

The influence of COVID-19 on the happiness of Groningen residents



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Abstract

National and local governments deal with the COVID-19 pandemic in various ways and individuals react to this differently. Therefore, additional research is needed in various areas. This paper contributed to existing studies by focusing on the happiness of residents from Groningen, the Netherlands. The primary research question for this paper was as follows, "How did the COVID-19 pandemic influence the happiness of residents from Groningen?". In order to answer the research question, a questionnaire was developed. The questionnaire, containing questions on various factors that could influence respondents' happiness, was sent to five hundred addresses in Groningen. After data collection, analyses with a multiple linear regression as the most important statistical test led to various insights. Happiness, in general, seems to have decreased during the pandemic, while fear for infection, health and past happiness were significantly related to recent happiness. Therefore, it is argued that although most factors do not relate to happiness during the COVID-19 pandemic, three in particular are of interest for academics, planners and policymakers. Future research should further examine how happiness during the corona crisis was influenced, to make sure the happiness of people all around the world can be increased.

Keywords:

Happiness, COVID-19, pandemic, coronavirus, Groningen, the Netherlands, measures

Table of contents

1 Introduction	4
2 Theoretical Framework	5
2.1 Happiness	5
2.2 Happiness in planning	6
2.3 Factors influencing happiness	7
2.4 Happiness and COVID-19	8
2.5 Restrictions for Groningen residents because of COVID-19	9
2.6 Overview consequences of COVID-19 in the Netherlands	10
2.7 Conceptual Model	11
2.8 Hypotheses	12
3 Methods	12
3.1 Methodological approach	12
3.2 Methods of data collection	13
3.3 Methods of data analysis	15
3.4 Ethical considerations	16
4 Results	17
4.1 Background characteristics	17
4.2 Other questionnaire results	23
4.3 Qualitative exploration	33
4.4 GIS output	34
4.5 Other responses	36
4.6 Multiple linear regression	36
4.7 Backward and forward method	42
4.8 Simple linear regressions	43
4.9 Change in happiness and additional data	43
5 Discussion and conclusion	44
6 Reflection	47
7 Appendix	48
7.1 Letter for selected residents from Groningen	48
7.1.1 Dutch letter	48

7.1.2 English letter.....	48
7.2 Questionnaire.....	48
7.2.1 Dutch Questionnaire.....	48
7.2.2 English Questionnaire.....	51
7.3 overview of variables used in regression.....	53
7.4 SPSS output.....	54
7.4.1 Correlation matrix.....	54
7.4.2 Backward method.....	56
7.4.3 Forward method.....	58
7.4.4 Simple regressions.....	59
7.4.5 Multiple linear regression, happiness change.....	62
7.4.6 Multiple linear regression, 9 responses included.....	64
7.4.7 Multiple linear regression, 9 responses included.....	65
8 References.....	67

1 Introduction

In December 2019 a new coronavirus, which was named COVID-19 by the WHO, originated in China (Singhal, 2020; Hageman, 2020). This eventually influenced countries all over the world. Besides the direct physical health risk that is linked to COVID-19, economies were negatively impacted by the virus (Ahmad et al., 2020). The same is true for the well-being of individuals. For instance, Dymecka et al. (2020) found a significant relationship between COVID-19 and stress among Polish people. Furthermore, Yildirim & Güler (2021) argued that there is a negative relationship between COVID-19 and happiness. Comparable researches were done in various countries including Spain (Rodríguez-Rey et al., 2020). Rodríguez et al. examined various variables in relation with the COVID-19 pandemic. For instance, they looked at demographics, changes in daily life and concerns about the virus.

Although there are examples of existing studies that examined COVID-19 and the relation to the well-being of individuals, the problem is that both national and local governments deal with the global pandemic in various ways and individuals react to this differently. Therefore, additional research should be done in various areas. This paper contributed to existing studies by focusing on the happiness of residents from a specific city in the Netherlands, which is Groningen. The first coronavirus infection in the Netherlands can be traced back to the 27th of February in 2020 (Rijksoverheid, 2020), when a 56-year-old man who travelled to Italy a week earlier got infected (Alderweireld et al., 2020). In the following weeks, the number of infections increased and at the beginning of 2021, the situation was still worrisome (Rijksoverheid, 2021a). While a concise discussion on the measures in the Netherlands will follow, I refer to the paper written by Antonides & van Leeuwen (2020) for an elaborate analysis of the first months of the COVID-19 pandemic in the Netherlands.

For this study, residents from the city of Groningen were selected to see whether their experiences during the COVID-19 pandemic differed from people in other environments. In that way, an overview of the experiences of people in times of crises, in this case the COVID-19 pandemic, was given which could be useful for both current and future generations.

The primary research question for this paper was formulated as:

- “How did the COVID-19 pandemic influence the happiness of residents from Groningen?”

In order to answer this question, secondary questions were made. The first sub-question was formulated as:

- “What is happiness and how is it influenced?”

The previous question is about happiness in general and was answered by using existing literature. Next to the research on happiness and the factors influencing this, a specific focus was on the influence of COVID-19 on the happiness of people. The second sub-question belonging to this research is:

- “What are the implications of the coronavirus on the daily lives of residents from Groningen?”

As discussed, governments dealt differently with the coronavirus and the restrictions they set had a different impact on populations. That is why an overview was made of these restrictions, to understand how their lives during the COVID-19 pandemic was influenced. After this, measuring the influence on the happiness of Groningen residents was possible. The final sub-question is:

- “How does the impact of the coronavirus differ between groups of people?”

The latter question involves a comparison within the studied population. Although differences might exist between other populations, the same is true for differences within Groningen. For instance, younger people might respond differently to questions on happiness than older people. Also, specific attention was given to a possible relation between the location where someone within Groningen lived and happiness during the COVID-19 pandemic.

Overall, this paper aims to add to the existing literature on happiness and with regard to COVID-19 specifically. Not only should academics try to come up with ways to prevent comparable future crises from happening. Also, there should be careful analyses of how the corona crisis affected the world population because the crisis had consequences on the daily lives of many people all around the world. For academia in general but planners in particular, the current research can be seen as an indication of how the choices they make affect the happiness of residents. Even if the circumstances are unique and hard to predict, planners have to think about how the built environment and the situation of the people that live in this environment could be improved, in case a comparable situation would occur. Rather than waiting for the moment when life gets back to the way it was, lessons should be learned on how life looks like during these extreme circumstances. Results from this study could be specifically relevant for the municipality of Groningen, the Dutch government and social-spatial planners.

To contribute to the discussion on happiness during the corona crisis, several things were reviewed. In the next chapter, existing literature on happiness will be discussed. Thereafter, happiness in relation to planning will be shortly reviewed. Following, there will be a discussion on happiness in relation to the COVID-19 pandemic, specifically focusing on restrictions for residents from Groningen. Moreover, existing research was analysed in order to give an overview of how people in the Netherlands were affected by the coronavirus. Subsequently, a conceptual model and the hypotheses will further elaborate on what this research is about. Then, the methodology section discusses the data collection process, data analysis and additional considerations. Finally, the results, discussion and conclusion will follow including shortcomings of the current research and advice for future research on happiness.

2 Theoretical Framework

2.1 Happiness

A lot of research has been done on individual well-being and which factors influence this. Various approaches have been taken which is why it is important to make some distinctions. First of all, the concepts happiness and quality of life are not the same (Susniene & Jurkauskas, 2009). Susniene & Jurkauskas define quality of life as the "satisfaction of a person with current life dimensions in comparison with the pursued ideal quality of life" (Ibid., p.59). They further divided quality of life into the subjective and the objective. The objective side is about what society expects from you while the subjective side focuses on your individual feelings towards life (Ibid.). Both sides then exist of different layers. The subjective quality of life includes happiness, along with well-being, life satisfaction and meaning in life (Ibid.). They argued that these different layers can both influence each other as that they can influence quality of life (Ibid.). Happiness is thus one of the components of quality of life. Veenhoven (2001) also studied the difference between quality of life and happiness and came to similar conclusions. He also argued that happiness is subjective and one of the components of quality of life. However, while Susniene & Jurkauskas (2009) argued that well-being and life satisfaction are different layers within the subjective side of quality of life, Veenhoven emphasized that these are often used as synonyms of happiness. Ballas (2013) added to previous research on quality of life and happiness with a particular focus on cities. When studying how people feel in cities, academics often choose either objective measures or subjective measures (Ibid.). These

objective measures, like information on the physical environment, are related to quality of life (Ibid.). In contrast, subjective measures are related to studying happiness (Ibid.). The previous discussion shows that the concepts of well-being, life satisfaction, quality of life and happiness are closely related but that academics should be cautious when using these concepts. As discussed by Easterlin (2003), the data on previous concepts of individuals and groups are comparable. However, they are not exactly the same. This study specifically focused on happiness in both the use of secondary data and the collection of primary data, to avoid disagreement on whether certain concepts can be used to measure the same thing or not.

Now that we have established that there are several ways to analyse individuals' feelings about their lives, further analysis is needed of what happiness entails and how it is influenced. Some scholars divided happiness into psychological and subjective well-being (Linley et al., 2009). However, Linley et al. claimed that psychological and subjective well-being might be closely interrelated. For instance, how someone reports his/her subjective well-being can influence their psychological well-being. Veenhoven (2017) also claimed happiness can be linked to various concepts but used it as "the subjective satisfaction with life" (p2). Similarly, this paper studied happiness as being part of the subjective view towards an individual's life.

Still, there are several ways to approach and measure happiness. Kim-Prieto et al. (2005) argued that the field of subjective well-being, which includes happiness studies, can have three main approaches. The first one focuses on judgements of how people feel about specific global themes, e.g. work or family (Ibid.). The second approach focuses on how people felt in the past (Ibid.). This means people are asked about how they remember their feelings in a certain time frame. The third and final approach tries to measure how people feel multiple times within a certain period (Ibid.). Which approach a researcher takes directly relates to the kind of data that is collected. Hence, a careful explanation on which approach was taken and why was included in the following chapter.

Apart from different kinds of approaches towards analysing how people feel about their lives, scholars have studied which specific questions people should use when measuring happiness. Some academics used several questions about life satisfaction and combine these to come to a meaningful comparison (Linley et al., 2019; Öztürk & Mutlu, 2010). However, Abdel-Khalek (2006) compared, among other measurements, the Oxford Happiness Inventory and the Satisfaction with Life Scale, which both consist of multiple items, with a single question on happiness. He claimed that asking the question 'Do you feel happy in general' is enough to measure someone's happiness while being reliable, valid and viable. Veenhoven (2017) supported single questions for measuring happiness and claimed measurements included in the World Data Base of Happiness are useful when doing research on happiness. Same for the approach towards measuring an individuals' happiness, the previous suggestions were considered in the following chapter.

2.2 Happiness in planning

While happiness is widely reviewed by academia in different disciplines, a concise overview of the importance of happiness with regard to planning can be taken as an example of why research on this topic is relevant. Duarte et al. (2010) focused on the role of happiness in transportation planning. In their research, they argued transport happiness should be optimized considering people spend a lot of time travelling either via public or private modes of transport (Ibid.). Musa et al. (2018) looked into community happiness and found that higher urban sustainability is related to higher happiness. Similarly, O'Brien (2005) looked at sustainability and happiness but saw happiness is not much included in planning. However, linking sustainable happiness with planning for a sustainable future might lead to a more inclusive world (Ibid). O'Brien & Tranter (2006) built further on the latter, the inclusion of marginalized groups. According to their research, walking and cycling possibilities should be thought through as it is related to the happiness of children (Ibid.). Another research in Egyptian

neighbourhoods focused on the relationship between so-called ten-minute neighbourhoods and citizens happiness (Elshater, 2016). Elshater argued that the maintenance and design of streets in these neighbourhoods are essential for achieving a happy neighbourhood. While the previous authors all look into different domains of planning in relation to happiness, it does show how happiness and planning can be interrelated. Similar in this paper, recommendations for planning practitioners were given after happiness in relation to COVID-19 was discussed.

2.3 Factors influencing happiness

After the discussion of the definition of happiness, approaches towards measuring happiness and happiness in relation to planning in the previous sections, different factors that influence happiness were examined. First of all, apart from various other factors, people their happiness is influenced by their genetics (Susniene & Jurkauskas, 2009; Weiss et al, 2009; Easterlin, 2003). The role of genetics is something that has to be kept in mind while reading this research, as it was not included as a factor. What is somewhat related to this, is trends in levels of happiness. In The World Happiness Report (Banks et al., 2021), changes in mental health levels based on the specific season were used as an explanatory factor of how the collection of data at a specific point in time can differ from data retrieved at multiple moments in time. Smith (1979) also acknowledged the importance of controlling for seasonal trends in his research and did so by only using data that was from approximately the same moment in each year. In addition, Lucas & Donnellan (2007) argued life satisfaction measures, like in this case happiness, are very stable in the short term. Further, academics have analysed demographic and socio-economic factors in relation to certain levels of happiness of individuals. For instance, Veenhoven (2001) said age and gender do not relate to happiness in many countries. On the other hand, education and income show varying results (Ibid.). Mostly in poorer countries, large differences in happiness in relation to education and income exist (Ibid). Other factors that have been discussed are employment, marital status and religion (Ibid.). Ballas (2013) also gave an overview of existing findings of happiness studies. He divided those findings as pertaining to individual, household and contextual characteristics. A few examples are that older and younger people are often expected to be happier; females tend to be happier than males; people with a higher income are often somewhat happier; unemployment is related to lower rates of happiness as well as the termination of relationships and a lower health status (Ibid). Finally, the location where people live can influence happiness (Layous & Lyubomirsky, 2013). Regarding the residential location of individuals, green space has received increasing interest. Fesharaki et al. (2020) argued that green space is increasingly important for the happiness of people. Also, they argued that the positive relationship between happiness on a country level and urban green space became stronger for countries with a higher GDP. Kwon et al. (2021) did similar research by comparing several countries based on satellite images and found that indeed, for the wealthiest countries, a relationship between urban green space and happiness was found. Herzele and de Vries (2011) also looked at green spaces but did so by focusing on a smaller scale. By comparing two neighbourhoods, they found that a greener neighbourhood leads to more happiness among its residents (Ibid). Cheng (2020) looked into the effects of green space on happiness in China and found that the background of individuals matters. Cheng discussed the findings that green space can lead to positive as well as negative effects on people their happiness, depending on their income. The different examples of happiness research in relation to green space show that frequently a significant relationship was found. However, differences in this relationship might exist between countries and individuals.

While a lot of factors were previously mentioned, there are a lot of other things in life that can influence somebody's happiness. Although examining all these factors influencing happiness does not lay within the scope of this paper, a short discussion on some additional studies can give an

idea on what happiness research has further focused on. A few examples will follow. Ballas & Dorling (2007) looked at things that made individuals in the United Kingdom more or less happy. Their main findings were that interpersonal relationships and being respected at work are most important for happiness. Specifically, a difference was made between static situations and dynamic events to show that the latter is the main contributor to one's happiness (Ibid.) According to Layous & Lyubomirsky (2013), activity features and personal features can contribute to how someone experiences certain activities. Using a positive-activity model, they demonstrated how increased well-being can be achieved (Ibid.). Through behavioural strategies described in the article of Layous & Lyubomirsky, happiness can be increased. Ballas (2013) emphasized the need to focus on the role of social inequality, spatial inequality, social justice and social cohesion. The previous factors seem to play an important role in the happiness of individuals (Ibid.). Further, Ballas (2013) argued interdisciplinary research could be particularly interesting for additional research within the fields of quality of life and happiness.

As said, the factors described in this section were not all included for an analysis of the coronavirus and happiness. Instead, the demographic background, socio-economic background and residential location of individuals or factors directly related to COVID-19 in relation to happiness were included as variables. Because there were varying conclusions and several different factors that were related to happiness in the studies mentioned in this section, researching which factors were related to the happiness of Groningen residents during times of a crisis gave new insights.

2.4 Happiness and COVID-19

It could be true that new factors, that were not taken into account in research earlier, are in relation to happiness during the COVID-19 pandemic. However, some research already exists on the consequences of the COVID-19 pandemic in relation to happiness. For instance, Yildirim & Güler (2021) analysed the consequences of the COVID-19 pandemic on individual well-being in Turkey. One of their conclusions was that a higher perceived risk due to COVID-19 relates to lower happiness of individuals. An explanation is that measures taken to prevent the virus from spreading can make individuals feel insecure about the future (Ibid.). While The World Happiness Report reported that fear for the coronavirus was low in the Netherlands, it could still be of influence (cited by NLTimes, 2021). Especially considering the fact that other researchers have found increasing feelings of fear in relation to the coronavirus (Mertens et al., 2020; Doshi et al., 2020; Ahuja et al., 2020), this is something that needed to be taken into account. Similarly, Gubler et al. (2020) discussed what the measures taken by governments all over the world meant for the well-being of their citizens. One of their topics interesting for this study was that isolation because of COVID-19 related measures can lead to lower well-being (Brooks et al., cited by Gubler et al., 2020). Greyling et al. (2020a) focused on what a lockdown meant for the happiness of people. They came to the conclusion that when governments would not go into lockdown, which was linked to more coronavirus infections, this is related to higher happiness in comparison to a lockdown with fewer coronavirus infections. Similarly, Greyling et al. (2020b) compared happiness during a lockdown between South Africa, New Zealand and Australia while taking into account their different characteristics. For all three countries, a lockdown negatively impacted the happiness of people (Ibid.). Also, stricter measures led to more negative effects on happiness (Ibid.). Although the previous academics focused on different contexts and had varying approaches for their research, they seem to agree that the COVID-19 pandemic is related to negative consequences for people their happiness.

Other research has shown that particular groups of people were harmed by the COVID-19 pandemic. For instance, a study in Greece during a lockdown period showed that men seem to be more vulnerable when it comes to life satisfaction and people who are 40-64 years old are less satisfied than older people (Anastasiou & Duquenne, 2021). Other findings showed that Greeks had

challenges during the pandemic concerning psychological and psychosomatic disorders, employment and the use of social media (Ibid.). Another interesting thing Anastasiou & Duquenne found, is that geographical characteristics like urbanity and insularity do not seem to influence people their life satisfaction. Parkes et al. (2020) focused on the role of financial hardship during the COVID-19 pandemic in the UK and argued it is important to support minorities that are less prosperous, because of the impact financial hardship has on an individual's well-being. Other specific findings were that one out of three students in the Netherlands rated their life during the pandemic as insufficient (NU.nl, 2021). Also, parents with cohabiting children and people who are uncertain about their income felt relatively unhappy due to the coronavirus pandemic (Wijngaards, 2020, cited by NU.nl, 2020). Further, a study in the Northern Netherlands showed that the quality of life of people of all populations groups has declined because of COVID-19 (Lifelines Corona Research, 2021, cited by The Northern Times, 2021). Antonides & van Leeuwen (2020) argued that people living in an urban environment might have a higher decrease in their well-being as compared to people living in rural areas. Moreover, older and younger people were most impacted by the situation (Ibid.). The preceding overview shows once again how differences exist between which part of the population is most heavily affected by the COVID-19 pandemic and emphasizes the need for further analysis in different contexts.

