Assignment 7   Bachelor Thesis
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Happiness in Friesland

- The influence of different capitals on subjective happiness -

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Preface

As happy as the Frisians are compared to a lot of other places in the world, so happy am I that I could work at the Fries Sociaal Planbureau for my internship for this bachelor thesis. Especially Miranda, but also Arjen, Frits and Klaas gave me the support I needed to make something from this project. I am also glad that my work will not fade away after being read only by the supervisors from the University, but instead will be used by a real research bureau and will contribute to ongoing research on for example what the FSP calls the 'Frisian Paradox'. For the GIS analysis I would like to thank Nickita who helped me send the GIS map while I was in Leeuwarden and could not access a RUG computer and the Geodienst who were very insightful for my questions.

Summary

Happiness is an increasingly important topic for both scientific research and international organisations like the OECD and the UN. Subjective happiness where people rate their happiness level in national surveys is sometimes even used as main development indicator instead of GDP. The Netherlands always were among the highest ranked countries for subjective happiness, and within the Netherlands, the province of Friesland has a special place. The citizens of Friesland are the happiest of all Dutch provinces while their income level is one of the lowest. Naturally, income is found to have a positive relationship with happiness so the Frisian Social Research Institute (FSP) dubbed this the 'Frisian Paradox'.

Among economic capitals, also other forms of capitals can be accumulated that are expected to have a positive effect on happiness. Social capital entails your social network and the trust you have in people and institutions. Personal capital entails characteristics within you as a person like mental and physical health. These capitals can be accumulated by individuals and facilitate the options people have in their lives and will therefore influence happiness levels. These three capitals are also used in the research of the Netherlands Institute for Social Research (SCP) 'Difference in the Netherlands'. Herein, personal capital had the highest effect on happiness, second came economic capital and last came social capital. In this research another is introduced: spatial capital, which involves proximity to relevant natural amenities and the economic status of inhabitants of the living area, measured by SCP's status scores).

The central question in this research is "How does the possession of different kinds of capitals influence the subjective happiness of people living in Friesland?".

To answer this question, quantitative research is done with the dataset of the FSP. An ordinal logistic regression is performed with SPSS. For economic, personal and social capital variables of the FSP surveys were used, along with control variables age, gender and education. For spatial capital SCP's status scores are used, along with the ratio of water and forest of the living area, wherefore GIS analysis is used.

Consistent with the literature, personal capital had the highest score of all capitals. People who gave a 10 on health were 15 times more likely of being in a higher happiness group than who gave a 4 or less. Social capital, however, was more important than economic capital for Friesland. This contradicts the study of the SCP for the whole of the Netherlands.

Social capital is higher and more important for Friesland than in the rest of the Netherlands. Frisians name this: 'Mienskip' which involves a strong embeddedness in local social life. The high local social ties go hand in hand with trust levels that are the highest of the Netherlands. Economic capital is on average lower in Friesland and less important for happiness. Status scores are lower and have lower standard deviation so overall there is less to compare with, which can have a positive effect on happiness. Spatial capital seems to work like a kind of antidepressant in Friesland. All people in higher scores of the water-forest-ratio and the status score were (very) happy.

The control factors were not significant, while the capitals were, even in the regression model. The main point therefore is that accumulated capitals do have a unique effect on happiness in Friesland, but that there are differences in how strong every capitals effect is compared with the rest of the Netherlands. This is due to a lower average and less difference in levels of economic capital, more benefits of natural amenities and a higher social cohesion.

Introduction

Motivation and social relevance

The Netherlands is among the happiest countries in the world. It belonged to the top 5 in the World Happiness Report by the United Nations (Helliwell et al., 2019). The importance of happiness is stressed by the UN with yearly reports since 2012 using survey data. These surveys ask people to rate their perceived level of happiness: subjective happiness. Subjective happiness is an increasingly important topic in research (Ballas, 2013) and for development organisations like the Organisation for Economic Cooperation and Development (2013). While it may be said that it depends on individual interpretations of the concept of happiness, research has shown that subjective happiness correlates to observable findings like brain activity and to how often someone smiles (Oswald, 1997). An important reason for happiness differences between people is inequalities in accumulation of capital. Capital takes times to accumulate and can be utilized in life to achieve desired outcomes. Bourdieu (1986) explains people not only can accumulate economic capital but also other capitals. Social capital for example concerns social contacts and related issues which people can also accumulate (a social network) and can utilise in life. It makes sense therefore to research subjective happiness in accordance to differences in accumulated capitals.

Inspired by outcomes of this research governments can create policies that enhance people's happiness levels by enhancing their capacity to accumulate relevant capitals. Bhutan for example focusses on 'Gross Domestic Happiness' as main development indicator rather than GDP (Royal Government of Bhutan, 2012).

Theoretical relevance

In the Netherlands, there is already done research (Vrooman et al., 2014) about the relationship between different types of capitals and social success by the Netherlands Institute for Social Research (Sociaal Cultureel Planbureau: SCP). However, what not was researched in this case is the spatial dimension in this. Especially on a lower scale it was not possible to be detailed about local circumstances like living area (SCP, 2014). Also, the focus was on social esteem and success and the correlations with happiness were merely stated, but not explained.

The FSP (Fries Sociaal Planbureau) found something special: Frisians had the highest level of happiness but meanwhile had lower economic capital than the rest of the Netherlands(FSP, 2019). Income is known by its positive relationship with happiness (Clark & Oswald, 2002) so this was dubbed the 'Frisian Paradox'. It seems like the link between happiness and capitals must be different in Friesland. There are speculations that the reason was a higher valuation of other aspects like social aspects or spatial aspects like the natural landscape (Pennewaard, 2018). It might also be because there is less economic status to compare with than in the Randstad. Clark & Oswald (2002) mention that this comparing might have a negative effect on happiness when the income level difference is large. Actual scientific research on the relationship between accumulated capitals and happiness for the region of Friesland was not done though.

The reason why accumulated capitals link with happiness in the first place, whether this is also the case in Friesland and whether they correlate in the same way as in the Netherlands is therefore breaking new grounds. Also new is to incorporate spatial aspects on a lower scale like living area.

Research Problem

The aim for this research is to test the results of the SCP in a different setting: that of Friesland and to further investigate the relationship of different accumulated capitals with subjective happiness and look onto important spatial aspects as well. The central question of this research will therefore be:

How does the possession of different kinds of capitals influence the subjective happiness of people living in Friesland?

Assisting questions to the central questions are:

1 Which important factors influence happiness in general and in what way according to the literature?

2 How does the geographical and socio-demographical spreading of subjective happiness look like in Friesland?

3 How does this Frisian spreading relate to the aforementioned theory and how can differences with the literature or with the Netherlands be explained by the Frisian context?

Research structure

In the chapter 'theoretical framework', factors that influence happiness according to the literature will be discussed. The chapter 'methodology' will explain exactly which methods were used for this research. The chapter 'results' is where the main argument is made by discussing outcomes in context with the literature. The chapter 'conclusions' summarizes the main findings and reflections on this research will be made in the commentary.

