HOUSEHOLD PRODUCTION, HEALTH, AND HAPPINESS

A comparison of the native Dutch and non-western immigrants in the Netherlands

Promotoren:	prof. dr. Henriëtte Maassen van den Brink Hoogleraar empirische arbeids- en onderwijseconomie Onderzoeksinstituut SCHOLAR Universiteit van Amsterdam
	prof. dr. G. Antonides Hoogleraar in de Economie van consumenten en huishoudens Wageningen Universiteit
Co-promotor:	dr. J.A.C. van Ophem Universitair hoofddocent Leerstoelgroep Economie van Consumenten en Huishoudens Wageningen Universiteit
Promotiecommissie:	prof. dr. L.J. Frewer, Wageningen Universiteit prof. dr. W.N.J. Groot, Universiteit van Maastricht prof. dr. W.J.M. Heijman, Wageningen Universiteit prof. dr. A. Niehof, Wageningen Universiteit prof. dr. R. Veenhoven, Erasmus Universiteit Rotterdam

Dit onderzoek is uitgevoerd binnen de onderzoekschool Mansholt Graduate School of Social Sciences

HOUSEHOLD PRODUCTION, HEALTH, AND HAPPINESS

A comparison of the native Dutch and non-western immigrants in the Netherlands

Judith R. Cornelisse-Vermaat

Proefschrift
ter verkrijging van de graad van doctor
op gezag van de rector magnificus
van Wageningen Universiteit,
prof. dr. ir. L. Speelman,
in het openbaar te verdedigen
op vrijdag 11 maart 2005
des namiddags te half twee in de Aula.

Household production, health, and happiness. A comparison of the native Dutch and non-western immigrants in the Netherlands/ Judith R. Cornelisse-Vermaat. PhD. Thesis, Wageningen University (2005). With ref. – ISBN 90-8504-147-3

To Bert and Joost, the two most important men in my life…

Acknowledgements

Before one starts writing a thesis, one does not really know how to begin. Maybe that is a good thing. The struggle of asking the right research questions, finding sufficient literature, solving problems with statistical computer programs is quite a bother. However, the joy of writing, discovering new scientific results, finding answers to the research questions, and actually finishing the thesis is great and gives a feeling of satisfaction. So, in the end, I can truly say that it all has been worth it.

I thank my first promotor, Henriëtte Maassen van den Brink, for all her help during the past years. Despite leaving Wageningen University for the University of Amsterdam already half a year after I started the research, she continued being my promotor. I am grateful for all the effort, time, and energy you put into this research. Thank you for your instructions for the direction of this thesis. Without you, this thesis would not have been the way it is now.

I thank my second promotor Gerrit Antonides. It must have been difficult to "jump" into the research when I was already halfway. I appreciate that you have taught me how to use LISREL for socio-economic research. I thank my co-promotor Johan van Ophem. I am thankful for your share in this thesis and that you always took the time to answer my questions at any moment. I have appreciated your words of encouragement along the way.

Many, many thanks go to Leendert van Beek. He has been my English teacher since grammar school and I hope he will be for years to come. Thank you for reading each chapter of this thesis and supplying me with useful comments on my English. I am sure that your work has improved my thesis.

Without the help of Rein Haagsma, Chapter 5 would have been quite different from what it is now. Thank you for your useful suggestions for this chapter. And thank you even more for your camaraderie; you have become a friend.

The secretaries of our department, Annelies and Margaret, I would like to thank for their practical help in many ways. You are indispensable for our department. I thank the other colleagues of our department; Wim, Pierre, Henk, and Jan, for also making me part of the ECH-group.

I would like to say thanks to my "buddy" PhD students in Wageningen and Amsterdam: Kofi, Subrata, Pius, Morteza, Huang, Chris, and Justin. I am grateful that you have "endured" me working together in one room. I have nice memories of all the talks and discussions we had, not all of which were about our research…

I thank Ria Slootman for her heart-warming and supportive friendship. There was always time for a talk and a cheerful word.

Alison Burrell, I appreciate your comments on earlier versions of Chapter 3. I am also thankful that you have helped me thinking about my future.

Jaap Bijkerk, I render thanks to you for your help with solving SPSS-problems. Your solutions saved me a lot of time.

I thank Daan Ooms for co-organising the PhD-student lunch meetings. These meeting have been a useful and “safe” environment to discuss our research.
The people working in the library of the Leeuwenborch are crucial for performing socio-economic research in Wageningen. I would like to thank them for their accurate help in finding the right literature. Kees Laban, thank you for your friendship.
I thank the Netherlands Heart Foundation, the Scholten-Cordes foundation, and Research Institute SCHOLAR for their financial support for the publication of this thesis.
My former manager at Baan Development, Cor van Dijk, taught me many things that were of great use during this project: learning to work goal-oriented, to know your strengths as well as your weaknesses, to put yourself to deadlines, and to get the best out of yourself. Thank you for that. But more importantly; thank you for your friendship.
Sjaak Brinkkemper was the first who gave me the suggestion to write a PhD thesis. Without him I might never have seen this as an achievable opportunity.
I am grateful to Ellen Droppert, to whom I could outsource many of my own household tasks. Thank you, Ellen, for relieving the day-to-day stress.
The love and support of my family and friends during the past years have been very important to me. Thank you all for your encouragement. I would like to thank Bert, Mom and Dad Cornelisse, Antonie, Gertine, Annemarie, Hanna, Joost, and Margaret for correcting the last versions of each chapter.
Sander, thank you for designing the cover. It is beautiful; you are a real artist!
Joost, you are my brother and a true friend. I am grateful for all your comfort and encouragement in so many ways. I think God holds a great future for you.
For 10 years now, Gertine has been my bosom friend. A friendship that started on the first day we met as freshmen in Wageningen. How can I ever thank you for everything you have done for me?
This thesis would not have been accomplished without the never-ending love and support of my husband Bert. Thank you for your patience with me during stressful periods. You have made sacrifices for this thesis, I am aware of that. The past six years as your wife have been the happiest years of my life. I hope there will be many more to come.
Above all, I owe all gratitude to my Lord, Who through Jesus has given me the strength, energy, and health to perform the tasks set before me. ,,*Except the Lord build the house, they labour in vain that build it (…) It is vain for you to rise up early, to sit up late, to eat the bread of sorrows: for so He giveth His beloved sleep*” (Psalm 127).

Household production, health, and happiness

A comparison of the native Dutch and non-western immigrants in the Netherlands

1

Introducing household production, demand for health, and happiness

1.1 Introduction

Almost 10 percent of the population in the Netherlands consists of non-western immigrants. The share of non-western immigrants[1] is expected to increase to over 20 percent of the total Dutch population in 2050, which will be about 4 million out of a total population of 18 million. (CBS, 2003). The four largest non-western immigrant groups in the Netherlands are people from Turkey, Morocco, Surinam, and the Dutch Antilles (including Aruba). In a total population of 16 million, there are 331,000 Turks, 284,000 Moroccan, 125,000 Antillean (including people from Aruba), and 315,000 Surinamese immigrants (CBS, 2003).

Over the course of past decades, the integration of immigrants into the Dutch society was not the focus of attention. During the past few years, however, discussions are being held about the poor integration of immigrants into Dutch society. Scheffer (2000 and 2000a) was one of the first publicists who started a discussion on the increasing number of Muslims in the Netherlands and the integration problems of non-western immigrants into the Dutch society.

According to a special governmental investigation committee (Parlementaire Enquête Commissie), the Dutch government should pay more attention to the integration of immigrants. Governmental policies should for example, act against discrimination, and encourage immigrants to learn the Dutch language. In addition, the government should install a committee that focus on matters concerning integration within its terms of reference (Tweede Kamer der Staten-Generaal, 2004).

There are concerns about the low labour market participation of immigrants in the Netherlands compared to the native Dutch (CBS, 2003b; SCP, 2002). In addition, the level of education of most non-western immigrants is lower than that of the native Dutch (SCP, 2003). A further problem is that there is not much social cohesion between non-western immigrants and the native (WRR, 2001a).

[1] We use the term non-western immigrants for the first as well as the second generation of immigrants from non-western countries. We are aware of the fact that strictly speaking, people from the second generation cannot be labelled as 'immigrants', because they were born in the Netherlands. However, in the current research we have not made a distinction between immigrants from the first or second generation. Therefore, we have labelled people as immigrants people when they have at least one parent born abroad, according to the standard definition (CBS, 2000).

The research on the demographic development of the Islam among non-western immigrants in the Netherlands has received much attention in the Dutch media (SCP, 2004). The research shows that the number of Muslims is rising, which might cause more integration problems into Dutch society.

Another problem relates to the lower socio-economic status of non-western immigrants in the Netherlands. The incomes of Turks and Moroccans are lower than those of the native Dutch, and they save less money per household compared to the native Dutch and the Surinamese/Antilleans (NIBUD, 2004). The NIBUD report also shows that most non-western immigrant households rent homes, whereas half of the native Dutch population own their own homes.

During the past 50 years, immigration has been influenced by the economic and political situation in the Netherlands. During the 1950's, the decolonisation process attracted immigrants from Indonesia. In 1954, inhabitants of Surinam and the Dutch Antilles received the Dutch nationality. This gave them the right to work and live in the Netherlands (WRR, 2000b; Entzinger and Stijnen, 1990).

In 1975, large numbers of Surinamese inhabitants migrated to the Netherlands just before the independence of Surinam. The same happened in the late eighties, at the end of the 50-year transitional period (for the independence of Surinam) (WRR, 2001b; Entzinger and Stijnen, 1990). Market labour and study have been the main reasons for Antillean people to migrate to the Netherlands. Today, the Dutch Antilles are still part of the Dutch Kingdom (WRR, 2001b).

Due to labour market shortage between 1960 and 1970, the prospering economy stimulated labour migrants to find a job in the Netherlands. Migrants were invited to take up (lower paid) occupations in the Netherlands (WRR, 2001b; CBS, 2001; Entzinger and Stijnen, 1990). Mainly (male) inhabitants from Mediterranean countries like Spain, Morocco, Turkey and Yugoslavia immigrated to the Netherlands.

With the oil crisis in 1973, this period of immigration ended. But it was during this period that the families of the workers also immigrated to the Netherlands. It can be concluded that, although most immigrants planned to stay only for a short period in the Netherlands, they ended up staying for the rest of their lives (WRR, 2001b; CBS, 2001).

In 2002, about 20 percent of the Dutch population consists of immigrants (including western and non-western immigrants). About half of the immigrants are from western countries like Germany, Poland, or Canada. The other half of the immigrants in the Netherlands consists of non-western immigrants. So about 10 percent of the Dutch population of 16 million are non-western immigrants. Table 1.1 gives an overview of the Dutch population.

Table 1.1 Population in the Netherlands (× 1000) 31-12-2002

TOTAL POPULATION	16,105		
Native Dutch		13,140	
Western immigrants		1,407	
Non-western immigrants		1,558	
Morocco			284
Turkey			331
Dutch Antilles and Aruba			125
Surinam			315
Other non-western countries			503

Source: CBS, 2003b

Table 1.1 shows that the Turkish and Surinamese immigrant groups represent the largest group of immigrants, followed by immigrants from Morocco and the Dutch Antilles. The other non-western immigrant groups are much smaller and consist of people from the east, the middle-east and Africa. Demographers expect that the number of non-western immigrants will increase to 2 million in 2010 (CBS, 2003a).

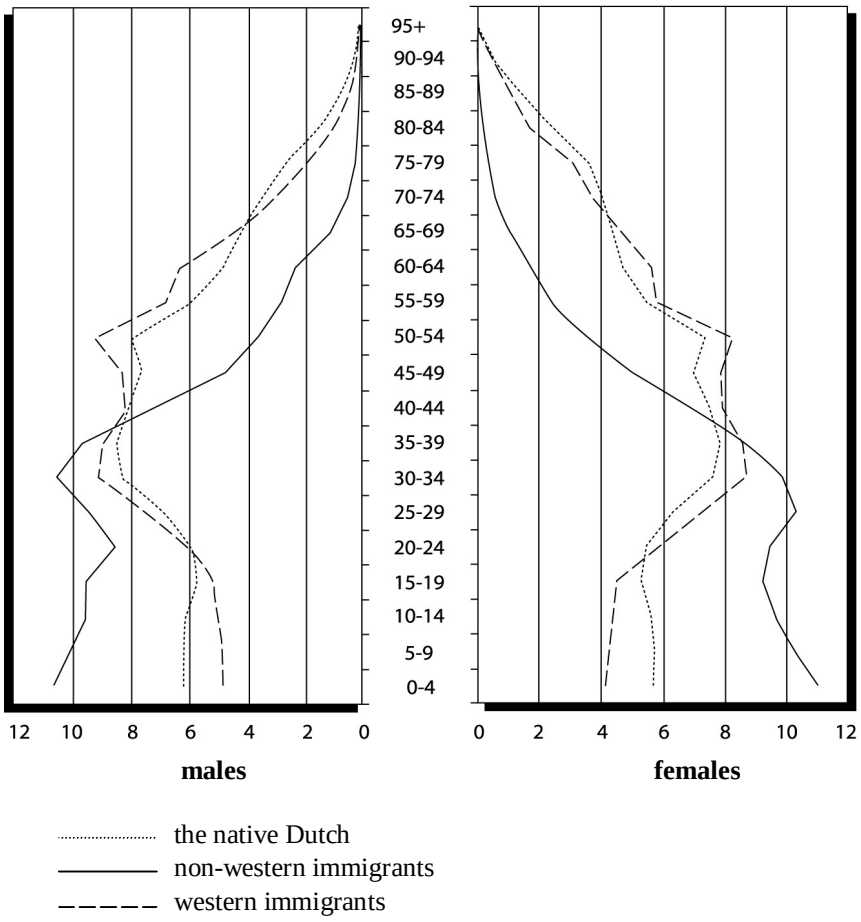
The Moroccans, Turks, Surinamese, and Antilleans mainly live in the four big cities in the Netherlands (Amsterdam, Rotterdam, Utrecht, and The Hague). In these cities immigrants represent a third of the population. Despite the fact that immigration in the Netherlands is declining (mainly because of stricter immigration policies), the share of ethnic groups is still increasing, caused by a relatively high birth rate, the immigration of Turkish and Moroccan marriage partners, Antilleans, and political asylum seekers (asylum seekers come to the Netherlands mainly for political reasons, whereas immigrants come to the Netherlands for economic reasons or family reunification) (SCP, 2003; Entzinger, 2002).

In these days, most of the new migrants do not come anymore from Morocco, Turkey, Surinam, or the Dutch Antilles. They come from anywhere in the world, from western and non-western countries (Entzinger, 2002).

More than a third of the non-western immigrants (Moroccans, Turks, Surinamese, and Antilleans) belong to the second generation of immigrants. This growth of the second generation exceeds the growth of the first generation (CBS, 2002; WRR, 2001b). More than 90 percent of the Moroccans and Turks of the first generation are married to an immigrant from their country of origin. The second generation of these groups is still young, but figures show that they are mainly married to a spouse from their parents' country of origin. On the contrary, Surinamese and Antillean immigrants of the second generation prefer a native Dutch spouse (CBS, 2002).

Compared to the native Dutch, the mean age of the non-western immigrants is relatively low. Figure 1.1 gives an indication of the age distribution among native Dutch, western and non-western immigrants.

Figure 1.1 Age distribution of native Dutch and immigrants (in percentage of the specific group) 01-01- 2001



Source: CBS, 2001

Figure 1.1 shows that the age distribution of the native Dutch is concentrated around 30 – 50 years of age. Western immigrants have about the same distribution. The age distribution of non-western immigrants is more concentrated around 25 – 40 years of age. Among ethnic minorities, the natural growth in population is relatively large due to a relatively high fertility rate. This results in a skewed age structure where the share of youngsters is dominant (SCP, 2003).

Non-western immigrants have lower levels of education and have lower household incomes than the native Dutch (see section 2.4 for figures). The Moroccans and the Turks have the lowest levels of education and the lowest incomes. In contrast, the level of education and the incomes of the Surinamese and Antilleans are more comparable to the native Dutch (CBS, 2003a; CBS, 2001).

According to Pels and Veenman (1996) the lower level of education of the Turks and Moroccans can be due to the migration itself. Many Turks and Moroccans do not speak Dutch very well and lack knowledge about the Dutch system of education. The lower socio-economic status of the parent has a negative effect on the education level of their children. The cultural differences between immigrant family and native Dutch school may also have a negative effect on the educational

development of the children, which can be attributed to differences in cultural context between school and at home (Pels and Veenman, 1996).

In general, the labour participation of non-western immigrants is lower compared to the native Dutch, except (to a lesser degree) for the Surinamese and Antilleans. For native Dutch as well as for immigrants, labour participation is higher among higher educated people (CBS, 2003a).

Table 1.2 shows the labour participation and unemployment rates of native Dutch and immigrants.

Table 1.2 Labour participation and unemployment among native Dutch and immigrants in the Netherlands (in percentages)

	Labour participation	Unemployment
Native Dutch	68	6
Surinamese	61	15
Antilleans/Arubanese	57	21
Moroccans	46	28
Turks	46	24

Source: CBS, 2003a, data from 2002

The native Dutch have the highest labour participation rate and the lowest unemployment rate. Whereas the labour participation of the Surinamese and Antilleans is more comparable to the native Dutch relative to the Moroccans or Turks, their unemployment rates are relatively high. Less than half of the Turk and Moroccans work on the labour market. The Moroccans have the highest unemployment rate (almost 30 percent).

As for the labour participation of women from the non-western immigrant groups, the relative high labour participation of Surinamese women is noteworthy, because it is higher than that of the native Dutch women. 55 percent of the native Dutch women have paid labour, against 59 percent of the Surinamese. The Antillean women however, have a lower percentage of women with paid labour, 48 percent (SCP, 2002 see also Table 5.3 in Chapter 5).

The labour participation of Turkish and Moroccan females is relatively low, but increased between 1994 and 2002 from 20 to 30 percent (SCP, 2003). Females of the second-generation immigrants have a higher labour participation than females of the first generation (SCP, 2002). The latter can mainly be attributed to a better education and a better command of the Dutch language (indicating a higher integration level in the Dutch society).

Immigrants have a net income that is about 150 – 200 Euro below the net income of native Dutch, which can be attributed to their lower levels of education. In addition the income distribution is smaller. Almost all immigrants have low-level incomes. A relative large share of their budget is used for daily essentials, whereas there is little money for durables and even hardly money for transportation (Van der Werf, 1998; Van Dorp and Van Ophem, 1998).

The native Dutch have the lowest percentage of people entitled to social security. In general, mostly the Turks and Moroccans receive social benefits. But also almost a one-fifth of the Surinamese

and Antilleans receives social benefits. Table 1.3 gives an overview of the percentage of people entitled to social security in general, the third column shows the percentage of people entitled to disablement insurance benefits (WAO).

Table 1.3 People (aged between 15 and 64) entitled to social security in the Netherlands (in percentages)

	Social security in general	Disablement insurance benefits (WAO)
Native Dutch	12	9
Surinamese	21	8
Antilleans/Arubanese	23	4
Moroccans	28	10
Turks	29	14

Source: CBS, 2002b, data from end 2000

Many immigrants are entitled to social security. According to Van der Werf (1998) the combination of heavy work, dissatisfaction resulting from not being able to remigrate (because of family or financial situation) and a difficult life often leads to a hopeless existence for immigrant workers. These immigrants often become recipient of disablement insurance benefits.

Several explanations for the disadvantaged position of non-western immigrants on the labour market are found in the literature. According to Veenman (2001) the disadvantaged position could be explained by an aggregation in demand for jobs by the immigrants, resulting into many immigrants applying for the same jobs. Many non-western immigrants have inadequate labour market competencies and skills, are in the wrong place on the labour market ('mismatch'), or are not well integrated in the Dutch society (lack of access to important networks).

However, also the unanticipated (negative) consequences of the Dutch policy measures play a role. Veenman (2001) as well as Kee (1995) claim that ethnic discrimination plays a role in the backward labour market situation of non-western immigrants in the Netherlands.

Most of the non-western immigrants (70 – 80 percent, both first and second generation) like to live in the Netherlands. The majority of the native Dutch, however, think there are too many immigrants in the Netherlands. Almost half of the immigrants themselves have the same opinion as the native Dutch (SCP, 2003).

Half of the Turks and Moroccans has only very few contacts with native Dutch, whereas half of the Surinamese and Antilleans has frequent contact with native Dutch. In all four groups, people from the second-generation immigrants have more contacts with native Dutch people compared to the first generation (WRR, 2001a).

For Moroccans and Turks, poor language skills explain the differences in social contact of immigrants with native Dutch for some extent. For these groups, level of education, generation of migration and the place of residence (mainly in 'immigrant quarters' in the cities) play a major role (Weijters and Scheepers, 2003).

Almost 75 percent of the Turks and 60 percent of the Moroccans encounter difficulties with the Dutch language and find it complicated to read and write in Dutch. This means that in they usually communicate with their children and family in their native language. In contrast, 75 percent of the Surinamese can easily read and write in Dutch. For the Antilleans, this percentage is lower at about 60 percent (WRR, 2001a). A better knowledge of the Dutch language by the Surinamese and Antilleans could be expected, since it is the official language in their countries of origin.

In short, with respect to the integration of immigrant into the Dutch society, there are concerns about the low labour participation of the non-western immigrants, about the relatively high number of non-western immigrants entitled to social benefits, and about the relatively low level of education of non-western immigrants.

In general, a lower socio-economic status is associated with a poorer health. Immigrants in the Netherlands report a poorer health and more chronic health problems than the native Dutch (Reijneveld, 1998; Weide and Foets, 1998). Not only socio-economic, genetic, and socio-cultural factors may account for the relationship between ethnic background and health. Culture involves health-related notions, such as nutrition, lifestyle, and adequate treatment of illnesses (Uniken Venema *et al*., 1995).

Another important health-issue in all western societies is the increase of overweight among populations. Overweight affects health negatively, since it is associated with cardiovascular disease, coronary heart disease, diabetes, and certain types of cancer (Philipson, 2001; WHO, 2000; McGrinnis and Foege, 1993).

In 2000, the World Health Organization (WHO) even declared overweight to be the number one global epidemic. The WHO has come up with reports that investigate the social determinants of health and how chronic diseases could be prevented through diet (WHO, 2003 and 2003a).

There is much attention for overweight in Dutch society. In 2003, the Health Council of the Netherlands published a report on overweight and obesity in the Netherlands (2003; Health Council of the Netherlands). In the same report, Groot and Maassen van den Brink (2003) have performed a study on the economic effects of (un-)healthy behaviour. Just recently, the Dutch Government Institute for Public Health and Environment (RIVM, 2004) issued a report on healthy and safe food in the Netherlands. In July 2004, the Dutch Minister of Public Health came up with a statement that in the Netherlands, overweight should be reduced and people should adopt healthier eating habits (VWS, 2004).

In many cases, overweight is the result of an unhealthy lifestyle. A caloric intake which is too high and little physical activity are the main causes of overweight (Health Council of the Netherlands, 2003).

During the past decades in the Netherlands, changes took place with respect to lifestyle. At present, households can outsource home cleaning to a cleaning lady/man, cooking to restaurants (or

people can eat ready-to-eat-meals, takeaway food or delivery food), and childcare to day-care centres. Since the end of the 1990s, household and care activities have been outsourced more frequently in the Netherlands (RIVM, 2004; SCP, 2000; and Tijdens *et al*., 2000).

In the nineties, food convenience became more important in the Netherlands. During that time, ready-to-eat meals belong to the top of the most fast growing products (Van Dam *et al.*, 1994). In addition, other types of outsourcing meal preparation have become more popular in the Netherlands.

In 1975, 40 percent of Dutch households visited restaurants 1 to 9 times a year, as compared to 61 percent in 1995 (Tijdens *et al*., 2000). At the present time, takeaway food is relatively important in the Netherlands. Sixty-three percent of all Dutch households eat takeaway food more than once a month and 82 percent of the households with a double income eat takeaway food more than once a month (SCP, 2000). Sixty percent of the households with a double income visit restaurants more than once a month, against 26 percent of the single income households (SCP, 2000).

The question arises whether the above-discussed socio-economic status of non-western immigrants in the Netherlands also relate to their happiness or well-being. Their poorer socio-economic status situation may cause a poorer health and a lower mean happiness. Although the importance of personal happiness may be different across cultures, it seems that in general, happiness is considered to be the ultimate goal of life (Frey and Stutzer, 2002).

Over the past few years, there has been research on the socio-economic status (market labour participation, income, and level of education) of non-western immigrants in the Netherlands (NIBUD, 2004; Tweede kamer der Staten-Generaal, 2004; SCP, 2003; WRR, 2001a; WRR, 2001b; and WRR, 2001c). However, as far as known, research on the health situation (including overweight) in relation to modern lifestyles (outsourcing of household and care tasks), and on the happiness of non-western immigrants in the Netherlands is scarce.

The purpose of this thesis is to study the health (including overweight), outsourcing behaviour, and happiness of non-western immigrants compared to the native Dutch in the Netherlands. This thesis investigates the socio-economic determinants of health, overweight, outsourcing, and happiness and studies the effect of the 'modern lifestyle' (outsourcing behaviour) on health, overweight, and happiness. The main questions examined in this thesis are:

1. What are the socio-economic and demographic determinants of health (and overweight) of non-western immigrants compared to the native Dutch in the Netherlands?
2. To what extent affects the outsourcing meal preparation the health and overweight of non-western immigrants and the native Dutch in the Netherlands?
3. What are the socio-economic, demographic, and ethnic determinants of the time spent on household and care activities?

4. a. To what extent does socio-economic background affect outsourcing of household and care time?

   b. What are the differences between the native Dutch and non-western immigrants with respect to outsourcing household and care time?
5. To what extent affects the socio-economic status the happiness of non-western immigrants in the Netherlands compared to the native Dutch?
6. What is the role of health and outsourcing household and care tasks with respect to happiness?

The household production theory (Becker, 1965) is used to analyse the demand for household and care time and outsourcing. The demand for health theory (Grossman, 1972) is used for the analysis of the determinants of health.

In this thesis, the largest non-western immigrant groups will be compared to the native Dutch. These groups are the Surinamese, Antilleans (including Arubanese), Moroccans, and Turks. Until now, in cross section data from the Dutch population, the number of immigrants is low. Therefore, for this current research, stratified data was required. This is by using with telephonic interviews, conducted by an agency specialised in marketing research (Total N = 2551). The data were collected at the end of 2001.

In this thesis, we will use the term *non-western immigrant* and *immigrant* interchangeably. With these terms we refer to the Moroccan, Turkish, and Surinamese/Antillean immigrants in the Netherlands.

The following section gives the conceptual model and provides the outline of the thesis.

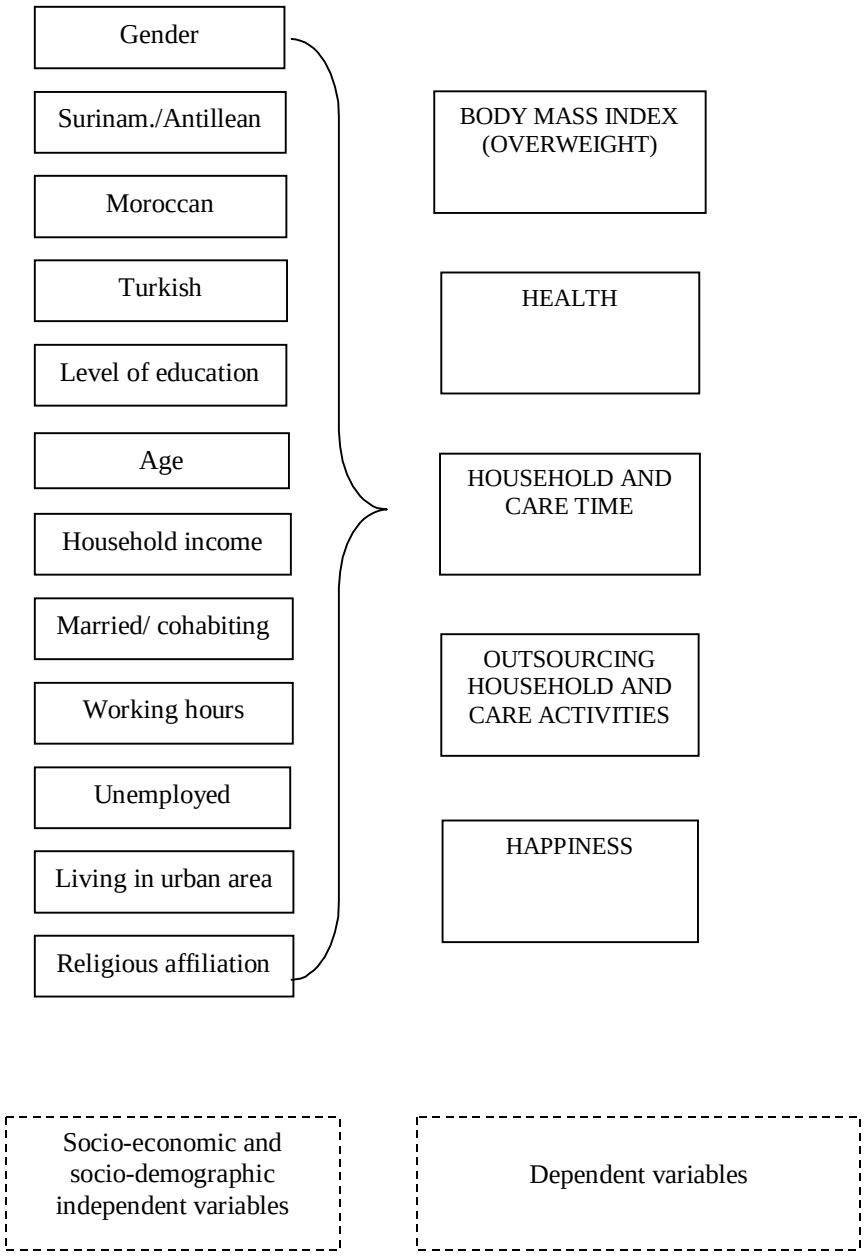
1.2 Conceptual model and outline of the thesis

The outline of the thesis is built around a conceptual model we developed for this research. Figure 1.2 gives an overview of this model. In Chapter 2 we will discuss the data gathering and compare the data with existing data of the Central Bureau for Statistics (CBS) in the Netherlands. This chapter gives also information about the characteristics of the sample and the distribution of the variables.

In Chapters 3, 4, 5, and 6 overweight, health, household and care time, outsourcing, and happiness will be studied. As mentioned in the previous section, the 'classic' socio-economic variables are included in the study of all topics. These socio-economic and demographic variables are level of education, employment, working hours, household income, age, marital status, and number of children. Whether or not people live in an urban area is added to the list of variables, because living in an urban area might affect people's health (CBS, 2001a). The religious affiliation is added as well, because of the possible relation with happiness and health (SCP, 2004; Cohen, 2002; Koenig *et al*., 2001; Levin and Chatters, 1998; and Myers and Diener, 1995).

Figure 1.2 gives a conceptual overview of the research performed in this thesis.

Figure 1.2 Conceptual research model of the thesis[23]



[2] If relevant, some variables have been added to the research in the different chapters. For example, smoking and sports are added in the study on overweight and health and quality time spent with children is added to the study on household and care time and outsourcing.
[3] Appendix I gives an overview of all variables studied in the different chapters.

The left-hand side of the conceptual model (Figure 1.1) depicts the studied socio-economic and socio-demographic (exogenous) variables and the right-hand side depicts the endogenous variables. First, the relationships between all independent variables and the dependent variables are studied separately for each endogenous variable.

Chapter 3 investigates to what extent the socio-economic and demographic variables affect the overweight of non-western immigrants and native Dutch in the Netherlands. The trend towards increased overweight in the past decade is alarming. The Netherlands is one of the countries with the highest prevalence of overweight, together with the USA, UK, and Germany (Mathus-Vliegen, 1998).

Genetic, socio-economic, and cultural factors act upon differences in overweight between groups in society. Earlier research shows that immigrants in the Netherlands have a higher risk of becoming overweight than the native Dutch (Brussaard *et al*., 2001; Mathus-Vliegen, 1998). Therefore it is interesting to investigate differences in determinants of overweight between the native Dutch and immigrants. Our research builds on existing research and investigates, in addition to socio-economic and demographic determinants, the effect of outsourcing meal preparation on overweight.

Chapter 4 studies the determinants of the demand for health. In the Netherlands, the health of immigrants is generally poorer than that of the native Dutch (Brussaard *et al*., 2001; Reijneveld, 1998; Weide and Foets, 1998; and Uniken Venema *et al*., 1995). Until now, little is known about the distribution of the most important determinants of health over the ethnic groups.

The demand for health model of Grossman (1972) is used to measure the 'stock of perceived health'. Overweight is known for its negative effect on health through cardiovascular disease, coronary heart disease, cancer, and diabetes (Philipson, 2001; WHO, 2000; McGrinnis and Foege, 1993). Therefore, besides the ethnic, socio-economic, and demographic variables as shown in Figure 1.1, the Body Mass Index (BMI) is added, to measure the effect of overweight on perceived health. In order to determine the marginal effect of overweight on perceived health, a calculation of Quality Adjusted Life Years is made.

