :--- |
| RECODE fb14b308 fb14b309 |
| fb14b310 $(1=3)(2=2)(3=1)$ |
| INTO fb14b308_new |
| fb14b309_new |
| fb14b310_new. |
| FXFCIJTF. |

In the tables and figures below, we first began by giving the statistics, frequencies and histograms of the original variables and ended with the statistics, frequencies and histogram of the final variable; Connectedness. This way, a comparison can be made between the original variables and the final variable.

## Statistics

fb14b307 I have a sense of emptiness
around me

| N | Valid | 842 |
| :--- | ---: | ---: |
|  | Missing | 238 |
| Mean | 2,63 |  |
| Mode | 3 |  |
| Std. Deviation | , 581 |  |
| Range | 2 |  |
| Minimum | 1 |  |
| Maximum | 3 |  |

## Statistics

fb14b308 There are enough people I
can count on in case of a misfortune

| N | Valid | 842 |
| :--- | ---: | ---: |
|  | Missing | 238 |
| Mean | 1,45 |  |
| Mode | 1 |  |
| Std. Deviation | , 632 |  |
| Range | 2 |  |


| Syntax scale |
| :--- |
| COMPUTE |
| Verbondenheid=MEAN(fb14 |
| b307,fb14b308_new,fb14b3 |
| 09_new,fb14b310_new,fb1 |
| 4b311,fb14b312). |
| FXFCIJTE. |

## Syntax Cronbach's Alpha

RELIABILITY
/VARIABLES=fb14b308_new fb14b309_new fb14b310_new fb14b307 fb14b311 fb14b312
/SCALE('ALL VARIABLES') ALL

| Minimum | 1 |
| :--- | ---: |
| Maximum | 3 |

## Statistics

fb14b309 I know a lot of people that I
can fully rely on

| N | Valid | 842 |
| :--- | ---: | ---: |
|  | Missing | 238 |
| Mean | 1,63 |  |
| Mode | 1 |  |
| Std. Deviation | , 721 |  |
| Range | 2 |  |
| Minimum | 1 |  |
| Maximum | 3 |  |

## Statistics

fb14b310 There are enough people
to whom I feel closely connected

| N | Valid | 842 |
| :--- | ---: | ---: |
|  | Missing | 238 |
| Mean | 1,52 |  |
| Mode | 1 |  |
| Std. Deviation | , 685 |  |
| Range | 2 |  |
| Minimum | 1 |  |
| Maximum | 3 |  |

## Statistics

fb14b311 I miss having people
around me

| N | Valid | 842 |
| :--- | :--- | ---: |
|  | Missing | 238 |
| Mean | 2,52 |  |
| Mode | 3 |  |
| Std. Deviation | , 690 |  |
| Range | 2 |  |
| Minimum | 3 |  |
| Maximum | 3 |  |

Statistics
fb14b312 I often feel deserted

| N | Valid | 842 |
| :--- | ---: | ---: |
|  | Missing | 238 |
| Mean | 2,75 |  |
| Mode | 3 |  |
| Std. Deviation | , 542 |  |
| Range | 2 |  |
| Minimum | 1 |  |
| Maximum | 3 |  |

## Statistics

## Connectedness

| N | Valid | 662 |
| :--- | :--- | ---: |
|  | Missing | 0 |
| Mean |  | 2,5577 |


| Mode | 3,00 |
| :--- | ---: |
| Std. Deviation | , 46185 |
| Range | 2,00 |
| Minimum | 1,00 |
| Maximum | 3,00 |

fb14b307 I have a sense of emptiness around me

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | Yes | 44 | 4,1 | 5,2 | 5,2 |
|  | more or less | 223 | 20,6 | 26,5 | 31,7 |
|  | No | 575 | 53,2 | 68,3 | 100,0 |
|  | Total | 842 | 78,0 | 100,0 |  |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b308 There are enough people I can count on in case of a misfortune

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | Yes | 527 | 48,8 | 62,6 | 62,6 |
|  | more or less | 251 | 23,2 | 29,8 | 92,4 |
|  | No | 64 | 5,9 | 7,6 | 100,0 |
|  | Total | 842 | 78,0 | 100,0 |  |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b309 I know a lot of people that I can fully rely on

|  |  |  | Cumulative <br> Percent |  |  |
| :--- | :--- | ---: | ---: | ---: | ---: |
| Valid | Yes | 434 | 40,2 | 51,5 | 51,5 |
|  | more or less | 288 | 26,7 | 34,2 | 85,7 |
|  | No | 120 | 11,1 | 14,3 | 100,0 |
| Total | 842 | 78,0 | 100,0 |  |  |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b310 There are enough people to whom I feel closely connected

|  |  |  | Cumulative <br> Percent |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: |
| Valid | yes | 495 | 45,8 | 58,8 | 58,8 |
|  | more or less | 255 | 23,6 | 30,3 | 89,1 |
|  | no | 92 | 8,5 | 10,9 | 100,0 |
| Total | 842 | 78,0 | 100,0 |  |  |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b311 I miss having people around me

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | yes | 95 | 8,8 | 11,3 | 11,3 |
|  | more or less | 218 | 20,2 | 25,9 | 37,2 |
|  | no | 529 | 49,0 | 62,8 | 100,0 |


|  | Total | 842 | 78,0 | 100,0 |  |
| :--- | :--- | ---: | ---: | ---: | :--- |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b312 I often feel deserted

|  |  |  | Cumulative <br> Prequency | Percent | Valid Percent |
| :--- | :--- | ---: | ---: | ---: | ---: |

Connectedness

|  |  |  | Cumulative <br> Percent |  |
| ---: | ---: | ---: | ---: | ---: |
| Valid | Frequency | Percent | Valid Percent | , 1,00 |
|  | 3 | , 5 | , 5 | , 5 |
| 1,17 | 6 | , 9 | , 9 | 1,4 |
| 1,33 | 13 | 2,0 | 2,0 | 3,3 |
| 1,50 | 11 | 1,7 | 1,7 | 5,0 |
| 1,67 | 14 | 2,4 | 2,4 | 7,4 |
| 1,83 | 44 | 6,1 | 2,1 | 9,5 |
| 2,00 | 43 | 6,5 | 6,6 | 16,2 |
| 2,17 | 53 | 8,0 | 6,5 | 22,7 |
| 2,33 |  |  | 8,0 | 30,7 |


| 2,50 | 84 | 12,7 | 12,7 | 43,4 |
| ---: | ---: | ---: | ---: | ---: |
| 2,67 | 80 | 12,1 | 12,1 | 55,4 |
| 2,83 | 97 | 14,7 | 14,7 | 70,1 |
| 3,00 | 198 | 29,9 | 29,9 | 100,0 |
| Total | 662 | 100,0 | 100,0 |  |





fb14b310 There are enough people to whom I feel closely connected



As can be seen in the histogram above, the distribution of the variable Connectedness is skew. The mean is 2.56 and is quite high since the scale is from 1 to 3 . Connectedness was measured by taking the mean of six items.

These items are A sense of emptiness, Enough people to count on, Enough people to fully rely on, Enough people to feel closely connected, Miss having people around and Feeling deserted. For all six items the respondents could answer with the following answer options: yes (1), more or less (2) and no (3). The last three items have been recoded so that a higher score means more connectedness. The six items have been added up and a mean has been calculated to compose a scale (Cronbach's Alpha= 0,815 ). A higher score on the variable Connectedness means feeling more connected to others.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Satisfaction about leisure time

| Syntax original variables |
| :--- |
| FREQUENCIES VARIABLES=fb14b001 |
| fb14b002 |
| /STATISTICS=MEAN STDDEV RANGE |
| MINIMUM MAXIMUM MODE |
| /HISTOGRAM |
| ................ |


| Syntax Satisfaction about leisure time |
| :--- |
| FREQUENCIES |
| VARIABLES=Satisfactionaboutleisuretime |
| /STATISTICS=STDDEV RANGE MINIMUM |
| MAXIMUM MEAN MODE |
| /HISTOGRAM |


| Syntax scale |
| :--- |
| COMPUTE |
| Tev_vrijetijd=MEAN(fb14b001, |
| fb14b002). |
| FXFCIITF |

In the tables and figures below, we first began by giving the statistics, frequencies and histograms of the original variables and ended with the

| Syntax Cronbach's Alpha |
| :--- |
| RELIABILITY |
| /VARIABLES=fb14b002 |
| fb14b001 |
| /SCALE('ALL VARIABLES') ALL | statistics, frequencies and histogram of the final variable; Satisfaction about leisure time. This way, a comparison can be made between the original variables and the final variable.