Theoretical Framework

As already mentioned, the SCP researched inequalities of accumulated capitals between people in the Netherlands (Vrooman et al., 2014). In 2014 they published the report 'Verschil in Nederland' (Difference in the Netherlands). They looked to different kinds of capital people can accumulate over their life like economic capital (mostly income), social capital (your social network of friends and acquaintances), and personal capital. Personal capital is defined by the capabilities you accumulate within you as a person: mental and physical health. When they assigned these variables to people (using their survey of almost 3000 people living all over the Netherlands) they found out that in the Netherlands you could speak of 6 different social segments in society when looking at the possession of capitals from high to low scores: the established upper class, the young advantaged, the working middle-class, the comfortable pensioners, the unsure workers and the precariat. They found out as well that this division had a relationship with subjective happiness. Since this division was based on the concepts of these capitals, they also calculated (significant) correlation levels of each capital with happiness: personal capital had the greatest followed by economic and social capital.

Measuring subjective happiness is increasingly being seen as insightful, also from a spatial viewpoint in assessing the happiness of a region or city (Ballas, 2013). The SCP, however, did not explain why this relationship between possessed capitals and subjective happiness exists. Is the relationship direct, or does it merely go via other factors like age or education? And how do interrelationships between capitals add to this? Since they focussed mostly on the sociological part, spatial concepts are less used which could play a vital role in assessing how the different capitals relate to each other and happiness. Living area affects social capital and therefore happiness, as Tönnies (1887) theory of Gemeinschaft and Gesellschaft explains, especially in the more rural areas, which Friesland has plenty of. For example, if your neighbours have also high economic capital and a good job, they might give you networking opportunities that will help your career if you become friends with them.Living area can also affect economic capital directly when housing prices in the area of residence are rising. Lastly, it affects personal capital: a polluted living area will affect health. All these potential spatial relationships with other capitals and happiness make it interesting to incorporate also 'spatial capital' in the equation. This is done with a geodemographical approach where a category is assigned to regions. This category sums up relevant attributes of individuals that live in a region (Xiang et al., 2018). This way regions like postal codes can be compared with each other. For this, the SCP uses status scores. These scores include inhabitants' average income, their level of education and the percentage of unemployment. The natural aspect of the region also influences happiness: according to MacKerron (2012) proximity to freshwater and woodlands has a positive correlation with happiness. Therefore, the spatial capital concept will also include these aspects.

Defining concepts is key in this literature since the main aim is to connect different concepts to each other. There is however some discussion on what the concepts of the different types of capitals really mean and how to measure them (Abbott, 2009). According to Abbott & Freeth (2008) and Han (2015) social capital is not just about your social network but also about trust people have in others and in institutions like the government and the justice system. These aspects are interrelated with each other since high trust in other people makes it easier to bond with other people. The oxford dictionary of human geography also notes personal trust and "the relations that exist between individuals within both families and communities" (Mayhew, 2015). Han (2015) also adds 'perceived helpfulness' which means if you have people to talk with in times of trouble. Economic capital will be classified as household income. Many researchers claim that income has a positive relationship with happiness, like Clark & Oswald (2002).

Conceptual Model
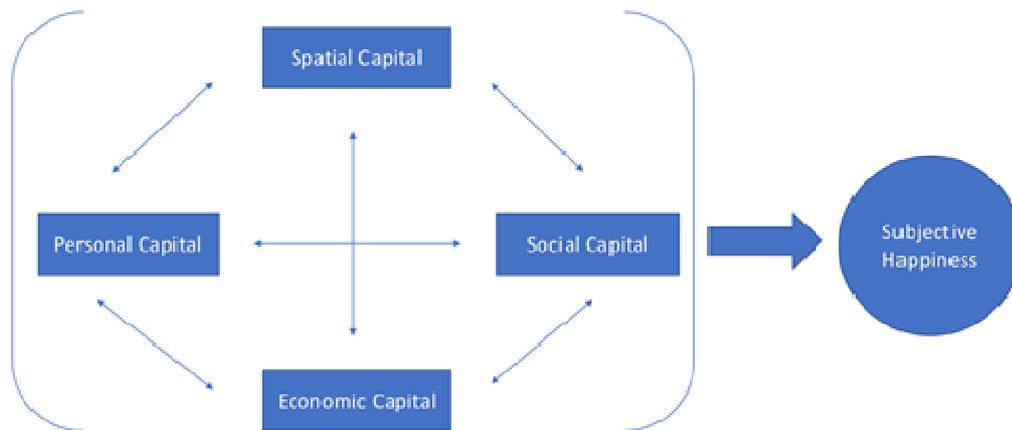
Figure 1: Conceptual Model

According to Bourdieu (1986) capitals can to some extent be converted to each other. Conceptually this makes sense since money can be used to buy health care which improves your health. Looking to each relationship something like this can be said about conversions and influences from one to another: Diseases can make it that you stop working and receive less income. Your social network can help you in receiving the needed (health)care. Abbott & Freeth (2008) also contribute to this in saying that there is evidence that trust and a good social network positively correlates with health. This might be the fact since trusting people experience less stress and anxiety which itself has some influence on heart diseases (Gallo & Matthews, 2003). Trust can also influence people's happiness Abbott & Freeth (2008) say as living in a place where you can trust others will have an impact on your happiness, but they mention that other research pointed out that this correlation merely exists because wealthier areas are more trustworthy and are only therefore happier since wealth affects happiness.

In comparing variables that influence happiness there is also research about giving a monetary value to specific life-events (Clark & Oswald, 2002). However, this must not be seen as a serious implication that happiness can be 'bought' or that there is a linear relationship between income and happiness: some research implies that there are diminishing returns to the positive effect and that at certain levels of richness more money does not have an effect anymore (Ballas, 2013). The monetary value is merely an absolute measure of the pleasantness of the event. Also, the relationship for income and happiness can be even more complicated: relative income also plays a role. There has been evidence that comparisons with friends or neighbours influence happiness in such a way that if you have a lower income than your reference group your happiness level will decrease. This comparison effect works on more levels: unemployment has little effect on happiness if your reference group is also unemployed (Clark & Oswald, 2002). Other evidence also points out that in general your happiness will be lower if your neighbours have more income (Luttmer, 2005). These aspects of income and work of neighbours relate to the status scores of the spatial capital part since these scores of postal codes are made up with data about the general level of income and unemployment of the inhabitants. The theory of social capital however implies a positive relationship with employed neighbours and happiness because they might give you the connections for a job (Bourdieu, 1986).

Besides from the capitals, also specific background factors tend to correlate with happiness: like age and gender. Research showed for example that age has a u-shaped relationship with happiness where younger and older people are happier than other people and, for most studies, that females rate their happiness a little higher than males (Dolan et al., 2007; Orviska et al., 2014). Education also plays a role in some researches where higher educated people score higher on happiness (Orviska et al., 2014). However, other research contradicted this where middle education had the highest scores on happiness (Dolan et al., 2007).