In Chapter 5, the demand for household and care time and outsourcing is investigated. Since the end of the 1990s, household and care activities have been outsourced more frequently in the Netherlands (RIVM, 2004; SCP, 2000; and Tijdens *et al*., 2000). At present in the Netherlands, household and care tasks such as home cleaning, childcare, and meal preparation can be outsourced to a cleaning lady/man, childcare centres, and restaurants, or people can eat ready-to-eat meals.

Although over the years the outsourcing possibilities have increased, in recent years, as far as known, little research activity has focused on outsourcing costs and the relation between the time spent on household and care activities. Also, very little is known about the outsourcing behaviour of immigrants in the Netherlands.

To study the determinants of household and care time and outsourcing, the household production theory of Becker (1965) is used, and demand functions for household and care time and outsourcing are developed. With this model the ethnic, socio-economic, and demographic variables of

the demand for household and care time and the demand for outsourcing household and care activities are estimated.

Chapter 6 examines whether the lower socio-economic status of the non-western immigrants in the Netherlands affects their personal happiness. This chapter also investigates the effect of health and outsourcing household and care time on happiness.

Happiness is defined as the degree to which people positively or negatively evaluate their overall life situation (Veenhoven, 1997). Cantril's ladder of life (1965) is used to investigate whether socio-economic and demographic factors affect people's happiness.

Earlier research shows that demographic factors, like marriage and children, affect happiness (Argyle, 1999; Oswald, 1997; and Plug, 1997). Socio-economic factors, like income and level of education are relevant as well (Gerdtham and Johannesson, 2001; Easterlin, 2000; Argyle, 1999; and Oswald, 1997). Health is also an important predictor of happiness (Van Praag and Ferrer-I-Carbonell, 2004; and Ruhm, 2003).

The literature does not give much information about the effect of overweight, household and care time, and outsourcing on happiness. Therefore, overweight and household and care time and outsourcing are included in the model to determine their effect on people's happiness. This study on the determinants of happiness will also show differences in happiness between the native Dutch and immigrants and differences in the determinants of happiness between the groups.

In Chapter 7, the topics studied in earlier chapters are synthesised into one structural model to investigate the interrelations between overweight, health, household and care time, outsourcing, happiness, and all before-mentioned ethnic, socio-economic, and demographic variables. This structural equation model also with the causality of the correlations between overweight, health, outsourcing, and happiness.

To investigate the inter-relationships between health, overweight, household and care time, outsourcing, and happiness a structural equation model is developed and estimated using LISREL. The outcomes of this estimation provide an overview of all analyses done in this thesis and present the main results into one model. In Chapter 7, the main results are discussed, policy implications are given, and recommendations are made for further research.

Appendix I Variables used in different chapters of the thesis

Variable	Ch. 3	Ch. 4	Ch. 5	Ch. 6
Ethnicity (dummy Turk, dummy Surinamese/Antillean, and dummy Moroccan ethnicity, with native Dutch as reference group)	X	X	X	X
Gender (1=female, 0=male)	X	X	X	X
Takeaway food (times per month)	X		y	
Delivery food (times per month)	X		y	
Eating out (times per month)	X		y	
Eating out (dummies for categories never, 1-4, 5-10, 10 p/m)		X		
Convenience food (dummies seldom, 1-2, 2-4, > 4 times per week)	X			
Ready-to-eat meals (dummies seldom, 1-5, 5-10, > 10 times per month)	X			
Outsourcing meal preparation (dummies incl. ready-to-eat meals, delivery food, and takeaway food seldom, 1-5, > 5 per month)		X		
Making use of childcare, household help, window cleaner (hours per month)			y	
Making use of car wash, launderette, and dry cleaner's (times per month)			y	
Total expenditures on outsourcing per month			Y	Y
Fresh vegetables (dummies seldom, 1-2, 2-4, > 4 per week)	X	X		
Smoking y/n	X	X	X	X
Married/cohabiting y/n	X	X	X	X
Children at home y/n	X	X		
Children at home dummies 0-3, 4-11, 12-15, 16-25, > 25			X	X
Age	X			
Age squared	X			
Age dummies 18-34, 35-44, 45-64, ≥ 65		X		X
Level of education (dummies for low, medium, high)	X	X		X
Level of education female (dummies)			X	
Level of education male (dummies)			X	
Household income	X			X
Working hours female			X	
Working hours male			X	
Working hours (dummies for categories 1-20, 21-40, 41-60, > 60)				X
Body Mass Index	Y			Y
BMI > 25		X		X
Living urban area		X	X	X
Being homeowner		X	X	X
Religious affiliation (dummy for going to church/mosque/temple/synagogue > once per month)			X	X
Health (5 categories)		Y	X	Y
Intake extra vitamins/minerals (dummy)			X	
Unemployment		X		X
Household and care time of household			Y	
Household and care time respondent				Y
Happiness				Y
Sport (dummies categories never, < 1, 2-3, > 3 per week)	x	x		
Quality time indicator 1: Read to children and play games with them			x	x
Quality time indicator 2: Help children with homework			x	x

X = independent variable in main estimation
x = independent variable in additional estimation
Y = dependent variable in main estimation
y = dependent variable in additional estimation

2

Data collection and sample description: A comparison of the non-western immigrants and native Dutch in the Netherlands

2.1 Introduction

Up to now, there is little data on health, household production, and happiness of non-western immigrants in the Netherlands. Therefore, for this research, new data needed to be collected. By the end of 2001, a research agency conducted a telephone questionnaire.

This chapter provides information on the process of the data collection, as well as on the sample itself, as it will be used in the forthcoming chapters. Section 2.2 gives an overview of the data collection from the telephone survey, the response rates, etc. In section 2.3 the procedure of the telephone survey is explained. Section 2.4 discusses the representativeness of the sample. Section 2.5 gives a description of the different groups in the sample. Section 2.6 concludes and discusses the data collection and the sample.

2.2 A stratified sample of the native Dutch and immigrants

Until now, in cross-section data from the Dutch population, the number of immigrants is low. Therefore, a stratified sample was needed in order to be able to compare in absolute numbers the immigrants with the native Dutch. To obtain enough information to compare both sexes and different household types and different ethnic groups, we aimed at having 700 respondents per group.

The data were collected in the Netherlands between September and November 2001 by DESAN, a Dutch organisation for Market Research. Data collection by phone was chosen since it assures response and it takes less time to gather the data as compared to written questionnaires. Besides these advantages it is cheaper than taking interviews at people's homes. One disadvantage of telephone and written questionnaires however, might be that respondents tend to give "social desirable" answers to the questions.

After developing the questionnaire, the Dutch Institute for Multicultural Development (FORUM) checked the questionnaire on its comprehension for both immigrants and the native Dutch. After this check, we modified the questionnaire.

Before starting the actual data gathering, a pilot study was conducted among approximately 100 people. The pilot study was done by telephone and conducted by the same organisation for market research that would do the complete telephone survey. The main purpose of the pilot study was to find out whether the questionnaire was suitable and whether the response was appropriate to meet the objectives of the research. Slight differences in the questionnaire were made on the questions about time allocation.

DESAN hired interviewers who could do bilingual interviews if necessary, who could speak both Dutch and Moroccan, or both Dutch and Turkish. The final version of the questionnaire was translated into Turkish and Moroccan, so that the interviewers would be able to switch to the native language of the Turks or Moroccans if needed.

By the end of September 2001, the agency started the actual telephone survey. For six weeks, interviewers dialled randomly chosen telephone numbers, on working days between 5:30PM and 9:30PM, and on Saturdays between 11:00AM and 15:00PM. The purpose of the data gathering was to obtain a sample containing:

- 700 native Dutch, 700 Moroccans, 700 Surinamese/Antilleans, and 700 Turks,
- about 50 percent women;
- at least 25 percent households with children living at home.

The Dutch sub-sample was drawn randomly from the total pool of phone numbers (about 6.8 million) administered by the Dutch Telephone Company (KPN Telefoongids) in 2001. The immigrant sub-samples were drawn from a sample of about 80,000 names owned by DESAN and used for a bi-yearly investigation among recent graduates from secondary education. The immigrants were selected on the basis of their name(s) (indicating their ethnicity). The DESAN looked up these immigrant names in the total pool of phone numbers mentioned above. From this initial pool (combining the four sub-samples), 20,738 numbers were drawn randomly to be used for the research. Table 2.1 gives an overview of the response rates. This procedure has resulted in a sample of 2,551 respondents in the stratified sample.

Table 2.1 Results of a random dialling procedure from stratified pools of the Dutch population

Description type of contact	Number of respondents	Percentages of initial sample	Percentages of respondents
Successful	4,857	23.4	34.5
Actual respondent	(2,551)		
Screener	(2,306)		
Refused co-operation	9,223	44.5	65.5
Line engaged	105	0.5	
No answer	1,294	6.2	
Inaccessible within period of research	437	2.1	
Does not speak Dutch and interviewer does not speak Turkish or Moroccan	259	1.3	
Not a household (enterprises, firms)	1,262	6.1	
Closed phone number	2,729	13.2	
Fax, computer, modem	484	2.3	
Double in pool	45	0.2	
Other	43	0.2	
TOTAL	20,738	100	100

The total response rate was 23.4 percent. About one third of the 20,378 randomly drawn telephone numbers produced successful contacts. About 47 percent of the 4,857 successful contacts fell outside the target group (screeners).

Table 2.2 shows the motives for refusing to co-operate. About one-fifth of the non-respondents did not reveal their motives when asked. More than 70 percent of the non-respondents indicated that they had no time to participate or did not feel like it. This is a large proportion, which will mainly have been caused by the fact that the interview would take about 12 minutes, which is quite long for telephone surveys (actually, it turned out that the interviews took about 15 to 20 minutes).

Table 2.2 Motives for refusal to co-operate in the research

Description	Numbers	Percentages
No motive given	1,672	18.1%
No time, did not feel like it	6,568	71.2%
Ill, disabled	148	1.6%
Objections of principle	697	7.6%
Sudden interruption halfway through conversation	138	1.5%
TOTAL	9,223	100%

The Moroccans appeared to be the most difficult group to contact. At the end of the six weeks of data gathering, only 449 Moroccan respondents were in the sample. The numbers of respondents of the other groups were: 701 Dutch, 701 Surinamese/Antilleans, 700 Turks, and a total N of 2,551. The share of women in the sample was about 57 percent, which is a little more than we had anticipated (50 percent).

Table 2.3 gives some background information on the actual respondents fitting the target group. The classification is based on a systematic combination of three variables: ethnicity, gender, and children living at home.

Table 2.3 Percentages of households with children living at home

Ethnicity	Sex	Numbers	Percentages per ethnicity	Percentage sample
1. native Dutch	female	203	29.0	8.0
2. native Dutch	male	90	12.8	3.5
3. Surinamese/Antillean	female	215	30.7	8.4
4. Surinamese/Antillean	male	129	18.4	5.1
5. Moroccan	female	142	31.6	5.6
6. Moroccan	male	137	30.5	5.4
7. Turkish	female	306	43.7	12.0
8. Turkish	male	213	30.3	8.3
Total		1,435		56.3

In the sample, a total of 56.3 percent of the respondents has children living at home. Turkish women in the sample have the highest percentage of children living at home. Dutch males have the lowest percentage of children living at home. This could be explained by the relative large part of native Dutch aged 65 and above (18 percent of the native Dutch in the sample is aged above 64, against 6 percent of the Surinamese/ Antilleans, 5 percent of the Moroccans, and 2 percent of the Turks).

Table 2.4 shows the figures of the respondents in the sample with a partner (married or cohabiting).

Table 2.4 Percentages of households with a partner

Ethnicity	Numbers	Percentages per ethnicity	Percentage total sample
1. native Dutch	476	67.9	18.7
2. Surinamese/Antilleans	366	52.2	14.3
3. Moroccans	321	71.5	12.6
4. Turks	550	78.6	21.6
No partner	833		32.6
Other	4		0.2
Total	2,551		100

Most respondents in the sample have a partner: 67.4 percent of the total sample. Table 2.4 shows that in the Surinamese/Antilleans group the fewest respondents have a partner, whereas in the Turkish group the most respondents have a partner.

2.3 Procedure of the telephone survey

We developed the questionnaire taking into account that parlance should be complete and exact, formulation should be strictly neutral, the questions should be unambiguous, and the questionnaire should be acceptable to the social-cultural system the respondent pertained to (Segers, 1983).

A native Dutch is defined as a person whose parents were both born in the Netherlands.
An immigrant is defined as a person who has at least one parent who was born abroad (CBS, 2000).

An adult (a person aged 18 years and above) was identified after the household was contacted by telephone and then asked to co-operate in a survey being carried out by the Wageningen University and the University of Amsterdam.

It was explained that the survey was done to obtain more insight in the life situation of people in the Netherlands, in particular regarding food habits, health, time allocation, and outsourcing of household activities. It was stressed that the researchers highly valued the opinions of the respondents on the different subjects, and that it would be greatly appreciated if they agreed to participate in the survey.

The questionnaire consisted of seven parts. In the first part the ethnicity of the respondent was assessed by asking in which country (s)he was born and in which country each of the parents were born. If the respondent appeared not to be native Dutch, Surinamese/Antillean, Moroccan or Turk, the interview ended and the respondent was thanked for the cooperation.

If the respondent belonged to one of the four ethnic groups, questions were asked about marital status, number and age of children living at home.

In the third part respondents were asked about their time allocation on a weekday (24 hours), i.e. the amount of time spent on the next fourteen categories: sleeping, working, eating and cooking, washing/getting dressed, reading newspapers/ magazines, reading books, household activities, partner, parents/ family, care for children, watching TV, computer, and leisure. If the total amount of time added up to more or less than 24 hours, respondents were asked to reschedule their time over the categories.

In part four, respondents were asked whether they outsourced household activities like home cleaning and window cleaning. People with children living at home were asked whether they outsourced the care for their children. Respondents who did not outsource household activities were asked about the reasons for not doing so.

People who claimed to outsource household activities were asked what kind of activities they outsourced, how many times per month/ year, and how much money they spent on outsourcing. People outsourcing the care for children were asked what number of hours that childcare was outsourced and how much money they spent on it.

In this section of the questionnaire, respondents were asked about their food habits. Questions on outsourcing meal preparation (to takeaway food, ready-to-eat meals, eating out etc.) were posed, as well as questions on how many fresh vegetables they ate and where they bought their groceries.

The health of the respondent was the subject of the fifth part of the questionnaire. People were asked to rate their own health on a five-point scale, whether they had visited their GP (General Practitioner) in the last two months and whether they had been hospitalised during the last year. People were asked about their height and weight, about their use of medication, and whether they had suffered from certain diseases last year. In this section, respondents were also asked about their physical activities.

In the last part of the questionnaire, several socio-economic and demographic questions were asked. People were asked about their age, level of education, and income. When applicable, this information was also asked for the partner. The interviewer filled out the gender of the respondent. At the end of the questionnaire, the respondent was thanked for the co-operation and was told that if (s)he wanted more information, (s)he could contact the researchers later.

Overview 2.1 shows the protocol that was used by the interviewers in a computerised format. The first column shows the questions the interviewers asked, the second column gives the possible answers, and the third column indicates the questions that followed a particular answer.

Overview 2.1 Interview protocol[1]

Standard questions	**Response**	**Follow-up**
1. Person aged above 18 years	Yes: No:	Ethnicity of respondent (go to question 2) End of interview (33)
2. Respondent is native Dutch, Surinamese/ Antillean, Moroccan or Turk	Yes: No:	Marital status (3) End of interview (33)
3. Respondent is married/ lives together	Yes: No:	Ethnicity partner (4) Children (5) Children (5)
5. Children living at home	Yes: No:	Age and number of children (6) Use of childcare (type, # hours/month, costs) (7) Time allocation (8) Don't ask (6) and (7) Time allocation (8)
8. Time allocation		Outsourcing (9)
9. Outsourcing household activities	Yes: No:	Type of activities, # hours/month, costs (9) Outsourcing meal preparation (11) Reason for not outsourcing (10) Outsourcing meal preparation (11)
11. Outsourcing meal preparation	Yes: No:	Type, times/month, costs (12) Other food habits (13) Health (14) Other food habits (13) Health (14)
14. Health, GP visits, hospitalisation, well-being, smoking		Have been ill (15)
15. Have been ill last year	Yes: No:	Type of disease(s) (16) Height and weight (17) Sport (18) Height and weight (17) Sport (18)
18. Sport	Yes: No:	Times per week (19) Employment (20) Employment (20)
20. Respondent has paid employment	Yes: No:	Number of hours per week (21) Income (22) Income (22)
22. Respondent has own income	Yes: No:	Net income respondent per month (23) Income partner (24) Type and amount of allowance (23) Income partner (22)
24. Partner has own income	Yes: No:	Net income partner per month (25) Number of hours work per week (26) Level of education (28) Type and amount of allowance partner (27) Level of education (28)
28. Level of education of respondent and partner		Age (29)
29. Age of respondent and partner		Visit church (30)
30. Visits church, mosque, synagogue, or temple	Yes: No:	How many times per week/month/year/ (31) Gender (32) Gender (32)
32. Gender	Male Female	Filled out by interviewer without asking, end (33)
33. Closing remarks and questions		

[1] Questionnaire and data are available on request.

If the respondent was not a native Dutch, Surinamese/Antillean, Moroccan, or Turk, the interview was ended. If people belonged to one of the target groups of the sample, they were asked about their marital status and about children living at home.

If the respondent had no partner, the question about the ethnicity, age, level of education, and employment of the partner were excluded (questions 4, 24, 25, 26, 27, 28, and 29). When respondents had children living at home, they were asked about the number of children living at home, age of the children, and outsourcing of childcare. These questions were excluded for respondents without children living at home.

Respondents were asked to divide 24 hours over fourteen different categories, and then asked whether they outsourced household activities. If people claimed not to outsource household activities, they were asked for a reason (too expensive, not necessary etc.). Respondents who made use of certain types of outsourcing were asked how many hours per week or per month they outsourced the different activities and how much money they spent on it. Thereafter, respondents were asked about their food habits.

In question 14, respondents were asked about their health and well-being. Subsequently, they were asked about their weight and height and sport habits.

Questions 20 through 27 concerned the employment and the income or allowance of the respondent (and partner), while question 28 dealt with the level of education of the respondent (and partner).

In question 29, respondents were asked about their age, and the questionnaire concluded with a question on religious affiliation. The interviewer filled out the gender of the respondent without asking (question 32), because it could be experienced as quite offensive if the respondents would be asked about it.

At the end of the interview, the respondent could give comments on the interview. The interview ended with some closing remarks of the interviewer.

2.4 Comparison of the sample with data of Statistics Netherlands (CBS and SCP)

To check the representativeness of our sample, we compare our sample to other samples from the Netherlands divided by ethnicity. In this section we give a few sample statistics and compare them to existing sample statistics of the Dutch Central Bureau of Statistics (CBS) and the Social and Cultural Planning Bureau (SCP) [2].

More than a third of the households in the Netherlands have children living at home. Half of the non-western households have children. Especially among Turks and Moroccans there is a relative

[2] The data are compared with data sets from the Dutch Central Bureau of Statistics and Social and Cultural Planning Bureau. To test the representativeness of our sample, it would be better to compare it with a census. Unfortunately, they are not available.

over-representation of households with children (SCP, 1998). Based on this information, we expected an over-representation of resident children in Moroccan and Turkish households.

Table 2.5 shows some background information of the respondents in our sample, compared to figures from the CBS.

Table 2.5 Household composition of respondents compared to CBS data (in percentages)

partner	children	Dutch	CBS*	Surinamese/Antilleans, Moroccans, and Turks	CBS*
no	no	27.5	14.5	24.0	14.5
no	yes	4.5	2.0	6.0	5.0
yes	no	30.5	52.0	22.0	35.0
yes	yes	37.5	27.5	55.0	39.5
other		-	4.0	8.0	6.0
Total		100	100	100	100

** Source: CBS, 2003a, data from 2002 (separate data for men and women are combined)*

Compared to the CBS data, singles and people with a partner and children are somewhat over-represented. In our sample, the Surinamese/Antilleans, Moroccans, and Turks have more single-person households compared to CBS data, whereas the number of two-person households without children is lower than the CBS figures. Our sample shows an over-representation of resident children in Surinamese/Antillean, Moroccan and Turkish households, which was expected as discussed above.

Table 2.6 gives an overview of the distribution of the respondents over age-brackets. The age-brackets are divided over 10 years up to the highest age-bracket of 50 years and older. The first age-bracket is small, since only adults were interviewed.

Table 2.6 Age of respondents compared to CBS data (in percentages)

age-brackets	Dutch	CBS*	Surinamese/ Antilleans	CBS** Surinamese	CBS** Antilleans	Moroccans	CBS**	Turks	CBS**
18 - 19	2.0	3.0	2.3	5.2	5.8	7.8	6.8	9.4	5.9
20 - 29	13.7	16.9	18.7	24.2	33.0	35.2	33.7	29.6	32.8
30 - 39	24.8	21.2	26.7	28.1	26.1	31.4	27.6	40.9	31.0
40 - 49	18.5	19.0	24.3	22.4	19.2	12.0	14.2	11.4	13.6
$\geq$ 50	40.9	39.9	28.1	20.1	15.9	13.6	17.7	8.7	16.7
total	100	100	100	100	100	100	100	100	100

** Source: CBS, 2003a, data from 2001*
*** Source: CBS, 2002, data from 2001*

Our sample shows a slight over-representation of people aged 50 and above for the native Dutch and the Surinamese/Antilleans. Conversely, the Moroccan and Turkish groups in our sample shows an over-representation of younger age-categories: our sample gives an over-representation of Moroccans aged between 20 and 29, and an over-representation of Turks aged between 30 and 39. However, this over-representation could not have been prevented, since the Turkish and Moroccan population in the Netherlands is relatively young (as shown in Figure 1.1 in Chapter 1). The over-representation of younger Moroccans and Turks has had some effect on our analyses in the

subsequent chapters. The different effects of an over-representation of relatively young Moroccans and Turks in our sample are discussed in the chapters concerned.

In the Netherlands, immigrants have a higher unemployment rate (about 11 percent in 2001) (CBS, 2001) than the native Dutch population (2.9 percent in 2001) (CBS, 2003a). Compared to the CBS data, the unemployment rate of our total sample (2.9 percent) is relatively low. Also, the immigrant groups in our sample have a relatively low unemployment rate (about 2 percent). This can be explained by the relatively young respondents in the three immigrant groups (assuming that unemployment rate is lower among younger immigrants[3]). Another explanation can be the fact that unemployed people are less likely to participate in telephone interviews, because they feel ashamed about their situation, or do not even have a telephone.

Table 2.7 shows the education level of people in our sample with a paid job, compared to figures from the CBS. A low level of education implies primary school and vocational education. Medium level of education implies lower and higher secondary education, pre-university education, and intermediate vocational education. High level of education includes people holding a bachelor's or a master's degree.

Table 2.7 Level of education of respondents compared to SCP data (in percentages)

	Sample	SCP*	
Native Dutch			
Low level of education	27.2	32.3	
Medium level of education	44.8	42.1	
High level of education	27.1	25.6	
Other**	0.9		
Total	100	100	
Surinamese/ Antilleans		Surinamese	Antilleans
Low level of education	20.5	54.9	51.9
Medium level of education	45.8	31.2	27.8
High level of education	30.5	13.9	20.3
Other	3.1		
Total	100	100	100
Moroccans			
Low level of education	17.4	71.7	
Medium level of education	44.5	20.6	
High level of education	19.6	7.7	
Other	18.5		
Total	100	100	
Turks			
Low level of education	49.6	74.9	
Medium level of education	37.1	19.4	
High level of education	9.6	5.7	
Other	3.7		
Total	100	100	

** Source: SCP, 2003, figures from 2002 people aged between 15 and 64 not going to school*
*** other education, or missing value*

[3] 10.5% of the non-western immigrant respondents are students, against only 3.9% of the native Dutch in the sample.

With respect to education, our sample figures concerning the native Dutch are close to the figures of CBS on level of education amongst the Dutch. Our sample shows an over-representation of higher educated Surinamese/Antilleans and an under-representation of lower educated respondents in this group. The same is also seen in our Moroccan and Turkish groups. In both groups our data have an over-representation of higher and medium educated respondents and an under-representation of lower educated respondents. For these two groups it can be caused by the relatively low mean age of the respondents (since in these groups older immigrants are lower educated than the younger immigrants).

Table 2.8 gives an overview of the mean net household incomes per ethnic group per month.

Table 2.8 Mean net household income of respondents per month (in Euro's)

Ethnicity	**Net household income**	**Net household income***	
1. native Dutch	1,694	1,500	
2. Surinamese/Antilleans	1,667	1,292	(Surinamese)
		1,208	(Antilleans)
3. Moroccans	1,335	1,083	
4. Turks	1,413	1,167	

** Source: CBS, 2003a data from 2000*

The income levels of the immigrants in our sample are higher than the CBS figures. Especially the income of the Surinamese/Antillean respondents in our sample is high. An explanation can be found in Table 2.10, which shows that the level of education of the Surinamese/Antillean respondents is considerably higher compared to the CBS data. A higher education correlates with a higher income. The level of education of the Surinamese/Antilleans in our sample is comparable to the level of education of the native Dutch, which explains why the incomes of these two groups are almost the same. The same holds for the other immigrant groups. Compared to the CBS data, they have relatively high levels of education. This explains the higher income levels in our sample.

2.5 Overview of socio-economic and demographic variables

As mentioned in section 2.3, after the assessment of their ethnicity, the respondents were asked about several subjects including time allocation, health, food habits, and happiness. All of these variables will be thoroughly discussed in the following chapters. However, some socio-economic and demographic variables will show up in all chapters. These are mentioned in Table 2.9 and will be referred to in the subsequent chapters.

Table 2.9 Sample characteristics of a survey of the native Dutch and non-western immigrants

	Dutch (N=701)	Surinamese/ Antillean (N=701)	Moroccan (N=449)	Turkish (N=700)
Gender (%)	N=701	N=700	N=447	N=700
Female	63.3	57.6	47.4	45.0
Male	36.7	42.4	52.6	55.0
Married/cohabiting (%)	N=701	N=700	N=449	N=699
	67.9	52.4	71.9	78.7
Children at home (%)	N=701	N=701	N=449	N=700
	41.8	49.2	62.6	74.0
Children aged 0-3 at home	13.8	12.8	33.6	25.6
Children aged 4-11 at home	18.1	22.4	37.6	47.0
Children aged 12-15 at home	10.4	14.1	16.0	22.7
Children aged 16-25 at home	11.4	16.3	16.7	17.1
Children aged > 25 at home	2.3	4.6	4.0	6.1
Net income level per month respondent (%)	N=356	N=435	N=228	N=343
<NLG 500 (€227)	5.3	2.1	4.4	4.7
NLG 500 - 2,000 (€227-€908)	25.3	17.5	23.2	21.9
NLG 2,000 - 3,500 (€908-€1,588)	43.8	50.4	55.3	62.6
NLG 3,500 - 5,000 (€1,588-2,269)	18.0	20.5	14.0	7.3
NLG 5,000 - 8,000 (€2,269-€3,630)	4.8	7.4	2.6	2.6
> NLG 8,000 (€3,630)	2.8	2.1	0.5	0.9
Net income level per month partner (%)	N=233	N=193	N=97	N=236
<NLG 500 (€227)	1.3	0.5	1.0	2.5
NLG 500 - 2,000 (€227-€908)	8.15	18.7	17.5	19.5
NLG 2,000 - 3,500 (€908-€1,588)	47.2	53.9	72.2	64.8
NLG 3,500 - 5,000 (€1,588-2,269)	18.0	20.5	8.6	9.3
NLG 5,000 - 8,000 (€2,269-€3,630)	9.4	6.2	1.0	3.8
>NLG 8,000 (€3,630)	1.3	1.0	1.0	0
Hourly wage rate respondent *	€9.95	€11.86	€8.49	€8.57
Hourly wage rate partner	€10.39	€9.54	€9.18	€8.85
Age respondent	N=701	N=699	N=444	N=700
Mean	46.70	41.83	33.90	33.13
S.D.	*16.85*	*13.72*	*12.44*	*10.93*
Min.	*18*	*18*	*18*	*18*
Max.	*90*	*88*	*81*	*75*
Age partner	N=467	N=360	N=297	N=521
Mean	46.03	42.89	37.70	35.85
S.D.	*14.46*	*11.27*	*10.89*	*9.73*
Min.	*21*	*20*	*19*	*18*
Max.	*86*	*85*	*85*	*72*
Level of education respondent (%)	N=700	N=689	N=397	N=691
Elementary school	9.3	9.1	12.6	29.1
Initial professional education	18.0	11.8	7.1	21.1
Lower gen. secondary education	12.0	13.9	11.1	10.0
Higher gen. secondary education	5.3	4.9	9.8	6.8
Grammar school	4.7	3.6	4.8	2.3
Intermediate vocational education	22.9	24.1	24.7	18.5
BSc/BA	20.6	24.4	15.1	7.7
MSc/MA	6.6	6.7	7.1	2.0
Other	0.7	1.5	7.8	2.5

** middle of income bracket divided by working hours.*

Table 2.9 (continued)

Level of education partner	N=460	N=346	N=241	N=506
Elementary school	7.6	7.8	22.0	40.5
Initial professional education	19.6	11.6	4.6	16.8
Lower gen. secondary education	10.9	15.0	12.4	12.6
Higher gen. secondary education	7.8	7.8	10.0	5.3
Grammar school	2.6	2.0	2.5	2.6
Intermediate vocational education	24.3	26.0	17.4	9.5
BSc/BA	19.3	21.1	12.0	6.1
MSc/MA	7.2	6.9	8.3	3.8
Other	0.7	1.7	10.8	2.8
Weekly working hours (if paid job)	31.02	33.40	33.83	34.33
S.D.	*14.04*	*11.76*	*14.45*	*14.37*
Min.	*3*	*1*	*2*	*1*
Max.	*88*	*90*	*87*	*96*
Weekly working hours partner (if paid job)	37.34	34.57	33.83	35.01
S.D.	*12.60*	*11.55*	*14.45*	*12.0*
Min.	*3*	*5*	*2*	*2*
Max.	*91*	*90*	*87*	*84*
Religious affiliation (%)****	23.3	26.9	40.8	40.9
Home owner (%)	59.0	39.3	19.9	26.0
Living in urban area (%)	10.3	43.4	39.9	32.9

*** visits at least once a month a church, mosque, synagogue, or temple*

In our sample, the Dutch females are somewhat over-represented. As discussed in section 2.4, the levels of education in our sample are comparable to the data from the Central Bureau for Statistics, except for the over-representation of higher educated immigrants (which can be ascribed to the relatively low mean age for immigrants in the sample; in general, younger immigrants are higher educated).

Except for the Surinamese/Antilleans, immigrants are more likely to be married than the native Dutch. The mean number of children living at home does not differ very much over the four groups, only the Surinamese/Antilleans have a relatively high number of children aged above 25 living at home. Obviously, in the other groups in general children move out before the age of 25.

The hourly wage rate of the native Dutch respondents in our sample is lower than the hourly wage rate of the Surinamese/Antilleans. The fact that Dutch females (who are less frequently employed, or only have small part-time jobs) are over-represented in our sample can be an explanation. The wage rate of the partners of the native Dutch respondents is higher than the wage rate of the Surinamese/Antillean respondents, indicating that there are more Surinamese/Antillean breadwinners in our sample compared to the native Dutch. The higher mean age of the native Dutch in our sample could also be an explanation, because a higher mean age means more retired people in our sample for the Dutch group (18 percent of the native Dutch in our sample is aged above 64).

The Surinamese/Antilleans have relatively high income levels and high levels of education. As discussed in section 2.4, we expected the same levels (or higher) for the native Dutch in our sample, but apparently mainly (unemployed or part-time working) women participated in our

research. The latter also explains the relatively low numbers of weekly working hours of the native Dutch. The immigrants have about the same mean working hours per week.

The mean age of Turks and Moroccans in our sample is significantly lower than the mean age of the native Dutch and Surinamese/Antilleans. Although bilingual interviewers conducted the telephone interviews, the language barrier may have been the reason why, on the whole, rather young and higher educated immigrants completed the questionnaire.

In the sample, immigrants mainly live in the four big cities in the Netherlands (Amsterdam, The Hague, Rotterdam, and Utrecht). In general, many native Dutch own their home, followed by Surinamese/Antilleans, while the Moroccans own a home the least frequently. Immigrants more often rent a home, mainly caused by their lower income levels.

Religious affiliation is measured by the number of visits to a church, mosque, synagogue or temple. About one quarter of the native Dutch and the Surinamese/Antilleans were religiously 'active'. The Moroccans and Turks (40 percent) seemed to be much more active in practising their religion, which is also found in the literature (SCP, 2004).

2.6 Conclusions and discussion

The purpose of the data gathering using a random dialling procedure was to obtain a stratified data set containing 700 native Dutch, 700 Surinamese/Antilleans, 700 Moroccans, and 700 Turks. The Moroccans turned out to be the group that was the most difficult to contact; we ended up having 450 of them in our sample. The total sample included 2,551 respondents, including 701 native Dutch, 701 Surinamese/Antilleans, 700 Turks, and 450 Moroccans.