## Statistics

fb14b001 How satisfied are you with
the amount of leisure time that you
have?

| N | Valid | 853 |
| :--- | ---: | ---: |
|  | Missing | 227 |
| Mean | 18,39 |  |
| Mode | 8 |  |
| Std. Deviation | 106,893 |  |
| Range | 999 |  |
| Minimum | 0 |  |
| Maximum | 999 |  |

## fb14b001 How satisfied are you

 with the amount of leisure timethat you have?

|  |  | Frequency | Percent | Valid Percent | Cumulative <br> Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | not at all satisfied | 12 | 1,1 | 1,4 | 1,4 |
|  | 1 | 14 | 1,3 | 1,6 | 3,0 |
|  | 2 | 26 | 2,4 | 3,0 | 6,1 |
|  | 3 | 50 | 4,6 | 5,9 | 12,0 |
|  | 4 | 50 | 4,6 | 5,9 | 17,8 |
|  | 5 | 85 | 7,9 | 10,0 | 27,8 |
|  | 6 | 101 | 9,4 | 11,8 | 39,6 |
|  | 7 | 139 | 12,9 | 16,3 | 55,9 |
|  | 8 | 153 | 14,2 | 17,9 | 73,9 |


| 9 | 75 | 6,9 | 8,8 | 82,6 |  |
| :--- | :--- | ---: | ---: | ---: | ---: |
| completely satisfied | 138 | 12,8 | 16,2 | 98,8 |  |
| I don t know | 10 | , 9 | 1,2 | 100,0 |  |
| Total | 853 | 79,0 | 100,0 |  |  |
| Missing | System | 227 | 21,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

## Statistics

fb14b002 How satisfied are you with
the way in which you spend your
leisure time?

| N | Valid | 853 |
| :--- | ---: | ---: |
|  | Missing | 227 |
| Mean | 20,55 |  |
| Mode | 7 |  |
| Std. Deviation | 999 |  |
| Range | 0 |  |
| Minimum | 999 |  |
| Maximum | 965 |  |

fb14b002 How satisfied are you with the way in which you spend your leisure time?

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | not at all satisfied | 9 | ,8 | 1,1 | 1,1 |
|  | 1 | 8 | ,7 | ,9 | 2,0 |


|  | 2 | 18 | 1,7 | 2,1 | 4,1 |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 3 | 47 | 4,4 | 5,5 | 9,6 |
|  | 4 | 54 | 5,0 | 6,3 | 15,9 |
|  | 5 | 98 | 9,1 | 11,5 | 27,4 |
|  | 6 | 101 | 9,4 | 11,8 | 39,3 |
|  | 7 | 199 | 18,4 | 23,3 | 62,6 |
|  | 8 | 180 | 16,7 | 21,1 | 83,7 |
|  | 9 | 59 | 5,5 | 6,9 | 90,6 |
|  | completely satisfied | 68 | 6,3 | 8,0 | 98,6 |
|  | I don t know | 12 | 1,1 | 1,4 | 100,0 |
|  | Total | 853 | 79,0 | 100,0 |  |
| Missing | System | 227 | 21,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

## Statistics

Satisfaction about leisure time

| N | Valid | 655 |
| :--- | ---: | ---: |
|  | Missing | 7 |
| Mean | 6,7405 |  |
| Mode | 7,00 |  |
| Std. Deviation | 2,00434 |  |
| Range | 10,00 |  |
| Minimum | 10,00 |  |
| Maximum |  |  |

## Satisfaction about leisure time

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | ,00 | 2 | ,3 | ,3 | ,3 |
|  | 1,00 | 5 | ,8 | ,8 | 1,1 |
|  | 1,50 | 2 | ,3 | ,3 | 1,4 |
|  | 2,00 | 4 | ,6 | ,6 | 2,0 |
|  | 2,50 | 12 | 1,8 | 1,8 | 3,8 |
|  | 3,00 | 15 | 2,3 | 2,3 | 6,1 |
|  | 3,50 | 24 | 3,6 | 3,7 | 9,8 |
|  | 4,00 | 20 | 3,0 | 3,1 | 12,8 |
|  | 4,50 | 14 | 2,1 | 2,1 | 15,0 |
|  | 5,00 | 43 | 6,5 | 6,6 | 21,5 |
|  | 5,50 | 42 | 6,3 | 6,4 | 27,9 |
|  | 6,00 | 55 | 8,3 | 8,4 | 36,3 |
|  | 6,50 | 46 | 6,9 | 7,0 | 43,4 |
|  | 7,00 | 90 | 13,6 | 13,7 | 57,1 |
|  | 7,50 | 65 | 9,8 | 9,9 | 67,0 |
|  | 8,00 | 76 | 11,5 | 11,6 | 78,6 |
|  | 8,50 | 32 | 4,8 | 4,9 | 83,5 |
|  | 9,00 | 49 | 7,4 | 7,5 | 91,0 |
|  | 9,50 | 13 | 2,0 | 2,0 | 93,0 |
|  | 10,00 | 46 | 6,9 | 7,0 | 100,0 |
|  | Total | 655 | 98,9 | 100,0 |  |
| Missing | 500,00 | 1 | ,2 |  |  |
|  | 502,00 | 1 | ,2 |  |  |
|  | 502,50 | 1 | ,2 |  |  |
|  | 503,00 | 1 | ,2 |  |  |


| 504,50 | 2 | , 3 |  |  |
| ---: | ---: | ---: | ---: | ---: |
| 999,00 | 1 | , 2 |  |  |
| Total | 7 | 1,1 |  |  |
| Total | 662 | 100,0 |  |  |



As can be seen in the histogram above, the distribution of the variable Satisfaction about leisure time is somewhat skew. It looks kind of normally distributed, but not in a perfect way. The mean is 6.74 and is quite low/average since the scale is from 1 to 10 . Satisfaction about leisure time was measured by taking the mean of two items. These items are Satisfaction about the amount of leisure time and Satisfaction about spending leisure time. For both items the respondents could answer with the following answer options: from not at all satisfied (0) to completely satisfied (10). The two items have been added up and a means has been calculated to compose a scale (Cronbach's Alpha= 0,626 ). A higher score on the variable Satisfaction about leisure time means being more satisfied about someone's leisure time.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Spending an evening

| Syntax original variables |
| :--- |
| FREQUENCIES VARIABLES=fb14b313 fb14b314 |
| fb14b315 |
| /STATISTICS=MEAN STDDEV RANGE MINIMUM |
| MAXIMUM MODE |
| /HISTOGRAM |


| Syntax Spending an evening |
| :--- |
| FREQUENCIES |
| VARIABLES=Spendinganevening |
| /STATISTICS=STDDEV RANGE |
| MINIMUM MAXIMUM MEAN |
| MODE |
| /HISTOGRAM |

## Syntax recoding

RECODE fb14b313 fb14b314
fb14b315 (1=6) (2=5) (3=4) (4=3)
(5=2) (6=1) (7=0) (9=0) INTO
fb14b313_new
fb14b314_new fb14b315_new.

In the tables and figures below, we first began by giving the statistics, frequencies and histograms of the original variables and ended with the statistics, frequencies and histogram of the final variable; Connectedness. This way, a comparison can be made between the original variables and the final variable.

```
```

Syntax Cronbach's Alpha

```
```

Syntax Cronbach's Alpha
RELIABILITY
RELIABILITY
/VARIABLES=fb24b313_new
/VARIABLES=fb24b313_new
fb14b314_new
fb14b314_new
gb14b315_new
gb14b315_new
/SCALE('ALL VARIABLES')
/SCALE('ALL VARIABLES')
ALL

```
```

ALL

```
```


## Statistics

fb14b313 How often do you do the
following? Spend an evening with
family (other than members of your
own)

| N | Valid | 842 |
| :--- | ---: | ---: |
|  | Missing | 238 |
| Mean | 3,69 |  |
| Mode | 2 |  |
| Std. Deviation | 2,006 |  |
| Range | 8 |  |
| Minimum | 9 |  |
| Maximum | 1 |  |

## Syntax scale

COMPUTE
Avondafspreken=SUM(fb14b 313_new,fb14b314_new,fb1 4b315 new).

## Statistics

fb14b314 How often do you do the
following? Spend an evening with
someone from the neighborhood

|  | Valid | 842 |
| :--- | :--- | ---: |
|  | Missing | 238 |
| Mean | 4,86 |  |
| Mode | 7 |  |
| Std. Deviation | 2,063 |  |
| Range | 8 |  |
| Minimum | 1 |  |
| Maximum | 9 |  |

## Statistics

fb14b315 How often do you the
following things? Spend an evening
with friends outside your
neighborhood

| N | Valid | 842 |
| :--- | ---: | ---: |
|  | Missing | 238 |
| Mean | 4,41 |  |
| Mode | 5 |  |
| Std. Deviation | 1,883 |  |
| Range | 8 |  |
| Minimum | 1 |  |
| Maximum | 9 |  |

## Statistics

Spending an evening

|  | Valid | 662 |
| :--- | ---: | ---: |
|  | Missing | 0 |
| Mean | 8,3746 |  |
| Mode | 8,00 |  |
| Std. Deviation | 3,97174 |  |
| Range | 18,00 |  |
| Minimum | , 00 |  |
| Maximum | 18,00 |  |

fb14b313 How often do you do the following? Spend an evening with family (other than members of your own)