According to Han (2015), social capital is positively associated with happiness. The study of the SCP also assigned significant correlations of the social, economic and personal capital with happiness where personal capital had the greatest followed by economic and at last social. Clark & Oswald (2002) also value health as the strongest predicting factor of happiness. MacKerron (2012) notes that proximity to freshwater and woodlands correlates positively with happiness, which is used in the new concept of spatial capital.

Therefore, the general hypothesis will be that people who possess higher levels of the four capitals will have higher subjective happiness as well. The following chapter will explain in what way the conceptual model shown in figure 1 and corresponding hypotheses will be tested.

Methodology

A quantitative analysis

Since the research question is about happiness that people assign themselves, it is less necessary to qualitatively research in-depth motivations about what happiness is or what it feels like. A number or answer on a Likert scale that the person himself chooses is fine enough. Quantitative research will therefore be the appropriate choice (Clifford et al., 2016). Quantitative research makes it possible to thoroughly investigate the correlation of happiness with other characteristics like the concepts of economic, social, personal and spatial capital. Since the research question is about the relationship between these aspects it is useful to have a large quantity of cases since it then will be possible to assess whether there is a statistically significant relationship between those aspects. Apart from the statistical power, a larger sample size helps with the generalizability of the results. This is also crucial for this research since the research question focuses on saying something about Frisian inhabitants.

Dataset

A dataset that fits the necessities for this research can be found in the panel data of the Fries Sociaal Planbureau (FSP) where ca. 3,600 people are in. Every few months a survey is sent to this panel which they then can fill in. For all concepts used in this research (except spatial capital) there are relevant questions. Of the ca. 3600 people 1355 answered all the surveys that have relevant questions. So that is the sample size for this research. All municipalities in Friesland are covered, but some municipalities are really small and only have a handful. Also, some groups are underrepresented like young people and lower educated people. Except for specific municipalities there are enough people in each group however to do statistical analysis on since the benchmark number for statistical tests is around 20 (Moore & McCabe, 2006).

Statistical analysis methods

When looking at the theory, also specific background factors tend to correlate with happiness: like age, gender and education (Orviska et al., 2014; Dolan et al., 2007). It would thus make sense to take out these control factors with a regression analysis to merely see if it is the capitals themselves that make people happier, or that background factors that relate to the capitals in a specific way make up for that different evaluation of happiness. A regression is also useful since capitals themselves also might have statistical interrelationships with each other. This way it can seem like they have a unique effect but controlled for each other they might lose their effect on happiness. Since the independent variable happiness is ordinal; asked on a Likert scale from very unhappy – to very happy, the type of regression analysis that was used is the ordinal logistic regression (Moore & McCabe, 2006).

First however, a large descriptive analysis was done to have general knowledge about the dataset. Histograms of all variables separately were made, alongside correlations of all variables with happiness. This made it possible to compare the correlation effects before and after controlling for other variables with the regression. To enhance the understanding how variables correlated with happiness, jitterplots (scatterplots for ordinal data) and frequency tables of each variable with subjective happiness were made. Finally, a large correlation matrix of all variables with each other were made to get a better understanding of why the regression results could be different from the normal results. SPSS was used to perform all statistical analyses.

Data for spatial capital and using GIS

For spatial capital, data was used outside the dataset of the FSP from two sources. The status scores made by the SCP for postal codes (on PC4 level) were the first. The SCP gave all postal codes a standardized score with average 0 and standard deviation 1. The score consists of an assessment of the combination of four topics: percentages of people with a lower income; low education; people who are jobless and as fourth the average income (SCP, 2016). This is done by a geodemographical approach where a region gets a score based on the characteristics of its inhabitants (Xiang et al., 2018). Operationalising spatial capital with only the status scores entirely dismisses the aspect of nature, so also incorporated is proximity to relevant natural amenities. Freshwater and woodlands are chosen who were also significant according to prior research (MacKerron, 2012). Again, postal codes are used as the container variable. There was no data on this yet so Geographic Information System (GIS) was used to make it, which makes sense since it is about spatial attributes (Jensen & Jensen, 2012). The ratio of water and forest within a radius of 3 km was determined for every postal code point as this radius was most significant according to MacKerron (2012). The geospatial processing program ArcMap was used to assign these scores like shown in figure 2.
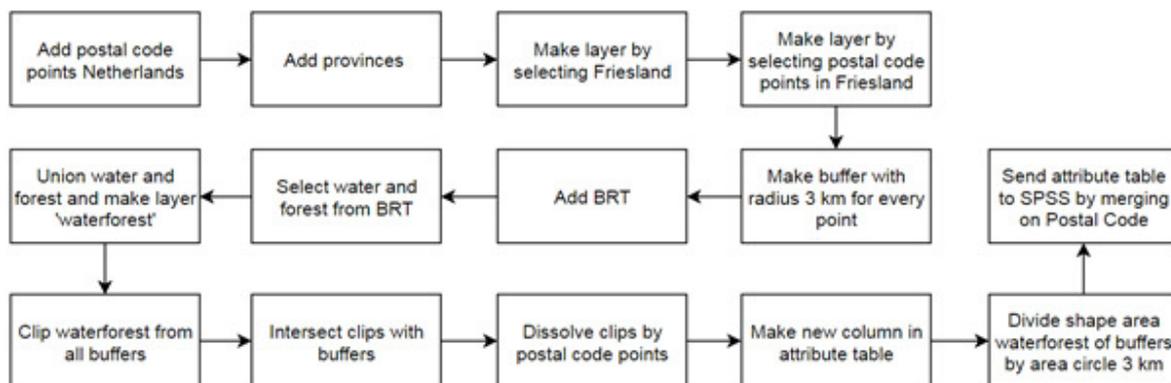

Figure 2: GIS actions flowchart (Layers are downloaded from ArcGIS Online. BRT = Basisregistratie Topografie)