In order to get insight in the characteristics of our sample, essential (socio-economic) variables like age, income, and level of education were compared to existing data of the Central Bureau of Statistics and the Social and Cultural Planning Bureau. Comparing the age of our respondents to CBS and SCP data, we see that our data are close to these figures.

The mean age of the Turks and Moroccans in our sample is significantly lower than the mean age of the native Dutch, which could have affected the outcomes of some of our analyses. This will be discussed in the chapters concerned.

The levels of education are comparable to the available data, but highly educated immigrants are (somewhat) over-represented (which will be caused by the low mean age of immigrants in the sample; in general younger immigrants are higher educated). The levels of income of the immigrants are close to available general statistics. There is, however, an over-representation of non-working Dutch women in our sample, which caused a relatively low mean level of income for the native Dutch.

3

The effects of food habits and socio-economic status on overweight

3.1 Introduction

Overweight is a growing problem worldwide. In the USA, it is currently estimated that mortality due to lack of exercise and to caloric intake is second only to tobacco consumption in the number of deaths that could be prevented by change in behaviour (Philipson, 2001; McGrinnis and Foege, 1993). In 2000, the World Health Organization has declared overweight to be the number one global epidemic (WHO, 2000).

The trend in overweight in the past decade is alarming. The Netherlands is one of the countries with the highest prevalence of overweight together with the USA, UK and Germany. Males in particular have an increased risk of becoming overweight as well as youngsters and individuals with low education (Mathus-Vliegen, 1998). In the 1980s, almost 30 percent of the Dutch population was overweight. Figures from 2002 show that 48 percent of the men and 39 percent of the women aged above 20 are overweight (CBS, 2002c). Men are more frequently overweight than women. Both level of education and income have a strong relationship with overweight. The prevalence of overweight is higher among low educated people and people who have a low income than among higher educated people and people with higher income.

Philipson and Posner (1999) argue that there might be important economic reasons for the growth in obesity in the previous decades: 1) the increase in prosperity results in higher expenditure on food; 2) technological change has lowered the real price of food as well as the physical expenditure of calories per hour worked in market or household production; 3) relative prices of mobility and physical activity have changed by technological progress, causing a decrease in direct mobility costs (the price of driving a car, travelling by train etc.); and 4) technological progress has changed the relation between physical labour and payment.

In an agricultural or industrial society, work is vigorous; in fact, the worker is paid for physical labour. In a post-industrial and redistributive society, most work entails little physical effort, and not working is unlikely to cause a reduction in weight since food stamps and other welfare benefits are also available to people who do not work. In fact nowadays, in many cases people must pay for undertaking physical activity (sport schools), rather than to be paid for it. Payment is mostly in

terms of foregone leisure, since leisure weight-control must be substituted for weight-control on the job (Philipson, 2001). On the other hand, doing sports can also be considered as 'fun' weight-control and can therefore be experienced as pleasant leisure instead of forgone leisure.

Genetic, socio-economic, and cultural factors like poor housing, low incomes, lifestyle, and the perception of cures and illness act upon differences in overweight between groups in the society. Earlier research shows that immigrants in the Netherlands have a higher risk of becoming overweight than the native Dutch (Mathus-Vliegen, 1998; Brussaard *et al*., 2001). Therefore, it is interesting to investigate differences in determinants of overweight between the native Dutch and immigrants. The determinants of overweight may differ across ethnic groups, caused by cultural differences in food habits, lifestyle, socio-economic status, or the way overweight is judged in a social environment.

The purpose of this chapter is to study the determinants of overweight. As literature shows, socio-economic variables are important determinants of overweight. Until now, not much is known about the relationship between overweight and 'modern food habits' like takeaway food and ready-to-eat meals. Therefore, certain modern food habits are included in the research to determine their effect on overweight.

This chapter also investigates whether the prevalence of overweight among immigrants differs from the native Dutch and whether their overweight-determinants differ from the native Dutch. Four groups are studied: a Dutch group, a Surinamese/Antillean group, a Moroccan group, and a Turkish group. As mentioned in Chapter 2, these three immigrant groups were selected, since they are the largest non-western immigrant groups in the Netherlands.

Section 3.2 provides an overview of the literature on differences between immigrants and native Dutch in the Netherlands on overweight and its determinants, food habits, and the interaction between socio-economic status and overweight. Section 3.3 describes the data, the methods used, and gives some descriptives of the sample. In section 3.4 the estimation results are shown. In section 3.5 the issue of physical activity in relation to overweight is discussed. Section 3.6 gives the conclusions and discusses some related issues.

3.2 Review of literature on overweight

3.2.1 Overweight and obesity in general

In many studies, information on weight and height is obtained by self-report of the respondents. In a telephone interview, self-reported weight and height is the most simple and adequate way to gain insight in prevalence of overweight. Body Mass Index (BMI), also known as Quetelet-index, is a simple index of weight-for-height that is used to classify underweight, normal weight, overweight, and obesity of adults, and was introduced in 1984. It is defined as the weight in kilograms divided by the square of height in meters (kg/m^2) (WHO, 2000; Mathus-Vliegen, 1998). The classification is

widely used and also recommended in Finland and other Scandinavian countries (Lähteenkorva and Lahelma, 2001). Overweight and obesity measured by BMI are strong indicators of mortality (Fontaine *et al*., 2003; Peeters *et al*., 2003).

The classification of overweight and obesity according to the BMI is shown in Table 3.1. People with a BMI smaller than 18.50 are underweight. A BMI between 18.50 and 24.99 is a recommended range, and is considered as normal weight. For example, someone is 1.80m tall and weighs 75kg. His BMI is $75/(1.80)^2 = 23.1$ then, which indicates a healthy weight. People with a BMI larger or equal to 25.00 are overweight. Overweight can be further divided into classes as shown in Table 3.1.

In the context of this research we will use the term 'overweight' for people with a BMI ≥ 25.00. Table 3.1 also gives an overview of the prevalence of underweight, normal weight, and overweight of the Dutch males and females.

Table 3.1: Classification of adults according to BMI

Classification*[1]	**BMI**	**Dutch women****	**Dutch men****
Underweight	<18.50	2.6%	0.9%
Normal range	18.50-24.99	58.2%	50.9%
Overweight	≥25.00	39.2%	48.2%
Preobese	25.00 - 29.99	N/A	N/A
Obese class I	30.00 - 34.99	N/A.	N/A
Obese class II	35.00 - 39.99	N/A	N/A
Obese class III	≥ 40.00	N/A	N/A

** Source: WHO, 2000* *N/A: Not Available*
*** Source: CBS, 2002c*

Table 3.1 shows that in the Netherlands in 2002, almost 40 percent of the females and almost 50 percent of the males have overweight. There are no data available about pre-obese and the obese classes I, II, and III. We know however, that in 2000, 8.6 percent of the Dutch males and 10.2 percent of the Dutch females are obese (BMI ≥ 30) (CBS, 2000b).

Although rough, BMI can be considered to provide the most useful population-level measure of overweight. BMI can be used to estimate the prevalence of overweight within a population and the risks associated with it, but it does not account for the wide variety in the nature of overweight between different individuals and populations (WHO, 2000).

Past analyses have shown strong associations between obesity and cardiovascular disease, coronary artery heart disease, diabetes, and cancer. Evidence showing that overweight or obesity has

[1] These BMI classification schemes are age-independent and the same for both sexes. However, BMI may not correspond to the same degree of fatness in different populations due, in part, to differences in body proportions. BMI does not distinguish between weight associated with muscle and weight associated with fat (WHO, 2000).

adverse effects on health and longevity is overwhelming. In comparison with other EU countries, the Netherlands occupies a mediate position on health of the population in particular with respect to life expectation and infant mortality.

Weide and Foets (1998) state that immigrants feel themselves less healthy than the Dutch population and immigrants report more chronic health problems. The risk of overweight is high among both children and adult women, and there is a higher risk for Turkish and Moroccan groups than for the Dutch group (Brussaard *et al.*, 2001). Uniken Venema *et al*. (1995) give three factors that explain how ethnic background relates to health: 1) biological/genetic factors; 2) socio-economic factors; and 3) socio-cultural factors. Biological/genetic factors can be related to health both directly and indirectly: directly through genetic variations and indirectly through discrimination.

In Chapter 4 we will discuss and investigate the issue of health and differences between natives and immigrants in the Netherlands. In that chapter we also investigate the relation between overweight and health.

3.2.2 Socio-economic status, culture, and overweight

In many cases, overweight and socio-economic status are negatively associated. Pagán and Dávila (1997) explore the possibility that obesity may be endogenously related to earnings. Their results suggest that males employed in "services" are more likely to have a higher risk for obesity. The hedonic interpretation Pagán and Dávila give is that individuals inclined to obesity may choose services because this occupation provides them with a higher wage in compensation for accepting a higher level of stress-related risk (assuming people to gain weight during stressful periods of time). The authors also claim that overweight women in the service sector are penalized for their obesity in their wage; this obesity wage penalty varies little across occupations (see also Averett and Korenman, 1996, and Register and Williams, 1990).

According to Register and Williams (1990) the pay differential is minus 12 percent for obese women and minus 5 percent for obese men compared to their normal weight counterparts. Obese females work mostly in relatively low-paid occupations and are largely excluded from the high-paid managerial and technical occupations (Pagán and Dávila, 1997). For women, a high BMI is associated with unemployment and a low income, whereas slimness shows a slightly weaker association with a low household income after transfers. For men, slimness (defined as BMI < 20) is associated with unemployment, low income and social isolation (Sarlio-Lähteenkorva and Lahelma 1999). Women with excess body weight are more likely to have experienced unemployment, indicating that unemployment might be related to weight gain. Another possibility is that a low income contributes to the likelihood of obesity, since healthy food is more expensive.

Jeffery and French (1996) investigate the interaction between weight control practices and socio-economic status. They show evidence that low-income women, in comparison with women at high-income levels, are less attentive to their weight and more tolerant to weight gain. These women

perceive less social support from friends for a healthy diet and exercise behaviour, and they engage in less healthy (yet not unhealthy) weight control practices (Jeffery and French, 1996).

Figures from the Netherlands show that socio-economic status affects overweight. From the group of individuals with only elementary school education, about 35 percent is overweight, which is twice as much as people holding a bachelor's or master's degree, indicating a relation between level of education and overweight (CBS, 2001a and 2002a and b). Although not much is known about the effects of socio-economic status on obesity and differential effects across between natives and immigrants in the Netherlands, some is known about income, level of education, and employment, and their effect on obesity.

The data of Averett and Korenman (1996) indicate that women, who are overweight at ages 16 to 24, have a lower family income and lower hourly wages at ages 23 to 31. These women are also less likely to be married, and if they are married, their partner has a lower income than women with a BMI in the recommended range. Contrary to this, Averett and Korenman (1996) find that heavier men are more likely to be married (Averett and Korenman, 1996).

In the Netherlands, the prevalence of obesity over time increases most among low educated men and women, and it also increases with age. Yet, in the past few decades, the average BMI increased most among low educated men and in all levels of education of women. This is somewhat contradictive, also when compared with later research. Van Lenthe *et al*. (2000) show that BMI is positively associated with age and negatively associated with level of education in both sexes, after adjustment for other socio-demographic variables. They find a positive association of BMI with family income in males and a negative association with occupational level in females (Van Lenthe *et al*., 2000). Visscher *et al.* (2002) also find a positive relationship between obesity and age (see also Mathus-Vliegen, 1998; Jacobs and Gottenborg, 1981). The prevalence of obesity especially increased for men aged 50 - 59 and for women aged 30 - 39.

The prevalence of obesity is three times higher among men with a low level of education compared to men with a high level of education. Among women the prevalence of obesity is more than five times higher among those with a low level of education than among women with a high level education (Visscher *et al*., 2002). Both results suggest a strong negative relationship between level of education and obesity. Still, the same research also shows an increase in prevalence of obesity during the last decade of the 20th century among women with a high level of education.

Being overweight might cause psychological stress, for example by a penalty in wage as discussed above. Nevertheless, there are cultural differences in the way people perceive being overweight. Pinhey *et al*. (1997) state that being overweight is psychologically distressing when a society views it negatively. This greater distress originates from the stigmatisation of overweight persons, who internalise negative self-evaluations, which in turn result in self-rejection. Although this stigmatisation process may commonly occur among groups in the US (as well as in other western countries) that highly values slimness, it is less likely to occur in Pacific Island cultures (which are

among the most overweight in the world), where obesity is traditionally associated with the positive attributes of wealth and rank. The more common obesity is in a social group, the less harmful will be its effects on self-reports of mental distress.

The above-discussed literature shows a vice versa relationship between overweight and socio-economic status. On the one hand, people with a lower socio-economic status have a higher risk of becoming overweight. On the other hand however, overweight people are more likely to have a lower socio-economic status.

Higher BMI-scores are significantly related with lower self-assessments of personal happiness in social groups where overweight is less common (Pinhey *et al*., 1997, see also Averett and Korenman, 1996). Therefore, it is interesting to investigate differences in overweight between the native Dutch and non-western immigrants in the Netherlands. The latter groups might view overweight as positive, resulting in a higher prevalence for overweight. Nayga's (2000) results indicate that blacks have a higher relative weight and probability of becoming obese than whites. The results suggest that differences in relative weights between blacks and whites are caused by less diet-disease knowledge of the blacks (Nayga, 2000).

3.2.3 Life style and food habits

When it comes to weight, smoking is an important factor. Studies show a negative relationship between smoking and body weight (Jacobs and Gottenborg, 1981; Wack and Rodin, 1982; Mathus-Vliegen, 1998; and Wannamethee, 2001). Obesity is more prevalent among people who have never smoked than among current smokers (Visscher *et al*., 2002). People who smoke have lower body weight, although they consume at least as many or more calories than never smokers (Jacobs and Gottenborg, 1981). Among smokers, body weight depends on the amount of cigarettes smoked (Visscher *et al*., 2002). Starting smoking results in an average weight loss of 3 to 4 kg. Giving up smoking is associated with gaining 2 to 5 kg in weight in the first 6 to 12 months (Mathus-Vliegen, 1998).

In the nineties, food convenience became more important in the Netherlands. During that time, ready-to-eat meals belong to the top of the most fast growing products (Van Dam *et al.*, 1994). Figures from the Social and Cultural Planning Bureau (SCP) show a slow growth of microwave penetration in Dutch households in the early nineties. But in 1998, about 84 percent of the households do have a microwave (SCP, 2000).

Outsourcing meal preparation has become more popular in the previous decades. In 1975, 40 percent of Dutch households visited restaurants 1 to 9 times a year, as compared to 61 percent in 1995 (Tijdens *et al*., 2000). Presently, takeaway food is relatively important in the Netherlands. Sixty-three percent of all Dutch households eat takeaway food more than once a month; 82 percent of the households with a double income eat takeaway food more than once a month (SCP, 2000). Sixty percent of the households with a double income visit restaurants more than once a month, against 26

percent of the single income households (SCP, 2000). There is little data available on differences in the outsourcing of meal preparation between immigrants and natives. It is known that immigrants (mainly the Surinamese/Antilleans) more often visit fast food restaurants than the native Dutch. Moroccans go to cafeterias and snack bars less frequently than the Surinamese/Antilleans, Turks, and native Dutch (Bedrijfschap Horeca en Catering, 2001).

Although it is not known whether ready-to-eat meals lead to overweight, the image of ready-to-eat meals is not very good with respect to nutrition value. De Graaf (1994) compares ready-to-eat meals to regular diner meals with respect to weight, energetic value, and percentage of salt. For females, the average weight of a regular meal is 425 grams, for males it is 525 grams. The average weight of a ready-to-eat meal is about the same as the weight of a regular meal. The energetic value of the ready-to-eat meals is good, but the percentage of salt is above the norm of 3 grams. A meal from a fast-food restaurant weighs less than a regular meal (about 400 grams), but has a much higher energetic value. Pizzas weigh much less than a regular meal (350 grams) and the energetic value is far above average. Ready-to-eat meals contain few vitamins. Almost 90 percent of the meals do not even contain half of the norm for vitamin C (De Graaf, 1994).

The intake of fresh vegetables (and fruits) is recommended in a healthy diet (WHO, 2003). The Dutch eat about 80kg of vegetables per year, which is much lower than Spain and Italy, and about the same as Great Britain, Belgium, and Germany. In the 1980s, the Dutch ate more vegetables, almost 100kg per person per year (CBS, 2000a). This decline in consumption of vegetables could be caused by the increase in ready-to-eat meals and takeaway food. Because of cooking-habits from their home countries, immigrants possibly eat more vegetables compared to the native Dutch. Another explanation could be that in countries like Spain and Italy, potatoes are being considered as vegetables, in other West-European countries they are not.

Food consumption is affected partly by differences in the economic circumstances of the consumer. Sarlio-Lähteenkorva and Lahelma (2001) report that even in developed welfare states, such as Finland, some people are hit by circumstances in which they are forced to reduce their intake of food due to economic problems. These people might turn to cheaper foods with inferior nutritional quality. Food insecurity or even hunger may be common among particularly vulnerable groups, such as immigrants. Also, obese people are more likely to buy cheaper food (Sarlio-Lähteenkorva and Lahelma, 2001). It might also be true that obese people need more food and buy cheaper food to be able to consume larger quantities of food.

Florkowski *et al*. (2000) find a negative relationship between level of education and time spent on meal preparation. This implies that higher educated people spend less time on meal preparation, and will therefore eat more ready-to-eat meals, takeaway food, convenience food, and delivery food. They will also eat out more frequently.

The expenditure on food-away-from-home is positively affected by household income and education (Mihalopoulos and Demoussis, 2001), which indicates that people with higher incomes

and/or a higher education spend more money on food-away-from-home like eating in restaurants and delivery food. Also Heiman *et al*. (2001) conclude that people with higher incomes consume more ready-to-eat meals.

It is interesting to investigate whether cultural differences in food habits affect the prevalence of overweight. Immigrants have lower levels of education and income than the native Dutch and might therefore outsource meal preparation less often than the native Dutch. The effect of outsourcing meal preparation on weight is not known yet and might differ over the different kinds of outsourcing. Perhaps immigrants use other (cheaper) kinds of outsourcing meal preparation than the native Dutch, and therefore have different effects of outsourcing meal preparation on their weight.

When it comes to lifestyle, physical activity is also an important issue. This will be discussed separately in section 3.5.

Scheme 3.1 gives an overview of the main results of studies on overweight and obesity mentioned above and depicts the expected signs of the variables used in this research affecting BMI.

Scheme 3.1 Studies on overweight and obesity

GENERAL

Study	Description and estimation methods	Controls used	Main results
Pinhey *et al*. (1997) Obesity and happiness: the reflected self-appraisal hypothesis reconsidered.	Sample of Asian-Pacific population, 1991 (N=398). OLS multiple-regression analysis is done to test whether the more common being obese is for a social group, the less detrimental its effects on personal happiness.	Dependent variables: BMI and happiness. Independent variables: BMI, ethnicity, age, sex, education, income, employed, married, parent.	The more uncommon obesity is in a social group, the greater the unhappiness when being obese. Being female affects BMI negatively. Being married affects BMI positively.
Nayga (2000) Schooling, health knowledge and obesity.	Data used from Diet and Health Knowledge Survey from the US, 1994 (N=1,879), collected by telephone. Probit analyses are done to measure the effect of several variables on BMI, obesity health (diet-disease knowledge).	Dependent variables: knowledge, BMI, and obesity. Independent variables: black, race, income, age, household size, education, self-perception of overall-health, sex, unemployed, exercises per week, smoking, diet, nutrition perception, taste perception, obesity perception, perception about food guide pyramid, perception about dietary guidelines.	Individuals with more years of schooling have higher diet-disease knowledge. Males and females with the same # of schooling years do not differ in probability of being obese. Females have more diet-disease knowledge than males. Blacks have higher relative weight than whites.
Jacobs and Gottenborg (1981) Smoking and weight: the Minnesota lipid research clinic.	Men and women aged 20 - 59 (N=3,291) are included. Weight and height are recorded during clinic visit, more is asked in home interviews. Conditional F-tests are used for regressions.	Smoking, sex, age, weight, height, physical activity, caloric intake.	Weight increases with age. Ex-smokers are at least as heavy as those who never smoked, except for recent male quitters. There is an inverse relationship between weight and level of physical activity.
Wack and Rodin (1982) Smoking and its effect on body weight and the systems of caloric regulation.	Literature study is done on data about smoking, cessation of smoking, regulation of body weight, and food consumption.	Smoking, food consumption, body weight, metabolic system, nicotine.	Smokers weigh less than non-smokers. Smokers, who quit gain weight, till the same level of never smokers. Smoking and nicotine lower the efficiency of caloric storage and/or increase metabolic rate.
Wannamethee *et al*. (2001) Weight change, body weight and mortality: the impact of smoking and ill health.	Longitudinal study of British males (N=7,065) aged 40-59 who are followed for 13.8 years. The Cox proportional hazard model is used to assess independent contributions of weight change and BMI to the risk of mortality.	BMI and weight change as independent variables, and smoking, social class, physical activity, alcohol intake, lung function, and health as dependent variables.	Weight loss and low body weight is associated with an increased risk of mortality. In healthy non-smoking men weight loss and leanness are not associated with increased mortality. There is a positive association between BMI and recent ex-smokers.

SOCIO-ECONOMIC STATUS AND BMI

Study	Description and estimation methods	Controls used	Main results
Jeffery and French (1996) Socio-economic status and weight control practices among 20- to 45- year-old women.	SES (defined by family income) examined among 998 women from the US. Frequencies and multivariate analyses are studied.	BMI, family income, dieting practices (like skipping meals, decrease fat, and visiting diet centres), ethnicity, education, employed, smoking.	Economic deprivation may contribute to high rates of obesity among lower SES women.
Averett and Korenman (1996) The economic reality of the beauty myth.	A sample of a longitudinal survey in the US (N=5,090 females, N=4,951 males) aged 23 - 31. Regressions are estimated with BMI as dependent variable in 1981 and 1988.	BMI, family income, income needs, marital status, sex, ethnicity, employment, hourly wage, self-esteem, health, occupation, and spouse's earnings.	Obese women have a lower family income than women in recommended BMI range. Marriage might add weight to women as well as to men. Women obese at a young age are penalized for that by their income. Obese black women earn more (8%) than obese white women.
Pagán and Dávila (1997) Obesity, occupational attainment, and earnings.	Data of the National Longitudinal Survey of Youth (1989) from the US is used (N=3,806 males and 3,486 females) aged 24 - 31. Multinomial logit models with BMI as dependent variable.	BMI as a dependent variable, health limitations, 'self-esteem' dummies, family poverty, education, experience, race, ethnic group, marital status, school enrolment, region, and occupation as independent variables.	Women pay a penalty for being obese. Overweight males sort themselves into jobs to offset this penalty via occupational mobility.

Scheme 3.1 (continued)

Sarlio-Lähteenkorva and Lahelma (1999) The association of BMI with social and economic disadvantage in women and men.	A nationwide sample of Finnish subjects aged 25 - 64 (N=6,016) is divided into four BMI groups, thin (BMI < 20), normal (BMI 20 - 24.9), overweight (BMI 25 - 29.9), and obese (BMI ≥ 30). Multivariate analyses using logistic regression are conducted to predict social and economic disadvantage.	BMI groups as dependent variables, and age, level of education, marital status, unemployment, household income, individual earnings, region of residence, limiting long-standing illness, no close friends and feeling lonely as independent variables.	In women, overweight is associated with current unemployment and obesity with long-term unemployment as well as the absence of close friends and low household and personal incomes. Obesity and overweight are associated with low individual earnings.
OVERWEIGHT IN THE NETHERLANDS			
Study	**Description and estimation methods**	**Controls used**	**Main results**
Seidell *et al*. (1995) Prevalence and trends of obesity in The Netherlands 1987 – 1991.	Respondents (N=36,135) aged 20-59 participated in Monitoring Project on Cardiovascular Disease Risk Factors (1987 - 1991) in three towns in the Netherlands. Linear regression analysis is done with BMI and age as dependent variables.	Two different analyses are done, one with BMI, and another with age as a dependent variable. Independent variables are: level of education, gender, birth cohort, and age.	Prevalence obesity (BMI ≥ 30): 7% in men and 9% in women. Over time, increase of obesity strongest for those aged 20-29 and 50-59. Prevalence of obesity in males increases till the age of 50, for women till 50-59. For males the prevalence of obesity declines somewhat after the age of 50. Increase in average BMI in men is strongest in the lowest level of education, in women in all levels of education. Prevalence of obesity increases most in the lowest level of education in both men and women.
Mathus-Vliegen (1998) Overweight. I. Prevalences and trends, II. Determinants and strategies for prevention.	Literature study with Dutch datasets from varying between 1989 till 1994.	BMI, mortality, smoking, age, level of education, marital status, cardiovascular diseases, diabetes, hypertension, and more diseases.	BMI increases with age. Overweight affects mortality. In Europe, 64% of the males and 56% percent of the females is obese (BMI > 25). For males prevalence of obesity increases till 50-59 years of age, for females till the age of 70. In the Netherlands, 30-40% is obese. Turkish and Moroccan children are more obese (19%) than the Surinamese (11%) and Dutch children (9%). Immigrants have higher weight. Being married increases BMI. Low education has a positive effect on BMI. Quitting smoking adds weight.
Van Lenthe *et al.* (2000) Socio-demographic variables and 6 year change in BMI.	Data used from Dutch cohort study with subjects aged 20 - 49 (N=405 females, N=362 males). Relationship between BMI and socio-demographic variables is investigated using multivariate linear regression analysis.	BMI as a dependent variable, and sex, age, level of education, occupational level of breadwinner, income, marital status, religious affiliation, and degree of urbanization as independent variables.	BMI is higher in males than in females. BMI positively associated with age. BMI negatively associated with level of education. A positive relation is found between BMI and family income for males, against a negative relation between BMI and family income for females.
Brussaard *et al.* (2001) Nutrition and health among migrants in the Netherlands.	Data used from other surveys with data from 1978-1992 with data of Dutch, Moroccan, and Turkish groups. Frequencies of the data are studied.	Meal pattern, food products, macro nutrients, micro nutrients, BMI.	Risk of overweight high among children and adult women. Higher risk for overweight among Turkish and Moroccan groups than among Dutch groups.
Visscher *et al.* (2002) Long-term and recent time trend in the prevalence of obesity among Dutch men and women.	Data used form several health monitoring projects between 1976 - 1997 (with N=29,141), and 1993 - 1997 (with N=21,926). Mean values and prevalence rates are studied, as well as general linear models.	BMI, age, sex, education, smoking.	There is an increase in obesity the last quarter of the 20th century, especially among low educated males, and high-educated females. Prevalence of obesity increases with age. Prevalence of obesity 3x higher among low educated men, and 5x higher among lower educated women. Obesity more prevalent among never smokers than among current smokers.

Based on the literature, hypotheses can be formulated with respect to the variables used in this research. Scheme 3.2 depicts the hypothesized effect of each variable on BMI.

Scheme 3.2 Expected effects of used variables on BMI

Variable	Hypothesized effect on BMI
Surinamese/Antilleans	+
Moroccans	+
Turks	+
Sex (1=female, 0=male)	–
Takeaway food	+
Delivery food	+
Eating out	+/–
Convenience food (like canned vegetables)	+/–
Ready-to-eat meals	+/–
Fresh vegetables	–
Smoking	–
Married/cohabiting	+
Children at home	–
Age	+
Age squared	–
Income	–
Level of education	–

+ positive effect, – negative effect, +/– either positive or negative effect expected.

It is expected that immigrants have a higher BMI than the native Dutch, because immigrants have lower levels of education and income, which in the literature is associated with higher weight; therefore a positive effect of ethnicity on BMI is hypothesized. On basis of the literature, it is expected that females have a lower BMI than males.

Takeaway food and delivery food (usually pizzas) are expected to affect BMI positively, since their image is one of 'fat food' or food with a high-caloric value, which will add weight. The effect of ready-to-eat meals could be either positive or negative. Nowadays, there is a great variety in ready-to-eat meals and the quality of the ready-to-eat meals may have become better. The effect of eating out in restaurants is unsure, since restaurants can cook low-caloric food just as easily as high-caloric food (Cutler *et al*., 2003). Fresh vegetables are considered to be good for health and 'low-fat', therefore a negative effect on BMI is expected. Nevertheless, outcomes might diverge over the different types of outsourcing meal preparation. The results might also differ across the ethnic groups, because food habits and types of food will vary across the groups. Maybe the native Dutch eat out more (which is more expensive than takeaway food and delivery food) than immigrants.

We follow the literature by hypothesizing a negative sign for smoking. Being married/cohabiting is assumed to affect BMI positively, because people might be less careful of their weight once they are married or live together. Yet, for children living at home a negative relation is hypothesized, because with the arrival of children people might reconsider their eating pattern whether it is healthy or not. For both income and level of education negative effects on BMI are expected, because of the strong evidence in the literature. For age a positive effect on BMI is

expected, because literature indicates that weight increases with age. But weight may increase until a certain age and then decrease, so age squared will be negative.

3.3 Description of the data on food habits and overweight

In this chapter, we use the sample as described in Chapter 2. The total sample size is 2,551. The sample consists of 701 native Dutch, 701 Surinamese/Antillean, 449 Moroccan, and 700 Turkish respondents. More on the data collection and the sample can be found in Chapter 2.

Respondents were asked about their weight and height and BMI was calculated as described in section 3.2. According to the literature, overweight people tend to underestimate their weight, whereas underweight people tend to overestimate their weight (Visscher *et al*., 2002; Nieto-Garcia *et al*., 1990; Sarlio-Lähteenkorva and Lahelma, 1999). This could have also occurred in our sample and have affected the results.

Takeaway food is food that people get from restaurants (like Chinese restaurants), snack bars etc. Delivery food is food that is brought to homes of the people that ordered the food, for example pizza delivery. When people eat their meal in a (fast-food) restaurant, it is called eating out. Eating out includes paid meals, we do not mean meals at family or friend's houses. Ready-to-eat meals are meals that for consumption only need to be heated up in oven or microwave. Convenience food is food that is partly prepared, like pre-cut vegetables.

For income the total net household income is used, since we assume the respondent's Body Mass Index is determined by the household income rather than by the respondent's income.

In Table 3.2 the mean values and standard deviations of the used variables are presented per group[2]. ANOVA analyses are performed to check the significance of the results. The results of these ANOVA analyses are not shown, but will be mentioned with the topics concerned.

[2] See Chapter 2 (section 2.6) for the distribution of the variables age, income, and level of education.

Table 3.2 Distribution of overweight and food habits over the sample

Variable	native Dutch	Surinamese/ Antilleans	Moroccans	Turks
BMI	N=683	N=681	N=422	N=688
≥ 25.00	42.5%	45.2%	41.2%	50.4%
Takeaway-food per month	N=688	N=696	N=440	N=601
Mean	2.13	2.73	2.65	3.12
S.D.	2.76	3.87	5.66	4.8
Min.	0	0	0	0
Max.	31	10	70	38
Convenience food	N=695	N=696	N=437	N=673
Seldom/never	41.2%	60.6%	64.3%	56.5%
1-2 times per week	38.9%	25.6%	24.5%	29.1%
2-4 times per week	13.8%	11.1%	8.7%	10.7%
> 4 times per week	6.1%	2.7%	2.5%	3.7%
Delivery food per month	N=668	N=683	N=431	N=559
Mean	0.62	0.62	0.61	0.80
S.D.	2.90	1.95	1.85	2.15
Min.	0	0	0	0
Max.	30	30	20	28
Eating out per month	N=689	N=690	N=440	N=548
Mean	1.41	1.22	1.14	1.68
S.D.	2.61	3.10	2.73	4.55
Min.	0	0	0	0
Max.	25	60	31	60
Ready-to-eat meals	N=700	N=698	N=443	N=674
Seldom/never	69.9%	86.1%	77.7%	78.6%
1–5 times per month	23.9%	10.7%	15.8%	16.5%
5–10 times per month	4.0%	2.1%	3.2%	2.8%
> 10 times per month	2.3%	1.0%	3.4%	2.1%
Fresh vegetables	N=701	N=701	N=447	N=697
Seldom/never	1.1%	1.6%	0.4%	1.4%
1–2 times per week	8.6%	7.1%	6.5%	12.2%
2–4 times per week	26.5%	18.5%	20.6%	24.4%
> 4 times per week	63.8%	72.8%	72.5%	62.2%
Gender	N=701	N=700	N=447	N=700
Female	63.3%	57.6%	47.4%	45.0%
Male	36.7%	42.4%	52.6%	55.0%
Married/cohabiting	N=701	N=700	N=449	N=699
	67.9%	52.4%	71.9%	78.7%
Children at home	N=701	N=701	N=449	N=700
	41.8%	49.2%	62.6%	74.0%
Smoking	N=701	N=701	N=449	N=699
Yes	34.0%	27.4%	18.7%	44.5%
No	66.0%	72.6%	81.3%	55.5%

In the sample, the Turkish respondents have the highest prevalence of overweight, followed by the Surinamese/Antillean respondents. The Moroccan have the lowest prevalence of overweight and the BMI of the native Dutch is in between. The four groups differ significantly in their BMI.

The highest frequency of smokers in the sample is found in the Turkish group. The Moroccan group has the lowest frequency of smokers (significant results).