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | almost every day | 81 | 7,5 | 9,6 | 9,6 |
|  | once or twice a week | 196 | 18,1 | 23,3 | 32,9 |
|  | a few times per month | 189 | 17,5 | 22,4 | 55,3 |
|  | about once a month | 105 | 9,7 | 12,5 | 67,8 |
|  | a number of times per year | 153 | 14,2 | 18,2 | 86,0 |
|  | about once a year | 30 | 2,8 | 3,6 | 89,5 |
|  | Never | 40 | 3,7 | 4,8 | 94,3 |
|  | don't know | 8 | ,7 | 1,0 | 95,2 |
|  | not applicable | 40 | 3,7 | 4,8 | 100,0 |
|  | Total | 842 | 78,0 | 100,0 |  |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |


| neighborhood |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | almost every day | 25 | 2,3 | 3,0 | 3,0 |
|  | once or twice a week | 109 | 10,1 | 12,9 | 15,9 |
|  | a few times per month | 130 | 12,0 | 15,4 | 31,4 |
|  | about once a month | 96 | 8,9 | 11,4 | 42,8 |
|  | a number of times per year | 161 | 14,9 | 19,1 | 61,9 |
|  | about once a year | 62 | 5,7 | 7,4 | 69,2 |
|  | Never | 209 | 19,4 | 24,8 | 94,1 |
|  | don't know | 14 | 1,3 | 1,7 | 95,7 |
|  | not applicable | 36 | 3,3 | 4,3 | 100,0 |
|  | Total | 842 | 78,0 | 100,0 |  |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b315 How often do you the following things? Spend an evening with friends outside your
neighborhood

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | almost every day | 18 | 1,7 | 2,1 | 2,1 |
|  | once or twice a week | 118 | 10,9 | 14,0 | 16,2 |
|  | a few times per month | 176 | 16,3 | 20,9 | 37,1 |
|  | about once a month | 136 | 12,6 | 16,2 | 53,2 |
|  | a number of times per year | 202 | 18,7 | 24,0 | 77,2 |
|  | about once a year | 48 | 4,4 | 5,7 | 82,9 |
|  | never | 95 | 8,8 | 11,3 | 94,2 |
|  | don't know | 18 | 1,7 | 2,1 | 96,3 |


|  | not applicable | 31 | 2,9 | 3,7 | 100,0 |
| :--- | :--- | ---: | ---: | ---: | ---: |
|  | Total | 842 | 78,0 | 100,0 |  |
| Missing | System | 238 | 22,0 |  |  |
| Total |  | 1080 | 100,0 |  |  |


|  |  | Spending an evening |  |  | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Frequency | Percent | Valid Percent |  |
| Valid | ,00 | 26 | 3,9 | 3,9 | 3,9 |
|  | 1,00 | 4 | ,6 | ,6 | 4,5 |
|  | 2,00 | 16 | 2,4 | 2,4 | 6,9 |
|  | 3,00 | 29 | 4,4 | 4,4 | 11,3 |
|  | 4,00 | 37 | 5,6 | 5,6 | 16,9 |
|  | 5,00 | 58 | 8,8 | 8,8 | 25,7 |
|  | 6,00 | 48 | 7,3 | 7,3 | 32,9 |
|  | 7,00 | 53 | 8,0 | 8,0 | 40,9 |
|  | 8,00 | 67 | 10,1 | 10,1 | 51,1 |
|  | 9,00 | 63 | 9,5 | 9,5 | 60,6 |
|  | 10,00 | 53 | 8,0 | 8,0 | 68,6 |
|  | 11,00 | 57 | 8,6 | 8,6 | 77,2 |
|  | 12,00 | 46 | 6,9 | 6,9 | 84,1 |
|  | 13,00 | 31 | 4,7 | 4,7 | 88,8 |
|  | 14,00 | 29 | 4,4 | 4,4 | 93,2 |
|  | 15,00 | 29 | 4,4 | 4,4 | 97,6 |
|  | 16,00 | 8 | 1,2 | 1,2 | 98,8 |
|  | 17,00 | 4 | ,6 | ,6 | 99,4 |
|  | 18,00 | 4 | ,6 | ,6 | 100,0 |
|  | Total | 662 | 100,0 | 100,0 |  |




fb14b315 How often do you the following things? Spend an evening with friends outside your neighborhood


As can be seen in the histogram above, the distribution of the variable Spending an evening looks normally distributed with a few outliers. The mean is 8.37 and this is a low score, because the scale ranges from 0-18. Spending an evening was measured by taking the sum of three items. These items are Spending an evening with someone from the neighborhood, Spending an evening with friends outside of the neighborhood and Spending an evening with family (not counting household members). For the three items the respondents could answer with the following answer options: almost every day (1), once or twice a week (2), a few times per month (3), about once a month (4), a number of times per year (5), about once a year (6), never (7), don't know (8), not applicable (9). As you can see, the items are a bit illogical to interpret; a higher score means less Spending an evening with someone else. Because of this, all three items have been recoded so that a higher score means Spending an evening with someone else more often.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Satisfaction about social contacts

```
FREQUENCIES VARIABLES=Satisfactionaboutsocialcontacts
/STATISTICS=MEAN STDDEV RANGE MINIMUM MAXIMUM MODE
/HISTOGRAM
```

We first began by giving the statistics, frequencies and histograms of the original variables and after we gave the statistics, frequencies and histograms of the final variables.

## Statistics

fb14b306 Satisfaction about social
contacts

| N | Valid | 843 |
| :--- | :--- | ---: |
|  | Missing | 237 |
| Mean |  | 45,74 |
| Mode | 8 |  |


| Std. Deviation | 192,533 |
| :--- | ---: |
| Range | 999 |
| Minimum | 0 |
| Maximum | 999 |

## Statistics

fb14b306 Satisfaction about social contacts

| N | Valid | 662 |
| :--- | :--- | ---: |
|  | Missing | 0 |
| Mean | 6,9169 |  |
| Mode | $7,00^{a}$ |  |
| Std. Deviation | 1,84351 |  |
| Range | 10,00 |  |
| Minimum | , 00 |  |
| Maximum | 10,00 |  |


| fb14b306 Satisfaction about social contacts |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Frequency | Percent | Valid Percent |
| Valid | not at all satisfied | 2 | ,2 | ,2 |
|  | 1 | 6 | ,6 | ,7 |
|  | 2 | 12 | 1,1 | 1,4 |
|  | 3 | 35 | 3,2 | 4,2 |
|  | 4 | 24 | 2,2 | 2,8 |
|  | 5 | 91 | 8,4 | 10,8 |
|  | 6 | 96 | 8,9 | 11,4 |
|  | 7 | 208 | 19,3 | 24,7 |
|  | 8 | 211 | 19,5 | 25,0 |
|  | 9 | 66 | 6,1 | 7,8 |
|  | completely satisfied | 59 | 5,5 | 7,0 |
|  | I don t know | 33 | 3,1 | 3,9 |
|  | Total | 843 | 78,1 | 100,0 |
| Missing | System | 237 | 21,9 |  |
| Total |  | 1080 | 100,0 |  |

fb14b306 Satisfaction about social contacts

|  |  |  |  | Cumulative <br> Percent |
| ---: | ---: | ---: | ---: | ---: |
| Valid | Frequency | Percent | Valid Percent | , 2 |
|  | 1 | , 2 | , 2 | , 9 |
| 1,00 | 5 | , 8 | , 8 | 2,3 |
| 2,00 | 9 | 1,4 | 1,4 | 6,3 |
| 3,00 | 27 | 4,1 | 4,1 | 2 |


| 4,00 | 19 | 2,9 | 2,9 | 9,2 |
| ---: | ---: | ---: | ---: | ---: |
| 5,00 | 75 | 11,3 | 11,3 | 20,5 |
| 6,00 | 79 | 11,9 | 11,9 | 32,5 |
| 7,00 | 174 | 26,3 | 26,3 | 58,8 |
| 8,00 | 174 | 26,3 | 26,3 | 85,0 |
| 9,00 | 50 | 7,6 | 7,6 | 92,6 |
| 10,00 | 49 | 7,4 | 7,4 | 100,0 |
| Total | 662 | 100,0 | 100,0 |  |

university of groningen



As can be seen in the histogram above, the distribution of the variable Satisfaction about social contacts looks somewhat skew. The mean is 6.92 and this is a low/average score since the scale is from 1-10.

Satisfaction about social contacts has the answer options from not at all satisfied (0) to completely satisfied (10).
In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Income

> FREQUENCIES VARIABLES=income
> /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN MODE /HISTOGRAM

We first began by giving the statistics, frequencies and histograms of the original variables and after we gave the statistics, frequencies and histograms of the final variables

## Statistics

Net monthly income in Euros

| N | Valid | 1027 |
| :--- | ---: | ---: |
|  | Missing | 53 |
| Mean | 1482,68 |  |
| Mode | 0 |  |
| Std. Deviation | 0 |  |
| Minimum |  |  |
| Maximum | 6849,346 |  |

## Statistics

Net monthly income in Euros

| N | Valid | 662 |
| :--- | ---: | ---: |
|  | Missing | 0 |
| Mean | 1609,96 |  |
| Mode | 0 |  |
| Std. Deviation | 3216,897 |  |
| Minimum | 0 |  |
| Maximum | 68388 |  |




As can be seen in the histogram above, the distribution of the variable Income is skewed. The mean is 1609.96 Euros and the standard deviation is really high ( 3216.90 Euros). The mean is quite high, since the mode is 0 .