The final result on ArcMap can be seen on the map in figure 3.
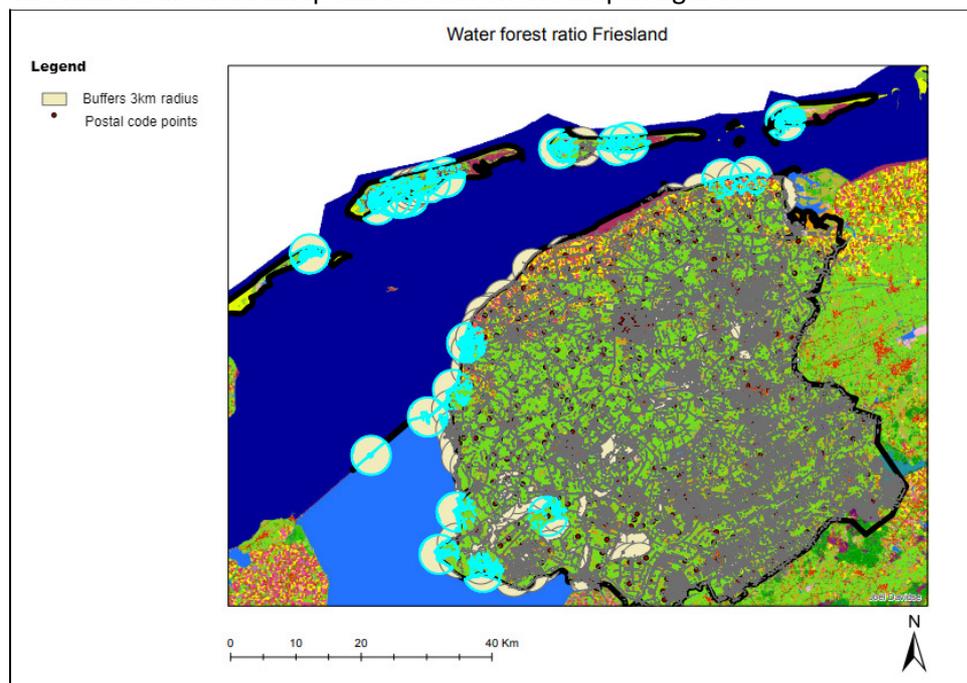
Figure 3: Highest water-forest-ratios are near islands, coasts and the Frisian lakes.

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Explanation use variables

First, the specific variables are chosen with the help of assessing relevant literature. Other researchers already assigned specific attributes to the concepts of the three capitals (the concept of spatial capital as used here is new in this research). For economic capital: household income is used (Oswald & Clark, 2002). Personal capital has health as used variable (Vrooman et al., 2014). Social capital is a mix of social contacts (Mayhew, 2015; Abbott & Freeth, 2008; Bourdieu, 1986) (quality, frequency and quality of contacts in the neighbourhood), perceived helpfulness (Han, 2015) (For problems I have people to talk to) and trust in people and institutions (Abbott & Freeth, 2008; Han, 2015) (second chamber, province, justice). The reviewed literature was clear on what other factors might influence happiness: age, gender and education (Dolan et al., 2007; Orviska et al., 2014). These were taken as control variables. Questions that linked to the operationalisations of the concepts were chosen from the surveys of the FSP panel. For a detailed list of all questions, see appendix.

Every variable has a hypothesis attached for how it relates to happiness, in accordance with the literature. For most of these variables this is clear: a positive relationship where more of the variable means higher happiness levels. Health (Clark & Oswald, 2002) and trust (Abbott & Freeth, 2008) are examples. Most other variables are expected to have the same linear relationship. Other variables may have a different kind of relationship: age has a u-shaped relationship (Dolan et al., 2007; Orviska et al., 2014), income is expected to have diminishing returns for higher incomes so is expected to have a square root relationship (Ballas, 2013). There is some discussion about education since some sources see a positive linear relationship (Orviska et al., 2014) while others mentioned that middle education had the highest scores on happiness (Dolan et al., 2007). Most sources claim that for gender females are a bit more positive on their happiness than males (Dolan et al., 2007; Orviska et al., 2014). For spatial capital, the hypothesis is also that a higher ratio of water and forest will be positive for happiness (MacKerron, 2012). The status score is more of a mixed bag since the comparison effect expects a negative relationship (Clark & Oswald, 2002) while the social network effect the opposite (Bourdieu, 1986).

These hypotheses will be tested by putting all variables into the ordinal logistic regression, by assessing whether variables belonging to each capital have significant correlations on happiness and by comparing their effect sizes on happiness.

Results

Final Regression Model

After testing multiple models this is the final model. Some variables were taken out because they had too many cases with missing values which made the amount of cases for the ordinal regression a lot smaller. Those were only variables that were not essential for the conceptual model like frequency of contact with colleagues and trust in unions. Others, like income, were too important for the conceptual model to give up on. This made the total amount of analysed cases not the initial 1355 but 919: still a large enough sample size to work with. Also, some answers of variables were grouped since otherwise there would be really small cells, like 1-4 for score on health. The model was significant on the highest level (.000), the pseudo r2 Nagelkerke was .342, the test of Parallel Lines was high enough: .527 and multicollinearity problems were absent: all VIF's were 1 - 10.

Parameter Estimates (only significant results, for whole table see appendix)

	Estimate	Wald	Sig.
Statusscore 2017	,147	4,322	,038
Ratio_water and forest	1,330	2,888	,089
Below average income	-,328	2,790	,095
Above average income	0ª	.	.
Satisfaction contacts low	-2,162	16,152	,000
Satisfaction contacts average	-1,434	22,713	,000
Satisfaction contacts high	-,786	13,942	,000
Satisfaction contacts very high	0ª	.	.
Never sees family	-1,161	5,258	,022
Sees family (almost) daily	0ª	.	.
Satisfaction contacts in village or neighbourhood = 4 or less	-1,935	5,859	,015
Satisfaction contacts in village or neighbourhood = 10	0ª	.	.
Rates own health 4 or less	-2,730	13,823	,000
Rates own health 5	-1,335	4,062	,044
Rates own health 10	0ª	.	.
Have people to talk to = disagree or strongly disagree	-1,388	9,680	,002
Have people to talk to = not agree not disagree	-1,481	25,290	,000
Have people to talk to = agree	-,780	14,504	,000
Have people to talk to = strongly agree	0ª	.	.
Trust in justice = 3	-1,822	5,795	,016
Trust in justice = 7	-1,103	5,331	,021
Trust in justice = 10	0ª	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant (reference group).

Figure 4: Estimate and significance scores of significant correlations variables with happiness

Variable	Compared groups	Estimate score / B	Exp B / odds ratio**
Health	<5 vs 10	-2.7	14.9
Quality social contacts	Rates quality Low vs very high	-2.2	9.0
Quality contacts living area	<5 vs 10	-1.9	6.7
Justice	3 vs 10	-1.8	6.0
Perceived helpfulness*	Neutral vs strongly Agree	-1.5	4.5
Water-forest ratio	(Entered as covariate)	1.3	3.7
Never sees family	vs sees family (almost) daily	-1.2	3.3
Income	Below average vs Above average	-.3	1.3
Status score	(Entered as covariate)	.1	1.1
Not significant:	**Gender, age, education, frequency contacts (except never sees family), trust in people, trust in province, trust in second chamber.**		

Figure 5: Scheme of significant variables from high to low
*Listed in figure 4 as 'Have people to talk to'.
**Inverted (1/Exp B) for negative estimates.