2.5 Restrictions for Groningen residents because of COVID-19

Groningen is an attractive city, particularly for students, in the northern Netherlands with approximately 233.000 people residing in the wider municipality (CBS, 2017; Allecijfers, 2020). As governments all over the world have posed different restrictions in order to combat the number of coronavirus infections, an overview of these in Groningen was needed as well. The Netherlands approached the virus differently than many other countries in a way that it was more about individual responsibility and self-discipline (Antonides & van Leeuwen, 2020; Kuiper et al., 2020). Also, scientists guided the government in what they should do to combat the virus (Antonides & van Leeuwen, 2020).

Most measures against the coronavirus in the Netherlands were taken in order to increase the physical distance between individuals and decrease the number of contacts (Backer et al., 2021). Since the beginning of the COVID-19 pandemic, the government of the Netherlands has sometimes increased or decreased the amount and strictness of measures, depending on the number of corona infections and hospitalised patients (Ibid.). In January 2020, the first messages about the coronavirus in foreign countries came into being (Rijksoverheid, 2020). In February 2020, the first Dutch corona infection occurred, followed by the first partial lockdown in March (Ibid.). While the government continued the measures in April, this was planned to become more flexible in May and June (Ibid.). However, in the following months, the number of infections rose, with a more extensive lockdown in November 2020 as a consequence (Ibid.). At the beginning of 2021, on the one hand, stricter measures were taken (RIVM, 2021). On the other hand, exceptions were made for some shops, contact professions, nursing homes and outside sports (Ibid.). However, the third wave of infections was expected to come somewhere at the end of April (Rijksoverheid, 2021b). When the peak of the third wave of corona infections and particularly the number of hospitalized patients would be over, plans would start to decrease the number of measurements and to start getting back to life without physical distancing (Rijksoverheid, 2021c). Because there was a lot of uncertainty about predictions of the number of corona infections, this could have an impact on the happiness of people in the Netherlands whenever the situation worsened. This underlines the difficult situation that both the government and the people were in during the COVID-19 pandemic.

In the case of Groningen, twelve general measures can be distinguished which also have been used in Lifelines Corona Research Project (2021). These measures include sneezing in your

elbow, using paper tissues, no handshaking, keeping distance, staying at home, working from home, receiving little visitors, avoiding busy places, not visiting health risk groups, letting the same person visit health risk groups, travelling domestically only if necessary and travelling abroad only if necessary (Ibid.). Other specific measures set out by the government that are specifically related to a lockdown include closing restaurants and bars, closing the cultural sector, limiting social contact, avoiding contact professions, teaching at home, closing indoor sports, closing outside sports and avoiding sports competitions (Ibid.). Also, people had to wear a face mask in most public spaces and a curfew was set for several weeks (Veiligheidsregio Groningen, 2021). From January 2021 and onwards, The Netherlands started to vaccinate people (Veiligheidsregio Groningen, 2021). The latter led to fewer restrictions, although uncertainty remained.

A study in China has shown that confidence in the way in which the government tries to decrease the number of coronavirus infections leads to higher levels of happiness (Lu et al., 2020). During the start of the COVID-19 pandemic, most people believed in the effectiveness of the measures set out by the Dutch government (Meier et al., 2020) and also complied with these measures because they are intrinsically motivated (Kuiper et al., 2020). When people would have to adhere to rules for a long time, however, this could lead to less compliance (Ibid.). The latter is what happened in some cases in the Netherlands when people demonstrated and revolted against the curfew almost a year after the start of the pandemic (Trouw, 2021). Although less visual, similar developments could have occurred when it comes to the happiness of individuals. At the start of the COVID-19 pandemic, people might not have felt less happy because they saw this as something that would soon be over. However, after more than a year people might have felt differently, considering the virus, as well as a lot of the related measures, were still present.

2.6 Overview consequences of COVID-19 in the Netherlands

The previous section showed how the daily lives of Groningen residents were affected sometime during the pandemic. Apart from the measures taken by the government and the research on COVID-19 in relation to happiness, other research on the consequences of COVID-19 can give an indication of how people in the Netherlands were affected by the pandemic.

Next to the direct health risks of the coronavirus, clearly described by Oudkerk et al. (2020), there are also indirect risks. As Dinmohamed et al. (2020) namely showed, there is a decrease in cancer diagnosis among people from all age groups and all locations in the Netherlands. This can be explained by the postponement of health diagnoses, barriers for individuals to visit health care, delayed hospital referrals and a halt on national screening programmes (Ibid.). Similarly, the number of organ donations and transplantations has decreased in the Netherlands since the outbreak of COVID-19 (de Vries et al., 2020). Another indirect negative consequence on health relating to the coronavirus is unhealthy eating behaviour by people who are obese or overweight (Poelman et al., 2021). Furthermore, Gietema et al. (2020) looked into the accuracy of diagnosing the coronavirus. They argued that although a CT scan is quite accurate in diagnosing COVID-19 and gives immediate results, the risk of missing COVID-19 infections makes it unsafe to completely rely on CT scans rather than using a PCR test. The previous researches show how the coronavirus was both directly and indirectly responsible for negative health risks among the Dutch population.

Besides, the COVID-19 pandemic resulted in negative consequences for the Dutch economy. For instance, Wang et al (2020, cited by Şenol & Zeren, 2020) found that the value of the Dutch stock market decreased in the first months of the COVID-19 pandemic. Furthermore, Hassink et al. (2020) discussed negative outcomes of the labour market as a consequence of the lockdown introduced by the Dutch government. Especially for people that had to close their businesses for a long time (e.g. restaurants), as discussed in the previous section, financial problems were present. However, there are examples where the Dutch government tried to lower the negative consequences for the

economy. For example, Kuiper et al. (2020) discussed economic compensation by the Dutch government for companies as an example that was aimed to lead to less negative consequences.

Other research exists on COVID-19 related issues. Chorus et al. (2020) for instance, studied the willingness of Dutch residents to accept certain trade-offs between effects on health, economy, education, and personal income. In other words, people were asked whether they would accept COVID-19 fatalities if this would imply the impact of a lockdown would be partly avoided. The outcomes of their experiment show how large differences are present among the Dutch population when it comes to COVID-19 related measures. This means that within the population, there are varying views on which factors, like health, economy, education, and personal income, should be most important. Interestingly, while heterogeneity among the population is partly explained by socio-demographic characteristics, also whether individuals have a relative that has been infected with the coronavirus turned out to be an explanatory factor (Ibid.). The last-mentioned factor was also included in this research as a potential relational factor with happiness during the pandemic.

Also, a possible relationship between religion and the spread of the coronavirus in the Netherlands was researched by Vermeer & Kregting (2020). Vermeer & Kregting concluded that there is indeed a relationship, both because of church attendance and because of church membership. This comes down to the spread of the coronavirus via religious services and more indirectly via related cultural gatherings or strengthened non-religious social bonds (Ibid.).

Other interesting research was done on travel behaviour and other activities among the Dutch population during the COVID-19 pandemic (de Haas et al., 2020). As de Haas et al. argue, several mobility changes could be seen in the Netherlands during a so-called intelligent lockdown. For instance, 80% of the respondents claimed they decreased their activities outside their homes. Also, while students and pupils were mostly unhappy with their education being at home, people that had to work from home experienced this as more positive (Ibid.). While this behaviour could be temporary, it shows once more how different groups of people experienced life during the COVID-19 pandemic differently.

2.7 Conceptual Model

The previous sections include several factors that were taken into account for this research. A visualisation of what was analysed is shown in figure 1. The central concept for the research is happiness, particularly of residents from Groningen one year into the COVID-19 pandemic. This central concept will be tested using a questionnaire, which is discussed in the following chapter. In the circles surrounding the central concept, potential relational factors are described. This study tried to analyse whether happiness during the start of the COVID-19 pandemic, socio-demographic factors, location and/or factors related to the coronavirus were in relation to the happiness of Groningen residents one year later during the COVID-19 pandemic. Because it tests both the recollection of an individuals' happiness one year ago as the level of happiness one year later, analysis of this data told more about whether COVID-19 influenced happiness in general (i.e. whether people report lower happiness one year after the start of the pandemic as when asked about the situation during the start of the pandemic) and which factors were in relation to happiness one year after the start of the pandemic.

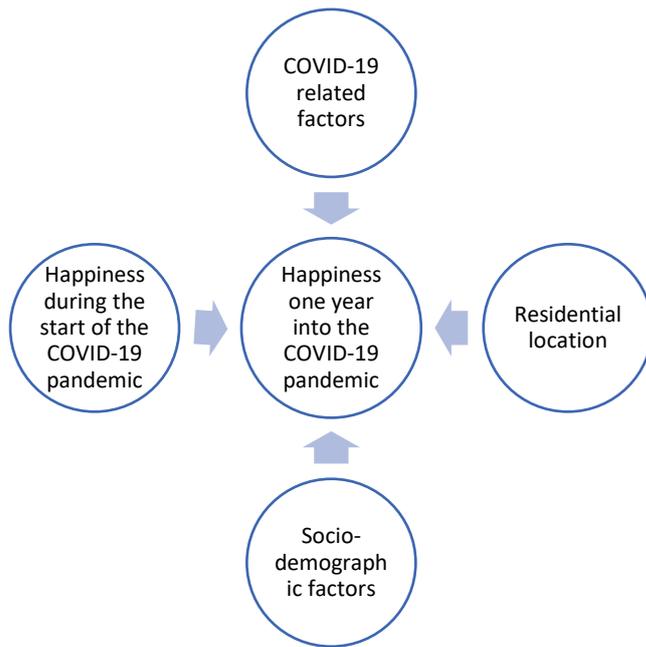


Figure 1, conceptual model

2.8 Hypotheses

Considering this was mainly a quantitative study, different hypotheses were formulated. These hypotheses were based on the conceptual model. The null-hypotheses were defined as:

H01 "Socio-demographic factors do not influence the happiness during the COVID-19 pandemic".

H02 "The location where someone lives does not influence happiness during the COVID-19 pandemic".

H03 "Happiness one year into the COVID-19 pandemic has not decreased as opposed to happiness during the start of the pandemic".

H04 "Happiness during the start of COVID-19 does not relate to happiness one year later".

H05 "Specific COVID-19 related factors do not influence happiness during the pandemic".

When certain null hypotheses would turn out to be false, alternative hypotheses had to be formulated. The alternative hypotheses were defined as:

H1 "Socio-demographic factors do influence the happiness during the COVID-19 pandemic".

H2 "The location where someone lives does influence happiness during the COVID-19 pandemic".

H3 "Happiness one year into the COVID-19 pandemic has decreased as opposed to happiness during the start of the pandemic".

H04 "Happiness during the start of COVID-19 does relate to happiness one year later".

H05 "Specific COVID-19 related factors do influence happiness during the pandemic".

After data analysis, conclusions were made related to specific factors that are part of the concepts used in the hypotheses.

3 Methods

3.1 Methodological approach

There are multiple approaches to studying the happiness of individuals and other individual perceptions. From an ontological perspective, this research took an idealistic approach. Idealism is based on the belief that the mind influences the way someone looks at reality (Rawnsley, 1998). The

latter was essential to this research, as people were asked about their happiness and possible relational factors were included in the analysis. Knowledge of how these people look at reality was researched using a questionnaire. To be more exact, the questionnaire was used to analyse the attitudes of residents from Groningen, which makes it an example of attitudinal surveying (May, 2011). The epistemological view that is linked to this is logical positivism. This view claims that experience is linked to people their believes while the corresponding scientific process presumes to be able to test and replicate this (Rawnsley, 1998). As the following sections will further emphasize, central in this research was testing data on the beliefs of Groningen residents with possibilities for repeating comparable research. While the main approach to finding out how Groningen residents looked at life during COVID-19 was focused on gathering quantitative data, the existing literature was used to decide which variables should be included and how eventual conclusions might differ with existing views on this topic.

3.2 Methods of data collection

Central to being able to acquire information on respondents' lives in relation to the happiness of Groningen residents, was getting enough responses. When more responses were given, the statements linked to this come closer to the true opinions of Groningen residents as a whole. With the help of Geodienst Groningen, a list of addresses in Groningen was retrieved. From this list, 500 addresses were randomly selected using excel. First, a column with varying numbers between 0 and 1 was made. Then, they were ranked based on this column from low to high. To the first 500 addresses, a letter including the link to google forms with the questionnaire and some necessary information (appendix 7.1) were sent in the hope of collecting a representative number of responses. Simple random sampling was chosen because every person within the population has an equal chance to be selected, which causes generalisability of results and representativeness of the sample (Acharya et al., 2013). Furthermore, the length, design and readability of the questionnaire were of interest, as it influences the response rate (Punch, 2011). The choice for including all people above 18 years old was made because it accounts for a specific analysis of how the happiness of different age groups within the population is influenced. As shown in section 2.4, it is possible that specific groups of people are influenced more negatively by the pandemic in comparison to others.

As discussed, quantitative surveying was chosen for this research. The questionnaire for this study was a self-administered method, which means there does not have to be face-to-face contact (Punch, 2011). Regarding the COVID-19 pandemic, this was an obvious, yet major advantage. Another advantage of using a questionnaire is that it is easier to get a lot of responses in comparison to the use of other methods (Gillham, 2007). Considering that a lot is yet unknown about the impact of COVID-19 on individual happiness, questionnaire data can be an important starting point for further research. Especially because this study tried to capture a lot of people with different backgrounds, a quantitative study offered more opportunities.

Researching in a valid and reliable manner is central to empirical research (White, 2011). Validity can be divided into internal and external validity. Internal validity, measuring what researchers claim to measure (Ibid.), was achieved in this study by formulating questions as straightforward as possible. Respondents should not interpret questions in a different manner so that they indeed give the answers this research aims to capture. External validity, whether results can be generalised (Ibid.), was achieved through the sampling technique discussed earlier. The fact that every adult resident from Groningen was included in the sampling, made generalisation of the results possible. Whether the results would be comparable in other contexts is debatable. On the one hand, Dutch residents, in general, might have similar feelings as residents from Groningen. On the other hand, location, in general, might influence an individual's happiness and governments in other countries dealt differently with the COVID-19 pandemic. Reliability, consistency and

replicability of research (Ibid.), was reached because the same questionnaire can be distributed in other contexts as well. Although different measures were taken in other countries, only minor changes would make it possible to replicate the data collection. The fact that existing literature was used to select potential factors that influence happiness confirms the reliability of this research.

The questionnaire consisted of three sections (Appendix 7.2). Based on analysis of the literature in chapter 2 the following demographic, socio-economic and other background characteristics of the respondents were included in section 1 of the questionnaire: age; gender; income; employment; marital status (Veenhoven, 2001; Ballas, 2013); education (Veenhoven, 2001); religion (Veenhoven, 2001; Vermeer & Kregting, 2020); Health status (Ballas, 2013); residential location; green space (Layous & Lyubomirsky, 2013); financial hardship (Parkes et al., 2020). The hypotheses that are directly linked to the first section are **H01** and **H02**.

Section 2 was about how people rate their happiness and how people would evaluate the impact of the coronavirus on their lives. The questions about happiness were based on a question included in the World Data Base of Happiness, "If you evaluate how happy you were last year, how many points can you score?" (Veenhoven, n.d.), in combination with The World Happiness Report (, Helliwell et al., 2020), where life evaluations were frequently measured on a scale from 0 to 10. As discussed in chapter 2.1, ways to measure subjective well-being can be divided into three main approaches (Kim-Prieto et al., 2005). In this study, the choice was made to ask people about their happiness in the past. As both questions were about happiness at the same time in the year, seasonal trends as discussed in The Happiness Report (Banks et al., 2021) and by Smith (1979) were controlled for. The question on the impact of the coronavirus on an individual's life was added to see whether there is a relationship with happiness. Further, the open answer question on the main influential factor in an individual's life was included because it aimed to find out whether the coronavirus was actually seen as the most influential factor or whether there is something else that had to be thought of when analysing the data. Something similar was done by Cark and Oswald (2002, cited by Ballas & Dorling, 2007). The other open answer question was added to specifically unravel how the coronavirus influenced an individual's life. Regarding the hypotheses, section 2 focuses on **H03**, **H04** and **H05**.

The third and final section consisted of statements concerning specific COVID-19 related factors and made a further analysis of **H05** possible. More specifically, in the third section people were asked about the following factors related to the discussed literature in chapter 2: whether the respondent has been infected with the coronavirus, as part of health status (Ballas, 2013); whether family/friends of the respondent have been infected with the coronavirus (Chorus et al., 2020); the respondents' perceived risk towards the coronavirus (Yildirim & Güler, 2021); how respondents looked at the measures taken by the government (Ibid.; Gubler et al., 2020; Lu et al., 2020); whether respondents felt isolated (Gubler et al., 2020). Also, people were able to give comments after they finished the questionnaire, which would lead to more qualitative information.

Next to the questionnaire data, analysis with the use of the tool GIS gave additional information about how the happiness of Groningen residents during the COVID-19 pandemic might have been influenced. While people were asked about the quality of local public green space, the distance to public green space gave additional information on the influence of residential location and distance to green space in relation to happiness. As most respondents gave their postal code, it was possible to see whether they were living close to green spaces. This was done by using data on recreational green spaces from BBG (bestand bodem gebruik), retrieved from Geodienst Groningen, from which the recreational green spaces in the city of Groningen were visible. After this, a buffer of 300 metres showed which areas in Groningen were within a distance of 300 metres from these recreational green spaces. A buffer of 300 metres was chosen because research in the UK found that when individuals live within this distance to green space, this relates to improved mental well-being

(Houlden et al., 2019). Next, the postal codes gave specific information on which respondents were and were not living in the vicinity of parks.

3.3 Methods of data analysis

As said, the different data consisted of Likert-scale data from 0 to 10, nominal data and ordinal data. Most of the data was used in a multiple linear regression in SPSS, which examines how several independent variables account for the variability of a dependent variable (Burt et al., 2009). However, before this regression was done to see which factors were in relation to the happiness of the respondents, certain changes had to be made. First, in excel the columns containing the questions were transformed into shorter descriptions of the data and missing data was checked. Whenever a question was not applicable, whenever respondents rather not answered a question and whenever respondents did not fill in an answer this was replaced by 97, 98 or 99 consecutively. When one of the previous three things applied, this was not included as a category for the regression analysis of the different variables.