The variables on food habits reveal some differences between native Dutch and immigrants. The Turks eat takeaway food, delivery food the most frequently and go eating out the most frequently. The Dutch eat convenience food and ready-to-eat meals the most frequently. Apparently, the Turks are more likely to outsource the complete meal preparation, while the native Dutch outsource only a part of the meal preparation. In general, immigrant groups eat more frequently takeaway food than

native Dutch. The studied groups do not differ significantly in eating takeaway food, convenience food, fresh vegetables, and eating out. Section 3.4 shows whether the groups differ significantly in their outsourcing behaviour in multivariate analyses. First, we will have a closer look on the BMI-values over the four groups.

The frequency of eating fresh vegetables is actually quite low. The respondents might have been confused about the definition of fresh vegetables and did not mention the cooked fresh vegetables they eat per week.

Table 3.3 shows the distribution of the groups over the BMI-classes. An ANOVA analyses shows (results not shown) that females and males do not differ significantly in their BMI. The differences between the four groups however are significant.

Table 3.3: BMI distribution of women and men in the Netherlands in percentages

WOMEN	**native Dutch (N=424)**	**Surinamese/ Antilleans (N=383)**	**Moroccans (N=187)**	**Turks (N=373)**
BMI < 18.50	2.4	2.6	4.3	4.5
18.50 ≥ BMI < 25.00	58.7	51.2	56.1	47.5
BMI ≥ 25.00	38.9	46.2	39.6	48.0
TOTAL	100	100	100	100

MEN	**native Dutch (N=256)**	**Surinamese/ Antilleans (N=294)**	**Moroccans (N=232)**	**Turks (N=311)**
BMI < 18.50	0	1.0	2.2	1.0
18.00 ≥ BMI < 25.00	52.0	54.8	55.6	45.0
BMI ≥ 25.00	48.0	44.2	42.2	54.0
TOTAL	100	100	100	100

Within the entire sample, only very few people are underweight (BMI < 18.50): about 3 percent of women and less than 1 percent of men. Thirty-nine percent of the Dutch women in the sample are overweight (which is the lowest rate in the whole sample) against 48 percent of the Dutch men. These figures closely correspond with those of CBS (2002c) indicating that 39 percent of the women and 48 percent of the men in the Netherlands are overweight (see also Table 3.1).

In our sample, the Turkish males have the highest prevalence of overweight. The Moroccans have the least incidence of overweight amongst males in the sample. In the Dutch, Moroccan and Turkish groups, men are more often overweight than women. Although the difference is small, only for the Surinamese/Antilleans the reverse is true: Surinamese/Antillean females have a higher prevalence for obesity than males with the same ethnicity.

Table 3.4 describes the food habits of the different groups in the sample by BMI range. The range of BMI < 18.50 was left out, since there were too few respondents (N = 57).

Table 3.4: Food habits per BMI group per ethnicity (in percentages)

WOMEN	**native Dutch**	**Surinamese/ Antilleans**	**Moroccans**	**Turks**
18.50 > BMI ≤ 24.99	(N=249)	(N=196)	(N=105)	(N=177)
> 1× per month takeaway food	64.5	68.2	59.2	77.0
> 1× per month delivery food	14.3	27.5	25.2	28.9
> 1× per month eating out	56.1	52.6	50.5	50.7
> 1× per week convenience food	60.6	44.4	39.4	41.7
> 1× per month ready-to-eat meals	26.9	11.3	27.9	22.4
> 4 × per week fresh vegetables	66.3	75.0	71.2	62.6
BMI ≥ 25.00	(N=165)	(N=177)	(N=74)	(N=179)
> 1× per month takeaway food	57.0	58.9	45.1	75.4
> 1× per month delivery food	11.9	20.6	17.1	25.0
> 1× per month eating out	37.2	30.8	25.4	39.5
> 1× per week convenience food	57.6	36.9	39.7	45.5
> 1× per month ready-to-eat meals	33.0	16.9	12.3	15.9
> 4 × per week fresh vegetables	74.5	76.8	70.3	53.6

MEN	**native Dutch**	**Surinamese/ Antilleans**	**Moroccans**	**Turks**
18.50 > BMI ≤ 24.99	(N=133)	(N=161)	(N=129)	(N=140)
> 1× per month takeaway food	73.3	72.7	63.0	70.4
> 1× per month delivery food	21.9	26.6	23.8	27.3
> 1× per month eating out	71.5	51.9	43.3	53.2
> 1× per week convenience food	60.3	40.6	36.9	44.5
> 1× per month ready-to-eat meals	40.6	14.9	27.5	24.6
> 4 × per week fresh vegetables	58.6	68.4	74.4	67.4
BMI ≥ 25.00	(N=123)	(N=130)	(N=98)	(N=168)
> 1× per month takeaway food	57.5	60.2	43.7	66.0
> 1× per month delivery food	14.0	15.9	16.1	23.0
> 1× per month eating out	63.6	46.5	31.2	51.5
> 1× per week convenience food	55.1	34.4	30.2	41.7
> 1× per month ready-to-eat meals	33.5	14.0	13.4	21.7
> 4 × per week fresh vegetables	47.2	69.2	69.4	66.1

Table 3.4 gives an indication of differences in food habits between different groups. In Scheme 3.2 it was hypothesized that all food habits (except eating fresh vegetables) would increase BMI. Therefore, one could expect overweight people to eat takeaway food, delivery food etc. more frequently than people without overweight.

However, Table 3.4 shows that overweight people (females and males) eat takeaway food, delivery food etc. with about the same or even lower frequencies than people without overweight. On the other hand, in the OLS regressions in the following section we will see that some food habits actually increase BMI. In the conclusions we will come back to this issue.

Dutch women make the least frequent use of delivery food, but do eat out more often and eat more convenience food than the other groups. Especially Turkish women eat takeaway food and delivery food frequently. Surinamese/Antillean women eat fresh vegetables the most frequently, even in the highest BMI-range. Turkish women eat fresh vegetables the least frequently, indicating a less healthy eating pattern. Except for the Moroccan and Turkish women in the normal weight range, in all

groups and weight ranges, women eat more fresh vegetables than men. For both females and males it can be concluded that overweight people eat out less often than people with a normal weight.

In general, Dutch men most frequently go eating out, most frequently eat convenience food, and most frequently eat ready-to-eat meals. It seems that many Dutch men (being married/living together or not) either don't like or don't have time to prepare a complete meal for themselves. The Turkish and Surinamese/Antillean men eat delivery food the most frequently. For males, the frequencies of eating out, convenience food, and ready-to-eat meals are lower in all overweight groups compared to males with normal weight. The Turkish overweight men most frequently eat takeaway-food and delivery food. Moroccan men most frequently eat fresh vegetables, while the Dutch men eat fresh vegetables the least frequently.

3.4 Estimation results of multivariate analyses on Body Mass Index

In the previous section we have performed bivariate analyses. In order to study the determinants of overweight, multivariate analyses will be carried out in this section. In this case, we use Ordinary Least Squares regression.

BMI is normally distributed, and can therefore be used as a dependent continuous variable on which linear regressions can be performed. As independent variables the following variables were used: ethnicity (with the native Dutch as reference group), gender, takeaway food, delivery food, eating out, convenience food, ready-to-eat meals, fresh vegetables smoking, married/cohabiting, children at home, net household income per month, age, age squared, and level of education.

First, an Ordinary Least Squares (OLS) is done for the whole sample for food habits, and other variables like smoking, household composition, and age. The OLS regressions are repeated for each group separately. The parameter estimates are shown in the Table 3.5.

Table 3.5 Parameter estimates of OLS regression on BMI (t-values in parentheses)

			st.coefficients
Intercept	18.523	*(17.511)***	
Female	-0.190	*(-0.777)*	-0.022
Native Dutch	*reference*	*group*	
Surinamese/Antilleans	0.712	*(3.026)***	0.076
Moroccans	0.627	*(2.195)***	0.056
Turks	1.119	*(4.120)***	0.110
Takeaway food	-0.009	*(-0.367)*	-0.008
Delivery food	0.051	*(1.219)*	0.025
Eating out	-0.054	*(-1.983)***	-0.041
Convenience food seldom	*reference*	*group*	
Convenience food 1-2 p/w	0.104	*(0.507)*	0.011
Convenience food 2-4 p/w	0.231	*(0.798)*	0.017
Convenience food >4 p/w	0.755	*(1.685)**	0.035
Ready-to-eat meals seldom	*reference*	*group*	
Ready-to-eat meals 1-5 p/m	-0.083	*(-0.352)*	-0.007
Ready-to-eat meals 5-10 p/m	0.223	*(0.436)*	0.009
Ready-to-eat meals > 10 p/m	0.579	*(0.962)*	0.019
Fresh vegetables seldom	*reference*	*group*	
Fresh vegetables 1-2 p/w	1.304	*(1.655)**	0.084
Fresh vegetables 2-4 p/w	0.404	*(0.537)*	0.039
Fresh vegetables >4 p/w	0.313	*(0.424)*	0.034
Smoking (y/n)	-0.750	*(-3.994)****	-0.082
Married/ cohabiting (y/n)	0.160	*(0.688)*	0.018
Children at home (y/n)	0.318	*(1.468)*	0.037
Low educated	*reference*	*group*	
Medium educated	-1.123	*(-5.259)****	-0.130
High educated	-1.683	*(-6.505)****	-0.167
Age	0.249	*(7.107)****	0.862
Age squared	-0.002	*(-4.747)****	-0.571
Household income	-0.005	*(-1.030)*	-0.025
#observations	2213		
Adj. R^2	0.144		
F statistic	16.555		

** p<0.10 ** p<0 .05 *** p<0.01*

All immigrant groups have a higher BMI than the native Dutch, ceteris paribus. This is in contrast with the findings in the previous section, where univariate analyses do not show a higher BMI for the Moroccans compared to the native Dutch. This means that the BMI of the Moroccans is not different from the native Dutch when there is not corrected for income, level of education etc. However, when correcting for age, level of education, income, etc., the BMI of Moroccans is higher compared to the native Dutch.

Eating out has a significantly negative effect on BMI, indicating that in contrast with expectation eating out does not increase but decreases BMI. This issue will be discussed later. Eating fresh vegetables has a significantly negative effect on BMI, while eating convenience food affects BMI positively.

Smoking affects BMI significantly in a negative way, which implies that smoking will decrease BMI. Of course, this does not mean, that smoking is good for people's health. On the contrary, smokers die earlier than non-smokers (Peeters *et al*. 2003). There is a positively significant

effect of age on BMI; BMI will increase with age. But the effect becomes negative for age squared, which means that BMI increases until a certain age and than decreases. Taking the partial derivative of BMI/age gives the maximum of 62 years, meaning that BMI increases up to the age of 62 and then decreases.

The effect of education on BMI is strong and negative. This means that higher educated people have a lower BMI.

Table 3.5 shows that the effect of age on BMI is very strong, as is indicated by the standardized coefficients. We have repeated the OLS regression with age excluded to see whether the results would change a lot. Table 3.6 gives the results.

Table 3.6 Parameter estimates of OLS regression on BMI, excluding age (t-values in parentheses)

			st.coefficients
Intercept	26.068	*(31.904)****	
Female	-0.504	*(-2.742)****	-0.058
Native Dutch	*reference*	*group*	
Surinamese/Antilleans	0.444	*(1.854)**	0.047
Moroccans	0.631	*(2.195)***	-0.056
Turks	-0.272	*(-1.053)*	-0.027
Takeaway food	-0.085	*(-0.3614)****	-0.078
Delivery food	0.047	*(1.079)*	0.022
Eating out	-0.075	*(-2.657)***	-0.057
Convenience food seldom	*reference*	*group*	
Convenience food 1-2 p/w	-0.144	*(0.494)*	-0.015
Convenience food 2-4 p/w	-0.165	*(-0.554)*	-0.012
Convenience food >4 p/w	0.207	*(0.447)*	0.010
Ready-to-eat meals seldom	*reference*	*group*	
Ready-to-eat meals 1-5 p/m	-0.179	*(-0.463)*	-0.016
Ready-to-eat meals 5-10 p/m	-0.103	*(-0.196)*	-0.004
Ready-to-eat meals > 10 p/m	0.576	*(0.845)*	0.019
Fresh vegetables seldom	*reference*	*group*	
Fresh vegetables 1-2 p/w	1.586	*(1.943)**	0.102
Fresh vegetables 2-4 p/w	0.773	*(0.992)*	0.075
Fresh vegetables >4 p/w	0.826	*(1.078)*	0.09
Smoking (y/n)	-0.748	*(-3.857)****	-0.082
Married/ cohabiting (y/n)	0.476	*(01.990)***	0.053
Children at home (y/n)	0.391	*(1.837)**	0.045
Low educated	*reference*	*group*	
Medium educated	-1.858	*(-8.718)****	-0.216
High educated	-2.204	*(-8.340)****	-0.219
Household income	-0.004	*(-0.800)*	-0.020
#observations	2216		
Adj. R^2	0.079		
F statistic	9.640		

** p<0.10 ** p<0 .05 *** p<0.01*

The R-squared in Table 3.6 is much lower than in Table 3.5, so when age is excluded from the regression a smaller part of the BMI is explained by the remaining variables. When age is excluded from the estimations, the effect of variables being married/cohabiting and children living at home (both strongly connected to age) now become significant. The effect of these variables is positive, meaning that they increase BMI.

The regression excluding age shows that with respect to BMI, now level of education has become more important when compared to the regression including age (indicated by the standardised coefficients). Of course this can be attributed to the strong relation between age and education.

In this regression the Turks have no significantly different BMI than native Dutch, which indicates that the BMI of 'younger' Turks and native Dutch differ more. The gender variable also becomes significant in this regression, which means that females have a lower BMI than males when not correcting for age.

Takeaway food becomes significant when age is excluded, suggesting an age-effect for takeaway food. Different than expected, in this regression takeaway food decreases BMI.

We have repeated the OLS regression also for the four groups excluding age to investigate whether the outcomes would change (results not shown). Here again, when age is excluded from the regressions, in the Dutch, Moroccan, and Turkish group females have a significantly lower BMI than males.

Table 3.7 shows the estimation results for the four groups separately to investigate differences between the groups in variables that affect BMI.

Table 3.7 Parameter estimates of OLS regression on BMI for native Dutch, Surinamese/Antilleans, Moroccans, and Turks (t-values in parentheses)

	native Dutch		**Surinamese/ Antilleans**		**Moroccans**		**Turks**	
Intercept	20.448	*(8.808)***	22.187	*(10.597)***	16.086	*(6.651)***	14.437	*(7.538)***
Female	-0.577	*(-1.574)*	0.393	*(1.131)*	0.010	*(0.025)*	-0.801	*(-2.330)**
Takeaway food	0.077	*(1.114)*	-0.014	*(-0.294)*	0.016	*(0.372)*	-0.063	*(-1.705)**
Delivery food	0.145	*(1.881)*	0.075	*(0.886)*	0.030	*(0.285)*	-0.099	*(-1.249)*
Eating out	-0.125	*(-1.851)**	-0.043	*(-0.780)*	-0.078	*(-0.911)*	-0.024	*(-0.641)*
Convenience food seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Convenience food 1-2 p/w	0.235	*(0.574)*	-0.293	*(-0.715)*	0.122	*(0.270)*	0.576	*(1.491)*
Convenience food 2-4 p/w	0.258	*(0.436)*	0.438	*(0.794)*	-0.026	*(-0.039)*	0.244	*(0.441)*
Convenience food >4 p/w	0.602	*(0.765)*	0.010	*(0.010)*	0.166	*(0.147)*	2.059	*(2.446)***
Ready-to-eat meals seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Ready-to-eat meals 1-5 p/m	0.056	*(0.134)*	0.440	*(0.802)*	-1.261	*(-2.436)***	0.063	*(0.143)*
Ready-to-eat meals 5-10 p/m	-0.236	*(-0.255)*	2.156	*(1.814)**	-2.199	*(-2.124)***	0.703	*(0.716)*
Ready-to-eat meals > 10 p/m	-0.316	*(-0.254)*	2.832	*(1.766)**	0.418	*(0.396)*	0.013	*(0.012)*
Fresh vegetables seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	1.492	*(0.814)*	0.125	*(0.085)*	4.642	*(2.357)***	0.232	*(0.180)*
Fresh vegetables 2-4 p/w	0.808	*(0.451)*	-0.411	*(-0.296)*	2.257	*(1.195)*	-0.217	*(-0.176)*
Fresh vegetables >4 p/w	0.782	*(0.436)*	-0.822	*(-0.610)*	2.791	*(1.503)*	-0.337	*(-0.282)*
Smoking (y/n)	-1.029	*(-2.841)****	-0.890	*(-2.349)***	-1.007	*(-2.065)***	-0.142	*(-0.423)*
Married/ cohabiting (y/n)	0.358	*(0.842)*	0.024	*(0.056)*	0.063	*(0.103)*	-0.044	*(-0.083)*
Children at home (y/n)	-0.050	*(0.124)*	0.557	*(1.441)*	-0.375	*(-0.670)*	0.423	*(0.840)*
Low educated	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Medium educated	-1.449	*(-3.296)****	-0.933	*(-2.062)***	-1.116	*(-2.404)***	-0.738	*(-1.977)***
High educated	-2.034	*(-3.940)****	-1.188	*(-2.393)***	-1.860	*(-3.275)****	-1.844	*(-3.280)****
Age	0.180	*(2.897)****	0.125	*(1.663)**	0.295	*(3.295)****	0.587	*(6.182)****
Age squared	-0.001	*(-1.918)**	0.000	*(-0.437)*	-0.002	*(-2.277)***	-0.006	*(-5.137)****
Household income	-0.008	*(-0.952)*	-0.007	*(-0.781)*	0.000	*(1.209)*	-0.010	*(-0.839)*
#observations	646		657		396		511	
Adj. R^2	0.105		0.119		0.200		0.229	
F statistic	4.607		5.201		5.726		8.224	

* *p<0 .10 ** p< 0.05 *** p<0.01*

A significant effect for gender is found for the Turkish group. The effect is negative, which means that in agreement with the findings from Table 3.2, Turkish males are heavier than Turkish females. Smoking has a significantly negative effect on BMI for the Dutch and the Surinamese/Antilleans. Smoking has a significantly negative effect on BMI for all groups, except for the Turks.

Again, there is a strong effect of age on BMI. Especially for the Turks, whose BMI not only strongly increases with age, but also strongly decreases after a certain age. In all groups, BMI decreases after a certain age, except for the Surinamese/Antilleans.

The four groups show different results for food habits. The Dutch group is the only group that shows a significantly effect of eating out on BMI. As in Table 3.5 the effect is negative. For the Dutch group no other food habit variables affect BMI significantly. The Surinamese/Antilleans show a significantly positive effect for ready-to-eat meals. This is a little strange since only 14 percent of them eat ready-to-eat meals regularly. Apparently, for Surinamese/Antilleans if they eat ready-to-eat meals, the effect on BMI is strong. On the other hand, the effect of ready-to-eat meals for Moroccans is negative. They choose probably other ready-to-eat meals than Surinamese/Antilleans. Moroccans also show an unexpected positive effect of eating fresh vegetables on BMI. The significant effect is only shown in the category of eating fresh vegetable 1-2 times per week, indicating a less 'healthy' diet with only few fresh vegetables. The Turkish respondents show an unexpected negative effect for takeaway food and a positive effect for convenience food on BMI.

The effect of education on BMI is significantly negative, as expected. A higher education indicates a lower BMI for all groups. Income gives no significant result, which can be attributed to the strong effect of education (also an indication of income).

The estimations as described were also done for each group, divided by gender. The results can be found in Appendix I. The adjusted R^2 is higher for females than males in all groups, which means that with the variables we included our model better predicts the BMI for females than for males. In all groups the effect of level of education on BMI is more negative for females (a higher standardized coefficient), suggesting that for females, level of education with respect to BMI is more important than for males.

These results will be discussed in section 3.6. First, in section 3.5, we will elaborate on sports in relation with overweight.

3.5 Overweight and physical activity

Overweight is associated with energy intake as well as physical activity. A small positive energy balance over longer periods of time leads to large differences in body weight. This means that with respect to energy use, overweight could easily be caused by a relatively small surplus in energy intake (Health Council of the Netherlands, 2003; Mathus-Vliegen, 1998).

Research shows that between the periods 1987/1988 and 1997/1998, the mean energy intake in the diets of the Dutch population has decreased. However, there are strong indications that the amount of physical activity also has largely decreased during the previous decades. The decrease in physical activity must be larger than the decrease in energy intake, given the high prevalence of overweight in the Netherlands (Health Council of the Netherlands, 2003).

There seems to be strong evidence that the lack of physical activity (especially in leisure time) is of great importance for the increase in overweight and obesity (Cutler*et al*., 2003; Lindström *et al*., 2003). Current public health guidelines advocate 30 minutes of moderately intensive exercise, at least five, if not all days of the week (Health Council of the Netherlands, 2003). About half the Dutch population does not meet this guideline (Ooijendijk *et al*., 2002).

In 1995, about 55 percent of the population (aged ≥ 12) in the Netherlands did exercise somewhat regularly. Between 1975 and 1995, time spent on doing sports increased from 0.7 hours per week to 1.4 hours per week per person. In 2000, time spent on doing sports decreased to 1.2 hours per week per person. Doing sports is an achievable and legitimate way of time allocation and are common in all levels of the society (Breedveld, 2001).

The development of growing numbers of people exercising too little partly is a result of mechanizing and automating within households and work environments (as we have discussed in the introduction). The washing machine and the car are examples of developments that have led to a decrease in physical activity (Breedveld, 2001). Table 3.8 gives an overview of the determinants of time spent on doing sports.

Table 3.8 Time spent on doing sports by background determinants, population aged ≥12 (hours per week)

Determinant		**Time spent on sporting activities**
Gender	male	1.5
	female	1.0
Age	12-19	2.6
	20-34	1.3
	35-49	1.1
	50-64	0.9
	≥ 65	0.9
Level of education	low	0.8
	mediate	1.4
	high	1.6
Labour market position	student, pupil	2.7
	employed	1.2
	homemaker	0.8
	unemployed	0.4
	retired	0.9

Source: SCP (2001)

Table 3.8 shows that males spend more time on doing sports than females. Yet, females are more likely to spend more time on physical activity during housekeeping (Ross and Bird, 1994). Time spent on doing sports decreases with age. People aged below 20 spend twice as much time on doing

sports than people aged between 20 and 34. Mediate and highly educated people spend about the same amount of time exercising, while lower educated people spend less time exercising than mediate and highly educated people. Employed people spend more time on doing sports than unemployed people, homemakers and people who are retired (Breedveld, 2001). For the negative association between homemaking, unemployment and physical activity see also the Australian research from Salmon *et al*. (2000).

Nevertheless, figures of time spent on doing sports should be interpreted critically. Research shows that when checking the time allocation diaries of the people that claim to do sports, 17 percent of them don't actually exercise very regularly (which is a third of all people claiming to do sports). This means that people tend to exaggerate the time they spend on doing sports (Breedveld, 2001).

In the Netherlands, the participation on doing sports among immigrants is lower than among the native Dutch. In 1999, 66 percent of the native Dutch aged between 6 and 79 do some kind of sports, for immigrants the figure then is 51.5 percent (Van der Meulen, 2003).

Table 3.9 gives the frequencies for our sample divided by ethnic group.

Table 3.9 Frequencies of doing sports in ethnic groups (in percentages)

Variable	**Total** (N=2551)	**native Dutch** (N=701)	**Sur./Antill.** (N=701)	**Moroccans** (N=449)	**Turks** (N=700)
Sports never	47.7	43.0	44.9	47.6	55.4
Sports ≤ 1 time p/w	19.1	21.1	18.0	19.8	17.6
Sports 2-3 times p/w	21.3	25.8	24.0	18.3	16.1
Sports > 3 times p/w	11.9	10.1	13.1	14.3	10.9
TOTAL	100.0	100.0	100.0	100.0	10..0

Our sample also shows that the participation of immigrants on doing sports is lower than the participation of the native Dutch. The figures of the Surinamese/Antillean group correspond mostly to the figures of the native Dutch, although the frequency of exercising of the Surinamese/Antilleans is higher. The Turks have the lowest prevalence for exercising and have the lowest frequency of doing sports. If the Turks and Moroccans do sports, they do it quite frequently. This could be caused by the relatively young age of the Moroccans and Turks in our sample (as seen in Table 3.2).

As discussed before, there is a relationship between exercising and higher BMI-levels (Philipson, 2001; Philipson and Posner, 1999). For example, lower physical fitness, or physical inactivity (indicated by watching TV) is a strong predictor of an increased BMI for children and adolescents in Australia. Watching TV can also contribute to overweight through the consumption of snack foods while watching (Burke *et al*., 2001). In the Netherlands, time spent watching TV has increased between 1975 and 1995 from 10 to 12.5 hours per week. In 2000, the figure is still 12.5 hours per week, but time spent on the computer and internet (which can be a substitute for TV watching) is 1.8 hours per week, indicating at least 14 hours of physical inactivity per week. The

share of watching TV in the total leisure time has grown from 21 percent in 1975, to 26 percent in 1995, and to 28 percent in 2000 (Huysmans and De Haan, 2001).

Table 3.10 shows the correlation between time spent on watching TV and doing sports[3]. The time spent on domestic activities is included, since it also indicates physical activity (usually, people are quite active while doing domestic activities). Table 3.10 shows that the correlation between time allocated to domestic activities or TV watching in relation to doing sports is stronger for Dutch and Surinamese/Antillean females than for males.

Table 3.10 Correlation matrix for women and men of the relation[a] between domestic activities and doing sports, and watching TV and doing sports (asymptotic standard error in parentheses)

	native Dutch		**Surinamese/ Antilleans**		**Moroccans**		**Turks**	
	Domestic activities	Watching TV	Domestic activities	Watching TV	Domestic activities	Watching TV	Domestic activities	Watching TV
Sports women	-0.095 *(-1.675)**	-0.095 *(-1.707)**	-0.129 *(-2.216)***	-0.028 *(-0.477)*	-0.067 *(-0.870)*	0.010 (0.131)	-0.082 (-1.400)	-0.060 (-1.031)
Sports men	0.042 (0.496)	-0.045 (-0.601)	-0.036 (-0.509)	-0.088 (-1.265)	-0.084 (-1.106)	-0.058 (-0.772)	-0.101 (-1.545)	-0.067 (-1.036)

a Interval by interval, Spearman correlation
** p<0 .10 ** p<0 .05 *** p<0.01*

Dutch and Surinamese/Antillean females show a significantly negative correlation between time spent on domestic activities and doing sports. This negative effect implies that time spent on domestic activities decreases the frequency of doing sports. Only for the Dutch females a significant correlation between time spent on watching TV and doing sports is found. The correlation is negative, which means that for Dutch females, time spent on watching TV decreases the frequency of sports. For males, no significant effects between time spent on watching TV or domestic activities and doing sports are found. This result implies that males' time allocation on watching TV and domestic activities does not affect their frequency of doing sports.

To investigate whether in our sample the frequency of doing sports decreases with age (as Table 3.8 suggests). Table 3.11 shows the distribution of doing sports per week, by age and by ethnic background.

[3] Doing sports is an ordinal variable, with the following categories: never, less then once a week, 2 - 3 times per week, more than 3 times per week.

Table 3.11 Frequencies of doing sports in different age categories (in percentages)

	18-34	35-44	45-64	≥ 65
native Dutch (n=701)				
never	33.9	40.0	43.6	59.5
≤ 1 time/w	25.5	23.6	19.7	13.5
2-3 times/w	30.7	31.5	24.3	13.5
> 3 times/w	9.9	4.8	12.4	13.5
Surinamese/Antilleans (n=700)				
never	36.6	44.6	46.7	79.5
≤ 1 time/w	15.9	17.2	23.1	6.8
2-3 times/w	33.9	25.0	16.9	4.5
> 3 times/w	13.7	13.2	13.3	9.1
Moroccans (n=449)				
never	39.1	49.5	69.4	85.7
≤ 1 time/w	21.4	21.1	14.5	9.5
2-3 times/w	22.5	16.8	8.1	0
> 3 times/w	17.0	12.6	8.1	4.8
Turks (n=700)				
never	54.6	57.7	51.3	69.2
≤ 1 time/w	16.1	19.6	17.1	23.1
2-3 times/w	19.0	13.9	9.2	0
> 3 times/w	9.9	8.8	22.4	7.7

Table 3.11 shows that also in our sample, the frequency of doing sports decreases with age, in particular when people are aged above 64. Yet, if people aged above 64 do sports, they do it considerable frequently. People aged between 18 and 44 are mainly doing sports two to three times per week, if they do sports.

In general, the immigrants do sports less frequently than the native Dutch. However, the younger immigrants do sports more frequently than the 'older' immigrants. The Moroccans and Turks are the least frequent sportsmen and -women in the sample.

To measure the effect of doing sports on BMI, we have repeated the OLS regression from Table 3.5, 3.6, and 3.7 (results not shown). If the OLS regressions are repeated with sports included, the estimations do not change, and doing sports has no significant effect in any of the groups, except for the Dutch group if sporting more than 3 times per week. When age is excluded from the regression for the whole sample, doing sports 2-3 times per week becomes significantly negative, which suggest an age-effect for doing sports (as could be expected). On the whole, the effect of doing sports on BMI is small. Apparently doing sports is neither a very good, nor a complete indication of physical activity. Doing sports does not give a complete insight in the people's physical activities. For example, physical activity during walking or home keeping is obviously not perceived as a part of doing sports.

3.6 Conclusions and discussion

The purpose of this chapter was to investigate differences in overweight between natives and immigrants in the Netherlands and to estimate the effects of food habits and socio-economic status on overweight.

In the sample, Turkish men most frequently are overweight, followed by the Turkish women and the Dutch men. Dutch women are overweight the least frequently (Table 3.3). In general, immigrant groups eat takeaway food more frequently than the native Dutch. For women, the Turkish have the least 'healthy' food habits: they eat takeaway food and delivery food the most frequently, and eat fresh vegetables the least frequently. In general, women eat more vegetables than men. Overweight men eat out less often than men with normal weight, and also eat less convenience food and ready-to-eat meals than men with a normal weight (Table 3.4).

We expected overweight people to eat more of delivery food, takeaway food etc., but in most cases overweight people ate these kinds of food with the same or even a lower frequency. Nevertheless, unexpectedly the OLS regressions show that some food habits actually increase BMI. This indicates that being overweight is something different than becoming overweight, which means that people can become fatter because of 'unhealthy' food habits, but when being overweight have the same 'unhealthy' food habits than people with a normal weight. However, to make firm conclusions on this issue, more should be known about the types of delivery food and takeaway food people eat. Overweight people may tend to choose delivery food or takeaway food with a higher caloric value than people with a normal weight.

Based on the literature the hypotheses were formulated as shown in Scheme 3.2. Both the hypothesised and the estimated effects of the OLS regressions of the different variables on BMI are presented in Scheme 3.3.

Scheme 3.3 Overview of expected effects of variables on BMI and confirmed results from research

Variable	**Expected effect on BMI** (based on literature)	**Confirmed**
Surinamese/Antilleans	+	Yes
Moroccans	+	Yes
Turks	+	Yes
Sex (1=female, 0=male)	–	Yes (only when age excluded)
Takeaway food	+	No (negative effect)
Delivery food	+	No
Eating out	+/–	Yes (only negative effect)
Convenience food	+/–	Yes (only small positive effect)
Ready-to-eat meals	+/–	Yes
Fresh vegetables	–	No
Smoking	–	Yes
Married/cohabiting	+	Yes (only when age excluded)
Children at home	–	No (small positive effect when age excluded)
Age	+	Yes
Age squared	–	Yes
Level of education	–	Yes
Income	–	No (not significant)

+ positive effect, – negative effect, +/– either positive or negative effect expected.

Our results show that immigrants have a significantly higher BMI than the native Dutch. With respect to gender, the regressions excluding age show that males are heavier than females, except for

the Surinamese/Antilleans. These findings support earlier research showing a higher BMI for males (Pinhey *et al*., 1997; Van Lenthe *et al*., 2000).

On the other hand, Seidell *et al*. (1995) found that the prevalence of obesity is higher among females than among males. These differences are caused by different measures of BMI and a different sample that was studied. Pinhey *et al*. investigated an Asian-Pacific population in the United States, while Seidell *et al*. and Van Lenthe *et al*. investigated the Dutch population. Seidell *et al*. investigated obesity (BMI $\geq$ 30), whereas Van Lenthe *et al*. looked at the development of BMI in 6 years.

Food habits partly explain differences in overweight between the groups. Eating out is only significant for the native Dutch, but the effect on BMI is negative instead of positive. An explanation can be twofold: mainly people with higher incomes (who are already more aware of a 'healthy diet') will go eating out, and once people go eating out, they might choose restaurants that serve lower caloric menus than 'cheaper' restaurants like MacDonald's (since in general healthy food is expensive). In Chapter 7 we will test a structural equation model that investigates whether the correlation found between outsourcing food preparation and overweight are causal relations.

People with higher education and higher incomes buy better quality food and will therefore have lower prevalence for overweight, while people with lower incomes will buy (more) cheaper, less healthy food and have higher prevalence for overweight (Hulshof *et al*., 2003). Especially lower educated people may have a lack of knowledge about a healthy lifestyle or prefer consumption in the present more (and without thinking about the consequences of their behaviour) than consumption in the future. This is called time preference (Groot and Maassen van den Brink, 2004; Cornelisse *et al*., 2003). This confirms the idea that in western countries, people with lower incomes are overweight, while in non-western countries people with higher incomes are overweight.