Listing significant variables

Figures 4 and 5 mention the significance level, the estimate score and corresponding odds ratio's for each variable that was significant (on the 5% level, except for water-forest ratio and income that were on the 10% level).After the expected highest score: health, a lot of social aspects arise that have high influence on happiness. The quality of social contacts is here highest with a 9 times higher chance of being in a higher happiness group when satisfaction is very high compared to people who rate their satisfaction with social contacts low. Quality is a lot more important than frequency of contacts, which are not significant at all except for the group that never sees their families (with a relatively low score of 3.3 times higher chance of being in a lower happiness group compared to people that see them (almost) daily). Of course, frequency does not say anything about whether a contact moment has been experienced as positive or not.

Right after these a similar variable: satisfaction people have with their contacts in the village or neighbourhood arises. People that gave a 4 or less (compared to who gave a 10) were almost 7 times less often in higher happiness groups. Trust in general is not significant anymore in this regression model, only trust in justice arises: The group that gave a 3 compared to the group that gave a 10 was 6 times more often in a lower happiness group. An explanation why trust in people is not significant anymore is because of its significant correlation with other variables, like health. This also confirms the theory that trust has a positive influence on health (Abbott and Freeth, 2008) because of a lower experienced stress level (Gallo & Matthews, 2003).

Next on the list is the ratio of water and forest with still a relative high score. Last come two low scores, surprisingly household income, (lower than average income had just 1.3 times the chance of being in a lower happiness level than higher than average) and the status score. This low level might come because of contradicting forces mentioned earlier: the comparison effect has a negative result if you have neighbours with higher economic status (Luttmer, 2005) while the social networking effect has a positive result (Bourdieu, 1986).

Personal Capital: Health facilitates Happiness

Just as Clark & Oswald (2002) noted, health is the most important factor in explaining happiness. The large difference especially in happiness between healthy people and unhealthy/ill people is consistent with their findings (15 times more often in a higher happiness level for a 10 compared to a 4 or lower). Health facilitates happiness in a way, since mental and physical illnesses / disabilities restrict persons in their daily activities. It is no surprise that this also goes for the Frisians.

Control factors:

Surprisingly, age did not correlate with happiness on a significant level, even when looking to a u-shaped relationship. Also, people in their 30's who according to the literature would be among the most unhappy groups had the highest percentage of very happy persons: 30% instead of other age groups with lowest 20 %. Maybe this is just a statistical distortion because of the relative low proportion of 30'ers, but since their size is still 49 a likelier solution is that 30'ers in Friesland really are happier compared to other places. This has some theoretical grounds concerning the theory of the escalator model: According to Fielding (1992) families with young children prefer to live in calmer, rural areas which Friesland has plenty of.

Gender was also not significant. This contradicts most studies, but confirms some others who also did not found a significant relationship (Dolan et al., 2007; Orviska et al., 2014).

Education was significant on its own, but not in the regression, partly because its high correlation with other variables like income (.418), and trust in people and institutions. The CBS (2018a) assigns higher educated people with being happier in the Netherlands. However, they merely use percentages and do not accord for other variables like income in a regression model. Since there was also a percentage difference in the FSP's dataset (16 % of lower educated people is very happy compared to 26 % of higher educated people) no particular difference with the Netherlands can yet be assumed.
The control factors therefore did not have a unique effect on happiness.

Spatial Capital: A good living environment as antidepressant?

It seems like a good spatial living environment works as an antidepressant. All the people who lived in areas with higher water-forest-ratios were happy or very happy. As shown in figures 6 and 7, there are more postal codes with a lower ratio score so it is expected to see a high concentration on the left side in the plot as well. However, the corner in the below right is empty, which thus shows this finding that there are no unhappy (or even neutral happy) persons that live in areas with higher water-forest-ratios in this dataset. The working of nature as antidepressant is confirmed in other studies as well, see for example Woo et al. (2012).
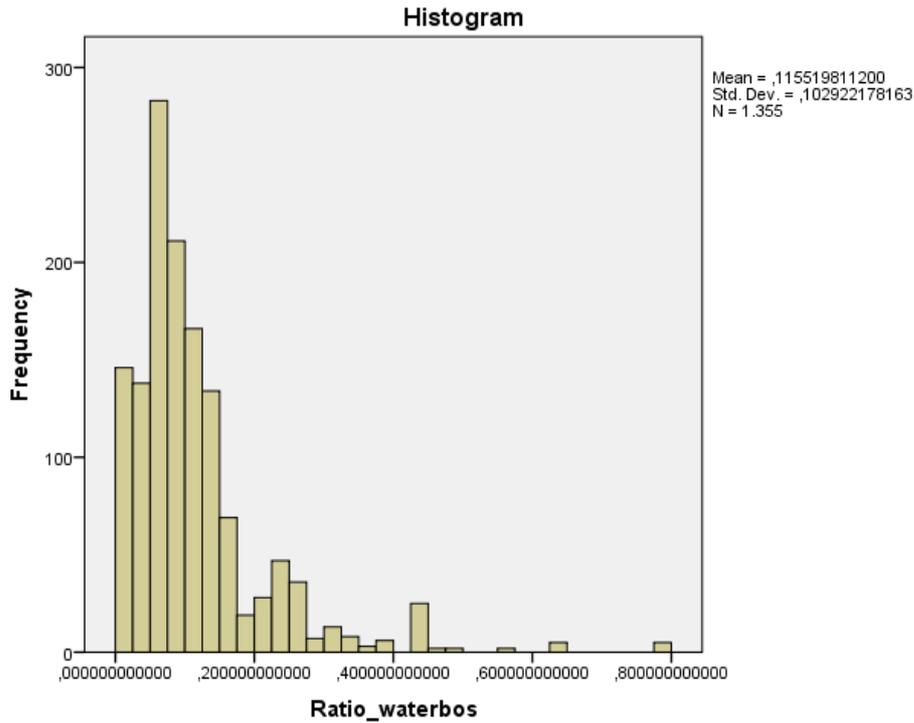
Figure 6: Histogram of water-forest-ratio frequencies
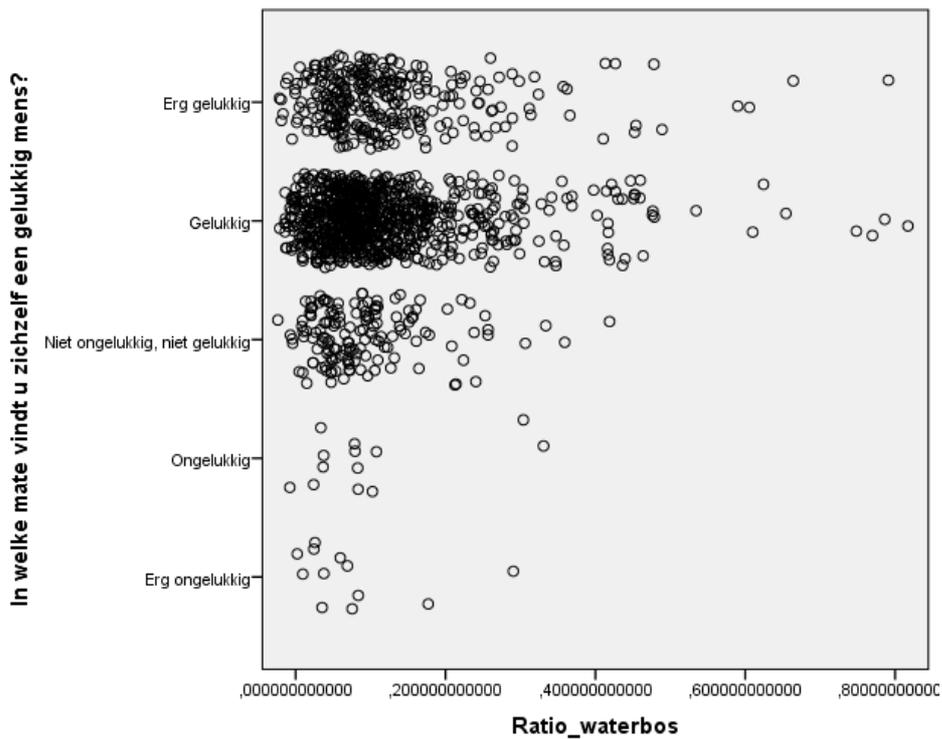
Figure 7: Jitterplot of water-forest-ratio with happiness