Then, some other things had to be considered within SPSS. First, Likert-scale data can be treated as interval data which means it could be included in the multiple linear regression (Albaum, 1997). Secondly, nominal and ordinal data were partly recoded into dummy variables so that they could be included in the regression as well. Specifically, gender was recoded with females as the reference category. Educational level was recoded into a dummy variable with 'University' and 'Hbo' as the reference category, to make sure the data is compared to higher educated respondents. When it comes to employment, a dummy variable was made where full-time workers, part-time workers and retired people were part of the reference category. Next, for relationship status, people that answered they were single were part of the reference category. For religion, the reference category existed of people for whom religion plays a role in their life. For personal infection and infection of family/friends with the coronavirus, a dummy with no infection as the reference category was created. Finally, income was recoded into a dummy variable where no decline in income was the reference category. Considering respondents were asked about their current or previous occupation (questions 6 and 7), an overview of the different occupations was also needed before it could be included in the statistical analysis. According to Holland (1994), six types of personalities corresponding to six types of occupations exist. These types exist of realistic, investigative, artistic, social, enterprising and conventional. After a division of the respondents according to the 6 different types of occupations, a dummy variable was made with investigative and conventional types of occupation as the reference category.

Other nominal data which was not included in the multiple linear regression was used in word clouds and tables to show what respondents' main answers were. Although several changes could have been made before the creation of these word clouds, only some minor adaptations were done. To make sure the word cloud came closest to the answers that were given, the choice was made to not make any changes, except for translating the answers of the English respondents into Dutch. For instance, whenever someone named corona as an influence on life, this was not changed to COVID-19 to make sure both descriptions were included as one. However, certain basic words like articles and linking words were deleted from the answers when creating additional tables to make sure only keywords were used. Further, open questionnaire responses were interpreted in a different sub-heading to show how respondents looked at the questionnaire, the corona pandemic and more.

Next to the data that was used for these word clouds, most variables were taken into account within the regression to see whether specific characteristics of respondents or other factors were in relation to happiness during the COVID-19 pandemic. For question 1 of the questionnaire, no data was used. This was partly due to the fact that many respondents answered they lived in a different neighbourhood and partly because most respondents gave their postal codes. As discussed,

the residential location could be derived from these postal codes, which was used to see whether respondents were within close distance to green space. First, point features were added to the map which represented the postal code. Some respondents only gave the 4 numbers of their postal code, which caused less precision for their residential location. When respondents gave the postal codes including the two letters, a more precise point feature could be added. These point features corresponded with the location of the postcodes according to the search engine postcodebijdres (2021). This was done for all the respondents that gave their postal code. To make this useful for statistical analysis, a dummy variable was created where respondents that did not live within 300 meters from public parks were part of the reference category. An additional dummy variable was made which does not include the postcodes of respondents that only gave the 4 numbers of their postcodes. This was done to see whether this would lead to a different relationship between residential location, green space and happiness. Again, people that did not live within 300 metres from public parks were part of the reference category.

3.4 Ethical considerations

Doing research includes thinking about being ethical: thinking about whether “some particular action is right or wrong” (Mackie, 1977, cited by Krishnamurthy, 2011). In the distribution of the questionnaire that was used for this research, several things had to be taken into account with regards to doing right by the respondents. First of all, some information was asked from the respondents which could be seen as sensitive. This is why the anonymity of their answers was essential. Furthermore, some people might not want to answer certain questions even if anonymity is assured. Also, considering the fact that people might have had a hard time during the COVID-19 pandemic, questions could have been confronting. The previous examples were considered in the development of the questionnaire and the letter that was sent to the selected addresses. Firstly, it was explained in the letter that it will not be possible to find out who filled in the questionnaire from the data. Secondly, people were told they can stop the questionnaire whenever they feel uncomfortable. Thirdly, the letter included information on what the data would be used for. Moreover, questions were either set as optional or people could indicate they rather not answered a question. The latter could result in a lack of data. However, the formulation of the questions is hoped to prevent this. Also, some questions were formulated in such a way that people might feel less inconvenience in answering them (E.g. people were not asked about their income, but whether their income has declined during the pandemic). A final point that had to be considered was the positionality of the researcher. Within the research process, there are moments when personal values can influence the outcomes of the study (May, 2011). These can be described as “Interests leading to research; Aims, objectives and design of research project; Data collection process; Interpretation of the data; The use made (or not) of the research findings” (Ibid.). In the case of the former two examples, the only thing I can do is acknowledge the fact that it was indeed my personal interest that led to researching this topic and this is also what partly forms the aims of the research project. Also, there were personal opinions on life during the COVID-19 pandemic but this did not influence the main outcomes of the study. In case of the latter four examples mentioned by May (2011), and preventing this from influencing the research, the fact that existing literature was used in the development of the questionnaire and the fact that SPSS will be used to analyse the primary data made it possible to come to accurate conclusions. Furthermore, literature on COVID-19 and happiness was used to analyse whether outcomes of the questionnaire data confirmed or opposed existing findings on the topic. In this way, a critical focus on the outcomes of the study was given.

4 Results

4.1 Background characteristics

This chapter reviews the data that was gathered via the online questionnaire. First, a general description of the number of responses and the background of the respondents will be given. Next, word clouds containing the answers to two of the open questions will be analysed, to see how the lives of respondents were impacted the past year in general and specifically in relation to the coronavirus. Moreover, the outcomes of the GIS analysis for distance to public green space will be shown. Finally, the output on the multiple linear regression will be reviewed.

While 500 letters were sent to addresses throughout the city of Groningen, 7 of them returned because there was no post-box on the address or a wrong address was used. After correcting for three double responses with the exact same data at the same moment of submission, 49 useful responses were given between 9 and 18 April 2021. This comes down to a response rate of around 9.9%. After the 20th of April, 9 other responses came in, leading to a response rate of 11.8%. However, as will be explained later, these other responses were included in a separate analysis.

Following, a description of the background of the respondents is given. First, an analysis of all responses on the questions about age, gender, education, occupation, relationship, religion, income, personal corona infection, infections of family/friends and neighbourhood is done.

The respondents were approximately 46 years old with a standard deviation of around 19 years (table 1). The youngest respondent was 20 years old, while the oldest respondent was 87 years old. What stands out in the histogram (figure 2), is that a specific high number of respondents were in their mid-twenties.

Statistics		
Age		
N	Valid	49
	Missing	0
Mean		45,63
Std. Deviation		19,379
Minimum		20
Maximum		87

Table 1, statistics age of the respondents

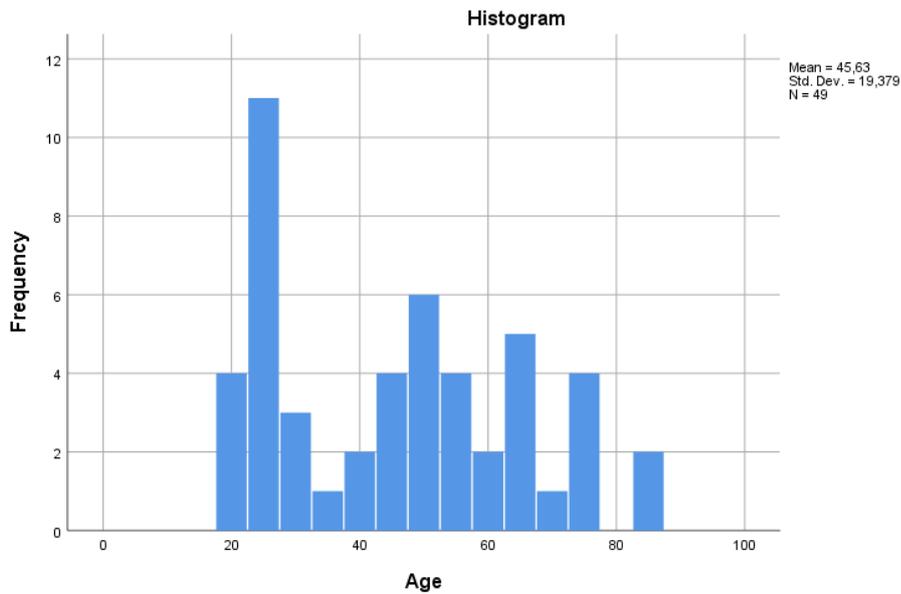


Figure 2, histogram on the age of the respondents

In figure 3, an overview of the gender of the respondents is given. While 2% (one person) answered to rather not tell the gender, 53% and 45% of the respondents answered female and male consecutively.

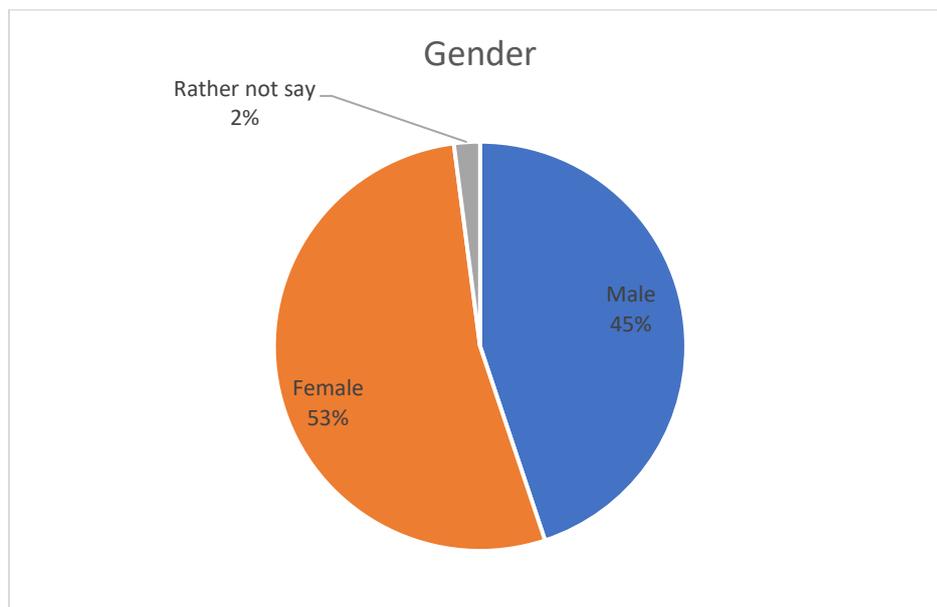


Figure 3, gender of respondents

Various answers were given for the highest finished education of the respondents (figure 4). The highest proportion of the respondents finished university (35%), followed by Hbo (higher professional education, 31%), High school (24%), Mbo (secondary vocational education, 8%) and lower than high school (2%). This shows that a lot of people finished additional education after high school, although there was also a considerable number of respondents that only (yet) finished high school education.

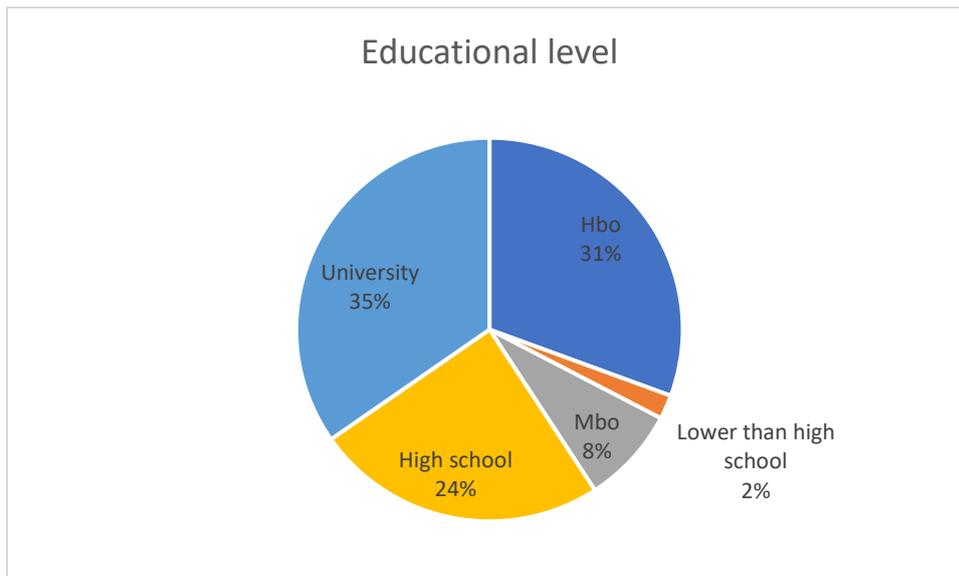


Figure 4, education of respondents

For question 5 of the questionnaire, What applies to you the most?, all answers were selected (figure 5). Most respondents were full-time working (39%). Next, 21% was retired, 16% was a student and 12% was part-time working. Finally, 10% of the respondents were unemployed at the time of submission and 2% rather not said what their main occupation was.

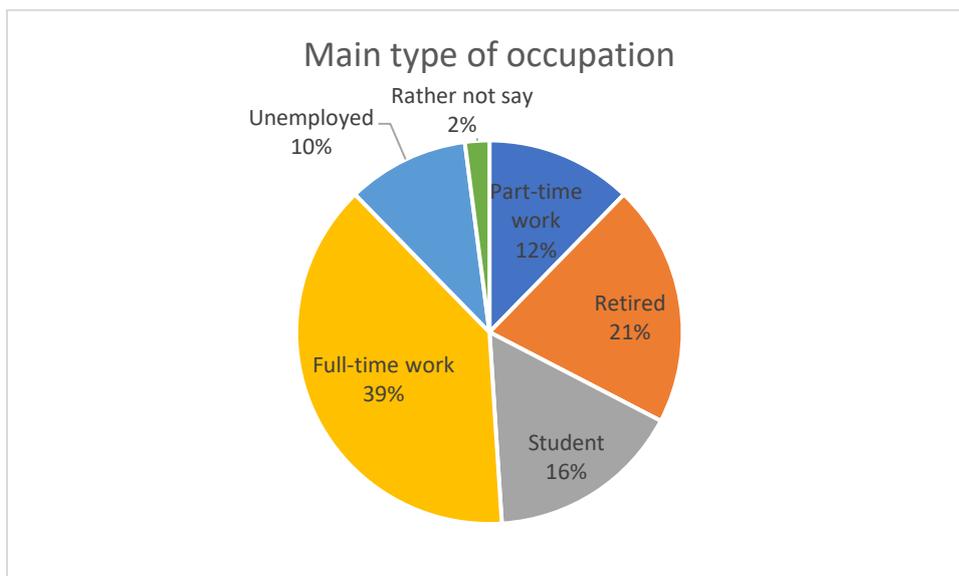


Figure 5, main occupation of respondents

For question 8 of the questionnaire, whether people were in a relationship and cohabiting or not, most people answered they were single (47%, figure 6). Next, 39% were cohabiting with a partner and 12% was in a relationship but did not live together. Finally, 2% of the respondents rather not answered the question.

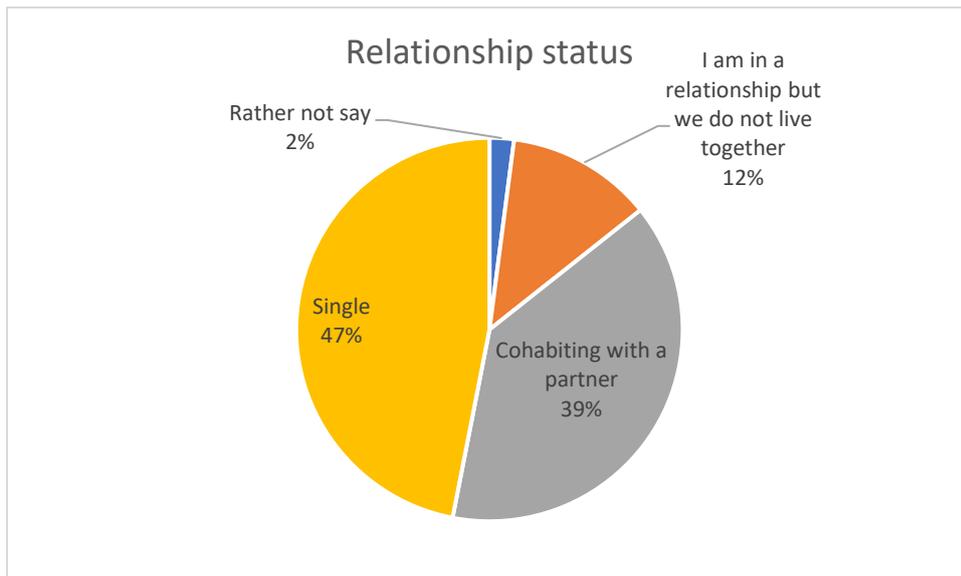


Figure 6, relationship of respondents

Figure 7 shows whether religion played a role in a respondents' life during the time of submitting the answers on the questionnaire. Again, 2% rather did not want to answer this question. However, 71% and 27% answered religion did not play or did play a role consecutively.

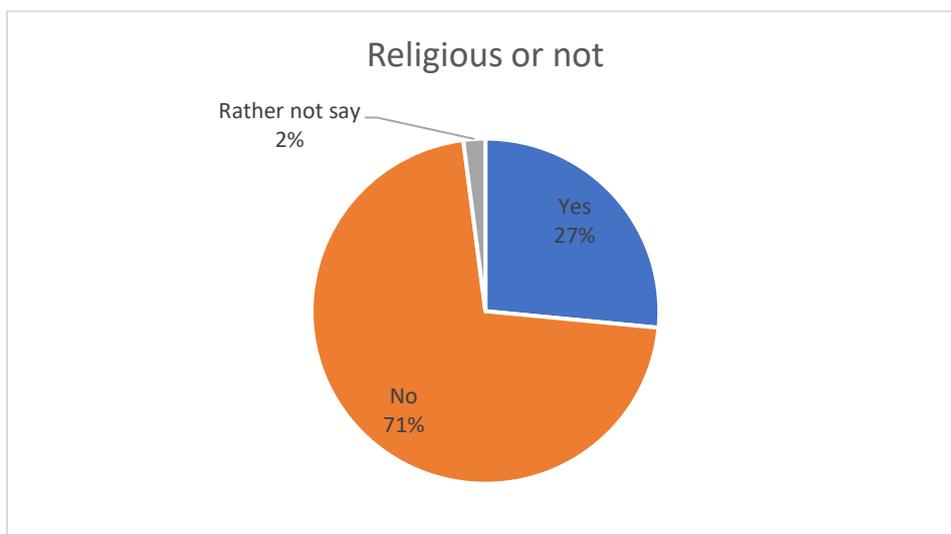


Figure 7, religion of respondents

For question 10, Did your income decline since the start of the COVID-19 pandemic?, a high number of people (86%) answered this was not true (figure 8). Further, for 8% this question was not applicable and 6% indicated their income did decline.