The Surinamese/Antilleans show a significantly positive effect for ready-to-eat meals in BMI. When looking at the low frequency (see Table 3.2) the result is unexpected. If Surinamese/Antilleans (who are known for their 'fatter' diet, SCP, 1998) eat ready-to-eat meals, they may eat meals with a high-caloric value that increase their BMI, whereas Moroccans choose more 'healthy' ready-to-eat meals. For the Turks, takeaway food decreases BMI indicating that they choose takeaway food that does not have a high-caloric value. On the other hand, convenience food increases the BMI of the Turks.

In all groups, *age* and *smoking* strongly affect BMI. While age increases BMI, smoking decreases BMI. The effect of age is so strong that it overrules the effects of income. In the whole sample, BMI increases up to the age of 62 and then decreases. As mentioned earlier in the chapter, although smoking reduces BMI, people's health decreased due to smoking. This issue will be discussed in more detail in the following chapter.

On the basis of literature, socio-economic status affects BMI negatively. This is shown for level of education in all groups. A higher education is associated with a lower BMI. Nevertheless, there are no significant results for income, which can have been overruled by the strong effects of age

and education. Or, education is a more important determinant for overweight than income. Higher educated people will have more knowledge of a healthy lifestyle and therefore watch their diet closer than lower educated people.

In the literature, *physical activity* is negatively associated with overweight. However, in our sample the effects of doing sports on BMI are very small, indicating that doing sports is not a complete measure for physical activity. Nevertheless, if doing sports is not a complete criterion for physical activity, it does give some indication about people's lifestyle and pattern of physical activity. About half of our sample does not do sports, which corresponds to the 50 percent of physical inactive people from the literature (Ooijendijk *et al*., 2002) who do not meet the guideline of 30 minutes of moderately intensive physical activity per week.

All immigrant groups do sports less frequently than the native Dutch, but especially Turkish respondents should be encouraged to do more sports, since they have the lowest participation in doing sports. This could be an indication that in the Turkish culture, doing sports is less important. In the cultures of non-western immigrants it may also be less common for females to do sports.

Younger non-western immigrants however, do sports more frequently than older non-western immigrants. There can also exist a relation between doing sports and socio-economic circumstances. People with lower incomes have less money to take part in organized sports activities.

Mainly due to the extra costs of chronic diseases caused by overweight (like diabetes), overweight leads to higher expenditure on national health care. Research shows that overweight-related costs constitute 1 up to 5 percent of the total public health costs, which in the Netherlands would be 400 million up to 1 billion Euro extra public health costs per year (Groot and Maassen van den Brink, 2003; Cornelisse-Vermaat *et al.*, 2003). These extra costs caused by overweight are not yet reflected by higher health insurance contributions to cover the overweight prevention costs.

The Dutch government should develop prevention programs to keep a large part of the Dutch population from becoming (more) overweight, especially among those already overweight. Immigrants in particular should be encouraged to lose weight, since they have a higher risk of becoming overweight. Public policies should aim at more healthy diets by subsidising healthy food (like fruit and vegetables) and by putting higher taxes on high-caloric foods.

The respondents reported their weight and height measurements themselves. Literature shows that when respondents have to indicate their height and weight themselves, overweight people tend to *underestimate* their weight, while thin people tend to *overestimate* their weight (Visscher *et al*., 2002; Sarlio-Lähteenkorva and Lahelma, 1999; and Nieto-Garcia *et al*., 1990). This process can have biased the data on BMI; the prevalence of overweight might actually be slightly higher.

In addition, future studies should examine also other measurements indicating overweight. Body weight is correlated with fat-percentage, but also with fat-distribution, which can be measured with the waist-hip ratio. Also fluctuations in weight at different points in time seem to be important (Mathus-Vliegen, 1998).

The question arises whether all differences with respect to BMI between the investigated groups now have been explained. The adjusted R-squared in the analyses is quite low (about 0.15), indicating that more variables are needed to explain BMI. These factors could be of a cultural and social nature (like eating time, number of eating moments per day, opinions on weight in a social environment), as well as biological and genetic variables. These factors could be used in further research to explain differences in BMI between the native Dutch and immigrants.

As we have seen, overweight is associated with poor health. While in this chapter we have investigated differences in determinants of overweight for immigrants and the native Dutch, it is interesting to investigate whether overweight affects the health of the native Dutch and immigrants differently. This will be done in the next chapter.

Appendix I Parameter estimates of OLS regression on BMI for women and men (t-values in parentheses)

	Dutch women	**Dutch men**	**Surin./Ant. women**	**Surin./Ant. men**	**Moroccan women**	**Moroccan men**	**Turkish women**	**Turkish men**
Intercept	24.559*(4.887)****	20.495 *(7.162)****	20.183 *(6.854)****	24.612 *(8.808)****	14.442 *(4.486)****	19.645 *(6.479)****	11.586 *(3.447)****	16.828 *(7.386)****
Takeaway	-0.030 *(0.109)*	0.151 *(1.786)**	0.017 *(0.218)*	-0.012 *(-0.223)*	0.038 *(0.594)*	-0.028 *(-0.486)*	-0.122 *(-1.489)*	-0.040 *(-1.044)*
Delivery	0.247 *(2.088)***	0 .041 *(0.443)*	0.200 *(1.326)*	-0.003 *(-0.040)*	-0.082 *(-0.388)*	0.060 *(0.508)*	-0.130 *(-1.143)*	0.020 *(0.179)*
Eating out	-0.245 *(-2.228)***	-0.016 *(-0.196)*	-0.224 *(-1.428)*	-0.025 *(-0.553)*	-0.090 *(-0.828)*	0.190 *(1.106)*	-0.151 *(-1.067)*	-0.032 *(-0.897)*
Conv. seldom	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Conv. 1-2 p/w	0.632 *(1.146)*	-0.349 *(-0.581)*	-0.445 *(-0.731)*	-0.299 *(-0.619)*	0.044 *(0.059)*	0.078 *(0.134)*	0.748 *(1.287)*	0.502 *(0.318)*
Conv. 2-4 p/w	0.946 *(1.159)*	-0.386 *(-0.440)*	0.092 *(0.108)*	1.033 *(1.655)**	-0.716 *(-0.703)*	0.779 *(0.832)*	1.353 *(1.601)*	-0.663 *(-0.913)*
Conv. >4 p/w	1.870 *(1.499)*	-0.734 *(-0.764)*	0.153 *(0.098)*	0.265 *(0.205)*	0.376 *(0.230)*	-1.178 *(-0.652)*	3.876 *(2.950)****	0.242 *(0.228)*
Rml seldom	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Rml 1-5 p/m	0.422 *(0.727)*	-0.590 *(-0.987)*	1.013 *(1.189)*	-0.368 *(-0.595)*	-1.278 *(-1.618)*	-1.473 *(-2.047)***	0.046 *(0.068)*	0.072 *(0.126)*
Rml 5-10 p/m	-1.015 *(-0.670)*	-0.321 *(-0.286)*	3.427 *(1.938)**	0.135 *(0.090)*	-4.097 *(-2.161)***	-2.183 *(-1.728)**	-0.608 *(-0.351)*	1.251 *(1.087)*
Rml > 10 p/m	-2.089 *(-0.984)*	0.711 *(0.478)*	4.169 *(1.705)**	2.201 *(1.184)*	0.950 *(0.320)*	0.063 *(0.057)*	0.826 *(0.442)*	0.270 *(0.209)*
Veg. seldom	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Veg. 1-2 p/w	-4.105 *(-0.858)*	2.550 *(1.415)*	1.508 *(0.756)*	-1.230 *(-0.526)*	4.102 *(0.983)*	3.837 *(1.642)*	0.945 *(0.427)*	1.496 *(0.988)*
Veg. 2-4 p/w	-4.038 *(-0.850)*	1.646 *(0.959)*	-0.561 *(-0.304)*	-0.237 *(-0.104)*	1.445 *(0.723)*	1.831 *(0.863)*	1.057 *(0.515)*	0.495 *(0.336)*
Veg. >4 p/w	-3.720 *(-0.781)*	0.925 *(0.535)*	-1.210 *(-0.690)*	-0.433 *(-0.192)*	1.514 *(0.376)*	2.444 *(1.171)*	0.835 *(0.415)*	0.145 *(0.103)*
Smoking	-0.958 *(-1.912)**	-0.964 *(-1.918)**	-0.984 *(-1.575)*	-0.499 *(-1.238)****	-1.229 *(-0.899)*	-0.693 *(-1.380)****	0.066 *(0.129)*	-0.386 *(0.901)*
Married/coh.	0.823 *(1.372)*	-0.094 *(-0.152)*	0.863 *(1.332)*	-0.181 *(-0.348)*	0.620 *(0.642)*	-0.500 *(-0.589)*	0.329 *(0.679)*	0.697 *(0.943)*
Children	-0.113 *(0.200)*	0.273 *(0.457)*	0.483 *(0.851)*	0.560 *(1.168)*	-0.836 *(-0.904)*	0.131 *(0.178)*	0.613 *(0.804)*	-0.254 *(-0.379)*
Low educated	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Med. educ.	-1.804 *(-2.901)****	-0.559 *(-0.920)*	-1.232 *(-1.794)**	-1.164 *(-0.312)*	-0.956 *(-1.272)***	-1.169 *(-1.876)**	-1.132 *(-1.945)**	0.243 *(0.509)*
High educ.	-2.138 *(-2.860)****	-1.443 *(-2.065)***	-1.739 *(-2.201)***	0.069 *(0.126)*	-2.479 *(-2.537)****	-1.198 *(-1.604)*	-2.662 *(-3.127)****	-0.806 *(-1.084)*
Age	0.173 *(1.972)***	0.165 *(1.870)**	0.259 *(2.394)***	-0.008 *(-0.084)*	0.429 *(2.804)****	0.130 *(1.107)*	0.605 *(3.461)****	0.401 *(3.354)****
Age squared	-0.001 *(-1.175)*	-0.001 *(-1.393)*	-0.002 *(-1.300)*	0.001 *(0.651)*	-0.003 *(-1.841)**	-0.001 *(-0.459)*	-0.006 *(-2.357)**	-0.004 *(-2.887)****
Hhld income	0.000 *(-1.176)*	-0.001 *(-0.669)*	0.000 *(-1.713)**	-0.001 *(-0.149)*	0.001 *(0.568)*	0.000 *(0.952)*	0.000 *(-1.029)*	-0.001 *(-0.142)*
#observations	405	240	371	285	178	217	265	245
Adj. R^2	0.131	0.048	0.174	0.037	0.250	0.130	0.300	0.128
F statistic	4.050	1.610	4.900	1.554	3.975	2.617	6.677	2.790

** p<0 .10 ** p<0 .05 *** p<0.01*

4

The demand for health: the relation between food habits, overweight, and self-reported health

4.1 Introduction

Health is affected by socio-economic variables, including income and level of education, although culture (e.g., food habits, life style) can also affect health. In Chapter 3 we learned that in the Netherlands, the health of immigrants is generally poorer than that of the native Dutch (Uniken Venema *et al*., 1995; Brussaard *et al*., 2001; CBS, 2000d). Empirical research on ethnic health differences is scarce. To obtain more insight into the differences between the health situation of the native Dutch and immigrants, it is important to learn more about the socio-economic and cultural determinants of health.

Until now, little is known about the distribution of the most important determinants of health over the ethnic groups. It is not clear which determinants are the most important. The well-known 'Black Report' (Black *et al*., 1988) has provided a start for socio-economic research on ethnic health differences. Differences in health can be attributed to the migration itself (differences in climate etc.), as well as to lifestyle, psycho-social stress, and material circumstances. Food habits also affect health, since some food habits lead to overweight.

As discussed in Chapter 3, overweight has a negative effect on health because of the strong relation between the prevalence of overweight and cardiovascular disease, coronary heart disease, cancer, and diabetes (Philipson, 2001; WHO, 2000; McGrinnis and Foege, 1993).

As mentioned in Chapter 3, three factors explain how ethnic background relates to health: 1) biological/ genetic factors, 2) socio-economic factors, and 3) socio-cultural factors. Biological/genetic factors can be related to health both directly and indirectly: directly through genetic variations and indirectly through discrimination for example by lower wage rates for black people. The following factors affect the socioeconomic status: material goods and housing conditions, working conditions, lifestyle, adequate use of health care, and psycho-social stress. Culture involves many health-related notions such as nutrition, lifestyle, ideas on adequate treatment of illness etc. (Uniken Venema *et al*., 1995).

In this chapter we will focus on socio-economic factors including level of education, and unemployment, and socio-cultural factors including food habits and smoking. This chapter

investigates whether besides the traditional socio-economic variables, lifestyle and overweight affect health. We will also investigate how ethnic differences between the native Dutch and immigrants in lifestyle, overweight, and socio-economic status affect health. To study the determinants of health, a demand for health model is used. In order to determine the effect of overweight health on utility, a calculation of a Quality Adjusted Life Years (QALY) is made, which can be used as a proxy for marginal effect. Four groups are studied: a native Dutch group, a Surinamese/Antillean group, a Moroccan group, and a Turkish group.

Section 4.2 provides an overview of the literature on health in the Netherlands. Section 4.3 describes the model used and the estimation methods. Section 4.4 provides information about the data. In section 4.5 the estimation results for the whole sample and for the different groups are shown. The estimations of QALY weights for overweight are described in section 4.6. Section 4.7 discusses the relationship between doing sports and health. Section 4.8 concludes and discusses the findings.

4.2 Review of the literature on health

Between 1995 and 1999, 19 percent of the Dutch considered themselves as having a less than good health status. In comparison with other EU countries, the Netherlands occupies a middle position with respect to life expectation and infant mortality. However, number of years living in good health is relatively low and mortality as a result of breast cancer and lung cancer is relatively high among women. With respect to men, the reverse is true. They lose fewer years on heart and blood vessel diseases, cancer, or liver cirrhoses than men in most other EU countries. The less favourable health of Dutch women decreases the middle health rank position of the Dutch population in the EU. On the other hand, in the EU as a whole, a tendency of less healthy women is being observed (SCP, 2000).

Table 4.1 gives the figures of life expectancy at birth and the infant mortality rate in non-western countries compared to the Netherlands. The figures give an indication of the health situation in these countries. Compared with the health situation of the Dutch population, the health situation of the inhabitants of Surinam, Dutch Antilles (in this table, excluding Aruba), Morocco, and Turkey is poor.

Table 4.1 Life expectancy and infant mortality in the Netherlands and non-western countries*

	the Netherlands	Surinam	Dutch Antilles	Morocco	Turkey
Life expectancy m/f[a]	76.2/81.3	66.8/71.6	73.4/78.0	68.1/72.7	69.7/74.6
Infant mortality m/f[b]	5.7/4.5	28.2/19.9	11.2/9.5	47.1/39.2	46.3/38.8

** source: CIA, 2004 estimation 2004*
a: life expectancy at birth
b: infant mortality rate per 1000 live birth

In general, compared with the non-western countries concerned, the Netherlands has the highest life expectancy and the lowest infant mortality rate. The figures of Surinam and the Dutch Antilles are closer to the figures of the Dutch than the figures of Morocco and Turkey. The relative

better health situation of the Surinamese and Antilleans can be attributed to the history of Dutch colonisation (and European influences). Compared to the Netherlands and the Dutch Antilles, the infant mortality rate in Turkey and Morocco is relatively high.

It is difficult however, to draw conclusions on their health situation in the Netherlands, based on the figures in Table 4.1, because the life situation of non-western immigrants in the Netherlands can be different than the life situation in their countries of origin.

Immigrants feel themselves less healthy than the native Dutch (Reijneveld, 1998; Weide and Foets, 1998). Compared with people in other parts of the Netherlands, the inhabitants of Amsterdam, Rotterdam, The Hague, and Utrecht (the four biggest cities in the Netherlands) are less healthy (CBS, 2001b). In 1998, sickness leave was 10 percent above average in the four big cities.

Since immigrants mainly live in the four big cities, this could explain the lower average health condition of the population in the four big cities. On the other hand, also natives living in the four big cities report a lower than average health status. Apparently, the physical and social environment affects the health situation of immigrants.

The difference in the health situation of immigrants could partly be explained by their socio-economic position (Reijneveld, 1998). In general, the level of education of Antilleans is equal to that of the native Dutch, and the Surinamese are in the middle level of education categories (Kee, 1995). The unemployment level among all immigrants is higher than among the native Dutch (CBS, 2001). Turkish and Moroccan families belong to the lower income categories because of their lower educational and professional level (CBS, 2001). However, the health status of Turkish people appears to be lower than that of Dutch people of comparable socio-economic status.

The Netherlands is one of the European countries that have a relatively low consumption of medical services. Especially in southern (Roman Catholic) European countries the consumption of medical services is high. National differences can partly be explained by culture, for example in the way people deal with pain and troubles. Also, characteristics of the medical services seem to cause differences in consumption of medical care. An example could be the General Practitioner (GP) in the Netherlands, who has a role as ‘gatekeeper’ to the medical specialists (SCP, 2000).

In general, immigrants, especially the Turks and Moroccans, make less frequent use of specialised health care than native Dutch. On the other hand, the use of GP care and prescribed drugs is relatively high among people from Surinam, Turkey, and Morocco. This suggests that the type of health care consumption is explained by ethnic background, possibly because of limited access (Reijneveld, 1998; Stronks *et al*., 2001).

Table 4.2 shows the use of GP, medication, medical specialists, and hospitals per age group.

Table 4.2 Percentage use of medical services and medicines in different age categories

Use in previous period:	2 months			12 months
Medical service:	**GP**	**specialist**	**medication**	**hospital**
35 – 54 years	34	16	13	6
55 – 64 years	41	20	16	8
65 – 74 years	51	29	21	14
≥ 75 years	59	26	26	8

Source: CBS, adapted by SCP (1998)

The youngest age group clearly uses medical services the least frequently. People aged between 65 and 74 have the highest prevalence for hospitalisation, while people aged above 75 visit GPs most often and have the highest prevalence for using medication. Having given some information on the health of the Dutch, we turn to the determinants of health next.

Men report better health than women (Groot and Maassen van den Brink, 2003c; CBS, 2001b; CBS, 1999; Ross and Bird, 1994). Women, on the other hand, live longer than men (Schultz, 1996 and see Table 4.1). Women – whether married or not – have lower incomes and more economic hardship than men, both associated with a poor health. The social stressors stemming from this inequality could cause the poorer health status of women and can cause acute illness and nonfatal chronic problems throughout life, but usually do not cause fatal disease. In contrast, the unhealthy lifestyle of men mainly in later life causes life-threatening diseases (Ross and Bird, 1994). Females generally suffer more from long-term diseases than males (CBS, 1999). Women more often make use of medical services than men (CBS, 2001b). Also people with a less than good health status, like the elderly and low educated, use medical services relatively frequently (CBS, 2000c).

Smoking is negatively related with health. As mentioned in Chapter 3, tobacco consumption is the number one death cause that could be prevented by behavioural change (Philipson, 2001; McGrinnis and Foege, 1993).

Table 4.2 shows that age is not only positively correlated with weight (see Chapter 3), but also negatively with health (Maddox *et al.*, 1987). Beyond the age of 65, visits to GPs and medical specialists tend to increase, as well as the use of medicines and hospitalisation. In an ageing society as the Netherlands, the use of medical services will increase in the coming years (Groot, 1998). Data from 1987 show that for people aged above 55, only 33 percent of the Turks, 15 percent of the Moroccans, and 42 percent of the Surinamese report a good health. In contrast, 52 percent of the native Dutch aged above 55 report a good health (SCP, 1998).

In Chapter 3 we have discussed the relationship between overweight and health. Reidpath *et al*. (2002) show a positive relationship between Body Mass Index (BMI) and the use of medical services. These services include medication use, visits to hospitals, doctor visits, and visits to other health professionals (women only). On the other hand, for women a negative relation between BMI and preventive health services was found (Reidpath *et al*., 2002).

Overweight and obesity are associated with large decreases in life expectancy as well as early mortality. These effects appear to be of the same size as those related to smoking. A 40-year-old

female nonsmoker loses 7.1 years and a 40-year-old male nonsmoker loses 5.8 years because of obesity (BMI ≥ 30). Overweight (BMI ≥ 25) reduces life expectancy for a 40-year-old female nonsmoker with 3.3 years and for a 40-year-old male nonsmoker with 3.1 years (Peeters *et al*., 2003). Obesity appears to reduce life expectancy considerably, especially among young adults (they have a higher risk for losing years, because they are overweight earlier in life). Associated with the fewest years of life lost, the optimal BMI differs between blacks and whites. For whites the optimal BMI is between 23 and 25, whereas for blacks the optimal BMI is between 23 and 30 (Fontaine *et al*., 2003).

Differences in health could be caused by genetic predispositions, living and working conditions, lifestyle, and food consumption patterns (Weide and Foets, 1998). In Chapter 3 we investigated the relation between certain food habits and BMI, and we noticed that food habits differ across ethnic groups and have different effects on BMI. It would be interesting to explore whether the food habits studied in Chapter 3 (mainly outsourcing of meal preparation) affect health. Outsourcing meal preparation has become more popular over the past decades. Chapter 3 shows figures on outsourcing meal preparation in the Netherlands and on the consumption of vegetables (section 3.2).

Most analyses of health technology have focused on the least ambiguous outcome, namely mortality. Birth weight, height for age, BMI, and skin fold thickness are justified measures of health status and have a strong correlation with age-specific mortality. Schultz (1996) however holds the view that too much attention has been given to mortality (Schultz, 1996). The perception of one's own health is considered one of the better indicators of health (Wannamethee and Shaper, 1991). Self-reported health is correlated with physical limitations and is therefore useful in health analysis.

4.3 Model and estimation methods of the demand for health

Grossman (1972) argues that 'good health' is a commodity produced by the individual. The commodity 'good health' is treated as part of his or her human capital, and as such it determines the total amount of time the individual can spend on productive activities in market and non-market sectors. The latter provides the rationale for the individual to demand health capital up to the point where the costs of one additional unit of health capital is equal to the value of the additional time for productive use generated by the better health, plus the utility of being healthy per se that an additional unit of 'good health' creates (Grossman, 1972 and 2000).

Gerdtham *et al*. (1999) use Grossman's model to measure health capital H_i and they measure the stock of health by a rating scale, a time trade-off, and a categorical health rating. Like in Cutler and Richardson (1998), a rating scale is a measure of perceived health where 0 means death, and 1 means perfect health.

The categorical health rating (or self-reported health) is the same as used in the research of Cutler and Richardson (1998) and is a measure of people's perceived health condition. People are

asked to rate their own health situation. The self-reported health has five categories: excellent, very good, good, fair, and poor) and used and validated in most research (see for example Wannamethee and Shaper, 1991). The self-reported health can be used to measure the stock of health (the health status).

In this chapter, we estimate the demand for health (see also Gertdham *et al.*, 1999, and Grossman, 2000) and use the respondent's self-reported health. A linear dependence between the latent variable health h_i^* and the regressor variables x_i, β, and e_i is assumed:

$$h_i^* = c + \beta' x_i + e_i, \qquad e_i \sim N(0, \sigma^2) \tag{4.1}$$

The health variable h_i^* defines variable h_i, which is related to the five health categories (4 = excellent, 0 = poor) in the following way (where $\theta_i = 0,1,2,3$ are unobservable thresholds):

$h_i = 0$ if $h_i^* \le \theta_0$

$h_i = 1$ if $\theta_0 < h_i^* \le \theta_1$

$h_i = 2$ if $\theta_1 < h_i^* \le \theta_2$

$h_i = 3$ if $\theta_2 < h_i^* \le \theta_3$

$h_i = 4$ if $\theta_3 > h_i^*$

For the estimations an ordered probit model is used (for references see Greene, 2000; Johnston and DiNardo, 1997; Agresti, 1996; Maddala, 1983). Assuming a normal distribution φ of h_i^* the probabilities are respectively:

Prob($y = 0$) = $\phi(\mu_0 - \beta' x)$,

Prob($y = 1$) = $\phi(\mu_1 - \beta' x) - \phi(\mu_0 - \beta' x)$,

Prob($y = 2$) = $\phi(\mu_2 - \beta' x) - \phi(\mu_1 - \beta' x)$,

Prob($y = 3$) = $\phi(\mu_3 - \beta' x) - \phi(\mu_2 - \beta' x)$,

Prob($y = 4$) = 1– $\phi(\mu_3 - \beta' x)$

In an ordered probit, the five censored health categories are projected on a continuum, leaving only four thresholds to estimate: $\mu_i = 0,1,2,3$ and no constant term.

We included as regressor variables a dummy for children living at home, living area, intake of vitamins, employment status, and the food habits also used in Chapter 3: outsourcing meal preparation, convenience food, eating out, and fresh vegetables. Takeaway food, ready-to-eat meals, and delivery food are added up in one variable for outsourcing meal preparation.

Gerdtham *et al*. (1999) included income in the estimations as well. One might argue whether to put income in the model for health production. For example, there will be less income if a person is not able to work because of serious illness. Therefore, we consider income to be endogenous. Schooling is positively associated with health outcomes (Nayga, 2000). Level of education can be seen as a good representative of income, since there is a strong positive relation between level of education and income. For this reason, we include education in our model, excluding income. We estimate the demand for health equation (4.1), where vector x_i consists of 13 different variables. The expected signs of the coefficients are put in Scheme 4.1.

Scheme 4.1 Expected signs for coefficients to be estimated

Beta	Variable	Expected sign
X_1	Gender (1=female, 0=male)	–
X_2	Level of education	+
X_3	Rate of depreciation (incl. age, smoking, and BMI ≥ 25)	–
X_4	Being married or cohabiting	+
X_5	Children living at home	+
X_6	Outsourcing meal preparation	–
X_7	Convenience food	–
X_8	Eating out	+/–
X_9	Fresh vegetables	+
X_{10}	Living in urban area	–
X_{11}	Ethnicity	–
X_{12}	Unemployment	–
X_{13}	Intake extra vitamins/minerals	+

+ positive effect, – negative effect, +/– either positive or negative effect expected

For women, a negative sign is expected since females in general report poorer health than males (Ross and Bird, 1994; CBS, 1999; CBS, 2001b). We expect a positive sign for level of education following Grossman (1972), who assumes that education increases the production of health because higher educated people are more efficient 'producers' of health (see also CBS, 2001b; CBS, 2000c; Weide and Foets; Uniken Venema *et al*., 1995).

As for being married/cohabiting a positive sign is expected following Gerdtham *et al*. (1999), who find a negative relation between living alone and health. People who are married or live together might take better care of their health in paying more attention to what they eat, in the time they take to relax, and in the time they take to sleep. Children in the household can affect health positively through a healthier eating pattern of the parents.

The signs for outsourcing meal preparation and convenience food are expected to be negative, because the consumption of takeaway food, delivery food, ready-to-eat meals, and convenience food is considered 'unhealthy' food habit, since it can cause overweight (as discussed in Chapter 3). Overweight (BMI $\geq$ 25) will affect health negatively, because it increases the risk of coronary heart diseases, cardiovascular diseases, and cancer (Philipson, 2001; WHO, 2000; McGrinnis and Foege, 1993).

For eating out either a positive or a negative effect is expected, since Chapter 3 showed a negative effect of eating out on BMI. The effect of eating out on health could therefore be positive. Nevertheless, until now, the effect of eating out on health is unknown; therefore also a negative effect is hypothesised.

The literature shows a poorer health situation in the four big cities because of a worse physical and social environment (CBS, 2001b). Therefore, we expect a negative sign for living in urban areas. The sign of ethnicity is expected to be negative, since the literature shows a poorer health for immigrants generally (CBS, 2001; Stronks *et al*., 2001b; Reijneveld, 1998; SCP, 1998).

Unemployment is associated with a low socio-economic status and lower incomes and therefore a poorer health (Reijneveld, 1998; Weide and Foets, 1998; CBS, 2000c). The lower one's wage, the smaller the marginal health utility due to less investment in own health (Grossman, 1972). Therefore we hypothesise a negative relation between unemployment and health.

There are people who take extra vitamins and/or minerals to improve their health (or to keep their good health). We expect a positive relation between the intake of extra vitamins/minerals, because it can improve people's health or contribute to a good heath condition.

4.4 Description of the data on self-reported health

In this chapter, we use the data used in Chapter 3 and elaborately described in Chapter 2 and again, we analyse four different groups: the native Dutch, the Surinamese/Antilleans, Moroccans, and Turks (total N=2,551). The independent variables are gender, level of education, age, smoking, BMI, marital

status, children at home, outsourcing meal preparation, convenience food, eating out, fresh vegetables, intake of extra vitamins, urban area, and unemployment. While Gerdtham *et al*. (1999) use a dummy for overweight with a BMI > 30, we use a dummy for BMI $\geq$ 25 since the WHO (2000) describes a BMI $\geq$ 25 already as overweight. The dependent variable 'health' is measured in five categories like in Gerdtham *et al*. (1999): excellent, very good, good, fair, and poor. See Appendix I for the definitions of the variables used and Appendix II for the description of the variables.

In Chapter 3 we have used BMI as a continuous variable, to study the determinants of BMI. To investigate the effects of overweight (BMI $\geq$ 25) on health, in this chapter, we will delimit BMI and use it as a dichotomous variable.

As also shown in Chapter 3, the Turkish respondents are lower educated than the other groups, while the Surinamese/Antillean respondents have the highest level of education (their figures correspond with the figures of the native Dutch). Compared to the other groups, the Turks smoke the most frequently, while the Moroccans smoke the least frequently. All groups have a relatively high prevalence for overweight. As we already learned in Chapter 3, the Turks have the highest prevalence of overweight, followed by the Surinamese/Antilleans (their figures are close to those of the native Dutch), and the Moroccans have the lowest prevalence of overweight. Based on this information, it could be expected that Turkish respondents report the poorest health.

The native Dutch respondents outsource meal preparation to snack bars, pizza deliverers etc. the least frequently, while Moroccan respondents make use of these services the most (as reported in section 3.3). To outsource meal preparation, the native Dutch make more use of convenience food and eating out in restaurants than the other groups, while Moroccans make the least frequent use of these services. The Surinamese/Antilleans take extra vitamins/minerals the most frequently, while the Turks do that the least frequently. As reported in section 4.2, immigrants mainly live in the four big cities, which is also shown in Appendix II.

The native Dutch and the Surinamese/Antilleans report a very good or an excellent health the most frequently. This is shown in Appendix III. The Turks report the poorest health, followed by the Moroccans. Appendix III also shows that in all groups, as people become older, their self-reported health becomes poorer. All groups report a poorer health when being overweight.

The native Dutch and Surinamese/Antilleans report the largest difference in self-reported health due to overweight. For Moroccans and Turks the differences in health are smaller between overweight people and people with a normal weight. Except for the Surinamese/Antillean group, all groups report a better health when living in rural areas. The result for the Surinamese/Antillean respondents (which is contradictory with the literature) could be affected by the relative large part of this group in the sample living in urban areas compared to the other groups in the sample.

Although the numbers of unemployed people in the sample are small, employed people report a better health than unemployed people, except for the native Dutch. Although we should be very

careful with drawing conclusions here (because this is based on only 8 observations), we will come back to this issue later.

4.5 Estimation results of ordered probit analyses on self-reported health

An ordered probit analysis, as described in section 4.3, was conducted for the whole sample including dummies for the immigrant groups (where the Dutch group is taken as a reference group). The second column of Table 4.3 shows the results. The analyses of Chapter 3 show that BMI is highly correlated with age and smoking. Therefore, we have checked for multicollinearity between health and BMI by leaving out BMI in the ordered probit analysis. The third column in Table 4.3 is the same estimation, this time without BMI ≥ 25.