The same happens with the status score albeit less extreme, after a certain status score benchmark level there are only happy persons. What is also interesting about the status scores is that they are a lot lower in Friesland (-.604) compared to the rest of the Netherlands (.012). Also,their standard deviation is lower for Friesland: 1,093, the Netherlands as a whole has 1,14. So, on average, there are larger differences in the Netherlands than in Friesland.

Social Capital: Mienskip in Friesland

The biggest correlations - after health - are within a lot of social aspects: satisfaction with social contacts, satisfaction with contacts in village or neighbourhood and perceived helpfulness are all on top. Only after these aspects, other aspects like income and status scores arise. It is clear that this social aspect is really important in Friesland. They even have their own word for it: "Mienskip". This word entails the social connections and trust people have in each other with a strong embeddedness in local social life, whether this is the neighbourhood or the province of Friesland as a whole (FSP, 2016).

Apart from correlating high with happiness (see figure 8),satisfaction with contacts in the neighbourhood also correlates well with trust in people. Srong localconnections definitely help with trusting people (think about people that trust to keep their front door unlocked) and with feeling embedded in the locality as well. This embeddedness may result in more bonding with Frisian government as well: Satisfaction with contacts in the neighbourhood also correlates high with trust in the province.

A similar concept to 'Mienskip' is social cohesion: "The extent to which there are bonds of trust that bind people together into a society" (Castree et al., 2013). These aspects of trust in people and in institutions are in fact also higher in Friesland than in the rest of the Netherlands. According to CBS (2018b) northern Friesland and south-west Friesland belong to the regions with the highest levels of trust in the Netherlands. The FSP-data reflects this where 3/4 trusts other people compared to a Dutch average of 62% (CBS, 2018b).

| | | How satisfied are you with your social contacts in your village or neighbourhood? (from 1-10, resized, see appendix for whole table) | | | | | | | |
| | | 4,00 | | 8,00 | | 9,00 | | 10,00 | |
		Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
To which degree would you consider yourself a happy person?	1 Very unhappy	1	2,9%	1	0,2%	2	1,7%	0	0,0%
	2 Unhappy	2	5,7%	1	0,2%	1	0,8%	0	0,0%
	3 Not happy, not unhappy	12	34,3%	40	7,7%	4	3,3%	2	7,7%
	4 Happy	16	45,7%	348	66,8%	73	60,3%	9	34,6%
	5 Very happy	4	11,4%	131	25,1%	41	33,9%	15	57,7%

Figure 8: Frequency table satisfaction contacts village/neighbourhood and happiness

As seen in figure 8, the percentage of people who are very happy increases sharply with each higher score on satisfaction with contacts in village/neighbourhood. A similar thing happens with satisfaction with social contacts in general: percentages 'very happy' increase from 10/20/42 there.

Economic Capital: Can money buy happiness?

For income there is a significant difference between high and low incomes. In the FSP-dataset, the percentage of people who are very happy is three times as big for high incomes as for low incomes. However, the effect size sharply decreased after being put in the regression model. This is because the effect on happiness goes through other variables, like education and perceived helpfulness. This last one unexpectedly had a significant correlation with income. There is however, a logical explanation: shame to talk about problems that are related to lower incomes. Chase and Walker (2013) mention how shame for poverty can be a threat to social bonds and makes people talk less about their problems. This can have a negative effect on happiness. Clark & Oswald (2002) add that this problem only arises when comparing to an individual that is 'better' than you. They mention that people compare themselves to their reference group, which often consists of people in the same household, neighbours, colleagues and friends, thus often people that live nearby. And when looking to the status scores it becomes obvious how this connects to theFrisians: they have less to compare with since the average status score is already a lot lower and the standard deviation is smaller too. This can make it the case that Frisians are happier with less money after all.

Overall, the capitals have a different ranking for effect size on happiness than for the SCP: while personal capital also comes on top, social capital has in this research a higher effect than economic capital.

Conclusions

Main findings

As expected, the possession of accumulated capitals has a positive effect on subjective happiness for inhabitants of Friesland. The control factors age, gender and education were not significant in the model. The capitals thus had this effect on their own. Also consistent with the literature was the high effect of personal capital on happiness which was the highest of all four capitals. People who gave a 10 on their health had a 15 times higher chance of being in a higher happiness level than people who gave a 4 or less. Different then in the results of the research by the SCP is that social capital was a more important predictor of happiness than economic capital.

The Frisians have high levels of social capital. They are among the regions with the highest levels of trust in all of the Netherlands. Social cohesion is important for the Frisians, they even have their own name for it in 'Mienskip', which stands for the strong embeddedness in local social life: this is important for happiness: there is a high correlation between satisfaction with contacts in the neighbourhood and happiness. This satisfaction goes hand in hand with the highest levels of trust in people and in the province of the whole Netherlands.

On why economic capital is less important for the Frisians: Frisians have less to compare with since the average income is lower and the standard deviation of status scores too. Therefore the comparison effect is less severe and there is less shame to talk about problems relating to low income. So overall it can be the case that Frisians are happier with less.

Spatial capital seems to work like a kind of antidepressant in Friesland. All people in higher scores of the water-forest-ratio and the status score were (very) happy. Friesland has plenty of these calm and nature rich areas that families with children like.

Overall, accumulated capitals have a unique effect on happiness in Friesland; there are differences in how strong every capitals effect is compared with the rest of the Netherlands. This is due to less economic capital to compare with, more benefits of natural amenities and a higher social cohesion.

Commentary

-Since this research mostly focuses on accumulated capitals there are a lot of things not considered who definitely can play a role. For example relative, contextual factors like differences in living costs per region. Income becomes less useful to 'convert' into happiness in a place where the rent is higher. However, most of the times people choose to migrate to a place where the rent is higher because those places are more attractive and have more amenities (Ballas, 2013). So this should cancel at least a part of this out.