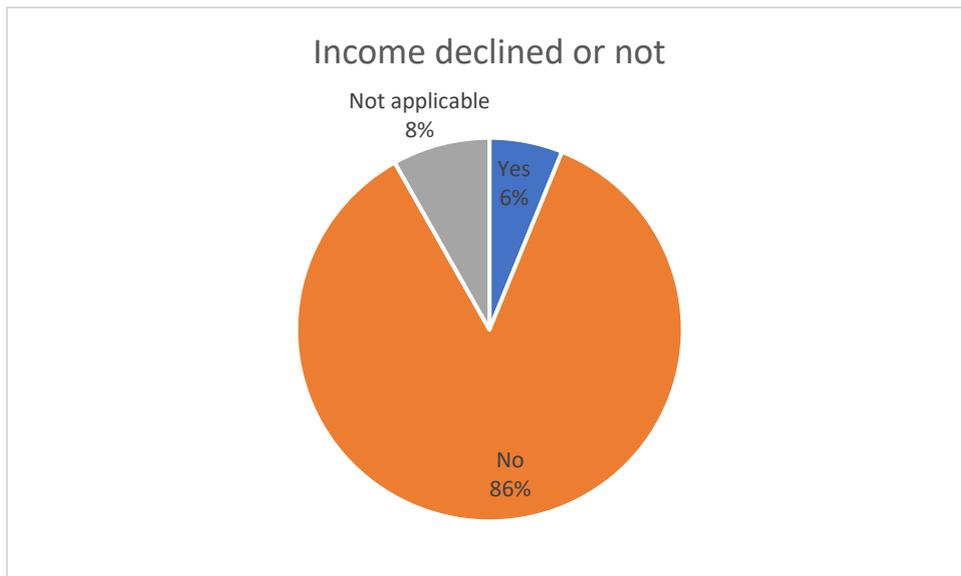


Figure 8, decline in respondents' income

Figure 9 shows the percentage of people that gave certain answers to the question of whether they have been infected by the coronavirus. A large proportion (92%) answered they have not been infected. However, 6% thought they were and 2% were infected according to a test.

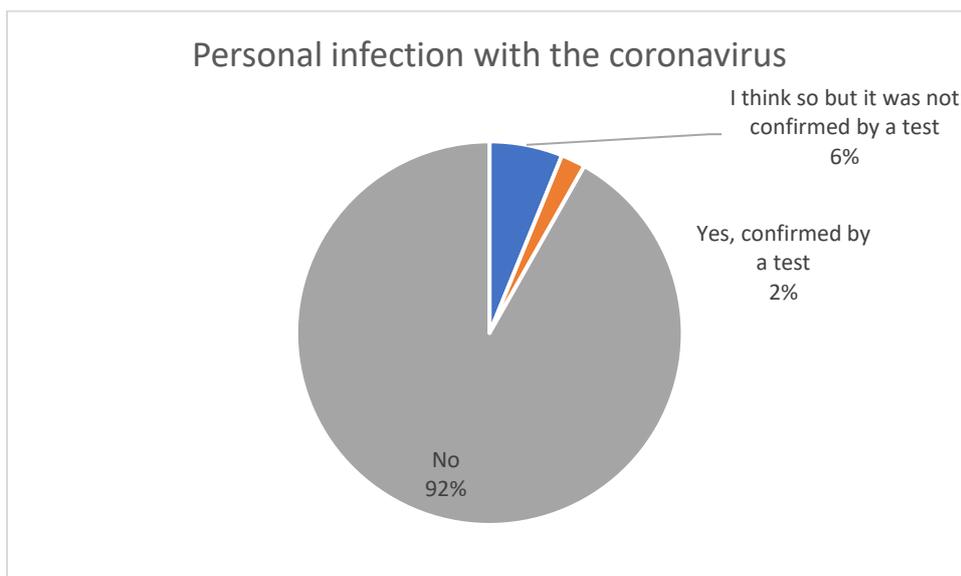


Figure 9, personal coronavirus infection of respondents

Although most people themselves answered they were not infected with the coronavirus, 47% said someone from their family and/or friends has been infected according to a test (figure 10). Also, 4% argued a family member and/or friend probably has been infected despite that there was no confirmation by a test. The other 49% indicated no family and/or friends have been infected with the virus.

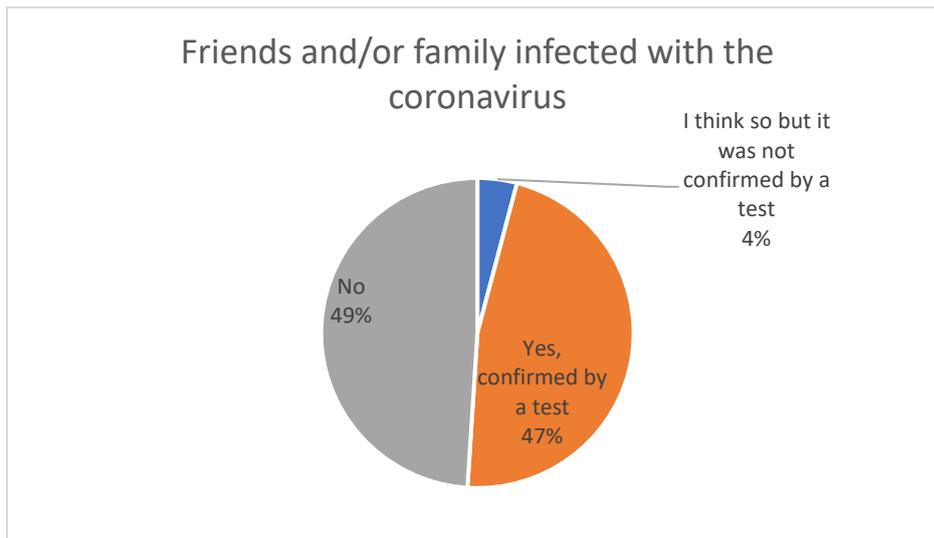


Figure 10, coronavirus infections among family/friends of respondents

For the current or previous occupation of respondents (questions 6 and 7; see table 2), ten persons did not answer. These were coded as 97, which can be interpreted as not being applicable for these respondents. Classifying the other 39 responses under one of the 6 occupational types according to the theory of Holland (1994) that was explained before, leads to various insights. Most occupations were part of the investigative type of occupation followed by social, while the fewest were part of the enterprising type of occupation. In between were artistic, realistic and conventional types of occupations.

		Type of occupation			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Artistic	6	12,2	15,4	15,4
	Conventional	6	12,2	15,4	30,8
	Enterprising	5	10,2	12,8	43,6
	Investigative	9	18,4	23,1	66,7
	Realistic	6	12,2	15,4	82,1
	Social	7	14,3	17,9	100,0
	Total	39	79,6	100,0	
Missing	97	10	20,4		
Total		49	100,0		

Table 2, Holland types of occupations

As discussed in the previous chapter, data on question one of the questionnaire was not used for further analysis. As shown in figure 11, many people indicated they lived in a different (anders) neighbourhood than the options that were given. Luckily, a lot of people gave their postal codes making an analysis of residential location possible.

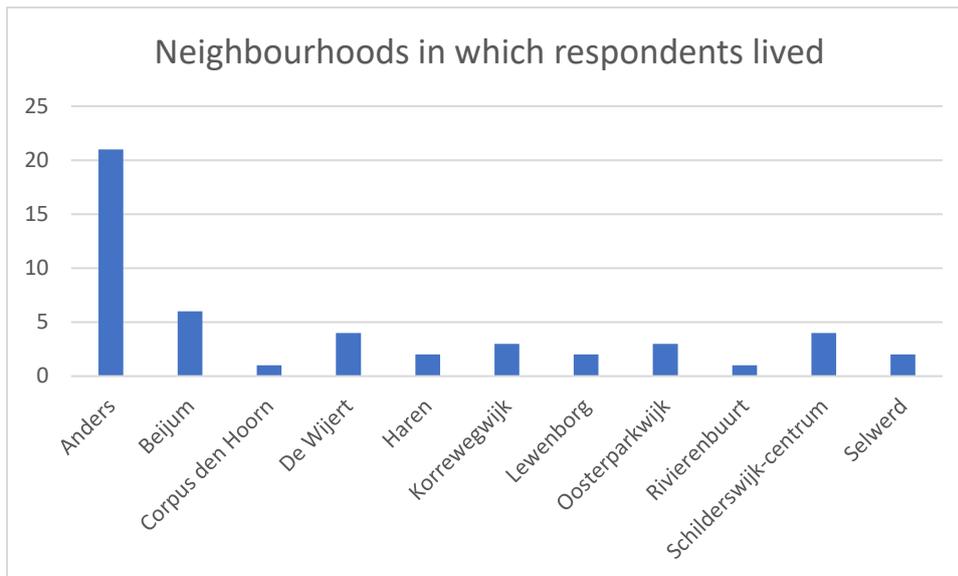


Figure 11, neighbourhoods of the respondents

4.2 Other questionnaire results

In table 2, descriptive statistics on the Likert-scale questions were included. While one person did not answer question 11 on financial hardship, all other questions were answered by every respondent. For question 11, 'To what extent, do you find it difficult to get by financially', the answers differed between 0 and 9, with a mean answer of 1,4. This shows that on average, the respondents did not have problems financially. For question 12, 'How would you rate your health in general?', respondents answers were between 2 and 10, meaning no one rated their health 0 or 1 (being poor). As the mean of 7,73 shows, respondents, in general, rated their health quite high. As the standard deviation is the lowest when compared to other variables, most respondents seemed to agree when it comes to their personal health. A focus on question 12, 'How would you evaluate public green spaces (e.g. parks, community gardens etc.) in your local environment?', shows that respondents' answers differed from 1 to 10. With a mean of 6,88, respondents, in general, were more positive about their local green space than negative. For question 16, 'If you evaluate how happy you were the last weeks, how many points would you score?', answers differed from 1 to 10 with a mean of 6,37. This signals towards more happiness as opposed to unhappiness, although it is not a very high number. Next, descriptive statistics on the answers to question 17, 'The COVID-19 pandemic has had a large impact on my life', show once more that respondents did not answer 0 (meaning that the pandemic did not have an impact at all). The mean impact of the pandemic was 6,53, meaning respondents on average seemed to agree with the statement, although not very much. Question 19, 'If you evaluate your general happiness level one year ago, how many points would you score' was also rated from 1 to 10, with a mean of 7,02. The latter shows that in general people were quite happy one year ago. Especially when compared to the happiness of the last weeks, which was 6,37 on average, it seems like people remember their happiness from one year ago as being more positive. The following statistics in the table concern question 22, 'Do you feel at risk for getting infected with the coronavirus?'. All the options, from 0 to 10, were selected leading to a mean of 4,63. This indicates that respondents in general slightly disagreed. However, the standard deviation is relatively the highest which shows that there was high variability in the answers of respondents. Next, statistics on question 23, 'The measures set out by the government to combat the number of corona infections have positively impacted my life', reveal that once more all the options were given as an answer. The mean of 3,59 shows that in general respondents did not agree with the statement. Finally, statistics on question 24, 'To what extent do you feel isolated from others, compared to life

before the COVID-19 pandemic?', show answers ranging from 2 to 10. This means no respondent did not agree at all. Further, the mean of 7,06 shows that respondents, in general, seemed to feel quite isolated during the COVID-19 pandemic.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Whether a respondents had a hard time getting by financially	48	0	9	1,4	2,161
How a respondent rated their health	49	2	10	7,73	1,705
How a respondent rated their local public green space	49	1	10	6,88	1,822
A respondents' happiness in the last weeks	49	1	10	6,37	2,118
The influence COVID-19 had on a respondents' life	49	1	10	6,53	2,442
A respondents' happiness one year ago	49	1	10	7,02	2,046
Whether a respondent was scared to get infected	49	0	10	4,63	2,899
The positive influence government measures had on a respondents' life	49	0	10	3,59	2,828
Whether a respondent felt isolated as compared to life before the COVID-19 pandemic	49	2	10	7,06	2,076

Table 3, descriptive statistics on Likert-scale questions

While there seems to be a difference when looking at the mean happiness levels of one year ago and of the last weeks, a paired samples t-test shows whether there is a significant difference between the two. The mean difference between happiness from one year back and from the last weeks is 0.653 (Table 4). Due to the significance level of 5.6%, it cannot be concluded based on the p-value that there is a difference between happiness from one year ago and happiness from the last weeks. However, seeing that a difference of zero is hardly within the lower and upper bound of the 95% confidence interval of the difference and looking at the low p-value makes a difference quite likely. More specifically, it seems like the happiness level from one year earlier is higher than the happiness from the last weeks.

Paired Samples Test

Paired Differences							
Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
			Lower	Upper			

Pair 1	Happiness of one year ago – Happiness of the last weeks	,653	2,332	,333	-,017	1,323	1,960	48	,056
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Table 4, paired samples test

By using the reported happiness from respondents of one year ago and the reported happiness of the last weeks, it is possible to see which respondents became happier, unhappier or which happiness levels remained the same. In the following cross-tabulations, a value of -1.00 represents a decrease in happiness. Further, a value of .00 means there has not been a change in happiness and 1.00 stands for an increase in happiness. Later in this report, the specific strength of an increase or decrease in happiness was also taken into account. Important to note is that some categories have a low number of respondents, which decreases the representativeness of some interpretations enormously.

As the percentages in table 5 show, the happiness of women has increased more as opposed to men, while male happiness has more often decreased or remained the same.

		Increase or decrease in happiness				
		-1,00	,00	1,00	Total	
Gender	98	Count	0	0	1	1
		% within Gender	0,0%	0,0%	100,0%	100,0%
Male		Count	7	5	10	22
		% within Gender	31,8%	22,7%	45,5%	100,0%
Female		Count	7	5	14	26
		% within Gender	26,9%	19,2%	53,8%	100,0%
Total		Count	14	10	25	49
		% within Gender	28,6%	20,4%	51,0%	100,0%

Table 5, Gender * Increase or decrease in happiness Crosstabulation

Looking at the education level of the respondents (table 6), people that finished Mbo are comparatively the highest group of people for whom happiness decreased. Further, a one-person group for whom happiness increased is someone that has an educational level lower than high school, making it relatively the largest group where happiness increased.

		Increase or decrease in happiness			
		-1,00	,00	1,00	Total

Educational Hbo level	Count	4	2	9	15
	% within Education	26,7%	13,3%	60,0%	100,0%
Lower than high school	Count	0	0	1	1
	% within Education	0,0%	0,0%	100,0%	100,0%
Mbo	Count	3	0	1	4
	% within Education	75,0%	0,0%	25,0%	100,0%
High school	Count	2	4	6	12
	% within Education	16,7%	33,3%	50,0%	100,0%
University	Count	5	4	8	17
	% within Education	29,4%	23,5%	47,1%	100,0%
Total	Count	14	10	25	49
	% within Education	28,6%	20,4%	51,0%	100,0%

Table 6, Education * Increase or decrease in happiness Crosstabulation

The following table presents people their main occupation, combined with the increase or decrease in happiness. Looking at the percentages per group, happiness has decreased most among people that retired, full-time workers and part-time workers consecutively. Further, students and people that are unemployed are among the groups for whom happiness has increased the most.

Main type of occupation	Part-time work	Count	Increase or decrease in happiness			Total
			-1,00	,00	1,00	
		Count	2	1	3	6
		% within Main_occupation	33,3%	16,7%	50,0%	100,0%
	Retired	Count	4	3	3	10
		% within Main_occupation	40,0%	30,0%	30,0%	100,0%
	Student	Count	1	0	7	8

	% within Main_occupation	12,5%	0,0%	87,5%	100,0%
Full-time work	Count	7	4	8	19
	% within Main_occupation	36,8%	21,1%	42,1%	100,0%
Unemployed	Count	0	2	3	5
	% within Main_occupation	0,0%	40,0%	60,0%	100,0%
Total	Count	14	10	24	48
	% within Main_occupation	29,2%	20,8%	50,0%	100,0%

Table 7, Main type of occupation * Increase or decrease in happiness Crosstabulation

Looking at table 8, where the kind of relationship is paired to the kind of change in happiness. Both the largest group of happiness increase and happiness decrease exists of people who were in a relationship but did not live together. This is the case because the happiness of single people and people that lived together with a partner relatively often remained the same.

			Increase or decrease in happiness			
			-1,00	,00	1,00	Total
Relationship status	I am in a relationship but we do not live together	Count	2	0	4	6
		% within Relationship	33,3%	0,0%	66,7%	100,0%
	Cohabiting with a partner	Count	6	5	8	19
		% within Relationship	31,6%	26,3%	42,1%	100,0%
	Single	Count	5	5	13	23
		% within Relationship	21,7%	21,7%	56,5%	100,0%
Total		Count	13	10	25	48
		% within Relationship	27,1%	20,8%	52,1%	100,0%

Table 8, Relationship * Increase or decrease in happiness Crosstabulation

Next, table 9 lists whether religion played a role in respondents lives and the increase or decrease in happiness over the past year. Happiness more often increased for people that stated religion did not

play a role, while the relative number of people for who happiness remained the same or decreased is higher for the other group.

			Increase or decrease in happiness			
			-1,00	,00	1,00	Total
Religious or not	Yes	Count	4	4	5	13
		% within Religion	30,8%	30,8%	38,5%	100,0%
	No	Count	9	6	20	35
		% within Religion	25,7%	17,1%	57,1%	100,0%
Total	Count	13	10	25	48	
	% within Religion	27,1%	20,8%	52,1%	100,0%	

Table 9, Religion * Increase or decrease in happiness Crosstabulation

Whether income declined in the past year is combined with the change in happiness in table 10. As can be seen, income decline is linked to an increase in happiness, although it only declined three times. For no decline in income, the largest group also exists of people for whom happiness increased.

			Increase or decrease in happiness			
			-1,00	,00	1,00	Total
Income declined or not	Yes	Count	0	0	3	3
		% within Income_decline	0,0%	0,0%	100,0%	100,0%
	No	Count	14	9	19	42
		% within Income_decline	33,3%	21,4%	45,2%	100,0%
Total	Count	14	9	22	45	
	% within Income_decline	31,1%	20,0%	48,9%	100,0%	

Table 10, Whether income declined * Increase or decrease in happiness Crosstabulation

Tables 11 and 12 show whether personal infection with the coronavirus or infection of family/friends is linked to an increase or decrease in happiness. As already discussed, personal infections were quite rare among the respondents, which makes the fact that those respondents more often reported an increase in happiness less valuable. For infections among family or friends, also an increase in happiness is more often seen among people who stated this was true for them.