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

Age

```
FREQUENCIES VARIABLES=age
    /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN MODE
    /HISTOGRAM
```

We first began by giving the statistics, frequencies and histograms of the original variables and after we gave the statistics, frequencies and histograms of the final variables.

## Statistics

| Age |  |
| :--- | ---: |
|  |  |
|  | Valid |
|  | Missing |
| Mean | 1080 |
| Mode | 0 |
| Std. Deviation | 45,36 |
| Minimum | 40 |
| Maximum | 16,377 |

## Statistics

| Age |  |  |
| :--- | :--- | ---: |
| N | Valid | 662 |
|  | Missing | 0 |
| Mean |  | 48,19 |
| Mode | 48 |  |


| Std. Deviation | 16,537 |
| :--- | ---: |
| Minimum | 16 |
| Maximum | 88 |


|  | Age |  |  |  |
| ---: | ---: | ---: | ---: | ---: |
|  | Frequency | Percent | Valid Percent | Percent |


| 36 | 25 | 2,3 | 2,3 | 32,0 |
| :---: | :---: | :---: | :---: | :---: |
| 37 | 19 | 1,8 | 1,8 | 33,8 |
| 38 | 22 | 2,0 | 2,0 | 35,8 |
| 39 | 22 | 2,0 | 2,0 | 37,9 |
| 40 | 35 | 3,2 | 3,2 | 41,1 |
| 41 | 22 | 2,0 | 2,0 | 43,1 |
| 42 | 23 | 2,1 | 2,1 | 45,3 |
| 43 | 24 | 2,2 | 2,2 | 47,5 |
| 44 | 29 | 2,7 | 2,7 | 50,2 |
| 45 | 27 | 2,5 | 2,5 | 52,7 |
| 46 | 24 | 2,2 | 2,2 | 54,9 |
| 47 | 25 | 2,3 | 2,3 | 57,2 |
| 48 | 29 | 2,7 | 2,7 | 59,9 |
| 49 | 17 | 1,6 | 1,6 | 61,5 |
| 50 | 18 | 1,7 | 1,7 | 63,1 |
| 51 | 21 | 1,9 | 1,9 | 65,1 |
| 52 | 19 | 1,8 | 1,8 | 66,9 |
| 53 | 22 | 2,0 | 2,0 | 68,9 |
| 54 | 11 | 1,0 | 1,0 | 69,9 |
| 55 | 21 | 1,9 | 1,9 | 71,9 |
| 56 | 15 | 1,4 | 1,4 | 73,2 |
| 57 | 17 | 1,6 | 1,6 | 74,8 |
| 58 | 13 | 1,2 | 1,2 | 76,0 |
| 59 | 14 | 1,3 | 1,3 | 77,3 |
| 60 | 16 | 1,5 | 1,5 | 78,8 |
| 61 | 19 | 1,8 | 1,8 | 80,6 |
| 62 | 13 | 1,2 | 1,2 | 81,8 |
| 63 | 20 | 1,9 | 1,9 | 83,6 |


| 64 | 14 | 1,3 | 1,3 | 84,9 |
| ---: | ---: | ---: | ---: | ---: |
| 65 | 17 | 1,6 | 1,6 | 86,5 |
| 66 | 20 | 1,9 | 1,9 | 88,3 |
| 67 | 18 | 1,7 | 1,7 | 90,0 |
| 68 | 14 | 1,3 | 1,3 | 91,3 |
| 69 | 10 | , 9 | , 9 | 92,2 |
| 70 | 14 | 1,3 | , 6 | 9 |


|  | Age |  |  |  |
| ---: | ---: | ---: | ---: | ---: |
|  | Frequency | Percent | Valid Percent | Percent |


| 41 | 11 | 1,7 | 1,7 | 35,3 |
| :---: | :---: | :---: | :---: | :---: |
| 42 | 14 | 2,1 | 2,1 | 37,5 |
| 43 | 11 | 1,7 | 1,7 | 39,1 |
| 44 | 18 | 2,7 | 2,7 | 41,8 |
| 45 | 13 | 2,0 | 2,0 | 43,8 |
| 46 | 17 | 2,6 | 2,6 | 46,4 |
| 47 | 17 | 2,6 | 2,6 | 48,9 |
| 48 | 20 | 3,0 | 3,0 | 52,0 |
| 49 | 10 | 1,5 | 1,5 | 53,5 |
| 50 | 14 | 2,1 | 2,1 | 55,6 |
| 51 | 13 | 2,0 | 2,0 | 57,6 |
| 52 | 13 | 2,0 | 2,0 | 59,5 |
| 53 | 13 | 2,0 | 2,0 | 61,5 |
| 54 | 8 | 1,2 | 1,2 | 62,7 |
| 55 | 13 | 2,0 | 2,0 | 64,7 |
| 56 | 13 | 2,0 | 2,0 | 66,6 |
| 57 | 11 | 1,7 | 1,7 | 68,3 |
| 58 | 12 | 1,8 | 1,8 | 70,1 |
| 59 | 11 | 1,7 | 1,7 | 71,8 |
| 60 | 13 | 2,0 | 2,0 | 73,7 |
| 61 | 15 | 2,3 | 2,3 | 76,0 |
| 62 | 9 | 1,4 | 1,4 | 77,3 |
| 63 | 12 | 1,8 | 1,8 | 79,2 |
| 64 | 13 | 2,0 | 2,0 | 81,1 |
| 65 | 11 | 1,7 | 1,7 | 82,8 |
| 66 | 17 | 2,6 | 2,6 | 85,3 |
| 67 | 11 | 1,7 | 1,7 | 87,0 |
| 68 | 12 | 1,8 | 1,8 | 88,8 |


| 69 | 6 | ,9 | ,9 | 89,7 |
| :---: | :---: | :---: | :---: | :---: |
| 70 | 12 | 1,8 | 1,8 | 91,5 |
| 71 | 5 | ,8 | ,8 | 92,3 |
| 72 | 4 | ,6 | ,6 | 92,9 |
| 73 | 9 | 1,4 | 1,4 | 94,3 |
| 74 | 2 | ,3 | ,3 | 94,6 |
| 75 | 10 | 1,5 | 1,5 | 96,1 |
| 76 | 3 | ,5 | ,5 | 96,5 |
| 77 | 6 | ,9 | ,9 | 97,4 |
| 78 | 1 | ,2 | ,2 | 97,6 |
| 79 | 1 | ,2 | ,2 | 97,7 |
| 80 | 1 | ,2 | ,2 | 97,9 |
| 81 | 3 | ,5 | ,5 | 98,3 |
| 82 | 3 | ,5 | ,5 | 98,8 |
| 83 | 2 | ,3 | ,3 | 99,1 |
| 85 | 2 | ,3 | ,3 | 99,4 |
| 86 | 2 | ,3 | ,3 | 99,7 |
| 88 | 2 | ,3 | ,3 | 100,0 |
| Total | 662 | 100,0 | 100,0 |  | groningen



As can be seen in the histogram above, the distribution of age seems quite normally distributed. The mean is 48.19, which is quite an average score for this variable since the range is from 16-88 years.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Gender

```
FREQUENCIES VARIABLES=Gender
/STATISTICS=MEAN
/HISTOGRAM
```


## Statistics

Gender

| N | Valid | 662 |
| :--- | :--- | ---: |
|  | Missing | 0 |
| Mean |  | , 5363 |


|  |  | Frequency | Gender |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Percent | Valid Percent | Cumulative Percent |
| Valid | ,00 |  | 307 | 46,4 | 46,4 | 46,4 |
|  | 1,00 | 355 | 53,6 | 53,6 | 100,0 |
|  | Total | 662 | 100,0 | 100,0 |  |



As can be seen in the histogram above, there are about the same number of women (0) and men (1). This is good, because then we can make fair conclusions about the variable Gender.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Cultural association

```
FREQUENCIES VARIABLES=fb14b010_culturalassociation
    /STATISTICS=MEAN
    /HISTOGRAM
    /ORDER=ANALYSIS
```

We first began by giving the statistics, frequencies and histograms of the original variables and after we gave the statistics, frequencies and histograms of the final variables

## Statistics

fb14b010 A cultural association or
hobby club, participated in an activity

| N | Valid | 852 |
| :--- | :--- | ---: |
|  | Missing | 228 |
| Mean |  | , 10 |

## Statistics

fb14b010 A cultural association or hobby club, participated in an activity

| N | Valid | 662 |
| :--- | :--- | ---: |
|  | Missing | 0 |
| Mean |  | , 11 |

fb14b010 A cultural association or hobby club, participated in an activity

|  |  |  | Cumulative <br> Prequency | Percent | Valid Percent |
| :--- | ---: | ---: | ---: | ---: | ---: |

fb14b010 A cultural association or hobby club, participated in an activity

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | 0 no | 592 | 89,4 | 89,4 | 89,4 |
|  | 1 yes | 70 | 10,6 | 10,6 | 100,0 |
|  | Total | 662 | 100,0 | 100,0 |  |