-Sometimes I did not found literature for questions that looked interesting.It was chosen not to use them since there was no literature base on why to chooseit.In hindsight this was too strict: of course variables can be researched that other researchers did not since then something new is added. Actually this was already done with the spatial capital concept.

-Only three of the nine institutions asked by the FSP were used. A different model where all institutions were combined gave a significant score on trust in combined institutions, but the inclusion of all the institutions made a worse regression model overall: There were hundreds of cases less which resulted in other variables not being significant anymore.

-The operationalisation of spatial capital is not perfect. In hindsight, also other variables can be added: the distance to important services and satisfaction with living area. It might be that the effect of spatial capital for happiness will go up this way. This is recommended for further research. Another recommendation is to do national analysis on the relationship between education and happiness in a regression model.

-There were problems with the operationalisation of social capital. As Abbott (2009) points out: scholars think of the concept differently, different parts may not correlate with each other, and the questions of the dataset were sometimes not adequate in assessing the concept of social capital and its usefulness: how often you meet someone does not say anything about the quality of the relationship. Also, simple counting how often you meet different persons treat every person as having the same positive effect on happiness.

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Appendix A   All questions of the FSP surveys used for the regression model

Question	Multiple choice answers	For research concept
To which degree you would consider yourself a happy human being?	5-point Liker scale Very unhappy; unhappy; not unhappy, not happy; happy; very happy; I don't know.	Subjective Happiness
Postal code	First 4 numbers only (PC4).	Spatial Capital (container for other two)
What is the total annual gross income of your household?	10 monetary scales, but after this assigned to below average, average, and above average by the FSP.	Economic Capital
Which report mark would you give your health?	1 - 10	Personal Capital
How satisfied are you in general with the quality of your social contacts?	5-point Liker scale (very unsatisfied, unsatisfied, neutral, etc.)	Social Capital
How often do you meet the following persons?	Family, neighbours, friends, Almost daily, once a week or more, 2-3 times a month, once a month, less than once a month, never, does not apply.	Social Capital
If I'm bothered with something I have people around me where I can talk to.	5-point Liker scale Very disagree, disagree, neutral, agree, very agree, dont know / no opinion.	Social Capital
How satisfied are you in general with your social contacts in your village or neighbourhood?	1 - 10	Social Capital
In general, do you agree that most people can be trusted?	5-point Liker scale Very disagree, disagree, neutral, agree, very agree, I don't know / no opinion.	Social Capital
How much trust do you at this moment have in the following institutions in the Netherlands?	Justice, Province, Second Chamber. (1-10)	Social Capital
Age	Number	Control factor
Gender	Male, female	Control factor
What is your highest completed education level?	8 levels, but after this assigned to low, middle and high by the FSP.	Control factor

*When after a likert scale there was a 6th option like I don't know / no opinion, I set it as missing.

Appendix B Scheme individual significant correlations with happiness (not inside the regression)

Variable	Remarkable things	Pearson's R / Eta Correlation
Health	For all positive health numbers happy people have a higher percentage.	.316
People to talk if bothered		.281
Quality of social contacts	Each time same groups the biggest one.	.277
Contacts with people in village or neighbourhood	When happier less and less insufficient marks.	.230
Trust in people		.182
Household income		.182
Trust in institutions	Government Police Justice Second Chamber Big companies Municipality Province	.182 .172 .166 .162 .148 .147 .144
Part of neighbourhood association		-.127
Status scores		.104
Sports association		-.103
Education		.102
Trust in unions Trust in press		.098 .078
Frequency contact family Other neighbours Direct neighbours		-.077 -.077 -.076
Ratio relevant natural amenities	All high scores are happy	.075
Sporting group Belonging to none of the groups Neighbourhood group		.070 -.070 .069

Appendix C: Complete Regression model Parameter Estimates

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	Happiness very low	-8,601	1,267	46,109	1	,000	-11,084	-6,119
	Happiness low	-7,774	1,233	39,746	1	,000	-10,191	-5,357
	Happiness neutral	-5,201	1,196	18,901	1	,000	-7,546	-2,856
	Happiness high	-1,043	1,184	,776	1	,378	-3,363	1,277
Location	status score	,147	,071	4,322	1	,038	,008	,285
	Ratio_waterforest	1,330	,783	2,888	1	,089	-,204	2,864
	Male	,274	,170	2,596	1	,107	-,059	,608
	Female	0[a]	.	.	0	.	.	.
	Below average education	,245	,235	1,086	1	,297	-,216	,705
	Average education	-,133	,182	,532	1	,466	-,491	,224
	Above average education	0[a]	.	.	0	.	.	.
	Below average household income	-,328	,196	2,790	1	,095	-,712	,057
	Average household income	,090	,214	,177	1	,674	-,329	,510
	Above average household income	0[a]	.	.	0	.	.	.
	Quality social contacts very low	-,356	,415	,737	1	,391	-1,169	,457
	Quality social contacts low	-2,162	,538	16,152	1	,000	-3,216	-1,108
	Quality social contacts average	-1,434	,301	22,713	1	,000	-2,024	-,845

	B	S.E.	Wald	df	Sig.	Lower	Upper
Quality social contacts high	-,786	,211	13,942	1	,000	-1,199	-,374
Quality social contacts very high	0ᵃ	.	.	0	.	.	.
Never sees family	-1,161	,506	5,258	1	,022	-2,153	-,169
Sees family less than 3 times per month	,059	,353	,028	1	,867	-,633	,752
Sees family 3 times per month	,282	,331	,725	1	,395	-,367	,930
Sees family once per week	,246	,319	,596	1	,440	-,379	,871
Sees family more than once per week	,054	,300	,032	1	,858	-,535	,642
Sees family (almost) daily	0ᵃ	.	.	0	.	.	.
Never sees neighbours	-,557	,459	1,474	1	,225	-1,457	,342
Sees neighbours less than 3 times per month	,535	,415	1,662	1	,197	-,278	1,347
Sees neighbours 3 times per month	,275	,379	,525	1	,469	-,468	1,018
Sees neighbours once per week	-,068	,302	,051	1	,822	-,659	,523
Sees neighbours more than once per week	-,326	,207	2,466	1	,116	-,732	,081
Sees neighbours (almost) daily	0ᵃ	.	.	0	.	.	.
Never sees other neighbourhood inhabitants	,489	,446	1,201	1	,273	-,385	1,363