			Increase or decrease in happiness			
			-1,00	,00	1,00	Total
Personal infection with the coronavirus	I think so but it was not confirmed by a test	Count	0	1	2	3
		% within Infected	0,0%	33,3%	66,7%	100,0%
	Yes, confirmed by a test	Count	0	0	1	1
		% within Infected	0,0%	0,0%	100,0%	100,0%
	No	Count	14	9	22	45
		% within Infected	31,1%	20,0%	48,9%	100,0%
Total	Count	14	10	25	49	
	% within Infected	28,6%	20,4%	51,0%	100,0%	

Table 11, Infected * Increase or decrease in happiness Crosstabulation

			Increase or decrease in happiness			
			-1,00	,00	1,00	Total
Friends and/or family infected with the coronavirus	I think so but it was not confirmed by a test	Count	1	0	1	2
		% within Friendsfamily_infected	50,0%	0,0%	50,0%	100,0%
	Yes, confirmed by a test	Count	2	6	15	23
		% within Friendsfamily_infected	8,7%	26,1%	65,2%	100,0%
	No	Count	11	4	9	24
		% within Friendsfamily_infected	45,8%	16,7%	37,5%	100,0%
Total	Count	14	10	25	49	

Sociale (social)	4
Thuiswerken (working from home)	3
Contacten (contacts)	3
Familie (family)	3
Studie (study)	3
Verhuizing (move)	2
Geen (no)	2
Huis (house)	2
Thuis (home)	2
Avondklok (curfew)	2
Minder (less)	2
Werken (work)	2
Fijne (pleasant)	2
Baan (job)	2

Table 13, what influenced respondents' lives the past year

Below, a word cloud with regards to question 18 is given, showing the things that impacted one's life specifically related to the coronavirus. Some answers were 'sociale contacten' (social contacts), 'sociale leven' (social life), 'verminderde contact familie' (less contact with family), 'geen bezoek van' (no visits from) and 'sociaal gezien verbeterd' (improved from a social standpoint). This shows that many respondents saw an impact on their social lives during the COVID-19 pandemic. Also, many other answers directly relate to the measures that were applied. For instance, 'vakantie kunnen gaan' (going on vacation), 'geen vakantie' (no vacation), 'aan nederland gekluisterd' (tied to the Netherlands), 'vrijwilligerswerk werd stopgezet' (voluntary work got stopped).

Kinderen (children)	3
Leven (life)	3
Eten (food)	3
Online	3
Huis (house)	3
Gesloten (closed)	3
Avondklok (curfew)	3
Thuiswerken (working from home)	3
Dingen (things)	3

Table 14, what influenced respondents' lives with regards to the coronavirus

4.3 Qualitative exploration

While the answers on the questionnaire gave a good overview of the lives of the respondents, specifically in relation to the coronavirus, the comments of some respondents gave additional insights. First of all, some respondents gave clarification on how their happiness has been impacted the past year.

Respondent 38 showed that other specific things matter to the happiness level, apart from corona and factors included in the questionnaire: "I have gotten a new job in April last year. I was really unsatisfied with my previous employer, so this has had an influence on my general happiness level. I have not gotten happier because of corona."

Others tried to indicate how their lives were impacted during times of the corona crisis and how they dealt with the situation. Respondent 12 mentioned the following: "my job, teaching, has gotten busier while it is questionable whether the subject material comes across sufficiently.". Respondent 25 said: "Fortunately I have my partner. If I would be alone at this time I would not have been able to cope with the pandemic and restrictions.". Respondent 39 mentioned: "I have more trouble with the division between work and private because I have to work from home due to corona while working from home already asks a lot from myself.". Respondent 40 added: "Listening to nice music, watching programmes, pleasant conversations... Looking broader helps a lot to stay in your strength"

The previous comments relate to various specific things that made someone (un)happier. Other respondents wanted to say something about how they looked at the restrictions set out by the government of the Netherlands. For instance, Respondent 16 looked negative towards the whole situation: "it is getting harder to deal with my growing anger(...)". The same is true for respondent 34: "Did get frightened from patronizing of the government and the power they have.". Respondent 24 made similar conclusions, although personally there was not that much impact: "the government has made a mess out of it, and still is. I'm fine, have an essential job. I easily adapt to the circumstances. Everything will be fine. Vaccinate as soon as possible, then everything can reopen, and hope that the middle-class people benefit from this. I do not have shortcomings, others do.". Respondent 37 had another perspective: "Although the measures are of course not nice, I do definitely support them. The heavier the better, in my opinion, to make sure it has to take as little time as possible.". Respondent 20 thought "corona has led to a larger gap between young and old, rich and poor, village and city."

Next to comments on how life has been impacted and how the government restrictions

related to that, a final comment was related to specific questions. Respondent 43 said: “I wasn't sure about the question about religion. It plays a small part, but not enough for me to say 'yes'. And with the question about the government rules, it is very complicated. I'm glad My family, friends and I were less likely to catch covid due to the rules, but my quality of life has been lowered.” This shows some questions might have been hard to answer.

4.4 GIS output

In figure 14, the map with parks in the municipality of Groningen is shown. As the map already shows, some areas in Groningen clearly have more and sometimes larger recreational green spaces, while other areas have little of those.

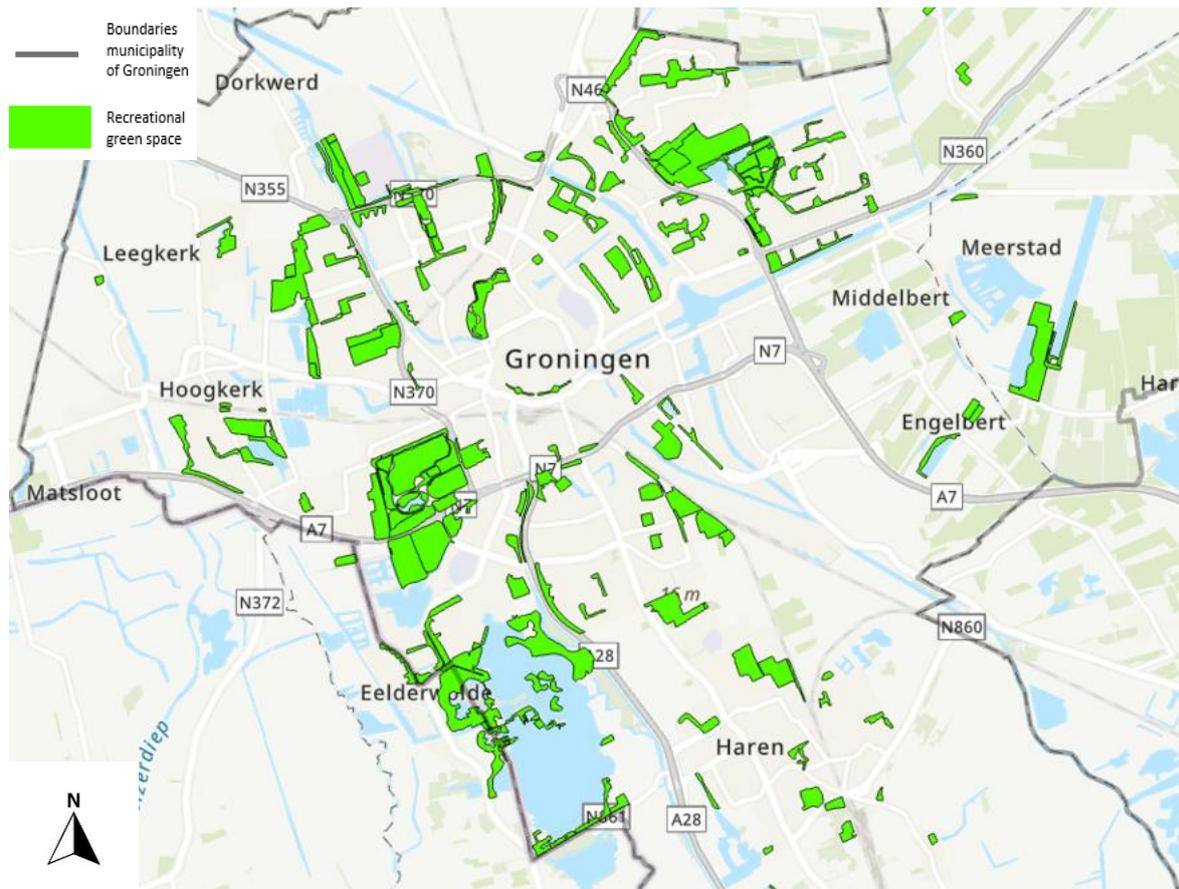


Figure 14, recreational green spaces Groningen

After a buffer of 300 metres around the recreational green spaces was set and points that represent an estimation of the location where the respondents live were added, the following map was created (figure 15). As the map shows, the largest part of the respondents does live within 300 metres of recreational green spaces, although several exceptions exist. Especially in the centre and the south of Groningen, some respondents do not live within 300 metres of green space.

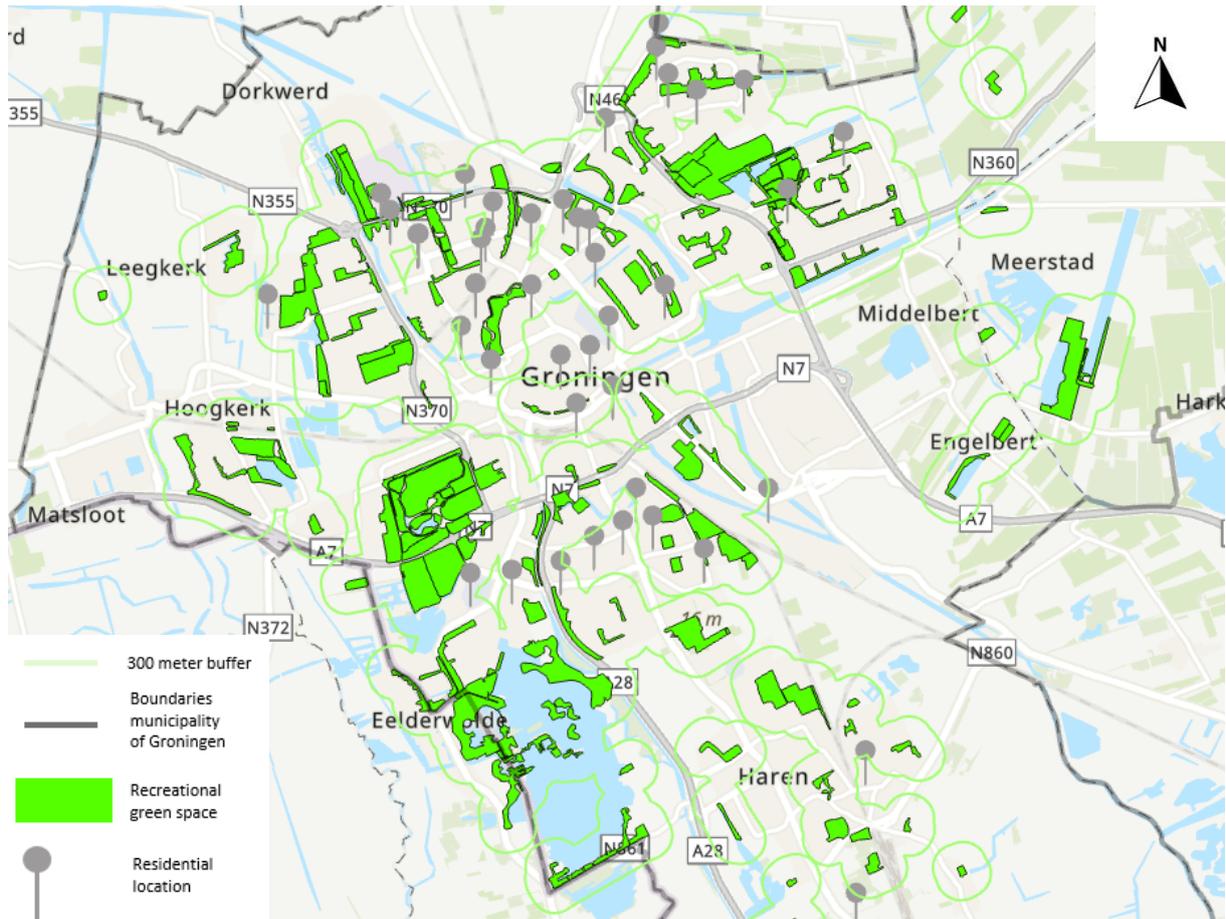


Figure 15, buffer of 300 metres around recreational green spaces and respondents' residential location

Table 15 shows the descriptive statistics on whether the estimated location of each respondent was within 300 metres from recreational green spaces. Three respondents did not fill in their postcode. Of the other 46 respondents, 33 lived within 300 metres of recreational green spaces and 13 did not. This comes down to 28.3% of respondents that did not live within 300 meters and 71.7% that did.

Respondents living within 300m of recreational green space					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	13	26,5	28,3	28,3
	Yes	33	67,3	71,7	100
	Total	46	93,9	100	
Missing	99	3	6,1		
Total		49	100		

Table 15, residential location of respondents within 300 metres of public parks

After excluding the 12 responses that only mentioned the 4 numbers of the respondents' postcode, table 16 was created. While 9 respondents are left that did not live within 300 metres of recreational green space, 25 did live within these 300 metres.

Respondents living within 300m of recreational green space, excluding incomplete postal codes		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	9	18,4	26,5	26,5
	Yes	25	51	73,5	100
	Total	34	69,4	100	
Missing	97	12	24,5		
	99	3	6,1		
	Total	15	30,6		
Total		49	100		

Table 16, residential location of respondents within 300 metres of public parks excluding incomplete postcodes

4.5 Other responses

While data on 49 respondents was used in the statistical analysis, 9 other responses were given. These were not used in the main analysis because they were given between the 20th of April and the 5th of May. As people were asked about their happiness in the past weeks, and because new developments related to the COVID-19 pandemic could influence this happiness, a boundary had to be set on which responses would no longer be included. Otherwise, the data might be less meaningful when comparing the respondents. The 20th of April was used as a boundary because on this day a lot of new (potential) relaxations of corona measures were planned in the Netherlands. An action plan was explained by the Dutch Prime Minister and the Minister of Health, Welfare and Sport at a press conference (Rijksoverheid 2021d). In this action plan, relaxations for shops, the catering industry, the curfew, home visits and more were mentioned (Rijksoverheid 2021e).

The choice for the previous boundary of including data seems to be justified because one of the respondents commented "At the moment I feel very positive, but around September when the whole catering industry had to be closed (...) and I was feeling down for several weeks". Also, another respondent said, "Stay positive, there is a lot left to enjoy". However, considering the previous comment was made after the first step of the action plan was set in motion, this development could have specifically impacted the respondents' feelings.

4.6 Multiple linear regression

Before going into the regression output, a closer look at each variable pair with the Pearson's correlation coefficient will show which pairs correlate and how strong the correlation is. The different variables that were included in these Pearson's correlation and also the ones that were used in the regression are described in appendix 7.3, including an elaboration on each type of variable.

The corresponding table for the correlations in appendix 7.4.1 shows that for many variable

pairs a significant correlation exists. For instance, for the extent to which respondents had financial troubles and being religious, a significant correlation exists. Also, a relationship exists between financial hardship and being a full-time worker, a part-time worker or retired. Finally, financial hardship is correlated with being single. For the pairs financial hardship and being single or financial hardship and being religious, an increase in one is expected to lead to a decrease of the other. Further, being a full-time worker, part-time worker or retired positively relates to financial hardship. Similarly, for all other variables, some correlations exist, except for the variables that concern the respondents' estimated residential locations based on the postcodes that were not within 300 meters from green space.

After the data was reviewed, the regression output indicated how the happiness of the respondents was affected during the COVID-19 pandemic, and whether this was representative for the wider population in Groningen. As said, part of the variables that were used in the regression concern the demographic and economic background of the respondents. However, also data on residential location, local green space, happiness, health, corona related measures, corona infection of the respondent and corona infection of the respondents' family/friends was included. The dependent variable that was used for the regression is the happiness of the respondents during the last weeks before their submission of answers on the questionnaire. Whenever a specific variable was analysed in the regression for a possible relationship with the respondents' happiness of the last weeks, this was controlled for all the other variables included in the model.

In table 17, the ANOVA for the multiple linear regression that included all the variables visible in appendix 7.3, except for the dummy with people that did not live within 300 metres of green space including the 9 additional respondents as a reference, is given. The independent variables that were included do not seem to be significant predictors of the dependent variable that contains the recent happiness from respondents because the significance level is a lot higher than 0.05%.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100,117	20	5,006	1,110	,518 ^b
	Residual	18,043	4	4,511		
	Total	118,160	24			

a. Dependent Variable: Respondents' happiness of the last weeks

b. Predictors: (Constant), Respondents that were single, To what extent people were scared to get infected, Age, Respondents whose family and/or friends were not infected with the corona virus, Respondents who were not infected with the corona virus, Respondents that did not live within 300 metres of green space excluding incomplete postal codes, Respondents that finished Hbo or University, Respondents that have a conventional or investigative type of occupation, Religious respondents, Happiness of one year ago, Personal health, How local public greenspace was perceived, Women, Respondents for who income did not decline, To what extent respondents had trouble getting by financially, How government measures positively influenced respondents' lives, Respondents that were cohabiting, How COVID-19 influenced respondents' lives, Respondents whose main occupation was fulltime work, parttime work or who were retired, To what extent people felt isolated as opposed to life before COVID-19

Table 17, ANOVA multiple linear regression

Also when looking at the coefficients for the different variables (table 18), there seems to be no significant relationship between any of the independent variables. Although the overall model is not

significant, the collinearity statistics give some insights into why this could be the case. When a linear relationship is present between some of the independent variables, this is called multicollinearity (Kumari, 2008). Although some factors individually might significantly relate to the dependant variable, a correlation between some of the independent variables might prevent this (Ibid.). The statistics on tolerance and variance inflation factor (VIF) for each independent variable indicate that some of them are quite interrelated. Low tolerance levels, that are closer to one, and VIF levels that are higher than ten indicate multicollinearity (Ibid.) As this is the case, certain variables had to be excluded to make sure multicollinearity is limited and potentially a predictive model for recent happiness could be found.