As can be seen in the histogram above, there are a lot more people who did not participate (0) in an activity organized by a cultural association or hobby club than there are people who did participate (1). This can disturb the conclusions we can make about this variable.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Religious organization

```
FREQUENCIES VARIABLES=fb14b040_religiousorganization
/STATISTICS=MEAN
/HISTOGRAM
```

We first began by giving the statistics, frequencies and histograms of the original variables and after we gave the statistics, frequencies and histograms of the final variables

## Statistics

fb14b040 A religious or church
organization, participated in an
activity

| N | Valid | 852 |
| :--- | :--- | :--- |
|  | Missing | 228 |
| Mean |  | , 09 |

## Statistics

fb14b040 A religious or church
organization, participated in an
activity

| N | Valid | 662 |
| :--- | :--- | ---: |
|  | Missing | 0 |
| Mean |  | , 09 |

fb14b040 A religious or church organization, participated in an activity

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | 0 no | 775 | 71,8 | 91,0 | 91,0 |
|  | 1 yes | 77 | 7,1 | 9,0 | 100,0 |
|  | Total | 852 | 78,9 | 100,0 |  |
| Missing | System | 228 | 21,1 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b040 A religious or church organization, participated in an activity

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | 0 no | 602 | 90,9 | 90,9 | 90,9 |
|  | 1 yes | 60 | 9,1 | 9,1 | 100,0 |
|  | Total | 662 | 100,0 | 100,0 |  |


fb14b040 A religious or church organization, participated in an activity


As can be seen in the histogram above, there are a lot more people who did not participate (0) in an activity organized by a religious or church organization than there are people who did participate (1). This can disturb the conclusions we can make about this variable.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Social society

```
FREQUENCIES VARIABLES=fb14b055_socialsociety
/STATISTICS=MEAN
/HISTOGRAM
```

We first began by giving the statistics, frequencies and histograms of the original variables and after we gave the statistics, frequencies and histograms of the final variables

## Statistics

fb14b055 A social society; an association for youth, pensioners/senior citizens, women; or friends' clubs, participated in an activity

| N | Valid | 852 |
| :--- | :--- | :--- |
|  | Missing | 228 |
| Mean |  | , 06 |

## Statistics

fb14b055 A social society; an association for youth, pensioners/senior citizens, women; or friends' clubs, participated in an activity

| N | Valid | 662 |
| :--- | :--- | ---: |
|  | Missing | 0 |
| Mean |  | , 06 |

fb14b055 A social society; an association for youth, pensioners/senior citizens, women; or friends' clubs, participated in an activity

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | 0 no | 802 | 74,3 | 94,1 | 94,1 |
|  | 1 yes | 50 | 4,6 | 5,9 | 100,0 |
|  | Total | 852 | 78,9 | 100,0 |  |
| Missing | System | 228 | 21,1 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b055 A social society; an association for youth, pensioners/senior citizens, women; or friends' clubs, participated in an activity

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | 0 no | 621 | 93,8 | 93,8 | 93,8 |
|  | 1 yes | 41 | 6,2 | 6,2 | 100,0 |
|  | Total | 662 | 100,0 | 100,0 |  |


fb14b055 A social society; an association for youth, pensioners/senior citizens, women; or friends' clubs, participated in an activity


As can be seen in the histogram above, there are a lot more people who did not participate (0) in an activity organized by a social society than there are people who did participate (1). This can disturb the conclusions we can make about this variable.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Voluntary work

```
FREQUENCIES VARIABLES=fb14b070_voluntarywork
/STATISTICS=MEAN
/HISTOGRAM
```

We first began by giving the statistics, frequencies and histograms of the original variables and after we gave the statistics, frequencies and histograms of the final variables

## Statistics

fb14b070 Did you perform any other
voluntary work over the past 12
months, other than indicated?

| N | Valid | 852 |
| :--- | :--- | :--- |
|  | Missing | 228 |
| Mean |  | 1,83 |

## Statistics

fb14b070 Did you perform any other voluntary work over the past 12
months, other than indicated?

| N | Valid | 662 |
| :--- | :--- | ---: |
|  | Missing | 0 |
| Mean |  | 1,83 |

fb14b070 Did you perform any other voluntary work over the past 12 months, other than indicated?

|  |  | Frequency | Percent | Valid Percent | Cumulative <br> Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | 1 yes | 143 | 13,2 | 16,8 | 16,8 |
|  | 2 no | 709 | 65,6 | 83,2 | 100,0 |
|  | Total | 852 | 78,9 | 100,0 |  |
| Missing | System | 228 | 21,1 |  |  |
| Total |  | 1080 | 100,0 |  |  |

fb14b070 Did you perform any other voluntary work over the past 12 months, other than indicated?

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Valid | 1 yes | 114 | 17,2 | 17,2 | 17,2 |
|  | 2 no | 548 | 82,8 | 82,8 | 100,0 |
|  | Total | 662 | 100,0 | 100,0 |  |


fb14b070 Did you perform any other voluntary work over the past 12 months, other than indicated?


As can be seen in the histogram above, there are a lot more people who did not perform any voluntary work (2) than there are people who did (1). This can disturb the conclusions we can make about this variable.

In cases where the respondent had not provided an answer or the answer could not be used, these could not be included in the analysis and were therefore set to system missing.

## Appendix 2: overview of the linear regressions

## Models 1, 2 (actually 3) and 3 (actually 4)

In the models 1, 2 and 3 below the dependent variable is Health. Model 2 in the tables below is actually model 3 in our results chapter and model 3 is actually model 4 . The mediation is actually model 2.

Model 3 in the Model Summary table below is used to test both hypotheses. As can be seen in this table, the $R^{2}$ of the model is $12 \%$. This is quite a low percentage and it means that the predictors and the mediating variables can explain $12 \%$ of the variance of Health. The F Change of model 3 is larger than the F Changes of models 1 and 2 , which means the added variables can explain more than models 1 and 2 which contain less variables. This is a significant result. This can also be seen in the

Anova table, in which the F-values and their significance of the three models are put into. In the Coefficients table some information about the models can be seen. We can see the (changing) slopes of the variables, the standard errors, the t-tests that have been done and their significance and the VIF values which are used to control for multicollinearity.

| Model Summary ${ }^{\text {d }}$ |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 | ,200 ${ }^{\text {a }}$ | ,040 | ,036 | ,88698 | , 040 | 9,057 | 3 | 651 | ,000 |
| 2 | , $293{ }^{\text {b }}$ | ,086 | ,073 | ,86950 | ,046 | 5,406 | 6 | 645 | ,000 |
| 3 | , $369^{\text {c }}$ | , 136 | , 122 | ,84649 | , 050 | 18,767 | 2 | 643 | ,000 |
| a. Predictors: (Constant), gender, income, age |  |  |  |  |  |  |  |  |  |
| b. Predictors: (Constant), gender, income, age, social society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time |  |  |  |  |  |  |  |  |  |
| c. Predictors: (Constant), gender, income, age, social society, cultural aossication, religious organization, voluntary work, spending an evening, satisfaction about leisure time, satisfaction about social contacts, connectedmess |  |  |  |  |  |  |  |  |  |
| d. Dependent Variable: Health |  |  |  |  |  |  |  |  |  |


| ANOVA ${ }^{\text {a }}$ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 21,375 | 3 | 7,125 | 9,057 | , $000{ }^{\text {b }}$ |
|  | Residual | 512,158 | 651 | ,787 |  |  |
|  | Total | 533,533 | 654 |  |  |  |
| 2 | Regression | 45,896 | 9 | 5,100 | 6,745 | , $000{ }^{\text {c }}$ |
|  | Residual | 487,637 | 645 | ,756 |  |  |
|  | Total | 533,533 | 654 |  |  |  |
| 3 | Regression | 72,792 | 11 | 6,617 | 9,235 | , $000{ }^{\text {d }}$ |
|  | Residual | 460,741 | 643 | ,717 |  |  |
|  | Total | 533,533 | 654 |  |  |  |

a. Dependent Variable: Health
b. Predictors: (Constant), gender, income, age
c. Predictors: (Constant), gender, income, age, social society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time
d. Predictors: (Constant), gender, income, age, social society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time, satisfaction about social contacts, connectedness