Table 4.3 Ordered probit of self-reported health for the whole sample with dummies for ethnicity (standard errors in parentheses)

Variable	Estimation		Estimation without BMI ≥ 25	
Female	-0.323	*(0.046)***	-0.312	*(0.046)***
Native Dutch	*reference*	*group*	*reference*	*group*
Surinamese/Antilleans	-0.098	*(0.063)*	-0.107	*(0.063)**
Moroccans	-0.229	*(0.075)***	-0.229	*(0.075)***
Turks	-0.368	*(0.068)***	-0.383	*(0.068)***
Low educated	*reference*	*group*	*reference*	*group*
Mediate educated	0.190	*(0.054)***	0.207	*(0.053)***
High educated	0.398	*(0.065)***	0.423	*(0.065)***
Age1 (18 - 34)	*reference*	*group*	*reference*	*group*
Age2 (35 - 44)	-0.165	*(0.057)***	-0.188	*(0.057)***
Age3 (45 - 64)	-0.351	*(0.064)***	-0.388	*(0.063)***
Age4 (≥ 65)	-0.438	*(0.096)***	-0.487	*(0.095)***
Smoking	-0.225	*(0.048)***	-0.215	*(0.048)***
BMI ≥ 25	-0.175	*(0.045)***		
Married/living together	0.113	*(0.055)***	0.109	*(0.055)**
Children at home	-0.040	*(0.056)*	-0.052	*(0.056)*
Outsourcing meal preparation seldom	*reference*	*group*	*reference*	*group*
Outsourcing meal preparation 1-5 p/m	-0.016	*(0.052)*	-0.020	*(0.052)*
Outsourcing meal preparation > 5 p/m	-0.152	*(0.102)*	-0.142	*(0.102)*
Convenience food seldom	*reference*	*group*	*reference*	*group*
Convenience food 1-2 p/w	0.034	*(0.051)*	0.031	*(0.051)*
Convenience food 2-4 p/w	-0.106	*(0.073)*	-0.108	*(0.073)*
Convenience food > 4 p/w	-0.005	*(0.116)*	-0.018	*(0.116)*
Eat out seldom	*reference*	*group*	*reference*	*group*
Eat out 1-4 p/m	0.135	*(0.049)***	0.142	*(0.049)***
Eat out 5-10 p/m	0.070	*(0.123)*	0.086	*(0.123)*
Eat out > 10 p/m	0.338	*(0.193)**	0.344	*(0.193)**
Fresh vegetables seldom	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	-0.022	*(0.193)*	-0.039	*(0.193)*
Fresh vegetables 2-4 p/w	0.045	*(0.185)*	0.032	*(0.185)*
Fresh vegetables > 4 p/w	0.250	*(0.181)*	0.244	*(0.181)*
Urban area	-0.065	*(0.049)*	-0.066	*(0.049)*
Unemployed	-0.386	*(0.128)***	-0.386	*(0.128)***
Intake vitamins	0.219	*(0.048)***	0.218	*(0.048)***
μ_0 [1]	-1.737	*(0.226)***	-1.677	*(0.225)***
μ_1	-1.081	*(0.223)***	-1.022	*(0.223)***
μ_2	-0.290	*(0.223)*	-0.234	*(0.222)*
μ_3	1.147	*(0.223)***	1.197	*(0.223)***
N	2542		2542	
Log-L	6282.068		6162.776	
Pseudo R^2	0.129[a]		0.124	

*a= Nagelkerke's R^2, * p<0 .10 ** p<0 .05 *** p<0.01*

Table 4.3 shows that females have a significantly poorer health than males, which was expected. Medium and higher education has a significantly positive effect on health. This is also

[1] Within an ordered probit analysis the projection is on a continuum, which is arbitrary. There are two ways to solve this problem: 1) to set one of the location parameters to 0, or 2) to exclude the intercept in the identification model and use all location parameters. Both methods give identical results for the independent variables. SPSS 11.0 uses the second method and includes an intercept within the different thresholds. We have chosen to use SPSS 11.0 and as a result make use of the second method.

according to expectation. As hypothesised, age[2], smoking, and a BMI ≥ 25 affect health significantly negatively. Being married/living together has a small positively significant effect on health, which corresponds to the hypothesis. No specific effect of eating out on health was expected. The table above shows that the effect of eating out on health is positive, for 1-4 times per month the effect is strong, for eating out more then 10 times per month the significantly positive effect is smaller. The Turks and the Moroccan respondents have a significantly poorer health than the Dutch natives. For all immigrants a negative effect on health was expected. Nevertheless, the results show no effect for the Surinamese/Antillean group. In correspondence with the hypothesis, unemployment has a significantly negative effect on health, meaning that unemployed people have a poorer health. The effect of the intake of extra vitamins on health was expected to be positive, which is confirmed by the estimation results. When BMI is excluded from the estimation, the estimates of the ordered probit analyses give mainly the same results, apart from some minor exceptions (married/living together is now only significant at a 5 and 1 percent level, and the dummy for the Surinamese/Antilleans gives a small negatively significant result). This indicates that BMI is not highly correlated with health for the whole sample, which is proved in Table 4.4, showing the estimation results of the ordered probit analysis for the Dutch, Surinamese/Antillean, Moroccan, and Turkish respondents.

[2] To check whether the strong effect of age on health overrules effects of other variables, the estimation is repeated excluding age (results not shown). The results do not change much, only the Moroccan respondents show an age-effect. This age-effect indicates that when becoming older, the health of Moroccan respondents changes less than the health of native Dutch respondents.

Table 4.4 Ordered probit of self-reported health per ethnic group (standard errors in parentheses)

Variable	Dutch		Surin./Antilleans		Moroccans		Turks	
Female	-0.183	*(0.095)**	-0.302	(0.090)***	-0.406	*(0.120)****	-0.471	*(0.089)****
Low educated	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Mediate educated	-0.023	*(0.111)*	0.193	(0.113)*	0.333	*(0.131)***	0.180	*(0.096)**
High educated	0.108	*(0.128)*	0.475	(0.121)***	0.718	*(0.167)****	0.371	*(0.150)***
Age1 (18-34)	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Age2 (35-44)	-0.220	*(0.125)**	0.021	(0.113)	-0.344	*(0.147)***	-0.221	*(0.103)***
Age3 (45-64)	-0.334	*(0.120)****	-0.223	(0.117)*	-0.393	*(0.175)***	-0.573	*(0.147)****
Age4 (>64)	-0.384	*(0.153)****	-0.607	(0.199)***	-0.817	*(0.284)****	-0.487	*(0.312)*
Smoking	-0.329	*(0.091)****	-0.214	(0.097)**	-0.294	*(0.145)***	-0.196	*(0.084)***
BMI $\geq$ 25	-0.312	*(0.090)****	-0.449	(0.086)***	0.172	*(0.114)*	-0.041	*(0.088)*
Married/living together	0.394	*(0.100)****	0.015	(0.094)	0.165	*(0.169)*	-0.048	*(0.137)*
Children at home	-0.056	*(0.109)*	0.107	(0.097)	-0.129	*(0.159)*	0.070	*(0.129)*
Outsourcing meal preparation seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Outsourcing meal preparation 1-5 p/m	-0.077	*(0.106)*	-0.146	(0.104)	0.102	*(0.126)*	0.046	*(0.098)*
Outsourcing meal preparation >5 p/m	-0.457	*(0.211)***	0.022	(0.218)	0.015	*(0.219)*	-0.132	*(0.196)*
Conv. food seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Conv. food 1-2 p/w	-0.017	*(0.100)*	-0.180	(0.102)*	0.057	*(0.130)*	0.133	*(0.095)*
Conv. food 2-4 p/w	-0.145	*(0.148)*	-0.182	(0.140)	-0.146	*(0.204)*	0.023	*(0.139)*
Conv. food > 4 p/w	0.021	*(0.198)*	-0.327	(0.260)	-0.418	*(0.344)*	0.484	*(0.225)***
Eat out seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Eat out 1-4 p/m	0.027	*(0.096)*	0.285	(0.096)***	0.072	*(0.124)*	0.132	*(0.094)*
Eat out 5-10 p/m	0.192	*(0.214)*	0.112	(0.240)	0.116	*(0.316)*	-0.245	*(0.271)*
Eat out > 10 p/m	-0.053	*(0.404)*	0.589	(0.414)	0.268	*(0.658)*	0.303	*(0.298)*
Fresh vegetables seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	-0.022	*(0.416)*	-0.283	(0.369)	-0.772	*(0.614)*	0.420	*(0.318)*
Fresh vegetables 2-4 p/w	-0.026	*(0.401)*	-0.341	(0.347)	-0.287	*(0.589)*	0.446	*(0.307)*
Fresh vegetables > 4 p/w	0.258	*(0.400)*	-0.268	(0.338)	-0.216	*(0.579)*	0.662	*(0.299)***
Intake vitamins	0.128	*(0.090)*	0.058	(0.085)	0.445	*(0.127)****	0.435	*(0.112)****
Urban area	-0.163	*(0.140)*	0.052	(0.084)	-0.181	*(0.109)**	-0.107	*(0.087)*
Unemployed	0.639	*(0.408)*	-0.500	(0.262)*	-0.913	*(0.361)***	-0.373	*(0.186)***
μ_0	-2.055	*(0.460)****	-2.546	(0.418)***	-1.598	*(0.642)***	-0.539	*(0.402)*
μ_1	-1.587	*(0.455)****	-1.760	(0.410)***	-0.803	*(0.636)*	0.149	*(0.400)*
μ_2	-0.686	*(0.452)*	-0.863	(0.407)**	-0.078	*(0.635)*	0.902	*(0.401)***

Table 4.4 (continued)

μ_3	1.044	*(0.453)***	0.490	(0.406)	1.530	*(0.638)***	2.176	*(0.401)****
N	700		698		447		697	
Log-L	1520.108		1719.725		1028.852		1832.731	
Pseudo R^2	0.126		0.174		0.222		0.158	

** p<0 .10 ** p<0 .05 *** p<0.01*

Table 4.4 demonstrates a significantly negative effect on health in all groups for females, indicating that the reported health of females is poorer than the reported health of males. Level of education has the hypothesised positive effect on health, except for the Dutch. Socio-economic variables may affect the health of the native Dutch in a different way than for immigrants. For example, level of education gives only significant results for immigrants. Age has a significantly negative effect on health for in all groups, which means that older people have a poorer health. For the Surinamese/Antillean respondents the effect of age starts from the age category between 45 and 64, while there is no effect of age for Turkish respondents aged above 65. Smoking gives the hypothesised negative effect for all groups. BMI ≥ 25 has a strong significantly negative effect on health for the native Dutch and the Surinamese/Antillean, but not for the Turkish and Moroccan respondents, indicating that only the native Dutch and Surinamese/Antillean respondents perceive negative effects from overweight on health. Eating out has a positive effect on health for the Surinamese/Antilleans, which means that this group encounters a positive effect from eating away from home on their health. The effect of the intake of extra vitamins on health is significant and positive for Moroccans and Turks. Unemployment has the expected significantly negative effect on health for all immigrants groups, indicating that mainly immigrants experience a negative effect of being unemployed on their health. Table 4.5 gives the estimation results for women.

Table 4.5 Ordered probit of self-reported health for women (standard errors in parentheses)

Variable	Dutch women		Surinamese/ Antillean women		Moroccan women		Turkish women	
Low educated	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Mediate educated	-0.157	*(0.146)*	0.229	*(0.151)*	0.122	*(0.188)*	0.227	(0.135)*
High educated	-0.047	*(0.178)*	0.538	*(0.168)***	0.583	*(0.260)***	0.342	(0.213)
Age1 (18-34)	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Age2 (35 - 44)	-0.211	*(0.161)*	-0.082	*(0.143)*	-0.341	*(0.224)*	-0.372	(0.140)***
Age3 (45 - 64)	-0.207	*(0.155)*	-0.168	*(0.161)*	-0.340	*(0.287)*	-0.597	(0.216)***
Age4 ($\geq$ 65)	-0.119	*(0.209)*	-0.566	*(0.263)***	-1.420	*(0.471)****	0.417	(1.112)
Smoking	-0.205	*(0.117)**	-0.212	*(0.139)*	-0.494	*(0.352)*	-0.244	(0.118)**
BMI $\geq$ 25	-0.416	*(0.116)****	-0.603	*(0.119)****	0.176	*(0.175)*	-0.099	(0.127)
Married/living together	0.429	*(0.128)****	0.016	*(0.121)*	0.087	*(0.240)*	0.136	(0.185)
Children at home	-0.059	*(0.142)*	0.203	*(0.126)*	0.054	*(0.230)*	-0.028	(0.182)
Outsourcing meal preparation seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Outsourcing meal preparation 1-5 p/m	0.064	*(0.130)*	-0.247	*(0.139)**	-0.044	*(0.177)*	0.106	(0.132)
Outsourcing meal preparation >5 p/m	-0.156	*(0.309)*	0.537	*(0.355)*	-0.138	*(0.360)*	0.205	(0.312)
Conv. food seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Conv. food 1-2 p/w	0.190	*(0.125)*	-0.372	*(0.134)****	0.114	*(0.188)*	0.212	(0.128)*
Conv. food 2-4 p/w	0.039	*(0.185)*	-0.363	*(0.189)**	-0.018	*(0.286)*	0.020	(0.195)
Conv.food > 4 p/w	0.392	*(0.296)*	-0.445	*(0.331)*	-0.725	*(0.433)**	-0.043	(0.309)
Eat out seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Eat out 1-4 p/m	0.166	*(0.124)*	0.200	*(0.129)*	0.247	*(0.188)*	0.111	(0.131)
Eat out 5-10 p/m	0.363	*(0.288)*	0.052	*(0.291)*	0.175	*(0.389)*	0.203	(0.407)
Eat out > 10 p/m	6.381	*(0.000)*	0.160	*(0.826)*	-0.074	*(0.793)*	0.233	(0.798)
Frech vegetables seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	0.377	*(0.673)*	-0.301	*(0.445)*	-0.693	*(1.165)*	0.844	(0.519)
Fresh vegetables 2-4 p/w	0.573	*(0.650)*	-0.138	*(0.402)*	-0.335	*(1.144)*	1.015	(0.499)**
Fresh vegetables > 4 p/w	0.951	*(0.648)*	-0.337	*(0.385)*	-0.168	*(1.127)*	1.199	(0.494)**
Intake vitamins	0.124	*(0.109)*	0.072	*(0.112)*	0.400	*(0.172)***	0.401	(0.134)***
Urban area	-0.235	*(0.176)*	0.054	*(0.111)*	-0.168	*(0.158)*	-0.006	(0.117)
Unemployed	0.927	*(0.475)**	-0.488	*(0.553)*	-1.864	*(0.849)****	-0.588	(0.279)**
μ_0	-0.966	*(0.686)*	-2.490	*(0.491)****	-1.621	*(1.196)*	0.417	(0.600)
μ_1	-0.521	*(0.683)*	-1.561	*(0.479)****	-0.615	*(1.186)*	1.159	(0.601)*
μ_2	0.480	*(0.494)*	-0.776	*(0.476)*	0.232	*(1.185)*	1.906	(0.604)***
μ_3	2.170	*(0.687)****	0.670	*(0.475)*	1.893	*(1.190)*	3.311	(0.614)***

Table 4.5 (continued)

N	443	401	212	384
Log-L	952.788	991.208	483.312	956.054
Pseudo R^2	0.153	0.200	0.197	0.152

** p<0 .10 ** p<0 .05 *** p<0.01*

One overall conclusion on the results shown in Table 4.5 could be that for women, the included variables are less significant compared to the whole sample. This can be attributed to the fact that in general, female's health is poorer than male's health (which are caused by other determinants not included in these estimations, like pregnancy).

Level of education gives some positive effect on self-reported health for all women, except for the Dutch. Apparently, a higher level of education does not have a positive impact on the health of Dutch women. Age has a negative effect on health, except for Dutch women. For Turkish women the age-effect on health already starts in the second age category (35 - 44). This earlier age-effect could be caused by the high prevalence of 'young' Turkish respondents due to language-problems (only 1.9 percent of the Turkish group is aged above 64, see Appendix II). The age-effect however, is smaller for females compared to the whole sample.

The effect for the intake of extra vitamins for the Turkish group is strong and positive, as can also be said for the Moroccan group. Turkish and Moroccan women have a poorer health when being unemployed.

However, the results for native Dutch women suggest that unemployment has a small, but positive effect on health. This implicates that native Dutch women without a paid job have less health problems than native Dutch women with a paid job. This confirms the findings from research showing that if women make more working hours, they take over the unhealthy habits of males (like smoking and drinking) and have more health problems (Maassen van den Brink, 2001).

Table 4.6 Ordered probit of self-reported health for men (standard errors in parentheses)

Variable	Dutch men		Surinam./ Antillean men		Moroccan men		Turkish men	
Lowe educated	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Mediate educated	0.089	*(0.184)*	0.041	*(0.178)*	0.710	*(0.199)***	0.121	*(0.144)*
High educated	0.363	*(0.205)**	0.335	*(0.182)**	1.038	*(0.246)***	0.442	*(0.228)**
Age1 (18-34)	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Age2 (35 - 44)	-0.260	*(0.215)*	0.236	*(0.197)*	-0.385	*(0.216)**	-0.046	*(0.162)*
Age3 (45 - 64)	-0.642	*(0.210)****	-0.265	*(0.184)*	-0.329	*(0.249)*	-0.524	*(0.209)***
Age4 ($\geq$ 65)	-0.871	*(0.246)****	-0.736	*(0.317)***	-0.350	*(0.389)*	-0.476	*(0.357)*
Smoking	-0.528	*(0.157)****	-0.179	*(0.140)*	-0.237	*(0.164)*	-0.060	*(0.128)*
BMI $\geq$ 25	-0.217	*(0.152)*	-0.273	*(0.134)***	0.209	*(0.159)*	0.051	*(0.130)*
Married/living together	0.421	*(0.190)***	0.023	*(0.164)*	0.247	*(0.251)*	-0.433	*(0.220)**
Children at home	0.019	*(0.196)*	-0.015	*(0.162)*	-0.67	*(0.231)*	0.332	*(0.196)**
Outsourcing meal preparation seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Outsourcing meal preparation 1-5 p/m	-0.238	*(0.192)*	0.035	*(0.165)*	0.225	*(0.185)*	0.024	*(0.154)*
Outsourcing meal preparation >5 p/m	-0.714	*(0.321)***	-0.185	*(0.293)*	0.195	*(0.292)*	-0.459	*(0.263)**
Conv. food seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Conv. food 1-2 p/w	-0.400	*(0.177)***	0.083	*(0.167)*	-0.065	*(0.191)*	-0.019	*(0.150)*
Conv. food 2-4 p/w	-0.491	*(0.269)**	0.042	*(0.216)*	-0.175	*(0.314)*	0.081	*(0.210)*
Conv. food > 4 p/w	-0.579	*(0.292)***	-0.228	*(0.433)*	0.117	*(0.639)*	1.079	*(0.362)****
Eat out seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Eat out 1-4 p/m	-0.237	*(0.163)*	0.409	*(0.151)****	-0.035	*(0.171)*	0.165	*(0.142)*
Eat out 5-10 p/m	-0.161	*(0.341)*	0.314	*(0.469)*	0.138	*(0.629)*	-0.582	*(0.377)*
Eat out > 10 p/m	-1.011	*(0.498)***	0.795	*(0.503)*	5.457	*(0.000)*	0.295	*(0.327)*
Fresh vegetables seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	-0.327	*(0.571)*	-0.825	*(0.874)*	-0.347	*(0.797)*	0.116	*(0.417)*
Fresh vegetables 2-4 p/w	-0.623	*(0.541)*	-1.024	*(0.854)*	0.083	*(0.715)*	0.047	*(0.411)*
Fresh vegetables > 4 p/w	-0.438	*(0.540)*	-0.699	*(0.846)*	0.118	*(0.157)*	0.328	*(0.390)*
Intake vitamins	0.080	*(0.167)*	0.011	*(0.138)*	0.510	*(0.210)***	0.589	*(0.219)****
Urban area	-0.138	*(0.250)*	0.105	*(0.137)*	-0.118	*(0.157)*	-0.196	*(0.136)*
Unemployed	-0.202	*(0.839)*	-0.416	*(0.309)*	-0.497	*(0.419)*	-0.210	*(0.270)*
μ_0	-3.467	*(0.699)****	-2.793	*(0.914)****	-0.636	*(0.823)*	-0.590	*(0.613)*
μ_1	-2.915	*(0.685)****	-2.295	*(0.906)***	0.033	*(0.817)*	0.054	*(0.609)*
μ_2	-2.122	*(0.675)****	-1.156	*(0.901)*	0.666	*(0.817)*	0.867	*(0.610)*
μ_3	-0.155	*(0.665)*	0.160	*(0.899)*	2.297	*(0.827)****	2.066	*(0.616)****

Table 4.6 (continued)

N	257	297	235	313
Log-L	517.325	691.489	520.881	776.184
Pseudo R^2	0.221	0.186	0.265	0.172

** p< 0.10 ** p< 0.05 *** p<0.01*

In general, when comparing the separate results for men and women, males show more significant results for the investigated variables than females in the sample. Table 4.6 shows positive effects for education on health for all male groups, most strongly for the Moroccans.

Dutch males report a poorer health when they outsource meal preparation, eat convenience food, and go eating out. As seen in Appendix II, the Dutch make use of outsourcing meal preparation and convenience food the most frequently and go eating out the most frequently. For the Surinamese/Antilleans the effect of eating out on health is positive.

Only the native Dutch males are healthier when being married/cohabiting (as also seen for the native Dutch females). For the other groups being married/cohabiting does not improve self-reported health.

Again, to test for multicollinearity, the estimations for the four groups were repeated excluding BMI $\geq$ 25 (results shown in Appendix IV). These estimations show only slightly different results, indicating that overweight is not endogenously related to health.

As also seen in Table 4.4, these estimations show that overweight does not explain health for the Moroccans and the Turks. We have checked the correlation between overweight and health by making correlation matrices for each group (Leeflang *et al*., 2000). The results are shown in Appendix V. The Moroccan group does not show significant results. For the Dutch and the Surinamese the correlation between overweight and health is significant and negative, indicating that people with overweight have a poorer health than people with normal weight. The effect of overweight on health is strongest for women; even Turkish women show a negative significant effect for overweight on health. Women may consider overweight as a more important health-issue than men.

4.6 Health utility loss of overweight

In their health capital model Cutler and Richardson (1998) describe a procedure to calculate Quality Adjusted Life Year (QALY) weights by assigning a value for each year in perfect health. They state that health is a multi-attribute concept, encompassing both physical and mental components. A person's quality of life in any year can be scaled on basis of 0 to 1, where 0 means dead and 1 means perfect health. Subsequently, the expected number of quality-adjusted life years a person has left can be added up to form a measure of expected quality-adjusted life years (QALY's) (see also Bleichrodt and Johannesson, 1997; Bleichrodt and Koopmanschap, 1999; Dolan, 2000; Smith, 2001 for an evaluation of the QALY-method). According to Cutler and Richardson (1998), the value of a year in perfect health is $100,000, which they call health capital or can be seen as wage risk trade-off (Viscusi, 1993). They also measure quality of life with life expectation and quality weights for certain conditions of health.

Mean life expectancy in the U.S. increased between 1970 and 1990 from 71 till 75 years. These survival rates are adjusted by the prevalence of disease at every age. Quality weights are

attached to each condition by asking people to rate their health in five categories (excellent, very good, good, fair, poor). According to Cutler and Richardson (1998), measuring changes in health capital by income or education is more difficult than measuring changes by race or by gender, largely because mortality is rarely classified by economic status.

In general there is a subjective and an objective health measure. The subjective health measure is often defined by the response to the survey question "Compared to people of your own age, would you say that your health has on the whole been: 1) excellent, 2) good, 3) fair, 4) poor or 5) very poor?". One advantage of using self-assessments of health for calculating QALY weights is that the cognitive burden on respondents is lower than with other techniques.

In Frybeck *et al*. (1993) it is shown that the scores on this self-assessed overall quality of health correlate highly with the scores of other quality of life indicators that are frequently used in QALY analysis. These life indicators are the time trade-off assessment, the quality of well-being index, and the outcomes of a general health perception questionnaire.

In order to determine the marginal effect of overweight (BMI ≥ 25) on health utility we calculate the Quality of Life Weight (QoLW) of overweight using the method Quality Adjusted Life Year (QALY). This approach to calculate the QoLW is similar to the procedure described by Cutler and Richardson (1998) and used by Groot and Maassen van den Brink (2003a and 2003b). QoLW weights can be attributed to the prevalence of specific chronic illnesses and physical handicaps (Van Praag and Ferrer-i-Carbonell, 2002, Groot and Maassen van den Brink, 2003a and 2003b).

Let β be the coefficients for BMI ≥ 25 in the subjective health equations for each group. These coefficients are not scaled, and therefore need to be normalised to produce a QoLW. We normalise them by dividing by the difference between the highest and the lowest health levels. By doing so it is assumed that the highest possible response to the health question corresponds to a nearly perfect health condition and the lowest possible response corresponds to the poorest possible health condition. Since μ_4 is the reference group, the QoLW now is defined as:

$$QoLW = \frac{\beta}{\mu_3 - \mu_0} \tag{4.3}$$

Equation (4.3) shows how overweight affects health. To calculate this QoLW for overweight, the estimations from Table 4.4 are used, where β is the coefficient of overweight (BMI $\geq$ 25.00). This QoLW can be used as a proxy for the marginal effect.

Table 4.7 shows the QoLW by ethnic group for BMI $\geq$ 25. The second row in the table gives the prevalence of overweight per group.

Table 4.7 Quality of Life Weights for overweight (BMI ≥ 25) and prevalence of overweight

	Dutch	Surinamese/Antilleans	Moroccans	Turks
BMI ≥ 25	-0.100	-0.147	0.054	-0.015
Prevalence (%)	41.4	43.9	38.8	49.6

Table 4.7 demonstrates that due to overweight the Surinamese/Antillean respondents encounter a reduction in QoLW of 14.7 percent. For the native Dutch the reduction in QoLW due to overweight is 10 percent, while for Turkish respondents it is 1.5 percent. The Moroccans even have an increase of QoLW due to overweight of 5.4 percent. Unfortunately, no conclusions can be drawn from the results of the Turkish and Moroccan respondents, since the estimated coefficients are not significant (as seen in Table 4.4 and Appendix II, where the overweight variable gives no significant results for these groups).

Due to overweight, the Dutch and Surinamese/Antillean respondents experience a reduction in their health utility of 10 – 14.7 percent, which implies that their health quality decreases with 10 – 14.7 percent when being overweight compared to peers with a normal weight. The result of the Surinamese/Antillean respondents is somewhat unexpected, because one could expect a less negative effect of overweight on health due to their cultural background. In non-western cultures people may associate overweight with happiness, well-being, and peace, and not with 'unhealthy'.

With the results from Table 4.7, we can calculate the implicit costs of overweight for the native Dutch and Surinamese/Antillean respondents, which will give an indication of the monetary value of the overweight effect on health. In some studies a value of $100,000 per QALY is used as criterion for cost effectiveness (Cutler and McClellan, 2001; Cutler and Richardson, 1998; Viscusi, 1993). An alternative value of $230,000 per QALY is also often used as a criterion for cost effectiveness (Groot en Maassen van den Brink, 2003b). It is calculated by Moore and Viscusi (1988), who calculate the value of a statistical life year at approximately $230,000. We will use both values as lower and upper limits respectively.

In the QALY the quality and quantity (mortality and morbidity) are unified in one measure of quality of life corrected life years. Life expectancy of the two groups in the Netherlands is 77.5 for the native Dutch and 76.8 for the Surinamese/Antilleans (Bos *et al*., 2003). As discussed in section 3, the years of life lost due to overweight (BMI ≥ 25) at the age of 40 is approximately 3.2 years for nonsmokers (for smokers even more) (Peeters *et al*., 2003)[3,4].

[3] Although more than 30 percent of our sample smokes, we use the years of life lost due to overweight for nonsmokers, in order to measure the effect of overweight (not a combination of the effect of overweight and smoking on health). The life expectancy we use is including people having overweight. When also correcting life expectancy with years of life lost due to overweight, we may have a life expectancy that is too low. However, this may be corrected by the fact that we use the correction for years of life lost due to overweight by using the figure of nonsmokers.

[4] The mean age in our sample is 39.4, we can therefore use the figures of Peeters *et al*. (2003) that give measurements of years of life lost for 40-year-old people.

The reduction of the QoLW due to overweight is 0.100 per point increase on the self-reported health scale for the native Dutch and 0.147 per point increase on the self-reported health scale for the Surinamese/Antilleans. These QALY losses figures are comparable to QALY losses because of diabetes and having heart and/or blood problems (Ferrer-i-Carbonell and Van Praag, 2002).

The implicit costs of overweight can be calculated using the life expectancy, the years of life lost due to overweight and QALY weights, and the value of a life year[5]. The undiscounted values over the lifecycle then become the following. For the native Dutch, the QALY loss due to overweight is $1.1 - $2.4 million per person. For the Surinamese/Antilleans the QALY loss due to overweight is a little lower: $1.4 - $3.2 million. These $1.1 - $3.2 million are the welfare effects for which people should be compensated to maintain the same value of life[6] as when not having overweight.

4.7 Health and doing sports

In Chapter 3 (section 3.5) we have reported that current public health guidelines advise 30 minutes of moderately intensive physical activity at least five, if not all days of the week (Health Council of the Netherlands, 2003). The main reason for this guideline is that overweight is associated with both caloric intake and physical activity. As almost half of the population has overweight due to unhealthy diets and lack of exercise.

Gerdtham *et al*. (1999) included doing sports as a determinant of health status and found a positive association between doing sports and health, mainly for individuals who do sports regularly. Obviously, lack of exercise is associated with poor health, mainly via obesity (Philipson and Posner, 1999, Philipson, 2001, Health Council of the Netherlands, 2003). It would therefore be interesting to investigate the relationship between doing sports and health over the four groups in our data. In the preceding sections we did not include doing sports in all analyses, since it is endogenously related to health (people with a poor health condition will not be able to exercise). Nevertheless, as discussed in Chapter 3 and above, doing sports is related to overweight and health. Because of the public health guideline and the findings from Gerdtham *et al*. (1999), we expect doing sports to affect health positively.

Our data in Chapter 3 (see Table 3.9) showed that about 50 percent of the four different groups exercise somewhat regularly, with the Dutch exercising the most frequently (57 percent), the Turks doing sports the least frequently (45 percent), and the Surinamese/Antilleans (55 percent) and Moroccans (52 percent) having an intermediate position. If Moroccans do sports, they do it quite frequently.

[5] The loss in health utility due to overweight is multiplied with the life expectancy (minus years of life lost due to overweight) and compared with the normal life expectancy for persons without loss in health utility (who have a QoLW of 1). The difference between these values of life in good health is multiplied with the value of one life year in perfect health.

[6] Which is the willingness-to-accept. The willingness-to-pay may be much lower (Kahneman, *et al*., 1990).

To investigate the effect of doing sports on health and to examine differences between Dutch natives and immigrants, we have included doing sports in our estimations (section 4.2). We have included three different dummies for sports that indicate the frequency of exercising per week (the same categories as used in Table 3.9) in the analysis to investigate whether a high frequency of exercising has a larger effect on health. The results of this ordered probit analysis are shown in Table 4.8.

Table 4.8 Ordered probit of self-reported health per ethnic group with sports included (standard errors in parentheses)

Variable	Estimation with sports included	
Female	-0.302	*(0.047)***
Native Dutch	*reference*	*group*
Surinamese/Antilleans	-0.091	*(0.063)*
Moroccans	-0.217	*(0.075)***
Turks	-0.354	*(0.068)***
Low educated	*reference*	*group*
Mediate educated	0.178	*(0.054)***
High educated	0.375	*(0.066)***
Age1 (18-34)	*reference*	*group*
Age2 (35-44)	-0.159	*(0.058)***
Age3 (45-64)	-0.342	*(0.064)***
Age4 ($\geq$65)	-0.392	*(0.097)***
Smoking	-0.203	*(0.048)***
BMI $\geq$ 25	-0.172	*(0.045)***
Married/living together	0.122	*(0.055)***
Children at home	-0.031	*(0.056)*
Outsourcing meal preparation seldom	*reference*	*group*
Outsourcing meal preparation 1-5 p/m	-0.027	*(0.052)*
Outsourcing meal preparation > 5 p/m	-0.173	*(0.103)**
Convenience food seldom	*reference*	*group*
Convenience food 1-2 p/w	0.036	*(0.051)*
Convenience food 2-4 p/w	-0.111	*(0.074)*
Convenience food > 4 p/w	-0.006	*(0.116)*
Eat out seldom	*reference*	*group*
Eat out 1-4 p/m	0.118	*(0.049)***
Eat out 5-10 p/m	0.041	*(0.123)*
Eat out > 10 p/m	0.335	*(0.194)**
Fresh vegetables seldom	*reference*	*group*
Fresh vegetables 1-2 p/w	-0.013	*(0.193)*
Fresh vegetables 2-4 p/w	0.046	*(0.185)*
Fresh vegetables > 4 p/w	0.245	*(0.181)*
Urban area	-0.060	*(0.049)*
Unemployed	-0.382	*(0.128)***
Intake vitamins/minerals	0.231	*(0.049)***
Doing sports never	*reference*	*group*
Doing sports $\leq$1 p/w	0.103	*(0.059)**
Doing sports 2-3 p/w	0.229	*(0.059)***
Doing sports > 3 p/w	0.266	*(0.071)***
μ_0	-1.606	*(0.228)***
μ_1	-0.947	*(0.225)***
μ_2	-0.153	*(0.225)*
μ_3	1.292	*(0.226)***
N	2542	
Log-L	6374.064	
Pseudo R^2	0.138	

** p<0 .10 ** p< 0.05 *** p<0.01*

With respect to the results from Table 4.8 we can remark that for the whole sample that doing sports affects health significantly positive (as expected), and that the effect of doing sports on health does not influence the other variables in their effect on health very much. We have also performed these estimations with doing sports included for men and women. The results of the four groups are

shown in Appendix VI. Dutch women show a positively significant effect for doing sports on health for a frequency of 2 - 3 times per week. Surinamese/Antillean women show a small positive significant effect for the first two sports categories. Moroccan and Turkish women do not show significant effects of doing sports on health, which can be attributed to a lower frequency of doing sports. The Dutch, Surinamese/Antillean, and Moroccan males show a significantly positive effect of doing sports on health, mainly for the highest frequency category (> 3 times per week). This difference in results for males and females is caused by the fact that in general, males spend more time on doing sports than females (SCP, 2001).