Model		Unstandardized Coefficients				Collinearity Statistics	
		B	Std. Error	t	Sig.	Tolerance	VIF
1	(Constant)	14,052	9,250	1,519	,203		
	Age	-,028	,070	-,401	,709	,089	11,244
	To what extent respondents had trouble getting by financially	-,018	,627	-,029	,978	,121	8,257
	Personal health	-,199	,970	-,205	,848	,078	12,880
	How local public greenspace was perceived	-,527	,538	-,980	,383	,167	5,993
	How COVID-19 influenced respondents' lives	,116	,525	,221	,836	,085	11,819
	Happiness of one year ago	,423	,527	,802	,467	,136	7,351
	To what extent respondents were scared to get infected	-,560	,759	-,738	,502	,037	27,098
	How government measures positively influenced respondents' lives	,355	,365	,974	,385	,166	6,023
	To what extent respondents felt	,059	1,042	,057	,957	,040	24,978

isolated as opposed to life before COVID-19						
Women	,095	2,814	,034	,975	,095	10,530
Respondents that were cohabiting	-2,646	2,089	-1,267	,274	,168	5,960
Religious respondents	-1,395	2,260	-,617	,571	,194	5,164
Respondents for who income did not decline	-,644	8,085	-,080	,940	,072	13,913
Respondents who were not infected with the corona virus	-,395	3,671	-,108	,919	,127	7,885
Respondents whose family and/or friends were not infected with the corona virus	-,148	2,671	-,055	,959	,105	9,493
Respondents that did not live within 300 metres of green space excluding incomplete postal codes	-2,061	1,819	-1,133	,321	,250	3,992
Respondents whose main occupation was fulltime work, parttime work or who were retired	-1,290	5,346	-,241	,821	,047	21,287
Respondents that finished Hbo or University	2,134	2,394	,892	,423	,137	7,318
Respondents that have a conventional or investigative type of occupation	-,139	2,460	-,057	,958	,129	7,728
Respondents that were single	-,447	1,991	-,224	,833	,185	5,413

Table 18, coefficients multiple linear regression

To have a useful interpretation of how certain independent variables might relate to the happiness of Groningen residents from the last weeks, an additional model was used for further analysis. Although different methods can be used to get a significant result, the aim of this research was not to come up with a model that has the highest significance level. Instead, some variables had to be removed, based on different types of reasoning, which could lead to significant outcomes. For instance, some

variables were not included when they are expected to have multicollinearity. Also, variables were not included whenever little variation was present between the different categorical answers and when it was expected that the independent variable had relatively little influence on someone's happiness. This means the dummy variables no personal infection with the coronavirus and no decline in someone's income were not included due to a small number of people that answered they were affected and a small number of people that answered their income declined. Also, the dummy variable with respondents that did not live within 300m of green space excluding the 9 responses as reference category was not included in the model, because of the lower amount of values as compared to the same dummy that includes 9 additional responses. Also, the variables with conventional and investigative types of occupation, when someone is religious and respondents that are full-time workers, part-time workers or retired as a reference were excluded, as happiness during a crisis with such heavy consequences was not expected to heavily relate to the (type of) occupation and whether someone is religious or not. Finally, to what extent people felt isolated during the pandemic was removed from the regression because it was expected to show multicollinearity with how respondents perceived the influence of government measures on their lives and to a lesser degree with how people perceived the impact of COVID-19 on their lives. Specifically, higher isolation probably relates to a higher perceived influence of measures and COVID-19 in general. Combining this with a short analysis of other regression methods later in this chapter led to meaningful conclusions.

As can be seen in table 19, the ANOVA turned out to be significant, meaning the model was indeed a significant predictor of the recent happiness of Groningen residents.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	94,170	13	7,244	2,393	,024 ^b
	Residual	90,830	30	3,028		
	Total	185,000	43			

a. Dependent Variable: Respondents' happiness of the last weeks

b. Predictors: (Constant), How COVID-19 influenced respondents' lives, How government measures positively influenced respondents' lives, Respondents that finished Hbo or University, Personal health, Women, How local public greenspace was perceived, Respondents that did not live within 300 metres of green space, Respondents whose family and/or friends were not infected with the corona virus, To what extent respondents had trouble getting by financially, Age, Respondents that were single, Respondents' happiness of one year ago, To what extent respondents were scared to get infected

Table 19, multiple linear regression ANOVA

A further look at the adjusted R square in the model (table 20), which is the coefficient of multiple determination (Burt et al., 2009) adjusted to the number of predictors, shows that 29.6% of the happiness from Groningen residents of the last weeks was linearly associated with the independent variables that are included.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
-------	---	----------	-------------------	----------------------------

1	,713 ^a	,509	,296	1,740
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a. Predictors: (Constant), How COVID-19 influenced respondents' lives, How government measures positively influenced respondents' lives, Respondents that finished HBO or University, Personal health, Women, How local public greenspace was perceived, Respondents that did not live within 300 metres of green space, Respondents whose family and/or friends were not infected with the corona virus, To what extent respondents had trouble getting by financially, Age, Respondents that were single, Respondents' happiness of one year ago, To what extent respondents were scared to get infected

Table 20, model summary

While the overall model was significant, two variables turned out to have a significant linear relationship with the recent happiness of Groningen residents (Table 21). First, the happiness level that respondents gave for one year ago had a significant linear relationship with recent happiness ($0,024 < 0,05$). As B is 0.407, this means that whenever the happiness from a respondent from one year back increased with 1, the recent happiness from the last weeks increased by 0.361. In other words, when respondents were happier one year ago, they were also more likely to be happy in the last weeks before answering the questionnaire. With a partial correlation of 30.3, which represents the measure of the relationship between two specific variables (Salkind, 2010), respondents' happiness from one year earlier seemed to have a strong influence on the recent happiness. Secondly, how respondents answered the question on whether they were scared to get infected with the coronavirus had a linear relationship with the recent happiness from respondents. More specifically, whenever respondents answer to the former question increased by 1, recent happiness was likely to decrease by 0.329 (B). This means that more fear for infection led to lower happiness of respondents during the last weeks before answering the questionnaire. Further, the partial correlation of -27.7 indicated that fear of infection had a strong negative linear relationship with recent happiness. As the statistics on VIF show, this has certainly improved as opposed to the first model of analysis and for all the independent variables this could now be accepted.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Part	Tolerance	VIF
		B	Std. Error	Beta					
1	(Constant)	2,262	2,491		,908	,371			
	Age	,005	,017	,049	,297	,768	,038	,605	1,653
	Women	-,454	,630	-,110	-,721	,476	-,092	,707	1,414
	Respondents whose family and/or friends were not infected with the corona virus	-,515	,646	-,126	-,798	,431	-,102	,660	1,514

Respondents that were single	,482	,670	,117	,719	,478	,092	,613	1,632
How local public greenspace was perceived	,078	,190	,069	,410	,685	,052	,585	1,711
Personal health	,282	,171	,241	1,653	,109	,211	,768	1,302
To what extent respondents were scared to get infected	-,329	,152	-,467	-,2,166	,038	-,277	,352	2,837
Respondents that finished Hbo or University	-,038	,672	-,009	-,056	,956	-,007	,659	1,518
Respondents' happiness of one year ago	,407	,172	,421	2,370	,024	,303	,519	1,928
To what extent respondents had trouble getting by financially	,066	,150	,071	,438	,665	,056	,628	1,592
How government measures influenced respondents' lives	,185	,142	,252	1,305	,202	,167	,440	2,273
Respondents that did not live within 300 metres of green space	-,836	,695	-,182	-,1,203	,239	-,154	,718	1,392
To what extent respondents felt isolated as opposed to life before COVID-19	,012	,167	,015	,073	,942	,009	,412	2,427

Table 21, coefficients multiple linear regression

4.7 Backward and forward method

Although the previous statistical analyses were useful, additional statistics were taken into account to support this research. The outcomes of these additional statistical analyses are meant as an elaboration on the previous analyses, although table 21 will remain of main interest for this study.

Instead of including every variable that was used in the questionnaire or arguing which variables might be most useful to include in the model, a multiple linear regression that uses another

method of entering and removing variables led to a significant predictive model where the independent variables explain recent happiness. First, Appendix 7.4.2 shows the ANOVA statistics for the backward method, meaning that each model removed one of the variables in the regression. From model 6 and onwards, each model turned out to be significant. Eventually, in model 16 the highest predictive value was reached, which includes the following variables: how scared people were to get infected and how people looked at the influence of government measures on their lives.

Next, appendix 7.4.3 gives the statistics on the ANOVA for the forward method, meaning that each model added a variable to increase significance. As shown here, the variable on how scared people were to get infected was used in the first model after which the variable with the influence of government measures on respondents' lives was included in the second model, same as with the backward method. Although both turned out to be significant, model 1 had the higher predictive value (F).

4.8 Simple linear regressions

Because not all variables were included in the main model of this research, simple linear regressions with one independent variable gave additional information on how happiness is affected. Appendix 7.4.4 shows the regression statistics for the ones that turned out to be significant. First, when people felt isolated, this had negative consequences for the recent happiness. When the feeling of isolation increased with one, the happiness of the last weeks decreased by 0.392. Next, how people perceived their local public green space had a positive linear relationship with happiness. More precisely, whenever the perceived quality of green space increased by one point, the happiness of the last weeks rose by 0.384. Moreover, how someone looked at personal health had a positive linear relationship with happiness. When the health of an individual increased by 1, recent happiness was expected to increase by 0.457. Between the amount of influence that COVID-19 has had on someone's life and happiness a negative linear relationship existed. For every point that the impact of COVID-19 increased, the happiness of the last weeks decreased by 0.358. Also, happiness from one year ago had a positive linear relationship with the happiness of the last weeks. When the former increased by one, the latter increased by 0.386. Furthermore, a linear relationship existed between being a full-time worker, being a part-time worker or being retired and happiness. Every time one of these options increased with one, the happiness of the last weeks decreased by 1.837. Finally, being single had a linear relationship with recent happiness. Specifically, for every increase of one single person, happiness increased by 1.391.

The other variables on their own did not seem to have a significant linear relationship with recent happiness. This was the case for age, the variable with women as a reference, the variable with Hbo and university as a reference, the variable with conventional and investigative types of occupation as a reference, the variable with religious people as a reference, the variable with no decline in income as a reference, how much trouble respondents had financially, the variable with no personal corona infection as a reference, the variable with no corona infection of friends and/or family as a reference, how scared people were for infection, how people perceived the positive influence of government measures and the two variables with respondents that did not live within 300 metres of green space including and excluding incomplete postal codes as a reference.

4.9 Change in happiness and additional data

Next, a multiple linear regression with the change in happiness as a dependant variable could add to this research. The happiness of one year before answering the questionnaire minus the happiness of the last weeks was taken as the dependant variable, leading to the output of appendix 7.4.5. Once more, including all the variables, except for respondents' happiness of the last weeks, respondents'

happiness of one year ago and the variable with respondents not living within 300m of a park excluding incomplete postal codes as a reference, did not lead to a significant prediction of change in happiness by the independent variables. To decrease multicollinearity, the same variables were excluded as for table 12. However, as can be seen in the second ANOVA in appendix 7.4.5, this also did not significantly predict the change in happiness.

Finally, data on a regression that included the 9 respondents that answered after the 20th of April was added in appendix 7.4.6. This was done to see whether meaningful changes occurred by adding more data, that might still be relevant despite the larger time frame in which respondents answered. As expected, the model that includes all the variables was still highly insignificant, although the p-value was somewhat lower. Also, the corresponding collinearity statistics showed a similar trend as for the first multiple linear regression. When only including the same variables as for the ones in table 12, the table in appendix 7.4.7 appears. As can be seen in the different tables, the regression turned out significant which means the independent variables were useful predictors of the dependent variable. More specifically, 36.6% of the variation in the dependent variables was explained by the independent variables, once more adjusted to the number of predictors. Again, how scared people were for getting infected with the coronavirus and happiness of one year ago had a significant linear relationship with people their happiness of the last weeks. Same as without the nine other respondents, whether people were scared for infection had a large negative effect on recent happiness (partial correlation= -0.263) and happiness from one year earlier had a large positive effect on recent happiness (partial correlation= 0.285). However, also personal health had a significant linear relationship with recent happiness in this model. More specifically, a medium positive effect existed of how people rate their health on the happiness of the last weeks (partial correlation= 0.237). This means that whenever a respondent perceived personal health as higher, happiness was also expected to increase. Again, the VIF and tolerance levels were acceptable.

5 Discussion and conclusion

This research aimed to contribute to existing studies that focused on the well-being of individuals in relation to the coronavirus, by concentrating on the happiness of people that lived in the city of Groningen in the Netherlands. Considering governments all around the world have responded to the COVID-19 pandemic in different ways, additional research was needed to see what elements influenced people their happiness during such unique circumstances.

After reflecting on the analyses of primary and secondary data, the sub-questions and research question could be answered. For sub-question 1, "What is happiness and how is it influenced?", a lot of literature was studied after which happiness was defined as the view towards an individuals' life from a subjective perspective. Furthermore, various factors have been selected that could influence people their happiness. Sub-question 2, "What are the implications of the coronavirus on the daily lives of residents from Groningen?", has also been studied by using existing literature and other information available online. Although the procedure of combatting the coronavirus in the Netherlands was for a large part based on individual responsibility and self-discipline, a lot of general measures were taken that, directly and indirectly, influenced the lives of Groningen residents. During the pandemic, the government constantly tried to adapt the measures to the amount of hospitalised patients and corona infections in general. By introducing these measures, the Dutch government tried to decrease the number of contacts. An expected consequence is that the happiness of Groningen residents was impacted. Furthermore, open questions within the questionnaire led to comments about how the coronavirus has impacted the lives of individuals. Many respondents argued their social lives were negatively influenced, due to the restrictions and the coronavirus in general. However, also a lot of specific things that were not

related to the coronavirus directly were visible among the responses.

The potential relational factors of recent happiness that have largely shaped this research consisted of COVID-19 related factors, socio-demographic factors, residential location and happiness during the start of the pandemic. While a lot of variable data turned out to show similar trends, which influenced the multicollinearity within the models, the eventual findings appeared to be useful. First of all, the mean happiness level declined from 7.02 to 6.37. Although it could not be said with 95% confidence that there was a difference between the two, the statistics on a paired sample test did seem to indicate that happiness, in general, became lower. Further, fear for infection with the coronavirus and happiness during the start of the pandemic turned out to be significantly and linearly related to recent happiness. The former had a negative relationship with happiness, which supports the findings in the research done by Yildirim & Güler (2021), who found that people their perceived risk towards the coronavirus negatively relates to their happiness. Also, despite reports of low feelings of fear in the Netherlands during the COVID-19 pandemic (The World Happiness Report, cited by NLTimes, 2021), this study acknowledged the role fear plays during the pandemic as also discussed by Mertens et al. (2020), Doshi et al. (2020) and Ahuja et al. (2020). The fact that happiness during the start of the pandemic was positively related to recent happiness, seems to coincide with what Lucas & Donnellan (2007) found when it comes to the high stability of life satisfaction in the short term. It seems like the specific circumstances that existed during the presence of the coronavirus did not influence this stability. Further, after adding additional data, health seemed to be positively related to happiness during the COVID-19 pandemic as well. This supports the finding by Ballas (2013), that health status is positively related to happiness. While the previous three factors did seem to influence the recent happiness of people during the pandemic, a lot of others within the model did not. Additional methods of analysis showed that individual and different combinations of independent variables can also lead to significant results. However, these other methods were purely used as a marginal note, considering this research focused on existing literature when coming up with a useful model.

In order to be able to answer sub-question 3, “How does the impact of the coronavirus differ between groups of people?”, cross-tabulations based on the retrieved primary data were used. More specifically, a positive, negative or absent change in happiness was combined with different characteristics of respondents. However, caution should be taken with the interpretation of these cross-tabulations due to a lack of selected categories among some of the variables. Despite the fact that this is in some cases a weak interpretation, a list of characteristics that were linked to a decrease in happiness could be created. The happiness of people that were male, from Mbo level, retired, in a relationship but did not live together, for whom religion played a role, whose income did not decline and who have not been infected with coronavirus while they do expect friends or family to have been infected has decreased more often when compared to the other groups of people. Although this might seem to support some of the statements made by other academics regarding how happiness depends on different characteristics, the multiple linear regression suggested otherwise. Further, when looking at the characteristics of people for whom recent happiness has increased as compared to one year earlier, interpretation of the results turned out to be even more difficult. People that were female, for who the educational level was lower than high school, that were students, who were in a relationship but did not live together, who were not religious, whose income did not decline, who have had a personal corona infection and have family or friends that tested positive seem to have had an increase in happiness. One might have doubts about some of the characteristics that seem to be linked to a decrease or increase in happiness. Also, the fact that some characteristics were linked to both an increase and decrease in happiness supports the argument that both lists of characteristics cannot be seen as highly reliable findings. Instead, it confirms the high probability of different, more representative, outcomes when a larger data set would have been

available.

Coming back to the hypotheses stated within this research, it can be concluded that **H1** for health status, **H02**, **H3**, **H4** and **H5** for fear to get infected can be accepted. More specifically, health status as a socio-demographic factor did influence happiness during the pandemic. However, residential location did not influence happiness during the COVID-19 pandemic. In addition, the happiness one year into the pandemic has decreased compared to one year earlier. Also, the happiness during the start of the COVID-19 pandemic related to happiness and the specific corona related factor fear for infection influenced happiness.

The previous outcomes of the study led to a valid answer to the main research question, "How did the COVID-19 pandemic influence the happiness of residents from Groningen?". Even though the happiness of residents from Groningen in general declined and various approaches towards the analysis of recent happiness led to different significant variables, the main argument of this study is that the happiness during the pandemic was affected by how scared individuals were for infection, how people rated their happiness level of one year earlier and how they looked at personal health. The other socio-demographics, COVID-19 related factors and factors regarding the residential location in relation to green space did not seem to significantly and linearly relate to the happiness of Groningen residents. This indicates that the coronavirus impacted the happiness of many people, regardless of their background. The latter goes against what was discussed by, among others, Veenhoven (2001), Vermeer & Kregting (2020), Layous & Lyubomirsky (2013), Parkes et al. (2020), Chorus et al. (2020), Gubler et al. (2020), Lu et al. (2020) and Gubler et al. (2020). These academics all argued that specific factors, which were included in this research, were related to the happiness of people. Important to note is that these conclusions were of course made with the use of different data, in different contexts and at different moments in time, which is why the different outcomes should be seen as complementary to each other.

For policymakers in general and planners specifically, the outcomes of this research suggest that they should mainly try to improve the liveability of people that argue they are unhealthy and that are anxious about getting infected if a similar situation would occur, while also recognizing that the coronavirus impacts people with all kinds of backgrounds. Further, planners should search for practical interventions that might positively influence the happiness of Groningen residents. Although planning might not influence the happiness levels of individuals when it comes to green space and although distance to green space does not seem to relate to any other factors, at least for how this was approached in this study, other focal points should be reviewed as well. People are more likely to spend time at home due to the restrictions. However, they will also make more use of public spaces that are one of the few things still accessible. This is why the public space needs to adapt to this, with physical distancing as the norm.