| Coefficients ${ }^{\text {a }}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Unstandardized Coefficients |  | Standardized Coefficients Beta | t | Sig. | Collinearity Statistics |  |
|  |  | B | Std. Error |  |  |  | Tolerance | VIF |
| 1 | (Constant) | 4,322 | . 115 |  | 37,438 | . 000 |  |  |
|  | Age | -,010 | . 002 | $-, 186$ | -4,762 | , 000 | . 967 | 1,035 |
|  | Income | 2,675E-5 | . 000 | . 096 | 2,451 | . 014 | . 967 | 1,034 |
|  | Gender | $-, 103$ | . 070 | -, 057 | -1,474 | . 141 | . 995 | 1,005 |
| 2 | (Constant) | 3,630 | . 251 |  | 14,487 | . 000 |  |  |
|  | Age | $-.013$ | . 002 | $-238$ | -5,730 | . 000 | . 823 | 1,215 |
|  | Income | 2,442E-5 | . 000 | . 087 | 2,277 | . 023 | . 962 | 1,040 |
|  | Gender | $-.085$ | . 069 | -.,047 | -1,241 | . 215 | , 984 | 1,016 |
|  | Cultural association | -, 177 | . 116 | $-.060$ | -1,531 | . 126 | . 915 | 1,092 |
|  | Religious organization | -.023 | . 122 | -,007 | -,186 | ,852 | . 952 | 1,051 |
|  | Social society | -,033 | . 148 | -.,009 | $-.224$ | . 823 | . 897 | 1.114 |
|  | Voluntary work | . 059 | , 091 | . 025 | . 646 | . 519 | , 971 | 1,029 |
|  | Satisfaction about leisure time | ,091 | , 018 | , 202 | 4,945 | . 000 | , 851 | 1,174 |
|  | Spending an evening | . 015 | . 009 | . 065 | 1,657 | . 098 | . 924 | 1,083 |
| 3 | (Constant) | 2,703 | . 287 |  | 9,415 | . 000 |  |  |
|  | Age | -.012 | . 002 | $-, 224$ | -5,528 | . 000 | . 819 | 1,221 |
|  | Income | 1,873E-5 | , 000 | . 067 | 1,787 | . 074 | . 954 | 1,048 |
|  | Gender | $-.103$ | . 067 | -. 057 | -1,539 | . 124 | . 976 | 1,025 |
|  | Cultural association | -. 142 | . 113 | -.,048 | -1,261 | . 208 | . 913 | 1.095 |
|  | Religious organization | -.019 | . 118 | -,006 | -,161 | . 872 | . 952 | 1.051 |
|  | Social society | -.030 | . 144 | -,008 | $-.206$ | . 837 | . 893 | 1,120 |
|  | Voluntary work | . 076 | . 089 | . 032 | . 854 | , 393 | . 970 | 1,031 |
|  | Satisfaction about leisure time | . 050 | . 020 | . 111 | 2,440 | , 015 | . 650 | 1,539 |
|  | Spending an evening | -.004 | . 009 | -,018 | -,448 | . 654 | . 815 | 1,227 |
|  | Connectedness | . 494 | . 093 | . 252 | 5,312 | . 000 | . 599 | 1.669 |
|  | Satisfaction about social contacts | . 006 | . 025 | . 013 | , 263 | ,792 | . 545 | 1,834 |

[^1]
## Model 2a

The dependent variable in this model is Connectedness. This variable is the first part (of two parts in total) of the mediation. In the Model Summary table the $R^{2}$ can be seen, which is $24 \%$. This means the predictors can explain $24 \%$ of the variance of Connectedness, which is quite a lot. In the Anova table the F value and its significance can be seen ( $F=22,59 ; p<0,000 ; d f=9,645$ ). In the Coefficients table the slopes of the variables, their standard errors, the t-tests and their

Syntax linear regression with connectedness as dependent variable
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA COLLIN TOL
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT verbondenheid
/METHOD=ENTER leeftijd nettoink_f geslacht_dummy culturelevereniging_fb14b010
religieuzeorganisatie_fb14b040 sociëteit_fb14b055
vrijwilligerswerk_fb14b070 tev_vrijetijd
avondafspreken.

| Model Summary ${ }^{\text {b }}$ |  |  |  |  |
| :--- | :--- | ---: | ---: | ---: |
| Model | R | R Square | Adjusted R <br> Square | Std. Error of <br> the Estimate |
| 1 | $.490^{\mathbf{a}}$ | , 240 | , 229 | , 40355 |

a. Predictors: (Constant), gender, income, age, social society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time
b. Dependent Variable: Connectedness

| ANOVA $^{\text {a }}$ |  |  |  |  |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Sum of <br> Squares |  |  |  |  |  | df |  | Mean Square | F | Sig. |
| 1 | Regression | 33,114 | 9 | 3,679 | 22,593 |  |  |  |  |  |  |
|  | Residual | 105,040 | 645 | , $000^{\text {b }}$ |  |  |  |  |  |  |  |
|  | Total | 138,154 | 654 |  |  |  |  |  |  |  |  |

a. Dependent Variable: Connectedness
b. Predictors: (Constant), gender, income, age, social society, cultural association religious organization, voluntary work, spending an evening, satisfaction about leisure time

| Coefficients ${ }^{\text {a }}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Unstandardized Coefficients |  | Standardized Coefficients Beta | t | Sig. | Collinearity Statistics |  |
|  |  | B | Std. Error |  |  |  | Tolerance | VIF |
| 1 | (Constant) | 1,832 | . 116 |  | 15,753 | ,000 |  |  |
|  | Age | -,001 | , 001 | -,052 | -1,386 | . 166 | , 823 | 1,215 |
|  | Income | 1,124E-5 | ,000 | , 079 | 2,257 | , 024 | , 962 | 1,040 |
|  | Gender | ,033 | ,032 | ,036 | 1,030 | , 303 | ,984 | 1,016 |
|  | Cultural association | -,069 | , 054 | -,046 | -1,278 | , 202 | ,915 | 1,092 |
|  | Religious organization | -,007 | , 056 | -,004 | -, 119 | , 905 | , 952 | 1,051 |
|  | Social society | -. 012 | ,069 | -,006 | -, 171 | ,864 | ,897 | 1,114 |
|  | Voluntary work | -,033 | , 042 | -, 027 | -,781 | , 435 | ,971 | 1,029 |
|  | Satisfaction about leisure time | , 077 | ,009 | ,336 | 9,017 | ,000 | ,851 | 1,174 |
|  | Spending an evening | , 037 | , 004 | ,319 | 8,939 | , 000 | . 924 | 1,083 |

a. Dependent Variable: Connectedness

## Model 2b

The dependent variable in this model is Satisfaction about social contacts. This variable is the second part of the mediation. In the Model Summary table the $R^{2}$ can be seen; this value is $31 \%$. This is quite a high value and it means that the predictors can explain $31 \%$ of the variance of Satisfaction about social contacts. In the Anova table the F value and its significance can be seen ( $F=21,89 ; p<0,000 ; \mathrm{df}=9,645$ ). In the Coefficients table the same information can be seen as in the Coefficients tables used in the models before.

| Model Summary ${ }^{\mathbf{b}}$ |  |  |  |  |
| :--- | :--- | ---: | ---: | ---: |
| Model | $R$ | R Square | Adjusted $R$ <br> Square | Std. Error of <br> the Estimate |
| 1 | $.555^{\text {a }}$ | , 308 | , 298 | 1,53204 |

[^2] society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time
b. Dependent Variable: Satisfaction about social contacts

Syntax linear regression with satisfaction about social contacts as dependent variable

REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA COLLIN TOL
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT tev_soccont_fb14b306
/METHOD=ENTER leeftijd nettoink_f geslacht_dummy culturelevereniging_fb14b010
religieuzeorganisatie_fb14b040 sociëteit_fb14b055
vrijwilligerswerk_fb14b070 tev_vrijetijd
avondafspreken.

| ANOVA ${ }^{\text {a }}$ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 673,646 | 9 | 74,850 | 31,890 | , $000{ }^{\text {b }}$ |
|  | Residual | 1513,902 | 645 | 2,347 |  |  |
|  | Total | 2187,548 | 654 |  |  |  |

a. Dependent Variable: Satisfaction about social contacts
b. Predictors: (Constant), gender, income, age, social society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time

| Coefficients ${ }^{\text {a }}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Unstandardized Coefficients |  | Standardized Coefficients Beta | t | Sig. | Collinearity Statistics |  |
|  |  | B | Std. Error |  |  |  | Tolerance | VIF |
| 1 | (Constant) | 3,361 | , 442 |  | 7,612 | ,000 |  |  |
|  | Age | -,006 | ,004 | -,057 | -1,572 | , 116 | , 823 | 1,215 |
|  | Income | 2,059E-5 | ,000 | , 036 | 1,089 | , 276 | ,962 | 1,040 |
|  | Gender | , 286 | , 121 | , 078 | 2,364 | , 018 | , 984 | 1,016 |
|  | Cultural association | -, 145 | , 204 | -,024 | -,712 | ,477 | , 915 | 1,092 |
|  | Religious organization | -.,037 | , 214 | -,006 | -,,174 | , 862 | , 952 | 1,051 |
|  | Social society | ,385 | , 261 | , 051 | 1,475 | , 141 | , 897 | 1,114 |
|  | Voluntary work | -,099 | , 161 | -.,021 | -,618 | ,537 | , 971 | 1,029 |
|  | Satisfaction about leisure time | ,448 | , 032 | . 491 | 13,835 | ,000 | , 851 | 1,174 |
|  | Spending an evening | ,099 | , 016 | , 213 | 6,263 | ,000 | , 924 | 1,083 |

a. Dependent Variable: Satisfaction about social contacts

## Correlations

## Syntax correlation continuous + continuous variables <br> CORRELATIONS <br> /VARIABLES=Gezondheid Verbondenheid Tev_vrijetijd <br> Avondafspreken geslacht_dummy leeftijd nettoink_f <br> /PRINT=TWOTAIL NOSIG <br> /MISSING=PAIRWISE.