Doing sports has a positive effect on health. In particular a relatively high frequency (more than twice per week) affects self-reported health in a positive way in all groups, especially for males.

4.8 Conclusions and discussion

In this chapter we have investigated whether and how differences in socio-economic status, lifestyle (mainly food habits), and overweight affect health of the native Dutch, the Surinamese/Antilleans, Moroccans, and the Turks. We were also interested in the differences between the four groups in socio-economic status, lifestyle, and overweight, and their effect on health.

The data show that the Turks have the poorest health, the Surinamese/Antilleans and the Moroccans have about the same health, which is intermediate. The native Dutch are the most positive about their health. Scheme 4.2 provides an overview of the determinants of health per group estimated in the ordered probit analyses.

Scheme 4.2 Expected effects of variables on self-reported health and confirmed (significant) results from the research

	Expected effects	**native Dutch**	**Surinamese/ Antilleans**	**Moroccans**	**Turks**
Female	–	No	Yes	Yes	Yes
Age > 35	–	No	No	Yes	Yes
Age > 45	–	Yes	Yes	Yes	Yes
BMI ≥ 25	–	Yes	Yes	No	No
Smoking	–	Yes	Yes	Yes	Yes
Outsourcing meal preparation	–	Yes	Yes (women)	No	No
Convenience food	–	Yes (men)	Yes	No	Yes
Eating out	+/–	Yes (– men)	Yes (+ men)	No	No
Fresh vegetables	+	No	No	No	No
Intake vitamins	+	No	No	Yes	No
Level of education	+	No	Yes	Yes	Yes
Unemployment	–	No	No	Yes (women)	Yes (women)
Married/ cohabiting	+	Yes	No	No	No

+ positive effect, – negative effect, +/– either positive or negative effect expected.

We have found a decrease in the demand for health for higher age, overweight, and smoking, and an increase in the demand for health for level of education and not living alone. These findings correspond with the findings of Gerdtham *et al*. (1999) and other literature (Philipson, 2001; CBS, 2000c; McGrinnis and Foege, 1993; Maddox *et al*., 1987). The analyses show a strong effect of gender: being female in all groups is negatively related to health utility in all groups, only not significant for the Dutch. The Turkish and Moroccan ethnicity is negatively related to health as hypothesized based on literature (CBS, 2001b; Brussaard *et al*., 2001; Uniken Venema *et al*., 1995). We found no effect for the Surinamese/Antillean ethnicity. This might be explained by the fact that the Surinamese/Antilleans are better educated than the other immigrant groups, and therefore have a higher socio-economic status. Remarkable is the fact that level of education does not affect the self-reported health of the native Dutch.

Moroccan and Turkish females report a poorer health when being unemployed. The results for native Dutch females however, show that unemployed females report a slightly better health than employed women. This implicates that unemployed native Dutch women have fewer health problems than employed native Dutch women.

The main contribution of this research may not be the confirmed results from the 'classic' determinants of health (like socio-economic status and smoking), but are the results from the investigated food habits and the comparison between the native Dutch and non-western immigrants in the Netherlands. The results of food habits reveal some cultural differences between the four groups. Native Dutch and Surinamese/Antillean respondents who eat takeaway food, ready-to-eat meals, or delivery food have a poorer health. This applies mainly for Dutch males and Surinamese/Antillean females.

Apparently, Dutch males and Surinamese/Antillean females outsource more of their meal preparation than their opposite sexes and therefore a greater (negative) effect on self-reported health is found. On the other hand, the self-reported health is better for Surinamese/Antillean males who go eating out, which may be caused by healthier menus for these respondents when eating out. Only for the Turkish respondents significant effects are found for convenience food. While a negative effect of convenience food on health was hypothesized, for Turks the effect of a frequent use of convenience food on self-reported health is positive. Perhaps mainly Turkish respondents in higher socio-economic positions (who have a better health) use convenience food and choose the 'healthy' convenience products (like pre-cut vegetables).

In contrast to Gerdtham *et al*. (1999), who included doing sports in all estimations, we only have included doing sports in some of our analyses. This is done because doing sports can be endogenously related to health (people with a poor health will not do sports). Still, we were interested in the effect of doing sports on health, and differences between the ethnic groups. In our analysis, doing sports affects health positively. This result was also found by Gerdtham *et al*. (1999).

The effect of doing sports on health increases with the frequency of doing sports. Doing sports more than two times per week has a stronger significant effect on health than doing sports less frequently. This result is not surprising, since regularly doing sports is associated with a good health and a lower BMI (Health Council of the Netherlands, 2003). However, doing sports is not a complete measure of time spent on exercising. For example, also domestic tasks can be moderately intensive exercise.

Native Dutch and Surinamese/Antillean respondents with overweight have a poorer health. Overweight has no significant effect on the health status of Turkish respondents, which is somewhat conflicting with their high prevalence of overweight. The last mentioned is probably caused by cultural differences in the way overweight is perceived. Turkish respondents may associate overweight with a life in welfare, happiness, and peace, and therefore experience less negative effects of overweight on their health status. Our findings suggest that overweight females report more health problems than males and non-overweight females.

The Quality of Life Weights give insight in the effect of overweight on health. The results show a reduction in QoLW due to overweight of 10 percent for the native Dutch and 14.7 percent for Surinamese/Antillean respondents (results of Moroccans and Turks are not significant). The findings of the implicit costs of overweight calculation can be used to determine the welfare effects of expenditures on care for overweight people and can be useful in discussions on the allocation of expenditures on public health care. The findings can also be of interest for health insurance companies, in determining the costs of overweight.

Our research shows that health decreases with age, smoking, overweight, and being female, whereas health increases with level of education. To improve the health of the multicultural population of the Netherlands, nutrition and overweight problems for the immigrant groups need more attention in public health policies. Especially the Turks and Surinamese/Antillean groups should be induced to lose weight and to prevent overweight.

Appendix I Definition of the variables used

Dependent variable:

Categorical/ self-reported health (4 = excellent, 3 = very good, 2 = good, 1 = fair, 0 = poor)

Independent variables:

Female	1 if female
Low educated	1 if low educated
Mediate educated	1 if mediate educated
High educated	1 if high educated
Age1	1 if age 18-34
Age2	1 if age 35-44
Age3	1 if age 45-64
Age4	1 if age >64
Smoking	1 if smoking
BMI ≥ 25	1 if BMI ≥ 25
Marital status	1 if married/living together
Children at home	1 if children living at home
Outsourcing food prep. seldom	1 if seldom or never outsourcing meal preparation
Outsourcing food prep. 1-5 p/m	1 if 1-5 times a month outsourcing meal preparation
Outsourcing food prep. >5 p/m	1 if >5 times a month outsourcing meal preparation
Convenience food seldom	1 if seldom or never making use of convenience food
Convenience food 1-2 p/w	1 if 1-2 times a week making use of convenience food
Convenience food 2-4 p/w	1 if 2-4 times a week making use of convenience food
Convenience food >4 p/w	1 if >4 times a week making use of convenience food
Eat out seldom	1 if seldom or never going to eat out
Eat out 1-4 p/m	1 if 1-4 times a month going to eat out
Eat out 5-10 p/m	1 if 5-10 times a month going to eat out
Eat out >10 p/m	1 if more than 10 times a month going to eat out
Fresh vegetables seldom	1 if seldom or never eating fresh vegetables
Fresh vegetables 1-2 p/w	1 if 1-2 times a week eating fresh vegetables
Fresh vegetables 2-4 p/w	1 if 2-4 times a week eating fresh vegetables
Fresh vegetables >4 p/w	1 if > 4 times a week eating fresh vegetables
Intake extra vitamins	1 if taking extra vitamins and/or minerals
Urban area	1 if living in one of the four big cities
Unemployed	1 if unemployed

Appendix II Distribution of variables over de sample (in percentages)

Variable	Total (N=2551)	native Dutch (N=701)	Sur./Antill. (N=701)	Moroccans (N=449)	Turks (N=700)
Female	56.7	63.3	57.6	47.4	55.0
native Dutch	27.5				
Surinamese/Antilleans	27.5				
Moroccans	17.6				
Turks	27.4				
Low educated	29.8	27.2	20.5	17.4	49.6
Mediate educated	42.9	44.8	45.8	44.5	37.1
High educated	21.9	27.1	30.5	19.6	9.6
Age 18-34	43.4	27.4	32.4	60.4	59.4
Age 35-44	25.8	23.5	29.1	21.2	27.7
Age 45-64	22.8	31.1	32.1	13.8	11.0
Age > 64	8.0	18.0	6.4	4.7	1.9
Smoking	32.4	34.0	27.4	18.7	44.5
BMI $\geq$25.0	43.9	41.4	43.9	38.8	49.6
Married/living together	67.3	67.9	52.4	71.9	78.7
Children at home	56.3	41.8	49.2	62.6	74.0
Outsourcing meal preparation seldom	31.1	28.4	29.7	41.0	29.0
Outsourcing meal preparation 1-5 p/month	62.9	66.5	65.3	50.6	64.9
Outsourcing meal preparation 5-10 p/month	5.8	5.0	4.9	8.2	5.9
Outsourcing meal preparation > 10 p/month	0.2	0.1	0.1	0.2	0.3
Convenience food seldom	55.7	41.8	60.9	65.3	58.1
Convenience food 1-2 p/w	29.4	38.5	25.4	23.8	28.0
Convenience food 2-4 p/w	11.1	13.7	11.0	8.5	10.3
Convenience food > 4 p/w	3.8	6.0	2.7	2.4	3.6
Eat out seldom	55.7	45.4	54.9	63.5	61.9
Eat out 1-4 p/month	39.6	48.8	40.7	32.7	33.6
Eat out 5-10 p/month	3.4	4.7	3.3	3.1	2.4
Eat out > 10 p/month	1.3	1.1	1.1	0.7	2.1
Fresh vegetables seldom	1.4	1.1	1.6	0.9	1.9
Fresh vegetables 1-2 p/w	8.8	8.6	7.1	6.5	12.1
Fresh vegetables 2-4 p/w	22.7	26.5	18.5	20.5	24.3
Fresh vegetables > 4 p/w	67.2	63.8	72.8	72.2	61.7
Taking extra vitamins	30.7	36.9	42.4	23.9	17.1
Urban area	30.8	10.3	43.4	39.9	32.9
Unemployed	2.9	1.1	2.6	2.2	5.4

Appendix III Self-reported health among the native Dutch and immigrants (in percentages)

		Poor	Fair	Good	Very good	Excellent	TOTAL
Native Dutch	Female	3.2	4.3	22.3	54.9	15.3	100
	Male	3.1	5.1	15.2	60.7	16.0	100
Surinamese/Antilleans	Female	3.5	12.7	21.9	45.6	16.2	100
	Male	2.7	4.0	24.9	44.4	23.9	100
Moroccans	Female	2.8	12.3	23.1	50.5	11.3	100
	Male	3.8	7.7	13.6	50.6	24.3	100
Turks	Female	9.4	16.1	25.0	40.4	9.1	100
	Male	5.1	9.3	22.7	40.6	22.4	100
Native Dutch	18 - 34	1.6	3.6	14.1	64.6	16.1	100
	35 - 44	4.2	3.6	15.2	62.4	14.5	100
	45 - 64	3.2	5.1	22.1	55.8	13.8	100
	≥ 65	4.0	6.3	30.2	40.5	19.0	100
Surinamese/Antilleans	18 - 34	1.3	4.4	18.1	57.5	18.6	100
	35 - 44	2.5	7.4	22.5	44.1	23.5	100
	45 - 64	4.9	12.5	25.9	38.4	18.3	100
	≥ 65	6.8	22.7	38.6	20.5	11.4	100
Moroccans	18 - 34	1.1	10.7	14.0	51.7	22.5	100
	35 - 44	4.2	8.4	21.1	55.8	10.5	100
	45 - 64	9.7	8.1	24.2	43.5	14.5	100
	≥ 65	10.5	10.5	42.1	31.6	5.3	100
Turks	18 - 34	3.9	10.2	25.9	5.3	14.8	100
	35 - 44	9.3	16.0	21.1	36.6	17.0	100
	45 - 64	12.1	18.2	23.4	23.4	13.0	100
	≥ 65	7.7	30.8	7.7	46.2	7.7	100
Native Dutch	BMI ≥ 25	3.4	5.9	24.8	54.5	11.4	100
	BMI < 25	3.1	3.8	15.1	59.1	18.9	100
Surinamese/Antilleans	BMI ≥ 25	4.9	14.3	27.3	41.6	12.0	100
	BMI < 25	1.9	4.6	19.1	48.6	25.1	100
Moroccans	BMI ≥ 25	4.7	8.1	20.3	46.5	20.3	100
	BMI < 25	2.4	10.5	16.6	53.0	17.4	100
Turks	BMI ≥ 25	8.7	16.5	21.7	38.2	15.0	100
	BMI < 25	6.6	9.6	26.6	41.8	15.5	100
Native Dutch	Rural area	3.2	4.3	20.0	56.4	16.1	100
	Urban area	2.8	6.9	18.1	61.1	11.1	100
Surinamese/Antilleans	Rural area	4.5	8.3	20.9	48.1	18.1	100
	Urban area	1.4	9.9	26.3	41.4	21.1	100
Moroccans	Rural area	3.0	9.6	13.3	54.4	19.6	100
	Urban area	4.5	10.1	25.1	44.7	15.6	100
Turks	Rural area	6.2	13.9	23.0	41.2	15.8	100
	Urban area	10.0	11.3	25.7	39.1	13.9	100
Native Dutch	Employed	1.2	3.2	14.0	65.8	15.8	100
	Unemployed	.	.	25.0	37.5	37.5	100
Surinamese/Antilleans	Employed	1.4	4.5	21.1	50.4	22.6	100
	Unemployed	11.1	11.1	50.0	11.1	16.7	100
Moroccans	Employed	0.7	8.1	13.7	53.7	23.7	100
	Unemployed	10.0	30.0	30.0	30.0	.	100
Turks	Employed	3.4	8.5	25.1	42.2	20.7	100
	Unemployed	10.5	26.3	26.3	26.3	10.5	100

.: no observations

Appendix IV Self-reported health analysis for all groups without BMI ≥ 25
(standard errors in parentheses)

Variable	native Dutch		Surin./Antilleans		Moroccans		Turks	
Female	-0.145	*(0.094)*	-0.294	*(0.090)***	-0.423	*(0.120)***	-0.468	*(0.089)***
Low educated	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Mediate educated	0.010	*(0.110)*	0.240	*(0.112)***	0.317	*(0.130)***	0.183	*(0.096)**
High educated	0.176	*(0.126)*	0.502	*(0.121)***	0.691	*(0.166)***	0.378	*(0.150)***
Age1 (18-34)	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Age2 (35-44)	-0.236	*(0.124)**	0.047	*(0.113)*	-0.333	*(0.146)***	-0.233	*(0.100)***
Age3 (45-64)	-0.377	*(0.119)****	-0.298	*(0.116)***	-0.361	*(0.174)***	-0.584	*(0.144)****
Age4 (≥ 65)	-0.442	*(0.151)****	-0.708	*(0.198)****	-0.804	*(0.283)****	-0.501	*(0.311)*
Smoking	-0.310	*(0.091)****	-0.181	*(0.096)**	-0.300	*(0.145)***	-0.195	*(0.084)***
Married/living together	0.377	*(0.100)****	0.037	*(0.094)*	0.184	*(0.168)*	-0.051	*(0.137)*
Children at home	-0.057	*(0.109)*	0.078	*(0.097)*	-0.110	*(0.159)*	0.065	*(0.129)*
Outsourcing meal prep. seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Outsourcing meal prep. 1-5 p/m	-0.082	*(0.106)*	-0.159	*(0.104)*	0.102	*(0.126)*	0.044	*(0.098)*
Outsourcing meal preparation >5 p/m	-0.417	*(0.211)***	0.021	*(0.217)*	0.020	*(0.217)*	-0.131	*(0.196)*
Convenience food seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Convenience food 1-2 p/w	-0.018	*(0.100)*	-0.155	*(0.102)**	0.066	*(0.130)*	0.130	*(0.095)*
Convenience food 2-4 p/w	-0.136	*(0.147)*	-0.180	*(0.140)*	-0.140	*(0.204)*	0.021	*(0.139)*
Convenience food > 4 p/w	0.024	*(0.197)*	-0.292	*(0.259)*	-0.391	*(0.343)*	0.479	*(0.225)***
Eat out seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Eat out 1-4 p/m	0.047	*(0.095)*	0.320	*(0.096)****	0.069	*(0.124)*	0.133	*(0.094)*
Eat out 5-10 p/m	0.228	*(0.214)*	0.180	*(0.239)*	0.120	*(0.316)*	-0.239	*(0.270)*
Eat out > 10 p/m	-0.052	*(0.404)*	0.698	*(0.412)*	0.223	*(0.657)*	0.298	*(0.297)*
Fresh vegetables seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	-0.077	*(0.415)*	-0.276	*(0.369)*	-0.723	*(0.613)*	0.418	*(0.318)*
Fresh vegetables 2-4 p/w	-0.076	*(0.400)*	-0.331	*(0.347)*	-0.267	*(0.589)*	0.441	*(0.307)*
Fresh vegetables > 4 p/w	0.221	*(0.399)*	-0.250	*(0.337)*	-0.208	*(0.579)*	0.661	*(0.299)***
Intake vitamins	0.122	*(0.089)*	0.084	*(0.084)*	0.447	*(0.127)****	0.433	*(0.112)****
Urban area	-0.139	*(0.139)*	0.073	*(0.084)*	-0.170	*(0.109)*	-0.109	*(0.087)*
Unemployed	0.603	*(0.407)*	-0.489	*(0.261)**	-0.952	*(0.360)****	-0.376	*(0.186)***
μ_0	-1.923	*(0.458)****	-2.215	*(0.413)****	-1.632	*(0.642)***	-0.534	*(0.401)*
μ_1	-1.455	*(0.453)****	-1.447	*(0.405)****	-0.837	*(0.636)*	0.154	*(0.400)*

Appendix IV (continued)

μ_2	-0.563	*(0.450)*	-0.570	*(0.402)*	-0.113	*(0.634)*	0.907	*(0.401)***
μ_3	1.147	*(0.451)***	0.753	*(0.403)**	1.489	*(0.637)***	2.181	*(0.405)****
N	700		698		447		697	
Log-L	1502.033		1719.188		1006.786		1779.482	
Pseudo R^2	0.109		0.139		0.217		0.158	

* *p<0.10* ** *p<0.05* *** *p<0.01*

Appendix V Correlation between overweight and health

Correlation between overweight and health for all groups

	Whole sample	native Dutch	Surinamese/ Antilleans	Moroccans	Turks
Correlation	-0.129**	-0.122**	-0.244**	-0.011	-0.074

*** correlation is significant at 1% level (2-tailed)*

Correlation between overweight and health for females

	native Dutch	Surinamese/ Antilleans	Moroccans	Turks
Correlation	-0.148**	-0.305**	-0.009	-0.161**

*** correlation is significant at 1% level (2-tailed)*

Correlation between overweight and health for males

	native Dutch	Surinamese/ Antilleans	Moroccans	Turks
Correlation	-0.090	-0.158**	-0.019	0.003

*** correlation is significant at 1% level (2-tailed)*

Appendix VI Self-reported health analysis including doing sports
(standard errors in parentheses)

Variable	native Dutch women		Surinam./ Antillean women		Moroccan women		Turkish women	
Low educated	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Mediate educated	-0.183	*(0.147)*	0.195	*(0.152)*	0.125	*(0.189)*	0.227	*(0.136)**
High educated	-0.064	*(0.178)*	-0477	*(0.170)****	0.583	*(0.261)***	0.341	*(0.214)*
Age1 (18-34)	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Age2 (35-44)	-0.249	*(0.162)*	-0.072	*(0.144)*	-0.341	*(0.225)*	-0.370	*(0.141)****
Age3 (45-64)	-0.202	*(0.155)*	-0.181	*(0.161)*	-0.310	*(0.291)*	-0.599	*(0.220)****
Age4 (≥65)	-0.076	*(0.211)*	-0.503	*(0.265)***	-1.377	*(0.476)****	0.408	*(1.113)*
Smoking	-0.138	*(0.120)*	-0.234	*(0.140)*	-0.495	*(0.352)*	-0.245	*(0.118)***
BMI ≥ 25	-0.420	*(0.117)****	-0.605	*(0.120)****	0.168	*(0.175)*	-0.098	*(0.127)*
Married/living together	0.416	*(0.129)****	0.004	*(0.121)*	0.093	*(0.241)*	0.136	*(0.186)*
Children at home	-0.045	*(0.143)*	0.208	*(0.126)**	0.057	*(0.233)*	-0.029	*(0.182)*
Outsourcing meal preparation seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Outsourcing meal preparation 1-5 p/m	0.046	*(0.131)*	-0.256	*(0.140)**	-0.050	*(0.178)*	0.110	*(0.133)*
Outsourcing meal preparation >5 p/m	-0.092	*(0.311)*	0.519	*(0.358)*	-0.146	*(0.361)*	0.208	*(0.313)*
Convenience food seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Convenience food 1-2 p/w	0.187	*(0.126)*	-0.381	*(0.135)****	0.123	*(0.190)*	0.211	*(0.128)**
Convenience food 2-4 p/w	0.002	*(0.186)*	-0.359	*(0.189)**	-0.015	*(0.288)*	0.014	*(0.196)*
Convenience food > 4 p/w	0.428	*(0.297)*	-0.433	*(0.332)*	-0.724	*(0.433)**	0.047	*(0.309)*
Eat out seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Eat out 1-4 p/m	0.141	*(0.124)*	0.197	*(0.129)*	0.229	*(0.190)*	0.112	*(0.132)*
Eat out 5-10 p/m	0.243	*(0.291)*	-0.084	*(0.292)*	0.178	*(0.391)*	0.207	*(0.408)*
Eat out > 10 p/m	6.525	*(0.000)*	0.299	*(0.830)*	-0.056	*(0.795)*	0.250	*(0.800)*
Fresh vegetables seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	0.588	*(0.679)*	-0.310	*(0.446)*	-0.731	*(1.167)*	0.829	*(0.524)*
Fresh vegetables2-4 p/w	0.808	*(0.658)*	-0.190	*(0.404)*	-0.364	*(1.146)*	0.995	*(0.505)***
Fresh vegetables> 4 p/w	1.153	*(0.655)**	-0.361	*(0.386)*	-0.209	*(1.128)*	1.181	*(0.500)***
Urban area	-0.215	*(0.176)*	0.069	*(0.112)*	-0.171	*(0.160)*	-0.008	*(0.119)*
Unemployed	0.858	*(0.478)**	-0.388	*(0.555)*	-1.816	*(0.853)***	-0.590	*(0.280)***
Intake vitamins	0.138	*(0.110)*	0.100	*(0.114)*	0.400	*(0.172)***	0.400	*(0.134)****
Doing sports never	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Doing sports ≤1 p/w	0.165	*(0.141)*	0.302	*(0.160)**	0.068	*(0.206)*	-0.041	*(0.152)*
Doing sports 2-3 p/w	0.461	*(0.142)****	0.248	*(0.148)**	0.126	*(0.239)*	-0.001	*(0.169)*
Doing sports > 3 p/w	0.199	*(0.210)*	0.218	*(0.176)*	0.134	*(0.247)*	0.004	*(0.198)*

μ_0	-0.601	*(0.700)*	-2.399	*(0.494)***	-1.609	*(1.197)*	0.391	*(0.617)*
μ_1	-0.146	*(0.697)*	-1.467	*(0.482)***	-0.603	*(1.187)*	1.132	*(0.618)**
μ_2	0.872	*(0.697)*	-0.672	*(0.479)*	0.244	*(1.186)*	1.879	*(0.621)****
μ_3	2.586	*(0.703)****	0.786	*(0.479)*	1.907	*(1.191)*	3.286	*(0.630)****
N	443		401		212		384	
Log-L	967.535		998.089		492.761		1029.369	
Pseudo R^2	0.173		0.212		0.199		0.152	

** p< 0.10 ** p< 0.05 *** p<0.01*

Variable	**native Dutch men**		**Surinam./ Antillean men**		**Moroccan men**		**Turkish men**	
Low educated	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Mediate educated	0.068	*(0.186)*	0.043	*(0.179)*	0.723	*(0.205)****	0.106	*(0.145)*
High educated	0.300	*(0.208)*	0.309	*(0.184)**	1.066	*(0.261)****	0.442	*(0.233)**
Age1 (18-34)	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Age2 (35-44)	-0.208	*(0.218)*	0.246	*(0.199)*	-0.367	*(0.218)**	-0.014	*(0.166)*
Age3 (45-64)	-0.641	*(0.212)****	-0.197	*(0.188)*	-0.306	*(0.251)*	-0.524	*(0.211)***
Age4 ($\geq$65)	-0.758	*(0.251)****	-0.585	*(0.324)**	-0.329	*(0.391)*	-0.413	*(0.359)*
Smoking	-0.496	*(0.159)****	-0.118	*(0.143)*	-0.195	*(0.167)*	-0.019	*(0.132)*
BMI $\geq$ 25	-0.157	*(0.154)*	-0.270	*(0.135)***	0.235	*(0.164)*	0.056	*(0.130)*
Married/living together	0.387	*(0.192)***	-0.048	*(0.167)*	0.262	*(0.253)*	-0.375	*(0.224)**
Children at home	0.049	*(0.204)*	0.030	*(0.164)*	-0.262	*(0.234)*	0.306	*(0.199)*
Outsourcing meal preparation seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Outsourcing meal preparation 1-5 p/m	-0.337	*(0.197)*	0.057	*(0.167)*	0.238	*(0.189)*	0.037	*(0.155)*
Outsourcing meal preparation >5 p/m	-0.871	*(0.330)***	-0.302	*(0.298)*	0.231	*(0.305)*	-0.460	*(0.264)**
Convenience food seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Convenience food 1-2 p/w	-0.450	*(0.180)***	0.045	*(0.169)*	-0.109	*(0.199)*	0.008	*(0.152)*
Convenience food 2-4 p/w	-0.556	*(0.271)***	-0.063	*(0.219)*	-0.325	*(0.324)*	0.099	*(0.210)*
Convenience food > 4 p/w	-0.697	*(0.296)***	-0.266	*(0.436)*	0.151	*(0.643)*	1.129	*(0.363)****
Eat out seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Eat out 1-4 p/m	-0.288	*(0.165)**	0.288	*(0.155)**	-0.005	*(0.173)*	0.146	*(0.143)*
Eat out 5-10 p/m	-0.337	*(0.348)*	0.196	*(0.474)*	0.204	*(0.634)*	-0.589	*(0.377)*
Eat out > 10 p/m	-1.086	*(0.503)***	0.628	*(0.508)*	5.145	*(0.000)*	0.285	*(0.327)*

Appendix VI (continued)

Fresh vegetables seldom	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Fresh vegetables 1-2 p/w	-0.463	*(0.576)*	-0.602	*(0.885)*	-0.348	*(0.802)*	0.110	*(0.422)*
Fresh vegetables 2-4 p/w	-0.752	*(0.546)*	-0.903	*(0.860)*	0.041	*(0.727)*	-0.062	*(0.418)*
Fresh vegetables > 4 p/w	-0.555	*(0.545)*	-0.626	*(0.853)*	0.025	*(0.721)*	0.304	*(0.395)*
Urban area	-0.142	*(0.253)*	0.142	*(0.139)*	-0.089	*(0.160)*	-0.193	*(0.137)*
Unemployed	-0.224	*(0.848)*	-0.411	*(0.312)*	-0.542	*(0.421)*	-0.216	*(0.270)*
Intake vitamins	0.114	*(0.169)*	0.034	*(0.140)*	0.569	*(0.205)****	0.646	*(0.228)****
Doing sports never	*reference*	*group*	*reference*	*group*	*reference*	*group*	*reference*	*group*
Doing sports $\leq$ 1 p/w	0.455	*(0.221)***	0.402	*(0.183)***	-0.196	*(0.232)*	-0.060	*(0.177)*
Doing sports 2-3 p/w	0.596	*(0.210)***	0.435	*(0.181)***	0.029	*(0.220)*	0.091	*(0.180)*
Doing sports > 3 p/w	0.612	*(0.247)***	0.867	*(0.219)****	0.322	*(0.262)*	0.308	*(0.214)*
μ_0	-3.377	*(0.706)****	-2.449	*(0.926)****	-0.488	*(0.829)*	-0.394	*(0.625)*
μ_1	-2.797	*(0.692)*	-1.929	*(0.919)***	0.179	*(0.823)*	0.251	*(0.621)*
μ_2	-1.979	*(0.682)****	-0.758	*(0.914)*	0.814	*(0.824)*	1.067	*(0.622)**
μ_3	0.048	*(0.673)*	0.606	*(0.914)*	2.463	*(0.834)****	2.275	*(0.629)****
N	257		297		235		313	
Log-L	513.545		679.158		518.810		816.465	
Pseudo R^2	0.261		0.237		0.278		0.179	

** p< 0.10 ** p< 0.05 *** p<0.01*

5

Outsourcing of household and care activities

5.1 Introduction

Due to the increased female labour participation of the past decades, households have lack of time to perform all household and care activities. There are three strategies to solve this problem: 1) outsourcing household and care activities; 2) substitution of household and care tasks by domestic appliances; and 3) time arrangement (adjusting working hours or shop opening hours) (SCP, 2000a; Van Ophem and De Hoog, 1995; and Van Dam *et al*., 1994). In this chapter, we will focus on the outsourcing of household and care activities and its determinants.

Outsourcing is defined as an arrangement for a particular service outside the household (either private or subsidised) to take care of household activities. Since the end of the 1990s, household and care activities have been outsourced more frequently (RIVM, 2004; SCP, 2000a; and Tijdens *et al*., 2000). Households can decide to outsource household and care activities more and more because they have more financial budget, and because of the increasing female labour participation (implying that more women combine labour and care). Over the years, the number of outsourcing possibilities has grown, which gives households more options to outsource their household and care tasks. Still, until now, not much research has been performed on the determinants of outsourcing and the relation between the determinants of household and care time. One could assume that the time-saving aspect is an important reason for outsourcing household and care activities.

At present in the Netherlands, households can outsource home cleaning to a cleaning lady/man, cooking to restaurants (or people can eat ready-to-eat-meals, takeaway food or delivery food), and childcare to day-care centres. The increased household income, attributed to higher female labour participation, gives more possibilities to outsource domestic work to others. 82 percent of the Dutch double-income households eat takeaway food more than once per month, against 62 percent of the single-income households. About half of the Dutch households with children living at home make use of childcare. Between 1995 and 2000, the expenses on childcare have more than doubled (SCP, 2000a). Parents that make use of outsourcing, could have more time left to spend quality-time with their children (like reading and playing games), which is seen as an investment in their children's human capital.

Until now, not much is known about the outsourcing behaviour of immigrants in the Netherlands and the same holds for the differences in outsourcing between immigrants and the native

Dutch. Outsourcing behaviour could not only be determined by socio-economic and demographic variables, culture (or ethnicity) can also be of importance in explaining outsourcing within households. They could choose different (cheaper) outsourcing possibilities than the native Dutch. Earlier research shows that immigrants in the Netherlands make less use of formal childcare than the native Dutch (NIBUD, 2004). In Chapter 3, we learned that immigrants do not outsource meal preparation less often than the native Dutch. Turks even eat takeaway food and delivery food more frequently than the native Dutch.

This chapter aims: 1) to study the determinants of the demand for household and care time and the demand for outsourcing household and care activities; 2) to investigate whether non-western immigrants differ from the native Dutch in their time allocation and outsourcing behaviour; and 3) to investigate whether in households with children outsourcing contributes to quality-time spent with children.

This chapter is structured as follows. Section 5.2 provides an overview of the theory and empirical results on time allocation and household production. Section 5.3 describes the data on time allocation and outsourcing behaviour among the native Dutch and the studied non-western immigrant groups. Section 5.4 gives the empirical model for the demand for household and care time and the demand for outsourcing. In section 5.5, the estimations on time allocated to household and care tasks and money spent on outsourcing household and care tasks are given. In section 5.6, we conclude and discuss some issues of this chapter.

5. 2 Time allocation, outsourcing, and household production. A review of the literature.

5.2.1 Time allocation research and time allocation in the Netherlands

Becker (1965) gives an important theoretical argument for outsourcing. Households can be considered as small production companies that try to maximise their output, restricted by their time and budget. If time spent on the labour market is more valuable than time spent on home production, it could be profitable to outsource home production (of course, this also depends on the price of outsourcing). It is therefore more likely for working wives to outsource household activities, since that will place a higher marginal value on their household production time than non-working wives (Kim, 1989).

Surveys on time allocation show that unpaid household labour is divided on the basis of gender, which was also the case at the end of the 19th century (Mokyr, 2000). Males spend the most time on market labour, while females do the most household labour. On average, women spend twice as much time on household labour than men do (Bittman *et al*., 1998). More than 80 percent of women's time is spent on non-market activities.

In general, time men spend on household activities is about the same in all countries, except Norway, Sweden, and Japan. Japanese men do not spend any time at all on childcare and household

activities, while Norwegian and Swedish men spend relatively more time on these activities within their households (Aronsson *et al*., 2001; Strober and Miling Kaneko Chan, 1998; Yamada *et al.*, 1999; Maassen van den Brink and Groot, 1997). In most developed countries, working wives perform about two-third of the total household activities. In Spain, even in households where the spouses' earnings and level of education are very similar, their time spent on household activities differ significantly (Álvarez and Miles, 2003).