Also for academics, more research should be done on what influences the health of individuals and the perceived health in particular. Similarly, the role of stability in levels of happiness in the short and longer-term seems to be of interest. In addition, how fear for infection is influenced should be examined, to eventually be able to increase happiness during the current pandemic, during future pandemics and even during life where pandemics are non-existent. Also, large scale secondary data on happiness during the COVID-19 pandemic has to be reviewed to see whether there is a difference with the outcomes of this research, where the happiness of one year ago had to be memorized. Possibly, these memories differ from how people actually felt in the past. Also, more data can contribute to different outcomes, as the lack of data for parts of this research had negative implications for some interpretations. Finally, qualitative data has proven to lead to interesting statements with regards to how life was perceived. Therefore, qualitative research should further examine how people their happiness during and after the pandemic is impacted.

To conclude this research, the happiness of Groningen residents during the COVID-19

pandemic became lower and was related to fear for infection, past happiness and health. While the research has confirmed statements of other academics, the specific circumstances under which people have lived for more than a year seems to have consequences in a way that a lot of other factors did not influence their happiness. Academics, planners and policymakers should take these findings as an additional explanation on how happiness during the COVID-19 pandemic is influenced, to hopefully be able to increase the happiness of people both currently and in the future.

6 Reflection

During the research, I came across several things that led to some extra time investment. While the SPSS analysis began quite promising, certain things had to be reconsidered. As the first regression led to problems regarding multicollinearity of the independent variables, another model had to be developed to make further interpretation of the data possible. Although this made the process somewhat stressful, the eventual development of a new model where certain variables were excluded did lead to useful output.

Further, including a spatial element in the research was challenging in the beginning. While the increasing attention for research on green space in relation to well-being offered opportunities for analysis, one question on how local green space was perceived by Groningen residents did not seem extensive enough. Also, the list of neighbourhoods that were added to question 1 of the questionnaire turned out to be insufficient. Luckily, the fact that many respondents gave their postal codes in combination with the use of geographic information systems (GIS) made more specific analysis possible.

What definitely supported the research, was the feedback of supervisors Bart Roelofs and prof. dr. Dimitris Ballas. Not only existing ideas could be improved based on the feedback. Also, additional ideas on what to include and how to elaborate on data were given.

Finally, although the topic of the corona crisis was quite new, a lot of relevant sources were available. Not only existing happiness research in general but also a lot of existing happiness research in relation to COVID-19 was already done during the start of this research.

Looking back, more careful consideration of some things would have made the research more efficient. Instead of thinking about the spatial element in the research as something which could be done later, it should have been prioritised. Eventually, by using GIS, spatial data was generated which was also used within the regressions. However, it would have been more useful if this was thought through more carefully in the beginning. Further, some residents that got a letter for the questionnaire did comment they had doubts regarding anonymity. Therefore, the fact that answers from respondents would be completely anonymous could have been made more clear. Finally, multicollinearity with a high amount of variables did not have to come as a surprise, making it another thing that could have been thought of earlier in this research. Instead of doing the most refreshing of knowledge on statistical tests and output after gathering data, looking into this before the data collection could have helped with the process.

Despite the various assumptions on how analyses on this topic could have been improved, the conclusion definitely seems useful. While the questions on happiness might be a discussion point for some, considering people their memory of happiness from one year earlier might be biased by their current feelings, the outcomes of the regressions seem realistic. While fear for infection, health and happiness from one year earlier had a linear relationship with the happiness of Groningen residents from the last weeks, which was also supported by literature, a lot of other variables did not. It makes sense that a lot of background characteristics did not relate to happiness in this study, considering the corona crisis affected everyone in unforeseen ways.

7 Appendix

7.1 Letter for selected residents from Groningen

7.1.1 Dutch letter

Geachte heer/mevrouw,

Voor mijn afstudeerproject van de studie Society, Sustainability & Planning aan de Rijksuniversiteit Groningen, wil ik het algemene geluksniveau van mensen tijdens de COVID-19 pandemie onderzoeken. Om de gevoelens van mensen rondom dit onderwerp te onderzoeken, vraag ik inwoners van Groningen om een vragenlijst in te vullen. U bent willekeurig geselecteerd en het zou mij enorm helpen als u via uw smartphone/computer/etc. naar de volgende link zou gaan om de vragenlijst in te vullen: "www.vragenlijstcorona.nl". Het invullen van de vragenlijst duurt ongeveer 5 minuten. Het is belangrijk dat u weet dat de antwoorden die u geeft volledig anoniem blijven en alleen voor dit onderzoek gebruikt zullen worden. U zal dan ook niet te herleiden zijn uit de resultaten. Wanneer u toch liever een vraag niet beantwoordt, kunt ervoor kiezen deze over te slaan. Bovendien, moet u weten dat u het beantwoorden van de vragen kunt stoppen wanneer u zich hier niet prettig bij voelt. Wanneer u vragen heeft na het invullen van de vragenlijst, kunt u deze mailen naar (...). Ik zal proberen deze vragen zo spoedig mogelijk te beantwoorden.

Dank u wel voor uw tijd, Ik hoop dat u mij wilt helpen door de vragenlijst in te vullen.

Jelmer Schuil

7.1.2 English letter

Dear Mr/Mrs,

As part of my graduation project for the study Society, Sustainability & Planning at the university of Groningen, I wish to research people their happiness during the COVID-19 pandemic. To research the feelings of people on this topic, I am asking residents from Groningen to fill in a questionnaire. You are randomly selected and it would be of great help if you would use your smartphone/computer/etc. to go the following link to answer the questions: "www.vragenlijstcorona.nl". Filling in the questionnaire takes about 5 minutes. It is important that you know that the answers you give are completely anonymous and will only be used for this research. Therefore, you cannot be traced back from the results. However, when there is a question you rather not answer, you can choose to skip it. Furthermore, you should know you are free to stop answering the questions whenever you feel uncomfortable. When there are any questions after filling in the questionnaire, you can email these to (...) I will try to answer these as soon as possible.

Thank you for your time, I hope you want to help me by filling in the questionnaire.

Jelmer Schuil

7.2 Questionnaire

7.2.1 Dutch questionnaire

Vragenlijst geluk

1. In welke van de onderstaande wijken woont u? (Optioneel)
A Beijum
B Corpus den Hoorn

- C De Wijert
- D Haren
- E Hoogkerk
- F Korrewegwijk
- G Lewenborg
- H Oosterparkwijk
- I Rivierenbuurt
- J Schilderswijk-centrum
- K Selwerd
- L Ten Boer
- M Vinkhuizen
- N Anders

2. Wat is uw leeftijd? (Alleen de cijfers a.u.b.) (Optioneel)
3. Welk geslacht identificeert u zich mee?
 - A Man
 - B Vrouw
 - C Anders
 - D Dit zeg ik liever niet
4. Wat is het hoogste schoolniveau dat u heeft afgerond?
 - A Lager dan middelbare school
 - B Middelbare school
 - C Mbo
 - D Hbo
 - E Universiteit
 - F Anders
 - G Dit zeg ik liever niet
5. Welke van onderstaande opties is het meest van toepassing voor u?
 - A Student
 - B Deeltijdwerker
 - C Voltijdwerker
 - D Gepensioneerd
 - E Werkloos
 - F Dit zeg ik liever niet
6. Wanneer dit van toepassing is, wat is uw huidige beroep? (Optioneel)
7. Wanneer u gepensioneerd of werkloos bent, wat was uw vorige beroep? (Optioneel)
8. Welke van onderstaande opties is het meest van toepassing voor u?
 - A Samenwonend met een partner
 - B Ik heb een relatie maar we wonen niet samen
 - C Single
 - D Dit zeg ik liever niet
9. Speelt religie een rol in uw leven?
 - A Ja
 - B Nee
 - C Dit zeg ik liever niet
10. Is uw inkomen afgenomen sinds de start van de COVID-19 pandemie?
 - A Ja
 - B Nee

C Niet van toepassing

D Dit zeg ik liever niet

11. In hoeverre heeft u problemen om financieel gezien rond te komen?
0= Helemaal niet 10= Heel erg
12. Hoe zou u uw gezondheid over het algemeen beschrijven? (Optioneel)
0= Slecht 10= Uitstekend
13. Hoe zou u de publieke groenvoorziening (Bijvoorbeeld parken en gemeenschappelijke tuinen) in uw lokale omgeving beoordelen? (Optioneel)
0= Slecht 10= Uitstekend
14. Wat is uw postcode? (Optioneel)

Sectie 2

15. Noem alstublieft in een aantal woorden hetgeen wat uw leven in de afgelopen 12 maanden het sterkst heeft beïnvloed (Optioneel)
16. Als u beoordeelt hoe gelukkig u de laatste weken bent, hoeveel punten zou u scoren?
0= erg ongelukkig 10= erg gelukkig
17. De COVID-19 pandemie heeft een grote invloed gehad op mijn leven (Optioneel)
0= helemaal niet 10= heel erg
18. Noem alstublieft drie dingen die uw leven hebben beïnvloed met betrekking tot het coronavirus (Optioneel)
19. Als u uw algemene geluksniveau een jaar geleden moet beoordelen, hoeveel punten zou u scoren?
0= erg ongelukkig 10= erg gelukkig

Sectie 3

20. Bent u geïnfecteerd geweest met het coronavirus?
A Ja, bevestigd door een test
B Ik denk van wel maar dit is niet bevestigd door een test
C Nee
D Dit zeg ik liever niet
21. Zijn er directe vrienden of familieleden van u geïnfecteerd geweest met het coronavirus?
A Ja, bevestigd door een test
B Ik denk van wel maar dit is niet bevestigd door een test
C Nee
D Dit zeg ik liever niet
22. Bent u bang om geïnfecteerd te raken met het coronavirus? (Optioneel)
0= Helemaal niet 10= Heel erg
23. De maatregelen die de overheid neemt om het aantal corona infecties te verlagen heeft mijn leven positief beïnvloed (Optioneel)
0= Helemaal niet 10= Heel erg
24. In hoeverre voelt u zich afgezonderd van andere mensen, in vergelijking met uw leven voor de COVID-19 pandemie? (Optioneel)
0= Helemaal niet 10= Heel erg

Als er iets is wat u wilt toevoegen (anoniem), kunt u dit hier doen:

.....

Ook kunt u een email sturen naar (...) als u vragen/opmerkingen heeft omtrent dit onderzoek. Waar nodig, zal ik deze zo spoedig mogelijk beantwoorden.

Nogmaals, hartelijk dank voor uw tijd.

Jelmer Schuil

7.2.2 English questionnaire

Questionnaire happiness

Section 1

1. In which of the following neighbourhoods do you live? (Optional)
 - A Beijum
 - B Corpus den Hoorn
 - C De Wijert
 - D Haren
 - E Hoogkerk
 - F Korrewegwijk
 - G Lewenborg
 - H Oosterparkwijk
 - I Rivierenbuurt
 - J Schilderswijk-centrum
 - K Selwerd
 - L Ten Boer
 - M Vinkhuizen
 - N Different
2. What is your age? (Just the numbers please) (Optional)
3. Which gender do you identify with?
 - A Male
 - B Female
 - C Different
 - D I would rather not say
4. What is the highest level of education you have completed?
 - A Less than high school
 - B High school
 - C MBO
 - D HBO
 - E University
 - F Other
 - G I would rather not say
5. What applies to you the most?
 - A Student
 - B Part-time worker
 - C Full-time worker
 - D Retired
 - E Unemployed
 - F I would rather not say
6. If this is applicable, what is your occupation? (Optional)
7. If you are retired or unemployed, what was your previous occupation? (Optional)

8. Which of the following options applies to you the most?
 - A Cohabiting with a partner
 - B I am in a relationship but we do not live together
 - C Single
 - D I would rather not say
9. Does religion play a role in your life?
 - A Yes
 - B No
 - C I would rather not say
10. Did your income decline since the start of the COVID-19 pandemic?
 - A Yes
 - B No
 - C not applicable
 - D I would rather not say
11. To what extent, do you find it difficult to get by financially?

0= not at all 10= very much
12. How would you rate your health in general? (Optional)

0=poor 10=excellent
13. How would you evaluate public green spaces (e.g. parks, community gardens etc.) in your local environment? (Optional)

0=poor 10=excellent
14. What is your postcode? (Optional)

Section 2

15. Please, name the one thing that most heavily influenced your life the past 12 months. (Optional)
16. If you evaluate how happy you were the last weeks, how many points would you score?

0=very unhappy 10=very happy
17. The COVID-19 pandemic has had a large impact on my life (Optional)

0=not at all 10=very much
18. Please, name three things that impacted your life with regards to the coronavirus (Optional)
19. If you evaluate your general happiness level one year ago, how many points would you score? 0=very unhappy 10=very happy

Section 3

20. Have you been infected with the coronavirus?
 - A Yes, confirmed by a test
 - B I think so but it was not confirmed by a test
 - C No
 - D I would rather not say
21. Has someone from your direct family/friends been infected with the coronavirus?
 - A Yes, confirmed by a test
 - B I think so but it was not confirmed by a test
 - C No
 - D I would rather not say
22. Do you feel at risk for getting infected with the coronavirus? (Optional)

0=not at all 10=very much

23. The measures set out by the government to combat the number of corona infections have positively impacted my life (Optional)
0=not at all 10=very much
24. To what extent do you feel isolated from others, compared to life before the COVID-19 pandemic? (Optional)
0=not at all 10=very much

If there is anything else you want to add (anonymously), please feel free to do so here:

.....

Also, you can email (...) when you have any questions/comments surrounding this questionnaire which I will try to respond to as soon as possible.

Once again, thank you for your time.

Jelmer Schuil

7.3 overview of variables used in regression

Variable name	Survey question number	Measurement
<i>Age</i>	2	Years
<i>Women</i>	3	Dummy > women as reference
<i>High_educated</i>	4	Dummy > Hbo and University as reference
<i>FullParttime_Retired</i>	5	Dummy > Fulltime worker, parttime worker and retired as reference
<i>C_I_type</i>	6, 7	Dummy > Conventional and Investigative as reference
<i>Single</i>	8	Dummy > Singles as reference
<i>Religious</i>	9	Dummy > Religion plays a role as reference
<i>Nodecline_Income</i>	10	Dummy > No decline in income as reference
<i>Financial_hardship</i>	11	Likert scale 0-10. 0=not at all 10=very much
<i>Health</i>	12	Likert scale 0-10. 0=poor 10=excellent
<i>Greenspace</i>	13	Likert scale 0-10. 0=poor 10=excellent
<i>Happiness_lastweeks</i>	16	Likert scale 0-10. 0=very unhappy 10=very happy
<i>Influence_COVID19</i>	17	Likert scale 0-10. 0=not at all 10=very much
<i>Happiness_yearago</i>	19	Likert scale 0-10. 0=very unhappy 10=very happy
<i>Personal_not</i>	20	Dummy > no infection as reference
<i>Friendsfam_not</i>	21	Dummy > no infection as reference
<i>Scared_infection</i>	22	Likert scale 0-10. 0=not at all 10=very much
<i>Influence_measures</i>	23	Likert scale 0-10. 0=not at all 10=very much
<i>Isolated</i>	24	Likert scale 0-10. 0=not at all 10=very much
<i>Notwithin300</i>	14	Dummy > Not within 300m of public parks as reference
<i>Notwithin300ex</i>	14	Dummy > Not within 300m of public parks as reference, excluding incomplete postcodes

7.4 SPSS output

7.4.1 Correlation matrix

	Financial_har dship	Age	Health	Greenspace	Happiness_las tweeks	Influence_CO VID19	Happiness_ye arago	Scared_inf ection	Influence_me asures	Isolated	Women	Religi ous	Nodecline_i ncome	Personal _not	Friendsfa m_not	Notwithi n300	Notwithi n300ex	FullParttime Retired	High_edu cated	C_I_T ype	Sin gle
Financial_har dship	Pearson Correla tion	,204	,026	-.287	,317	-.183	,315	,217	,209	,285	-.591**	,197	-.023	,076	,086	,086	,422	,211	-.296	-.525**	
	Sig. (2- tailed)	,329	,128	,900	,165	,123	,381	,125	,297	,315	,167	,002	,345	,914	,720	,681	,681	,036	,312	,150	,007
Age	Pearson Correla tion	,204	-.215	-.024	,110	-.457*	,283	,017	,186	-.387	,356	-.294	,002	-.112	-.138	,155	,155	-.329	,235	-.055	-.066
	Sig. (2- tailed)	,329	,303	,909	,600	,022	,170	,936	,373	,056	,081	,153	,994	,594	,510	,460	,460	,108	,258	,794	,753
Health	Pearson Correla tion	-.313	,215	,007	,269	-.437*	-.076	-.208	,075	-.091	,083	,050	-.603**	-.464*	-.229	,007	,007	-.594**	,225	,093	,310
	Sig. (2- tailed)	,128	,303	,972	,194	,029	,717	,318	,722	,666	,693	,812	,001	,020	,272	,975	,975	,002	,280	,657	,132
Greenspace	Pearson Correla tion	,026	-.007	,001	,236	-.309	,432*	-.233	,242	-.129	,110	-.192	,123	,285	,110	,076	,076	,093	,278	,024	,177
	Sig. (2- tailed)	,900	,909	,972	,257	,133	,031	,262	,244	,540	,601	,358	,560	,167	,601	,717	,717	,660	,179	,909	,398
Happiness_las tweeks	Pearson Correla tion	-.287	-.11	,269	,236	1	-.561**	,314	-.567**	-.098	,028	-.229	-.131	-.240	-.256	-.256	-.339	,270	-.002	-.328	
	Sig. (2- tailed)	,165	,600	,194	,257	,003	,127	,003	,966	,001	,642	,896	,271	,531	,247	,218	,218	,097	,192	,994	,110
Influence_CO VID19	Pearson Correla tion	,317	-.454	-.437	-.309	1	-.588**	,453*	-.077	-.665**	-.194	,073	,120	,041	,188	,089	,089	,375	-.247	,067	-.262
	Sig. (2- tailed)	,123	,022	,029	,133	,003	,002	,023	,713	,000	,354	,730	,567	,847	,369	,673	,673	,065	,235	,750	,206
Happiness_ye arago	Pearson Correla tion	-.183	,283	-.432*	,314	-.588**	1	-.070	,170	-.416*	-.239	-.002	,172	,198	,164	,207	,207	-.032	-.017	-.136	,323
	Sig. (2- tailed)	,381	,170	,717	,031	,127	,002	,738	,415	,039	,250	,994	,411	,342	,432	,320	,320	,879	,937	,518	,115
Scared_infec tion	Pearson Correla tion	,315	-.017	-.233	-.567**	,453*	-.070	1	-.548**	-.636**	-.280	-.360	,294	,110	-.028	,336	,336	,367	-.149	,120	-.033
	Sig. (2- tailed)	,125	,936	,318	,262	,003	,023	,738	,005	,001	,175	,077	,153	,601	,894	,101	,101	,071	,478	,567	,875
Influence_me asures	Pearson Correla tion	,217	-.18	,075	,242	-.009	-.077	,170	-.548**	1	-.253	-.086	-.386	,095	-.429*	,384	,384	,061	,018	,128	,158
	Sig. (2- tailed)	,297	,373	,722	,244	,966	,713	,415	,005	,223	,684	,003	,057	,652	,032	,058	,058	,772	,934	,541	,451
Isolated	Pearson Correla tion	,209	-.38	-.091	-.129	-.640**	-.665**	-.416*	-.636**	,253	1	-.353	-.116	,167	,208	,153	,153	,251	-.397*	,275	-.084
	Sig. (2- tailed)	,315	,056	,666	,540	,001	,000	,039	,001	,223	,084	,581	,357	,426	,318	,465	,465	,227	,049	,184	,690