## Syntax correlation Health + cultural association

UNIANOVA gezondheid BY culturelevereniging_fb14b010
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/PRINT F DESCRIPTIVE
/CRITERIA=ALPHA(0.5)

## Syntax correlation Health + religious organization

UNIANOVA gezondheid BY
religieuzeorganisatie_fb14b040
Syntax correlation Health + social society
UNIANOVA gezondheid BY sociëteit_fb14b055
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/PRINT F DESCRIPTIVE
/CRITERIA=ALPHA(0.5)

| Syntax correlation Health + voluntary work |
| :--- |
| UNIANOVA gezondheid BY vrijwilligerswerk_fb14b070 |
| /METHOD=SSTYPE(3) |
| /INTERCEPT=INCLUDE |
| /PRINT F DESCRIPTIVE |
| /CRITERIA=ALPHA(0.5) |

Syntax correlation Health + satisfaction social contacts
UNIANOVA gezondheid BY tev_soccont_fb14b306
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/PRINT F DESCRIPTIVE
/CRITERIA=ALPHA(0.5)
university of groningen

## Appendix 3: overview of the assumptions, outliers and multicollinearity

Before checking the assumptions associated with a linear regression analysis, it is important to see if there is multicollinearity between the variables. Multicollinearity means that there is a large correlation (linear relationship) between the independent variables. One way to check for multicollinearity is through the VIF values. The Coefficients table below shows that all VIF values are between one and two, with the highest VIF value belonging to the variable Satisfaction about social contacts (VIF value is 1.83). However, none of the VIF values is a cause for concern, as none of the values is greater than four. Thus, there appears to be little or no multicollinearity.

```
Syntax to check for multicollinearity and outliers
REGRESSION
    /MISSING LISTWISE
    /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
CHANGE
    /CRITERIA=PIN(.05) POUT(.10)
    /NOORIGIN
    /DEPENDENT gezondheid
    /METHOD=ENTER leeftijd nettoink_f geslacht_dummy
    /METHOD=ENTER leeftijd nettoink_f geslacht_dummy
culturelevereniging_fb14b010
    religieuzeorganisatie_fb14b040 sociëteit_fb14b055
vrijwilligerswerk_fb14b070 tev_vrijetijd
    avondafspreken
/METHOD=ENTER leeftijd nettoink_f geslacht_dummy
culturelevereniging_fb14b010
    religieuzeorganisatie_fb14b040 sociëteit_fb14b055
vrijwilligerswerk_fb14b070 tev_vrijetijd
    avondafspreken verbondenheid
tev_soccont_fb14b306
/SAVE COOK LEVER ZRESID DFBETA DFFIT.
```

| Coefficients ${ }^{\text {a }}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Unstandardized Coefficients |  | Standardized Coefficients Beta | t | Sig. | Collinearity Statistics |  |
|  |  | B | Std. Error |  |  |  | Tolerance | VIF |
| 1 | (Constant) | 4,322 | . 115 |  | 37,438 | ,000 |  |  |
|  | Age | -,010 | , 002 | $-, 186$ | -4.762 | , 000 | . 967 | 1,035 |
|  | Income | 2,675E-5 | . 000 | . 096 | 2,451 | . 014 | . 967 | 1,034 |
|  | Gender | $-, 103$ | . 070 | -,057 | -1,474 | , 141 | . 995 | 1,005 |
| 2 | (Constant) | 3,630 | , 251 |  | 14,487 | , 000 |  |  |
|  | Age | -, 013 | . 002 | -. 238 | $-5,730$ | . 000 | . 823 | 1,215 |
|  | Income | $2,442 \mathrm{E}-5$ | . 000 | . 087 | 2,277 | . 023 | . 962 | 1,040 |
|  | Gender | -,085 | . 069 | -.,047 | -1,241 | . 215 | , 984 | 1,016 |
|  | Cultural association | -, 177 | . 116 | -.,060 | $-1,531$ | . 126 | . 915 | 1,092 |
|  | Religious organization | $-, 023$ | . 122 | -,007 | $-, 186$ | , 852 | . 952 | 1,051 |
|  | Social society | -,033 | . 148 | -.009 | -,224 | , 823 | . 897 | 1,114 |
|  | Voluntary work | . 059 | . 091 | . 025 | . 646 | . 519 | . 971 | 1,029 |
|  | Satisfaction about leisure time | ,091 | , 018 | , 202 | 4,945 | , 000 | . 851 | 1,174 |
|  | Spending an evening | . 015 | . 009 | . 065 | 1,657 | . 098 | . 924 | 1,083 |
| 3 | (Constant) | 2,703 | . 287 |  | 9,415 | . 000 |  |  |
|  | Age | -012 | , 002 | $-, 224$ | -5,528 | . 000 | . 819 | 1,221 |
|  | Income | 1,873E-5 | , 000 | . 067 | 1,787 | . 074 | . 954 | 1,048 |
|  | Gender | $-.103$ | . 067 | -.,057 | -1,539 | . 124 | . 976 | 1,025 |
|  | Cultural association | $-.142$ | . 113 | -,.048 | -1,261 | . 208 | . 913 | 1,095 |
|  | Religious organization | -.019 | . 118 | -.,006 | $-, 161$ | . 872 | . 952 | 1,051 |
|  | Social society | -.030 | . 144 | -,008 | $-.206$ | . 837 | . 893 | 1,120 |
|  | Voluntary work | . 076 | , 089 | , 032 | . 854 | , 393 | . 970 | 1,031 |
|  | Satisfaction about leisure time | , 050 | , 020 | . 111 | 2,440 | . 015 | . 650 | 1,539 |
|  | Spending an evening | -.004 | . 009 | $-, 018$ | -,.448 | . 654 | . 815 | 1,227 |
|  | Connectedness | . 494 | , 093 | . 252 | 5,312 | . 000 | . 599 | 1,669 |
|  | Satisfaction about social contacts | . 006 | , 025 | , 013 | , 263 | ,792 | , 545 | 1,834 |

After this it is important to control for the assumptions. The reason for this is that, in this way, it can be controlled whether valid statements can be made about the results. The first assumption to be controlled for is the assumption of normality. Normality means that the residuals of the variable are normally distributed. The histogram below shows that the distribution is not normally distributed. In the middle it can be seen that the rods are smaller than you would like with normality; the distribution is too flat here. A few bars on the right shoot out; the distribution is too squeaky here. The overall distribution appears to be skewed to the left. The PP-plot also shows this trend. In the beginning, the residuals are fairly spread around the line. In the middle of

## Syntax for controlling the assumptions

REGRESSION

## /MISSING LISTWISE

/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT Gezondheid
/METHOD=ENTER leeftijd nettoink_f
geslacht_dummy culturelevereniging_fb14b010
religieuzeorganisatie_fb14b040
sociëteit_fb14b055 vrijwilligerswerk_fb14b070
Tev_vrijetijd
Avondafspreken Verbondenheid
tev_soccont_fb14b306
/SCATTERPLOT=(*ZRESID ,*ZPRED)
/RESIDUALS NORMPROB(ZRESID)
the line it can be seen that the residuals are above the line and at the end the residuals are below the line. If there had been perfect normality, the residuals should have been on the line. The assumption of normality thus seems to be violated.

Syntax for controlling the assumptions
FREQUENCIES VARIABLES=Gezondheid
/HISTOGRAM NORMAL



The second assumption to be controlled for is the assumption of independence of the observations. This means that the used sample is random and therefore very similar to the population. In this research it can be said that the independence of the observations cannot be fully guaranteed. The reason for this is that some of the respondents may be from the same household. Therefore, these respondents could be influenced by one another, which means these observations are not completely independent. Thus, it is possible that this assumption is violated.

The third assumption to be controlled for is the assumption of homoscedasticity. This means that there is a constant conditional standard deviation. The variance of Health is then the same for each value. The scatterplot below shows that the distribution of the residuals remains approximately the same. Thus, the variance appears to be approximately equal for each group. There are some outliers, but the overall trend appears to be the same. The assumption of homoscedasticity therefore does not appear to have been violated. The fourth assumption to be controlled for is the assumption of linearity (straight line). This means that the mean of the residuals is zero for any set of $x$ 's; there is therefore a linear relationship between the independent variables. In the scatterplot below it can be seen that the mean of the residuals is not around the zero line. The mean falls below zero and thus the assumption appears to have been violated.


It is also important to check if there are any outliers. To do so, the standardized residuals, the leverage, the Cook's Distance, the DFFIT and the DFBETA are looked at. The first is the standardized residuals. Because the assumptions of normality and linearity have been violated, we need to be strict about possible outliers. Therefore, we will use a limit value of -2 and 2 for the standardized residuals. Every residual that does not fall between these values is considered to be an outlier. In total, there are 29 respondents who scored a value that does not fall between -2 and 2. For these respondents, it is important to check if they have a low score on Health. We are now going to look at the leverage values. The limit value of the leverage is $0.05(12 \times 3 / 655)$. There are 11 values that fall outside the limit value. None of the respondents with a value outside the limit value of the leverage have a high score on the standardized residuals. However, there are some respondents who have a high score on the leverage and on the Cook's Distance. The limit value of the Cook's Distance is 0.006 (4/655). These respondents are cases 829241 (leverage=0.67; Cook's Distance=0.53) and 801416 (leverage=0.06; Cook's Distance=0.015). It is plausible that these respondents are outliers.