	B	Std. Error	Wald	df	Sig.	Lower	Upper
Sees other neighbourhood inhabitants less than 3 times per month	,261	,403	,418	1	,518	-,529	1,050
Sees other neighbourhood inhabitants 3 times per month	,326	,402	,660	1	,417	-,461	1,113
Sees other neighbourhood inhabitants once per week	,497	,356	1,949	1	,163	-,201	1,194
Sees other neighbourhood inhabitants more than once per week	,296	,332	,797	1	,372	-,354	,947
Sees other neighbourhood inhabitants (almost) daily	0[a]	.	.	0	.	.	.
Never sees friends	,044	,677	,004	1	,948	-1,283	1,370
Sees friends less than 3 times per month	,243	,538	,205	1	,651	-,810	1,297
Sees friends 3 times per month	-,040	,528	,006	1	,939	-1,074	,994
Sees friends once per week	-,155	,513	,091	1	,763	-1,160	,851
Sees friends more than once per week	-,147	,509	,084	1	,772	-1,144	,850
Sees friends (almost) daily	0[a]	.	.	0	.	.	.
Age = 10-19	-1,242	2,488	,249	1	,618	-6,119	3,634
Age = 20-29	-,211	,807	,068	1	,794	-1,792	1,370
Age=30-39	,044	,565	,006	1	,937	-1,063	1,152

	B	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Age=40-49	-,181	,498	,132	1	,716	-1,158	,796
Age=50-59	-,438	,466	,884	1	,347	-1,351	,475
Age=60-69	-,285	,453	,394	1	,530	-1,173	,604
Age=70-79	-,321	,454	,499	1	,480	-1,211	,569
Age=80-90	0[a]	.	.	0	.	.	.
Satisfaction contacts neighbourhood 4 or less	-1,935	,799	5,859	1	,015	-3,501	-,368
Satisfaction contacts neighbourhood 5	-1,171	,742	2,492	1	,114	-2,625	,283
Satisfaction contacts neighbourhood 6	-1,146	,655	3,057	1	,080	-2,431	,139
Satisfaction contacts neighbourhood 7	-1,153	,616	3,504	1	,061	-2,360	,054
Satisfaction contacts neighbourhood 8	-1,102	,608	3,284	1	,070	-2,295	,090
Satisfaction contacts neighbourhood 9	-,884	,645	1,878	1	,171	-2,149	,381
Satisfaction contacts neighbourhood 10	0[a]	.	.	0	.	.	.
Rates health 4 or less	-2,730	,734	13,823	1	,000	-4,169	-1,291
Rates health 5	-1,335	,663	4,062	1	,044	-2,634	-,037
Rates health 6	-1,105	,593	3,470	1	,062	-2,267	,058
Rates health 7	-,583	,561	1,081	1	,298	-1,682	,516
Rates health 8	-,205	,554	,137	1	,711	-1,291	,881
Rates health 9	,484	,572	,716	1	,398	-,637	1,605
Rates health 10	0[a]	.	.	0	.	.	.
Have people to talk to strongly disagree or disagree	-1,388	,446	9,680	1	,002	-2,262	-,513

	B	Std. Error	Wald	df	Sig.	Lower	Upper
Have people to talk to not agree, not disagree	-1,481	,295	25,290	1	,000	-2,058	-,904
Have people to talk to agree	-,780	,205	14,504	1	,000	-1,181	-,378
Have people to talk to strongly agree	0ᵃ	.	.	0	.	.	.
People can be trusted strongly disagree	-,783	,917	,728	1	,394	-2,580	1,015
People can be trusted disagree	-,210	,451	,216	1	,642	-1,094	,674
People can be trusted not agree, not disagree	-,248	,337	,544	1	,461	-,909	,412
People can be trusted agree	-,074	,263	,080	1	,778	-,589	,441
People can be trusted strongly agree	0ᵃ	.	.	0	.	.	.
Rates trust in province 2 or less	1,511	,922	2,687	1	,101	-,296	3,318
Rates trust in province 3	1,091	,899	1,472	1	,225	-,672	2,853
Rates trust in province 4	,696	,787	,782	1	,377	-,847	2,240
Rates trust in province 5	1,359	,697	3,808	1	,051	-,006	2,724
Rates trust in province 6	1,100	,673	2,667	1	,102	-,220	2,419
Rates trust in province 7	1,284	,664	3,743	1	,053	-,017	2,585
Rates trust in province 8	,672	,660	1,036	1	,309	-,622	1,965

Rates trust in province 9 or 10	0[a]	.	.	0	.	.	.
Rates trust in second chamber 1	-,734	,887	,685	1	,408	-2,473	1,004
Rates trust in second chamber 2	,056	,998	,003	1	,955	-1,900	2,011
Rates trust in second chamber 3	,082	,795	,011	1	,918	-1,476	1,641
Rates trust in second chamber 4	,088	,740	,014	1	,906	-1,363	1,538
Rates trust in second chamber 5	-,437	,711	,377	1	,539	-1,830	,957
Rates trust in second chamber 6	,003	,690	,000	1	,997	-1,350	1,355
Rates trust in second chamber 7	,199	,685	,084	1	,772	-1,143	1,540
Rates trust in second chamber 8	,498	,680	,537	1	,464	-,834	1,830
Rates trust in second chamber 9 or 10	0[a]	.	.	0	.	.	.
Rates trust in justice 1	-,545	,942	,335	1	,563	-2,391	1,301
Rates trust in justice 2	-,354	,775	,208	1	,648	-1,873	1,166
Rates trust in justice 3	-1,822	,757	5,795	1	,016	-3,305	-,338
Rates trust in justice 4	-,292	,609	,230	1	,632	-1,486	,902
Rates trust in justice 5	-,642	,529	1,473	1	,225	-1,679	,395
Rates trust in justice 6	-,801	,494	2,635	1	,105	-1,768	,166

Rates trust in justice 7	-1,103	,478	5,331	1	,021	-2,040	-,167
Rates trust in justice 8	-,748	,460	2,644	1	,104	-1,649	,154
Rates trust in justice 9	-,683	,466	2,151	1	,142	-1,596	,230
Rates trust in justice 10	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Appendix D: Entire frequency table satisfaction contacts village/neighbourhood and happiness

tuinmanschap_bewanden_dorp_wijk

polv_V003 In welke mate vindt u zichzelf een gelukkig mens?	4,00 Count	4,00 Column Valid N %	5,00 Count	5,00 Column Valid N %	6,00 Count	6,00 Column Valid N %	7,00 Count	7,00 Column Valid N %	8,00 Count	8,00 Column Valid N %	9,00 Count	9,00 Column Valid N %	10,00 Count	10,00 Column Valid N %
1 Erg ongelukkig	1	2.9%	0	0.0%	3	2.0%	5	1.1%	1	0.2%	2	1.7%	0	0.0%
2 Ongelukkig	2	5.7%	4	7.4%	2	1.3%	3	0.7%	1	0.2%	1	0.8%	0	0.0%
3 Niet ongelukkig, niet gelukkig	12	34.3%	16	29.6%	26	17.3%	50	11.2%	40	7.7%	4	3.3%	2	7.7%
4 Gelukkig	16	45.7%	28	51.9%	84	56.0%	317	70.8%	348	66.8%	73	60.3%	9	34.6%
5 Erg gelukkig	4	11.4%	6	11.1%	35	23.3%	73	16.3%	131	25.1%	41	33.9%	15	57.7%