Women	Pearson Correlation	,285	,356	,083	,110	,098	-.194	,239	-.280	-.086	-.353	1	-.115	-.167	-.050	,167	,210	,210	-.134	-.102	-.578**	-.099
	Sig. (2-tailed)	,167	,081	,693	,601	,642	,354	,250	,175	,684	,084		,585	,426	,811	,426	,314	,314	,524	,627	,002	,639
Religious	Pearson Correlation	-.591**	-.294	-.050	-.192	,028	,073	-.002	-.360	-.570**	-.116	-.115	1	-.363	-.081	,268	-.185	-.185	-.266	-.164	-.031	,257
	Sig. (2-tailed)	,002	,153	,812	,358	,896	,730	,994	,077	,003	,581	,585		,074	,701	,196	,377	,377	,199	,434	,882	,216
Nodecline_inc ome	Pearson Correlation	-.197	,002	-.603**	,123	-.229	,120	,172	-.294	,386	-.192	-.167	-.363	1	.553**	-.167	,140	,140	.468**	-.153	,153	-.230
	Sig. (2-tailed)	,345	,994	,001	,560	,271	,567	,411	,153	,057	,357	,426	,074		,004	,426	,504	,504	,018	,465	,465	,268
Personal_not	Pearson Correlation	-.023	-.112	-.464**	,285	-.131	,041	,198	-.110	,095	,167	-.050	-.081	.553**	1	,201	-.011	-.011	,175	-.277	,277	,079
	Sig. (2-tailed)	,914	,594	,020	,167	,531	,847	,342	,601	,652	,426	,811	,701	,004		,335	,960	,960	,404	,180	,180	,706
Friendsfam_not	Pearson Correlation	-.076	-.138	-.229	,110	-.240	,188	,164	-.028	-.429*	,208	,167	,268	-.167	,201	1	,035	,035	,312	-.102	,102	,066
	Sig. (2-tailed)	,720	,510	,272	,601	,247	,369	,432	,894	,032	,318	,426	,196	,426	,335		,868	,868	,129	,627	,627	,755
Notwithin300	Pearson Correlation	-.086	,155	,007	,076	-.256	,089	,207	-.336	,384	,153	,210	-.185	-.140	-.011	,035	1	1,000**	-.168	-.021	-.157	,083
	Sig. (2-tailed)	,681	,460	,975	,717	,218	,673	,320	,101	,058	,465	,314	,377	,504	,960	,868		,000	,421	,919	,453	,694
Notwithin300 ex	Pearson Correlation	-.086	,155	,007	,076	-.256	,089	,207	-.336	,384	,153	,210	-.185	-.140	-.011	,035	1,000**	1	-.168	-.021	-.157	,083
	Sig. (2-tailed)	,681	,460	,975	,717	,218	,673	,320	,101	,058	,465	,314	,377	,504	,960	,868	,000		,421	,919	,453	,694
FullParttime Retired	Pearson Correlation	-.422**	-.329	-.594**	,093	-.339	,375	-.032	-.367	,061	,251	-.134	-.266	.468**	,175	,312	-.168	-.168	1	,127	,100	-.273
	Sig. (2-tailed)	,036	,108	,002	,660	,097	,065	,879	,071	,772	,227	,524	,199	,018	,404	,129	,421	,421		,544	,634	,187
High_educate d	Pearson Correlation	-.211	,235	,225	,278	,270	-.247	-.017	-.149	,018	-.397*	-.102	-.164	-.153	-.277	-.102	-.021	-.021	,127	1	,042	-.175
	Sig. (2-tailed)	,312	,258	,280	,179	,192	,235	,937	,478	,934	,049	,627	,434	,465	,180	,627	,919	,919	,544		,843	,404
C_L_Type	Pearson Correlation	-.296	-.055	-.093	,024	-.002	,067	-.136	,120	,128	,275	-.578**	-.031	,153	,277	,102	-.157	-.157	,100	,042	1	,342
	Sig. (2-tailed)	,150	,794	,657	,909	,994	,750	,518	,567	,541	,184	,002	,882	,465	,180	,627	,453	,453	,634	,843		,094
Single	Pearson Correlation	-.525**	-.066	-.310	,177	,328	-.262	,323	-.033	,158	-.084	-.099	,257	-.230	,079	,066	,083	,083	-.273	-.175	,342	1
	Sig. (2-tailed)	,007	,753	,132	,398	,110	,206	,115	,875	,451	,690	,639	,216	,268	,706	,755	,694	,694	,187	,404		,094

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

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

c. Listwise N=25

7.4.2 Backward method

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91,092	17	5,358	1,386	,344 ^b
	Residual	27,068	7	3,867		
	Total	118,160	24			
2	Regression	91,073	16	5,692	1,681	,231 ^c
	Residual	27,087	8	3,386		
	Total	118,160	24			
3	Regression	90,931	15	6,062	2,004	,147 ^d
	Residual	27,229	9	3,025		
	Total	118,160	24			
4	Regression	90,621	14	6,473	2,350	,089 ^e
	Residual	27,539	10	2,754		
	Total	118,160	24			
5	Regression	89,237	13	6,864	2,611	,060 ^f
	Residual	28,923	11	2,629		
	Total	118,160	24			
6	Regression	87,933	12	7,328	2,909	,038 ^g
	Residual	30,227	12	2,519		
	Total	118,160	24			
7	Regression	86,388	11	7,853	3,213	,025 ^h
	Residual	31,772	13	2,444		
	Total	118,160	24			
8	Regression	83,978	10	8,398	3,440	,018 ⁱ
	Residual	34,182	14	2,442		
	Total	118,160	24			
9	Regression	81,927	9	9,103	3,769	,012 ^j
	Residual	36,233	15	2,416		

	Total	118,160	24			
10	Regression	80,422	8	10,053	4,262	,007 ^k
	Residual	37,738	16	2,359		
	Total	118,160	24			
11	Regression	78,928	7	11,275	4,886	,004 ^l
	Residual	39,232	17	2,308		
	Total	118,160	24			
12	Regression	73,510	6	12,252	4,939	,004 ^m
	Residual	44,650	18	2,481		
	Total	118,160	24			
13	Regression	70,456	5	14,091	5,612	,002 ⁿ
	Residual	47,704	19	2,511		
	Total	118,160	24			
14	Regression	66,374	4	16,594	6,409	,002 ^o
	Residual	51,786	20	2,589		
	Total	118,160	24			
15	Regression	61,787	3	20,596	7,672	,001 ^p
	Residual	56,373	21	2,684		
	Total	118,160	24			
16	Regression	55,340	2	27,670	9,690	,001 ^q
	Residual	62,820	22	2,855		
	Total	118,160	24			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Single, Scared_infection, Age, Friendsfam_not, Personal_not, Notwithin300ex, High_educated, C_I_Type, Religious, Happiness_yearago, Health, Greenspace, Women, Nodecline_income, Financial_hardship, Influence_measures, Influence_COVID19

c. Predictors: (Constant), Single, Scared_infection, Age, Personal_not, Notwithin300ex, High_educated, C_I_Type, Religious, Happiness_yearago, Health, Greenspace, Women, Nodecline_income, Financial_hardship, Influence_measures, Influence_COVID19

d. Predictors: (Constant), Single, Scared_infection, Personal_not, Notwithin300ex, High_educated, C_I_Type, Religious, Happiness_yearago, Health, Greenspace, Women, Nodecline_income, Financial_hardship, Influence_measures, Influence_COVID19

e. Predictors: (Constant), Single, Scared_infection, Personal_not, Notwithin300ex, High_educated, C_I_Type, Religious, Happiness_yearago, Greenspace, Women, Nodecline_income, Financial_hardship, Influence_measures, Influence_COVID19

f. Predictors: (Constant), Single, Scared_infection, Personal_not, Notwithin300ex, High_educated, C_I_Type, Religious, Happiness_yearago, Greenspace, Nodecline_income, Financial_hardship, Influence_measures, Influence_COVID19

g. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, C_I_Type, Religious, Happiness_yearago, Greenspace, Nodecline_income, Financial_hardship, Influence_measures, Influence_COVID19

h. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, Religious, Happiness_yearago, Greenspace, Nodecline_income, Financial_hardship, Influence_measures, Influence_COVID19

i. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, Religious, Happiness_yearago, Greenspace, Nodecline_income, Influence_measures, Influence_COVID19

j. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, Religious, Happiness_yearago, Greenspace, Influence_measures, Influence_COVID19

k. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, Religious, Happiness_yearago, Greenspace, Influence_measures

l. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, Happiness_yearago, Greenspace, Influence_measures

m. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, Happiness_yearago, Influence_measures

n. Predictors: (Constant), Single, Scared_infection, Notwithin300ex, High_educated, Influence_measures

o. Predictors: (Constant), Single, Scared_infection, High_educated, Influence_measures

p. Predictors: (Constant), Single, Scared_infection, Influence_measures

q. Predictors: (Constant), Scared_infection, Influence_measures

7.4.3 Forward method

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38,038	1	38,038	10,919	,003 ^b
	Residual	80,122	23	3,484		
	Total	118,160	24			
2	Regression	55,340	2	27,670	9,690	,001 ^c
	Residual	62,820	22	2,855		
	Total	118,160	24			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Scared_infection

c. Predictors: (Constant), Scared_infection, Influence_measures

7.4.4 Simple regressions

Isolated

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31,804	1	31,804	8,142	,006 ^b
	Residual	183,584	47	3,906		
	Total	215,388	48			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Isolated

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	9,136	1,011		9,040	,000
	Isolated	-,392	,137	-,384	-2,853	,006

a. Dependent Variable: Happiness_lastweeks

Greenspace

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23,520	1	23,520	5,762	,020 ^b
	Residual	191,868	47	4,082		
	Total	215,388	48			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Greenspace

Coefficients^a

Model		Unstandardized Coefficients	Standardized	t	Sig.
			Coefficients		

		B	Std. Error	Beta		
1	(Constant)	3,724	1,138		3,272	,002
	Greenspace	,384	,160	,330	2,400	,020

a. Dependent Variable: Happiness_lastweeks

Health

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29,146	1	29,146	7,355	,009 ^b
	Residual	186,242	47	3,963		
	Total	215,388	48			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Health

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,833	1,334		2,123	,039
	Health	,457	,169	,368	2,712	,009

a. Dependent Variable: Happiness_lastweeks

Influence_COVID19

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36,745	1	36,745	9,668	,003 ^b
	Residual	178,642	47	3,801		
	Total	215,388	48			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Influence_COVID19

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	8,707	,802		10,851	,000
	Influence_COVID19	-,358	,115	-,413	-3,109	,003

a. Dependent Variable: Happiness_lastweeks

Happiness_yearago**ANOVA^a**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29,987	1	29,987	7,602	,008 ^b
	Residual	185,400	47	3,945		
	Total	215,388	48			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Happiness_yearago

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	3,656	1,024		3,571	,001
	Happiness_yearago	,386	,140	,373	2,757	,008

a. Dependent Variable: Happiness_lastweeks

Fullparttime_Retired**ANOVA^a**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32,001	1	32,001	8,285	,006 ^b
	Residual	177,666	46	3,862		
	Total	209,667	47			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), FullParttime_Retired

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	6,914	,332		20,814	,000
	FullParttime_Retired	-1,837	,638	-,391	-2,878	,006

a. Dependent Variable: Happiness_lastweeks

Single

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23,188	1	23,188	5,629	,022 ^b
	Residual	189,478	46	4,119		
	Total	212,667	47			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Single

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	5,609	,423		13,253	,000
	Single	1,391	,586	,330	2,373	,022

a. Dependent Variable: Happiness_lastweeks

7.4.5 Multiple linear regression, happiness change

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
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1	Regression	134,650	18	7,481	2,044	,090 ^b
	Residual	51,229	14	3,659		
	Total	185,879	32			

a. Dependent Variable: HappinessChange

b. Predictors: (Constant), Notwithin300, C_I_Type, Influence_COVID19, Friendsfam_not, Nodecline_income, High_educated, Religious, Greenspace, Age, Influence_measures, Personal_not, Single, Women, Health, Financial_hardship, Scared_infection, Isolated, FullParttime_Retired

Model		Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.	Part	Tolerance	VIF
1	(Constant)	-7,833	5,417		-1,446	,170			
	Age	,023	,038	,191	,585	,568	,082	,185	5,405
	Financial_hardship	,268	,353	,208	,759	,460	,106	,261	3,829
	Health	,726	,601	,447	1,208	,247	,169	,144	6,967
	Greenspace	,334	,260	,262	1,283	,220	,180	,472	2,118
	Influence_COVID19	-,186	,300	-,203	-,622	,544	-,087	,184	5,442
	Scared_infection	,467	,343	,529	1,362	,195	,191	,131	7,654
	Influence_measures	-,231	,225	-,266	-1,031	,320	-,145	,296	3,375
	Isolated	-,409	,426	-,335	-,959	,354	-,135	,162	6,185
	Women	-1,307	1,967	-,272	-,665	,517	-,093	,117	8,526
	Religious	2,310	1,177	,447	1,963	,070	,275	,379	2,637
	Nodecline_income	3,481	4,276	,251	,814	,429	,114	,206	4,846
	Personal_not	1,887	1,885	,259	1,001	,334	,140	,293	3,413
	Friendsfam_not	,936	,931	,196	1,005	,332	,141	,516	1,940
	FullParttime_Retired	3,080	3,007	,424	1,025	,323	,144	,115	8,684
	High_educated	-2,430	1,777	-,471	-1,367	,193	-,192	,166	6,015
	C_I_Type	-1,493	1,164	-,307	-1,283	,220	-,180	,343	2,915

Single	-,293	,988	-,062	-,297	,771	-,042	,458	2,183
Notwithin300	2,122	1,351	,421	1,570	,139	,220	,273	3,658

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92,054	12	7,671	1,873	,079 ^b
	Residual	126,946	31	4,095		
	Total	219,000	43			

a. Dependent Variable: HappinessChange

b. Predictors: (Constant), Notwithin300, High_educated, Health, Friendsfam_not, Women, Age, Greenspace, Financial_hardship, Influence_measures, Single, Influence_COVID19, Scared_infection

7.4.6 Multiple linear regression, 9 responses included

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	88,060	19	4,635	1,191	,401 ^b
	Residual	38,907	10	3,891		
	Total	126,967	29			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Single, Friendsfam_not, Age, Scared_infection, Personal_not, Notwithin300ex, High_educated, Financial_hardship, Greenspace, C_I_Type, Religious, Happiness_yearago, Women, Health, Influence_measures, Nodecline_income, Influence_COVID19, FullParttime_Retired, Isolated

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance VIF
1	(Constant)	10,846	6,722		1,613	,138	
	Age	,009	,039	,086	,225	,826	,211 4,736
	Financial_hardship	-,354	,401	-,361	-,881	,399	,182 5,493

Health	-,594	,596	-,461	-,997	,342	,144	6,964
Greenspace	-,298	,397	-,264	-,750	,471	,247	4,051
Influence_COVID19	-,011	,284	-,015	-,038	,971	,193	5,170
Happiness_yearago	,406	,399	,406	1,019	,332	,193	5,182
Scared_infection	-,648	,448	-,908	-1,446	,179	,078	12,879
Influence_measures	,318	,261	,434	1,220	,251	,242	4,124
Isolated	,401	,597	,428	,671	,517	,076	13,240
Women	,288	1,129	,070	,255	,804	,409	2,446
Religious	-1,576	1,634	-,324	-,965	,357	,272	3,683
Nodecline_income	-4,572	5,330	-,399	-,858	,411	,142	7,058
Personal_not	-,069	2,307	-,010	-,030	,977	,271	3,694
Friendsfam_not	-,838	1,387	-,202	-,604	,559	,274	3,644
Notwithin300ex	-1,109	1,160	-,238	-,956	,362	,493	2,030
FullParttime_Retired	-,147	2,750	-,027	-,053	,958	,123	8,098
High_educated	1,526	1,458	,357	1,047	,320	,263	3,807
C_I_Type	-,378	1,353	-,087	-,279	,786	,319	3,139
Single	1,014	1,279	,242	,793	,446	,330	3,027

a. Dependent Variable: Happiness_lastweeks

7.4.7 Multiple linear regression, 9 responses included

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	108,992	12	9,083	3,602	,001 ^b
	Residual	105,918	42	2,522		
	Total	214,909	54			

a. Dependent Variable: Happiness_lastweeks

b. Predictors: (Constant), Single, Age, Greenspace, Women, Financial_hardship, Friendsfam_not, High_educated, Influence_measures, Health, Happiness_yearago, Scared_infection, Influence_COVID19

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,712 ^a	,507	,366	1,588

a. Predictors: (Constant), Single, Age, Greenspace, Women, Financial_hardship, Friendsfam_not, High_educated, Influence_measures, Health, Happiness_yearago, Scared_infection, Influence_COVID19

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Part	Tolerance	VIF
		B	Std. Error	Beta					
1	(Constant)	2,457	1,995		1,232	,225			
	Age	-,004	,013	-,044	-,327	,745	-,035	,660	1,516
	Financial_hardship	,025	,119	,027	,209	,836	,023	,690	1,450
	Health	,327	,150	,285	2,186	,034	,237	,692	1,444
	Greenspace	,127	,158	,111	,799	,429	,087	,608	1,646
	Influence_COVID19	-,072	,122	-,095	-,592	,557	-,064	,459	2,178
	Happiness_yearago	,377	,143	,383	2,635	,012	,285	,555	1,801
	Scared_infection	-,255	,105	-,378	-2,425	,020	-,263	,483	2,072
	Influence_measures	,113	,102	,157	1,107	,275	,120	,580	1,723
	Women	-,587	,495	-,148	-1,185	,243	-,128	,748	1,337
	Friendsfam_not	-,563	,507	-,142	-1,110	,273	-,120	,716	1,396
	High_educated	-,111	,521	-,027	-,214	,832	-,023	,716	1,397

Single	,044	,516	,011	,085	,933	,009	,691	1,447
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