As can be seen in the figure below, cases 829241,826263 and 872341 stand out in comparison with the other cases. We can see that case 829241 scores high on both the Cook's Distance and the leverage. Cases 826263 and 872341 score high on the leverage. It is important to check if these cases have a high or low score on the predictors. In the table below, there is an overview of these cases and their values that stood out on some of the predictors. Cases 826263 and 872341 only score high on the leverage and therefore have some high and low scores on some of the predictors. Because they do not have high scores on the other measurements, these two cases are not considered as outliers. However, it is good to know they score high on the leverage.


| Case | Low score on predictor | High score on predictor |
| :--- | :--- | :--- |
| 829241 | Spending an evening $=2.00$ | Connectedness= 2.83; Satisfaction about leisure time $=9.00$ |
| 872341 | - | Connectedness= 3.00; Satisfaction about leisure time $=10.00 ;$ <br> Satisfaction about social contacts= 9.00 |
| 826263 | - | Connectedness= 3.00; Satisfaction about leisure time $=8.00$ |

*Scale Spending an evening: 1-18, scale Connectedness: 1-3, scale Satisfaction about leisure time: 1-10, scale Satisfaction about social contacts: 1-10

It is also important to check if the respondents who have a high score on the standardized residuals have a low score on the independent variable (Health), because then we can explain the violation of the normality assumption. For 27 of the 29 respondents this is the case. We will combine these outliers with outliers who violate the limit values of other multiple measurements. It is possible that the outliers based on the standardized residuals also have a high score on the other measurements. A table with an overview of the outliers is below. Not all outliers violate the limit value of every measurement. Whenever they do not violate the limit value of a measurement, this value is not added in the tables.


As a conclusion we can say the cases above are considered to be outliers. We will run the regression again without these outliers to see if the distribution becomes more normal distributed and to see what this does to the slopes of the variables. As can be seen in the figures below, the distribution of the dependent variable Health seems to be a little less skewed than before. This means the distribution is more normal than with the outliers. However, we can
still see that the assumption of normality is violated. Therefore, running the regression again without the outliers did not seem to do much for the assumption of normality for the dependent variable Health.


We are now going to look if the slopes of the variables have changed by running a linear regression without the outliers. As can be seen in the Model Summary below, the $\mathrm{R}^{2}$ of model 3 is $17 \%$. This is not a very high percentage, but it is not low either. It means that the predictors and the mediating variables can explain $17 \%$ of the variance of Health. This $R^{2}$ is higher than the $R^{2}$ of the linear regression with the outliers ( $R^{2}=12 \%$ ). This means that the model can now explain more variance of Health than it did before. The F Changes are also higher than before and they are still significant. This result can also be seen in the Anova table below. In the Coefficients table below, we can see that a lot of slopes are bigger now than before in the linear regression with the outliers. A lot of the effects are still insignificant, but we can see that a lot of $p$-values became smaller.

| Model Summary ${ }^{\text {d }}$ |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 | ,249 ${ }^{\text {a }}$ | ,062 | ,057 | ,78387 | ,062 | 13,695 | 3 | 622 | ,000 |
| 2 | , $346{ }^{\text {b }}$ | ,119 | ,107 | ,76318 | ,057 | 6,697 | 6 | 616 | ,000 |
| 3 | . $434{ }^{\circ}$ | , 188 | , 174 | ,73389 | ,069 | 26,073 | 2 | 614 | , 000 |
| a. Predictors: (Constant), gender, income, age |  |  |  |  |  |  |  |  |  |
| b. Predictors: (Constant), gender, income, age, social society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time |  |  |  |  |  |  |  |  |  |
| c. Predictors: (Constant), gender, income, age, social society, cultural association, religious organization, voluntary work, spending an evening, satisfaction about leisure time, satisfaction about social contacts, connectedness |  |  |  |  |  |  |  |  |  |
| d. Dependent Variable: Health |  |  |  |  |  |  |  |  |  |


| $\text { ANOVA }^{\text {a }}$ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 25,245 | 3 | 8,415 | 13,695 | , $000{ }^{\text {b }}$ |
|  | Residual | 382,190 | 622 | . 614 |  |  |
|  | Total | 407,435 | 625 |  |  |  |
| 2 | Regression | 48,650 | 9 | 5,406 | 9,281 | . $000{ }^{\circ}$ |
|  | Residual | 358,785 | 616 | . 582 |  |  |
|  | Total | 407,435 | 625 |  |  |  |
| 3 | Regression | 76,736 | 11 | 6,976 | 12,952 | . $000{ }^{\text {d }}$ |
|  | Residual | 330,699 | 614 | . 539 |  |  |
|  | Total | 407,435 | 625 |  |  |  |

a. Dependent Variable: Health
b. Predictors: (Constant), gender, income, age
c. Predictors: (Constant), gender, income, age, social society, cultural association religious organization, voluntary work, spending an evening, satisfaction about leisure time
d. Predictors: (Constant), gender, income, age, social society, cultural association religious organization, voluntary work, spending an evening, satisfaction about leisure time, satisfaction about social contacts, connectedness

| Coefficients ${ }^{\text {a }}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model |  | Unstandardized Coefficients |  | Standardized Coefficients Beta | $t$ | Sig. | Collinearity Statistics |  |
|  |  | B | Std. Error |  |  |  | Tolerance | VF |
| 1 | (Constant) | 4,441 | , 104 |  | 42,528 | . 000 |  |  |
|  | Age | -, 012 | . 002 | -.,245 | -6,126 | . 000 | .946 | 1,057 |
|  | Income | 4,922E-5 | , 000 | . 118 | 2,936 | . 003 | . 931 | 1,074 |
|  | Gender | -. 060 | . 063 | -. 037 | -.954 | . 341 | . 981 | 1,019 |
| 2 | (Constant) | 3,770 | . 224 |  | 16,798 | , 000 |  |  |
|  | Age | -. 015 | , 002 | $-.307$ | -7,306 | , 000 | . 810 | 1,235 |
|  | Income | 4,679E-5 | , 000 | . 112 | 2,844 | , 005 | . 917 | 1,091 |
|  | Gender | -. 038 | . 062 | -. 023 | -.604 | . 546 | . 965 | 1,036 |
|  | Cultural association | $-.254$ | . 102 | -.098 | $-2,486$ | . 013 | . 911 | 1,097 |
|  | Religious organization | . 003 | . 109 | . 001 | . 029 | . 977 | . 956 | 1,046 |
|  | Social society | -.,087 | . 132 | -. 026 | -.658 | . 511 | . 894 | 1,118 |
|  | Voluntary work | . 098 | . 081 | . 046 | 1,205 | . 222 | . 969 | 1,032 |
|  | Satisfaction about leisure time | . 091 | . 017 | . 225 | 5,531 | . 000 | , 861 | 1,162 |
|  | Spending an evening | . 006 | , 008 | . 027 | . 690 | . 490 | . 926 | 1,080 |
| 3 | (Constant) | 2,817 | . 254 |  | 11,110 | . 000 |  |  |
|  | Age | -,014 | . 002 | $-, 287$ | -7,077 | . 000 | . 805 | 1,242 |
|  | Income | $3,429 \mathrm{E}-5$ | . 000 | . 082 | 2,155 | . 032 | . 906 | 1,104 |
|  | Gender | -,066 | . 060 | -,041 | -1,095 | . 274 | ,955 | 1,048 |
|  | Cultural association | -. 223 | . 098 | -.,087 | -2,276 | . 023 | . 910 | 1,099 |
|  | Religious organization | . 021 | . 105 | . 007 | . 198 | . 843 | . 955 | 1.047 |
|  | Social society | -,080 | . 127 | -,024 | $-.631$ | . 528 | . 891 | 1.122 |
|  | Voluntary work | . 112 | . 078 | . 053 | 1,431 | . 153 | . 969 | 1.032 |
|  | Satisfaction about leisure time | , 043 | . 018 | . 106 | 2,341 | , 020 | . 642 | 1,557 |
|  | Spending an evening | -. 014 | . 008 | -. 068 | -1,702 | . 089 | , 823 | 1,215 |
|  | Connectedness | . 485 | . 082 | . 275 | 5,893 | . 000 | . 606 | 1,651 |
|  | Satisfaction about social contacts | , 023 | . 022 | , 052 | 1,047 | . 296 | . 539 | 1,856 |

a. Dependent Variable: Health


[^0]:    * significant on 0,05; ** significant on 0,01; ${ }^{a}$ Pearson correlate; ${ }^{b}$ Cramer's V; correlation on the basis of ANOVA.

[^1]:    a. Dependent Variable: Health

[^2]:    a. Predictors: (Constant), gender, income, age, social