During past decades, the time pattern in households is one of the 'masculanisation' of unpaid work: women's time spent on unpaid work is increasingly coming down to meet men's, rather than men's unpaid work-time rising to meet women's (Bittman *et al*., 1998). Although men's household and care time has increased over the decades, women still spend more hours on these activities than men and women still spend less hours on labour market than men (Sousa-Poza, 2001). Women's time allocated to household and care activities depends on several social, economic, and demographic factors, while men's household and care time is largely invariant to these factors (Ciscel *et al*., 2000). Other research shows that a change in mother's working hours has less influence on the parent's time with their children than a change in the father's working hours (Hersch and Stratton, 1994).

Every five years, the Social and Cultural Planning Bureau investigates time allocation of the Dutch population. Over the last decades, the time allocation of the Dutch population has changed. Table 5.1 shows some results of the Time Budget Research (TBO) from 1980 to 2000.

Table 5.1 Time allocation of women and men in The Netherlands between 1980 and 2000 (people aged ≥ 18)

Hours per week

	women			men		
	1980	1990	2000	1980	1990	2000
Labour	6.8	9.7	12.9	28.8	25.4	26.0
Education (formal and informal)	1.8	2.0	2.3	3.3	3.6	2.7
Household and care activities	35.8	30.6	28.2	10.5	12.3	13.6
Sleeping, eating, personal care	78.6	77.2	79.8	78.9	77.7	77.4
Leisure	46.0	47.5	45.0	49.8	49.0	48.3
TOTAL	168.0	168.0	168.0	168.0	168.0	168.0

Source: SCP, 2004a

For women, time spent on market labour has doubled in two decades, while for men time spent on market labour has decreased by almost 3 hours per week. Because of the increase of labour time for women, one could expect a decrease in time spent on household and care activities for women, which is indeed the case. Over the years, time spent on household and care activities by men has increased by 3 hours per week, indicating that the division of time between males and females in the households has become more balanced. Still, in 2000, women spend more than twice as much time on domestic and care activities than men do.

The total time spent on labour, household, and care activities are quite close to each other for both sexes (41.1 hours for females and 42.6 hours for males). Over the years, the total time

households spend on household and care activities has decreased with 5 hours, which could have several causes: 1) the technologies used for household and care tasks are have improved; 2) people do the household and care tasks more efficiently; 3) more tasks are left undone; or 4) more activities are being outsourced, which relieves the 'household burden'. We will come back to this issue later.

Table 5.2 gives an overview of time allocation in the last two decades, according to households with or without children.

Table 5.2 Time allocation of households with or without children living at home in the Netherlands between 1980 and 2000 (people aged ≥ 18)

Hours per week	couples *with* children			couples *without* children		
	1980	1990	2000	1980	1990	2000
Labour	13.8	17.0	19.7	14.6	14.6	16.3
Education (formal and informal)	1.6	1.3	1.4	1.9	2.3	1.4
Household and care activities	31.3	30.3	29.8	18.9	19.1	19.2
Sleeping, eating, personal care	77.7	76.8	76.9	81.2	81.0	80.5
Leisure	43.6	42.6	40.2	51.4	51.0	50.6
TOTAL	168.0	168.0	168.0	168.0	168.0	168.0

Source: SCP, 2004a

Over twenty years, for both households with and without children, the number of hours spent on market labour has increased and leisure has decreased. Households with children have more working hours than households without children, whereas households without children have more time for education (although, not in 2000). The time spent on household and care time in households with children is about a third more compared to the households without children. This increased household and care time is compensated with less time for sleeping etc. and leisure.

Although little is known about the time allocation of immigrants in the Netherlands, there are data on labour participation of immigrants in the Netherlands that give an indication of the time division in these households. Surinamese/Antillean women are more often employed than Turkish and Moroccan women. Table 5.3 gives the labour participation and working hours of the different groups in the Netherlands.

Table 5.3 Labour participation and working hours among the native Dutch and non-western immigrants in the Netherlands in 2001 of people aged between 15 - 64 (in percentages)

	native Dutch		**Surinamese**		**Antilleans**		**Moroccans**		**Turks**	
	women	men	women	men	women	men	women	men	women	men
Labour participation	55	80	59	66	48	62	26	56	33	62
Working hours										
12 – 19	19	2	10	3	16	3	12	2	18	3
20 – 34	46	10	39	12	46	20	37	14	43	10
> 34	36	88	51	85	38	77	51	83	40	87
TOTAL	100	100	100	100	100	100	100	100	100	100

Source: SCP, 2002

Table 5.3 shows that the Dutch men have the highest labour participation, whereas the Moroccans have the lowest labour participation for both males and females. This could imply that Turks and Moroccans have more time left for household and care activities than the native Dutch have. From the native Dutch women with paid work about two-third works part-time (defined as less than 34 hours per week), which is more than the women in non-western immigrant groups where 40 to 50 percent works part-time. Among women, the labour participation of the Surinamese is the highest, followed by the native Dutch and the Antilleans. The working-hours pattern of Moroccan and Turkish men and women is quite comparable.

In comparison with other EU countries, the Netherlands has a relative high prevalence of part-time workers: 70 percent for females and 19 percent for males. In other EU countries these figures are about 35 percent for females and 5 percent for males (SCP, 2002).

In the past decade in the Netherlands, female working hours have doubled and men also work more hours. The time spent on household activities has not changed much, while free time has decreased. This indicates that households are under some pressure. However, the increased household income gives opportunities to outsource household tasks.

5.2.2 Outsourcing of household tasks and care activities

As discussed in the previous section, in the Netherlands the number of households with two working partners is increasing. This increase is mainly caused by an increase in labour supply by women with young children during the past decade (Maassen van den Brink and Groot, 1997). Between 1995 and 2000, the rate of people combining labour with care increased from 38 percent to 47 percent for people between the ages of 20 and 64 (SCP, 2001). The increased female labour participation is barely accompanied by a decrease in male labour participation.

Earlier research shows that households with higher educated wives are more likely to make use of outsourcing opportunities than households with lower educated wives (Bellante and Forrester, 1984; Soberon-Ferres and Dardis, 1991). With respect to outsourcing household activities, both the household's income and the wife's income are important. Soberon-Ferrer and Dardis (1991) find that unearned income (non-labour income), wives' wages, wives' education, and being white are significant factors in outsourcing home cleaning. Spitze (1999) and Oropesa (1993) found that in the United States, higher-income households receive more paid household help than lower-income households. This is also true in Dutch households (Lambriex and Siegers, 1993). In the United States, the top-income households spend more than twelve times as much on housekeeping services and four times as much on food away from home than the lowest income group (Cohen, 1998).

In the Netherlands, mainly two-earner households (largely one-and-a-half income households) outsource the care for children to paid childcare centres (47 percent), but also one-earner households make use of this service (20 percent). Except labour participation, there are lots of other

reasons to send children to play groups. Parents could do that for pedagogical reasons, to let their children play with other children, or to have more leisure time for themselves.

In the Netherlands, outsourcing the care for children is not only positively related to income, but to level of education (SCP, 2000a). Especially two-earner households use formal childcare like childcare centres (at the parent's work), host family, or childcare outside of school. However, for all kinds of households, informal childcare (grandparents, brothers/sisters, or friends) is still the most popular way of outsourcing childcare. 54 percent of the two-earner households and 28 percent of the one-earner households use informal care.

Table 5.4 shows that immigrants make less use of formal childcare than the native Dutch do. The table shows the use of formal childcare for both one-earner and two-earner households with children living at home. The amounts are excluding subsidies.

Table 5.4 Use of formal childcare by native Dutch and immigrant households in the Netherlands

	Frequency (%)	Expenditures of users per month (€)
the native Dutch	36.2	218
Surinamese/Antilleans	29.6	151
Turks	18.1	61
Moroccans	16.2	100

Source: NIBUD, 2004

Table 5.4 shows that the Surinamese/Antilleans are comparable to the native Dutch with respect to the use of formal childcare. It seems strange that the Turks make a little more use of formal childcare than Moroccans, but pay about 40 percent less than the Moroccans do. This can be attributed to the use of subsidised pre-school education used by the Turks (SCP, 2003).

The time women spend on taking care of their children is quite stable, despite their increasing working hours. The care of children is still mainly a task for women, even when childcare services are used (Maassen van den Brink and Groot, 1997). Sousa-Poza *et al*. (2001) find that for wives, the presence of children, marital status, and hourly wage rate are important factors influencing time spent on household activities and childcare. Out-of-home childcare is not a substitute taking care of one's own children. Parents use out-of-home childcare to combine work with the time for their children and cut down on private leisure and household activities (Hallberg and Klevmarken, 2003).

Home cleaning is mainly outsourced by two-earner households, especially when they have children. Outsourcing home cleaning is also positively related to household income, and income and level of education of the female in the household (Tijdens *et al*., 2000; SCP, 2000a; Lambriex and Siegers, 1993). Between 1975 and 1995, the number of two-earner households outsourcing home cleaning more than doubled from 10 to 25 percent. The number of one-earner households outsourcing home cleaning has been quite stable in that time period (around 5 percent). Other help for domestic work (not specified) is also primarily used by two-earner households (29 percent) and is positively

related with having children living at home (Tijdens *et al*., 2000). Tijdens *et al*. (2000) show that using a household help (mainly for cleaning, doing the laundry, and ironing) is negatively correlated to the time spent on household activities. The number of children and having children aged 0 – 5 are positively correlated to time spent on household activities.

Table 5.5 shows that between 1992 and 2000, the expenditures on household services in the Netherlands have more than doubled.

Table 5.5 Mean expenditures on paid household services 1992 – 2000 for all Dutch households (in Euros per year)

	1992	**1995**	**2000**
Childcare	60	87	184
Expenditures general household help	87	102	160
Window cleaner	22	25	24
Launderette/ Dry cleaner's	11	11	17
TOTAL	180	225	380

Source: CBS Statline, 2003, the figures are not corrected for inflation

In the Netherlands, between 1995 and 2000, the expenditures on childcare have doubled. The expenditures on wage for service personnel (like household help) have also increased between 1995 and 2000, but less than the expenditure on childcare. Compared to the other categories, the expenditures on window cleaning and clothing care have been rather constant.

Data from the Social and Cultural Planning Bureau (SCP) show that, in the Netherlands, meal preparation is mainly outsourced by two-earner households: 60 percent eats out more than once per month, and 82 percent eat takeaway food more than once per month (35 percent even more than once a week). For one-earner households these figures are 26 percent for restaurant visits more than once per month and 62 percent for takeaway food more than once per month (SCP, 2000a). Visiting restaurants is highly positively correlated to income and negatively correlated to having children. Takeaway food is cheaper and less time-consuming, which explains why in particular middle-income households with children eat takeaway food (SCP, 2000a). Between 1980 and 1999, the expenditures on outsourcing meal preparation in the Netherlands increased from 3.1 to 4.2 percent of the total household budget (CBS, 2001). Time spent on cooking and dishwashing significantly decreases with takeaway food and increases with the number of children living at home, cohabiting without children, and having children aged above 15 years and older (Tijdens *et al*., 2000). Time spent on cooking also decreases with the working hours of both males and females (Labriex and Siegers, 1993).

Research in other western countries shows that outsourcing meal preparation is positively related with income, employment status, urban location, and the number of people in the household aged above 14 (Heiman *et al*., 2001; Mihalopoulos and Demoussis, 2001; and Manrique and Jensen, 1998). The expenditures on food away from home are positively associated with income and education (Mihalopoulos and Demoussis, 2001). Higher educated people are more likely to participate

in preparing meals, but the amount of time allocated on meal preparation is less than the time lower educated people allocate to meal preparation (Florkowski *et al.*, 2000).

Research on outsourcing behaviour of immigrants is scarce, some studies have been found in the United States and in Switzerland. Both US studies show that blacks (although the question arises whether these people should be considered as immigrants or not) spend less on food away from home and domestic services, but more on clothing care than whites (Soberon-Ferrer and Dardis, 1991; Bellante and Foster, 1984). In Switzerland, when corrected for wage rate, immigrants spend more time on household activities, which could imply that they outsource less (Sousa-Poza *et al.*, 2001). Also in the Netherlands, immigrants may outsource less household tasks, or other tasks than the native Dutch. Recent research shows a large unfulfilled demand for childcare amongst immigrants, the cause of which is unknown[1] (Tijdens *et al.*, 2000). A difference in culture can be an explanation: immigrant mothers might want to outsource the care for their children, but their husbands do not give their permission because of their values and beliefs or religion (cultural background).

5.2.3 Household production and time allocation models

In 1965, Becker introduced a model that would dramatically change the way households were studied in traditional microeconomic theory. Becker's idea was that households obtain utility not only indirectly from market goods and services purchased on the market, but also directly from household commodities. Household commodities are products that the members of the household produce by combining their time with market goods. Market goods and services are not the only inputs in this process; the other input is the household's time.

Becker's theory is called the 'New Home Economics' (NHE) theory. In the model of household production, maximising household utilities directly depends on household commodities. According to this approach, a household both consumes and produces, and maximises welfare subject to time and budget constraints. Welfare is a function of household commodities, which are produced using market goods and time (for example, a clean house and prepared meals). So, the production process requires input: time of the household members and market goods; and generates one or more outputs: commodities. This idea is formalised by introducing household production functions, where the commodities resulting from these production processes generate utility in turn. Becker's theory has transformed the household from a passive maximizer of utility from market goods into an active maximizer also engaged in extensive production and investment activities (Becker, 1965).

According to Gronau (1977, 1980), the analysis can be substantially simplified by the assumption that output of the home production process is a perfect substitute for goods that can be

[1] People were asked whether they found formal childcare important in the welfare policy making of the municipality they lived in (Tijdens *et al.*, 2000).

bought on the market[2]. Where neo-classical theory only distinguishes labour and leisure, the NHE theory makes a distinction between work, leisure and household labour. In later work, Gronau (1986) reduces trade-offs between spending one more hour on home production and selling this hour on the labour market to a comparison of the wage rate and the marginal product value of household production time[3]. In this way the role of the utility function is limited to the decision to allocate the time that is not used for home production activities to leisure and work. In the extreme case, work at home and work in the market are perfect substitutes[4]. A person is indifferent to the composition of the goods and services (s)he consumes, whether they are produced at home or purchased in the market. Browning and Chiappori (1998) have added important new insight in using the household production theory. For individuals, the household production theory implies efficient outcomes for each decision. Browning and Chiappori prove this is also true in multi-person households, and call it 'collective setting'.

For several decades, household production has received much attention in economic literature. Between 1965 and 1990, the economic theory was mainly focused on extending theoretical notions, not on empirical research because of econometric difficulties and lack of data. The empirical research during the mentioned period was among others done to solve econometric issues, like corner solutions (Kooreman and Kapteyn, 1987; Gronau, 1986; Graham and Green, 1984; and Gronau, 1977). Homan *et al*. (1991) used Becker's model to estimate the monetary value of household production in Dutch households.

During the past years, more attention has been paid to empirical research on household production (see for example Ermisch, 2003; Jenkins *et al*., 1998; Maassen van den Brink and Groot, 1997). Empirical household production research is now also performed in countries where in the past such research was not common, like Spain (Manrique and Jensen, 1998), and Bulgaria (Florkowski *et al*., 2000).

For an overview of applications of the NHE theory to paid labour and household work, see Ermisch (2003), Vogel *et al*. (2003), Jenkins *et al*. (1998), and Maassen van den Brink and Groot (1997).

Although Becker's ideas have been criticised over the years[5], the NHE theory has been leading in economic theory in time allocation and has led to many results in opening the "black box" of household production. In the (recent) past, Becker's model has been used for constructing

[2] This is not always true. For example, when outsourcing meal preparation, a ready-to-eat meal is not always a perfect substitute for a home made meal. Nevertheless, this assumption is necessary to simplify the model (and in many cases, market goods and commodities are close substitutes).
[3] Which is then equalized in equilibrium (Gronau, 1986).
[4] Under the assumption that the person(s) in the household is/are able to work and has/have the opportunity to participate on the labour market.
[5] For example, Chiappori (1997, 1988), Lundberg and Pollak (1994, 1993), Sawhill (1980) criticise the fact that Becker assumes altruism within a multi-person household. Others argue the fact that Becker attaches too much weight on purely economic motives, leaving not much room for social and psychological motives (see among others Kirzner, 1999 and Haagsma, 1995).

household production models including outsourcing. These models were mainly constructed to explain household's expenditures on outsourcing meal preparation and home cleaning.

Hallberg and Klevmarken (2003) have developed a model with time spent with children as a utility function depending among others on out-of-home childcare. Mihalopoulos and Demoussis (2001) and Manrique and Jensen (1998) use Becker's model to estimate expenditures on food away from home (and at home). Florkowski *et al*. (2000) construct a household production model to predict the time allocated to meal preparation. Kim (1989) uses the model to investigate the determinants of time-saving tendencies in Canadian households.

5.3 Description of the data on time allocation and outsourcing

In this chapter, we use the same sample (total N=2551) that was used in Chapters 3 and 4 and described extensively in Chapter 2. As in Chapters 3 and 4, we use four different groups for the analyses: the native Dutch (N=701), the Surinamese/Antilleans (N=701), Moroccans (N=449), and Turks (N=700).

In our analyses we use total time spent on household and care activities as a dependent variable. Total time includes time spent on household tasks like home cleaning and doing laundry, time spent on cooking[6], and time spent on childcare, and is the sum of the time both partners in the household spend on these time categories[7]. An overview of the independent variables is stated in Appendix I. In Chapter 2, a description of most variables is given, except for time allocation and outsourcing, which will be described in the tables to follow. Table 5.6 gives an overview of time allocation of the native Dutch and immigrants in our sample.

[6] Our data had one combined time category for eating and cooking. The most recent data from Time Budget Research in the Netherlands (TBO 2000) shows that from the total time spent on eating and cooking (for all meals), one third is spent on cooking and preparing meals. We multiplied our time category for eating and cooking with one third in order to get an estimation of the time spent on cooking only.

[7] In our data, we had a time division over 24 hours of the respondent and we had information on the working hours of the partner. We assume partners spend leisure, sleeping, and remaining time together (Hallberg, 2003; and based on Table 5.4), leaving the rest of the partner's time to be spent on household activities.

Table 5.6 Time allocation for the native Dutch and immigrants according to gender (N=2551)

Hours per day (24 hours)	**native Dutch**		**Surinamese/ Antilleans**		**Moroccans**		**Turks**	
Working time	3.9		5.4		4.6		3.1	
female		3.1		4.7		2.8		1.9
male		5.2		6.3		6.1		4.7
HH activities*	2.9		2.6		3.2		3.3	
female		3.6		3.4		4.8		4.3
male		1.5		1.7		1.7		2.2
Leisure**	5.9		5.5		5.5		6.9	
female		6.1		5.3		5.4		6.9
male		5.7		5.7		5.5		7.0
Sleeping, eating, pers. care	11.1		10.1		10.2		10.1	
female		11.0		10.3		10.4		10.4
male		11.3		9.9		10.1		9.7
Education	0.2		0.3		0.5		0.5	
female		0.2		0.3		0.6		0.5
male		0.3		0.4		0.2		0.4
TOTAL	24.0		24.0		24.0		24.0	

** household activities include meal preparation, domestic tasks, and care for children*
*** incl. time spent on newspapers, TV, partner, family, computer, books, and remaining free time*

Table 5.6 shows that the Turks in our sample have the highest mean household and care time, followed by the Moroccans. The Surinamese/Antilleans spend less time on household and care time than the native Dutch, which can be ascribed to more working hours for the Surinamese/Antilleans. Compared to the other groups, Surinamese/Antilleans have relatively more working hours. As mentioned before, this could be explained by the fact that for the native Dutch mainly (not-working or part-time working) women participated in the research. Time spent on sleeping and personal care is about the same for all groups.

Table 5.7 shows the time allocation of the four groups divided over households with children and households without children. Analysis of variances was conducted in order to investigate whether the differences between the time categories differ significantly over the four groups.

Table 5.7 Time Allocation for the native Dutch and immigrants for different households

	native Dutch (n=701)	Surinamese/ Antilleans (n=701)	Moroccans (n=449)	Turks (n=700)
Working time [b, c]				
hh with children	4.3	5.8	4.2	3.1
hh without children	3.6	4.9	5.1	3.4
HH activities [a, b, c]				
hh with children	4.2	3.3	4.3	3.9
hh without children	1.8	2.0	1.5	1.6
Leisure [a, b, c]				
hh with children	4.8	4.7	5.2	6.9
hh without children	6.8	6.2	5.9	7.0
Sleeping, eating, pers. care [a, b, c]				
hh with children	10.5	9.9	10.1	9.8
hh without children	11.6	10.3	10.5	10.9
Education [a, b, c]				
hh with children	0.2	0.2	0.2	0.2
hh without children	0.2	0.5	1.1	1.0
TOTAL	24.0	24.0	24.0	24.0

a: significant main effects of having children across the four groups (ANOVA)
b: significant main effects of ethnicity across households with and without children (ANOVA)
c: significant interaction effects (ANOVA)

The native Dutch and Surinamese/Antillean respondents with children spend more time on paid labour, while the Turkish and Moroccan respondents with children spend less time on paid labour. The ethnic groups differ significantly in number of working hours ($F = 25.563$, $p < 0.01$).

For all time categories an interaction effect between ethnicity and children living at home exists (working time $F = 4.455$, $p < 0.01$; household and care activities $F = 9.466$, $p < 0.01$; leisure $F = 8.133$, $p < 0.01$; sleeping $F = 2.523$ $p < 0.10$, study $F = 14.195$, $p < 0.01$). This means that for all time categories the different ethnic groups respond differently in their time allocation when children are present. Time allocated to household and care activities is significantly higher in households with children in all groups, which is caused by the time needed to take care of children.

Households with children at home differ significantly from households without children at home in their time spent on household activities ($F = 413.391$, $p < 0.01$). Surinamese/Antillean households show the lowest number of hours spent on household activities, which is compensated by the higher number of working hours.

The four ethnic groups and the different household types (with or without children at home) differ significantly in leisure time ($F = 21.672$, $p < 0.01$ for ethnic groups and $F = 52.224$, $p < 0.01$ children living at home).

The native Dutch and Surinamese/Antilleans 'lose' more leisure time than the Turks or Moroccans when they have children. As also seen in Table 5.6, the Turkish respondents have the most leisure time, which is associated with fewer working hours.

For all groups, it is shown that households with children spend less time on sleeping and personal care than households without children (significant effect $F = 34.052$, $p < 0.01$), which can be attributed to the time needed for childcare. Except for the native Dutch, all groups spend less time on

education when they have children. In this time category, ethnic groups differ significantly (F = 19.691, p <0.01), households with children living at home differ significantly from households without children living at home (F = 92.734, p <0.01), and there is a significant interaction effect (F = 14.195, p <0.01).

When having children, all groups spend more time on household and care activities, less time on sleeping, eating, and personal care, and less time on leisure. The native Dutch and Surinamese/Antilleans make more working hours when they have children, while Moroccans and Turks make fewer working hours when they have children.

Table 5.8 gives an overview of the use of outsourcing methods by the native Dutch, Surinamese/Antillean, Moroccan, and Turkish households. Again, analysis of variances is done to investigate whether the differences in outsourcing between the groups are significant for each outsourcing category.

Table 5.8 Use of outsourcing methods per group (in percentages)

	native Dutch (N=701)	Surinamese/ Antill. (N=701)	Moroccans (N=449)	Turks (N=700)
Household help* **	18.7	13.1	4.2	3.4
Window cleaner* **	14.8	21.8	10.2	12.0
Launderette[a]*	14.4	15.5	14.9	11.1
Carwash* **	23.0	31.7	36.5	35.3
Childcare[b]*	41.3	32.5	33.5	27.8
Takeaway food* **	61.5	64.1	50.6	61.3
Delivery food* **	14.8	22.3	19.4	20.6
Eating out* **	54.6	45.1	37.3	38.1

a: and dry cleaner's
b: when children living at home
* p < 0.10, ** p < 0.05, *** p < 0.01 (ANOVA)

The analyses of variance show that the four groups differ significantly in all outsourcing categories. Almost a fifth of the Dutch households uses household help. Surinamese/Antilleans make less use of this service, while Moroccans and Turks scarcely use a household help. The use of a window cleaner is about the same for all groups, except for Surinamese/Antilleans who make use of this service about 10 percent more than the other three groups. The native Dutch make less use of the carwash than immigrants of whom about a third makes use of the carwash.

About 30 percent of the Moroccans and Turks in our sample make use of childcare, which is higher than the NIBUD figures (2004) in Table 5.4. However, Table 5.9 shows that the Turks pay less for childcare than the other groups. This difference can be attributed to the fact that NIBUD (2004) only measured the use of formal childcare, while we measured the use of both formal and informal childcare[8]. Turks probably outsource childcare more to (unpaid) family and friends.

[8] We measure both formal and informal childcare, because the number of hours childcare is outsourced affects the total time parents spend on care for their children.

As also seen in Chapter 3, Turks outsource meal preparation relatively frequently. This is also seen in Table 5.8, although a larger part of the native Dutch eat out (but as we learned in chapter 3, the Turks eat out more frequently).

Table 5.9 gives insight into the expenditures on outsourcing by households that make use of it, separately for households with and without children.

Table 5.9 Average monthly amount in Euros* spent on outsourcing for all households according to different household types (standard error in parentheses)

	Dutch	Surinamese/ Antilleans	Moroccans	Turks
Household help	90 *(6.7)*	96 *(9.7)*	54 *(11.7)*	68 *(17.4)*
hh with children	111 *(13.1)*	110 *(16.4)*	45 *(22.0)*	78 *(25.2)*
hh without children	75 *(6.1)*	84 *(11.4)*	64 *(11.4)*	50 *(16.7)*
Childcare (hh with children)	173 *(22.2)*	163 *(22.7)*	101 *(17.3)*	95 *(18.7)*
Window cleaner	6 *(0.5)*	8 *(0.7)*	6 *(0.7)*	6 *(0.5)*
hh with children	7 *(0.9)*	8 *(0.7)*	6 *(0.7)*	6 *(0.6)*
hh without children	6 *(0.7)*	8 *(1.4)*	6 *(1.5)*	4 *(1.1)*
Launderette & dry cleaner's	14 *(1.1)*	28 *(2.8)*	26 *(3.6)*	28 *(3.4)*
hh with children	15 *(1.8)*	24 *(2.4)*	30 *(5.4)*	26 *(3.6)*
hh without children	13 *(1.3)*	32 *(4.7)*	20 *(3.7)*	35 *(8.1)*
Carwash	9 *(0.5)*	12 *(0.7)*	11 *(0.9)*	10 *(0.7)*
hh with children	9 *(0.8)*	14 *(1.0)*	11 *(1.2)*	10 *(0.7)*
hh without children	9 *(0.8)*	11 *(1.1)*	11 *(1.3)*	13 *(1.7)*
Takeaway food	39 *(1.8)*	48 *(2.3)*	52 *(4.7)*	49 *(3.9)*
hh with children	44 *(2.7)*	48 *(3.0)*	47 *(5.2)*	48 *(5.0)*
hh without children	33 *(2.2)*	48 *(3.5)*	58 *(8.3)*	51 *(5.3)*
Delivery food	34 *(2.8)*	39 *(5.5)*	55 *(11.0)*	49 *(6.4)*
hh with children	33 *(3.1)*	38 *(5.7)*	73 *(17.5)*	42 *(6.9)*
hh without children	35 *(4.5)*	39 *(9.5)*	25 *(2.7)*	62 *(13.0)*
Eating out	88 *(6.5)*	88 *(10.2)*	69 *(4.4)*	72 *(6.6)*
hh with children	104 *(15.4)*	88 *(11.8)*	61 *(5.9)*	64 *(4.3)*
hh without children	78 *(5.1)*	88 *(15.2)*	76 *(6.5)*	86 *(16.6)*

* *rounded off to the nearest Euro*

Moroccans spend the most on takeaway food and delivery food. Table 5.8 showed that the Turks eat takeaway food the most frequently, as was also seen in chapter 3. Apparently, they choose cheaper takeaway food than Moroccans. The relatively large standard errors for almost all categories indicate that expenses on outsourcing facilities differ among households.

The native Dutch and Surinamese/Antilleans spend the most on eating out (in Chapter 3 we already learned that these two groups have the highest frequency for eating out). Although the groups differ in their outsourcing behaviour with respect to meal preparation, their monthly expenditures are about the same for all groups.

The native Dutch outsource home cleaning the most frequently, while they pay relative little. This could be explained by the use of black labour for household cleaning (these households pay a lower price for household cleaning, because no tax is paid), which might be higher among the native Dutch.

The frequency of outsourcing childcare is about the same among all groups. The native Dutch have the highest costs for outsourcing childcare per month, which can be caused by the fact that the native Dutch outsource their childcare more hours per month than the other groups or by the fact that immigrant groups outsource childcare more to family and friends (informal childcare), or they make more use of subsidized pre-school education. Another cause on the difference in expenditures on childcare is the fact that the costs of formal childcare depends on income (households with higher incomes have to pay more than households with lower incomes).

There are only small differences in the outsourcing behaviour between households with and without children living at home. In most categories, the differences are small, except for childcare and household help. There appear to be some differences for household help, delivery food, and eating out. In all groups, households[9] with children pay more for household help than households without children. Moroccans spend more on delivery food when they have children, while Turks spend less on delivery food when they have children. Since eating out is in general more expensive than takeaway food or delivery food, one could expect that with the arrival of children a household will spend less on eating out. This is true for Moroccans and Turks, but the native Dutch spend significantly more on eating out when they have children, indicating they will still eat out and even take the children with them. The Dutch also spend more on takeaway food when they have children. These habits could indicate that the native Dutch outsource meal preparation more when they have children, perhaps because of lack of time.

5.4 Empirical model of the demand for household and care time and outsourcing

We use the household production theory of Becker (1965) and Gronau (1986, 1972) as a framework to construct linear specifications of the demand functions for household and care time and the demand for outsourcing household and care activities.

We are aware of the fact that the number of working hours (N_i) is endogenous. However, in real-life, it will be difficult to adjust the time spent on market labour (especially in the short run) when compared with household and care time or leisure. Therefore, we consider N_i as given for each partner (see also Van Ophem and De Hoog, 1995a; Lambriex and Siegers, 1993; and Homan, 1998), and equal to $\overline{N}_i$. The following demand functions can be constructed for demand for household and

[9] Except for the Moroccan households, but those amounts are based on only a few respondents.

care activities time[10] (H, measured in hours per day) and the demand for outsourcing goods and services (O, measured in expenditures per month[11]) for a two-person household (couples):

$$H = \alpha_0 + \alpha_1 Y + \alpha_2 \overline{N}_f + \alpha_3 \overline{N}_m + \alpha_4 D + \varepsilon_1 \quad (5.1)$$

$$O = \beta_0 + \beta_1 Y + \beta_2 \overline{N}_f + \beta_3 \overline{N}_m + \beta_4 D + \varepsilon_2 \quad (5.2)$$

with α_0 and β_0 are the constant terms, α_1 to α_4, and β_1 to β_4 coefficients to be estimated. Y is the household income per month (net income of each partner, and/or other income like social security or children's allowance[12]). $\overline{N}_f$ and $\overline{N}_m$ are the market working hours for female and male per week[13]. D is a vector of socio-economic and demographic variables and includes dummies for ethnicity (with the native Dutch as reference for Surinamese/Antilleans, Moroccans, and Turks as used also in Chapter 3 and 4[14]), age of each partner, level of education of each partner, children living at home, living in an urban area, being a homeowner, religious affiliation, and health. ε_1 and ε_2 are the stochastic disturbance terms with a normal distribution and zero mean.

Scheme 5.1 shows the expected signs for the effects of the different variables on equation household and care time (5.1) and outsourcing (5.2).

[10] We study the following household and care tasks: cooking, childcare, and other household tasks, like cleaning, doing the laundry etc.

[11] These are measured as $P_o O$, because our cross-section data do not give enough information about the prices. For simplicity reasons we write O in equation (5.14). The same holds for the prices of goods X, they are not included in the empirical model.

[12] This is the same variable as used in Chapter 2 and 3. See Appendix II in Chapter 2 for a description of this variable.

[13] Working hours are measured per week and household and care time is measured per day, while income and expenditures are measured per month. This difference in measurements does not affect the estimation results. We use these figures this way, because they are easier to interpret.

[14] Where we assume that both partners in each household have the same ethnicity, which is true for about 80 percent of the households in our sample.

Scheme 5.1 Expected signs for coefficients to be estimated

Variable	Expected sign equation household and care time (5.1)	Expected sign equation outsourcing (5.2)
Gender (female)	+	+/–
Surinamese/Antilleans	+/–	–
Moroccans	+/–	–
Turks	+/–	–
Working hours female	–	+
Working hours male	–	+
Age	+/–	+/–
Household income	–	+
Children living at home	+	+
Level of education female	–	+
Level of education male	–	+
Living in an urban area	–	+
Religious affiliation	+	–
Health	–	+
Homeowner	+	+

+ positive effect, – negative effect, +/– either positive or negative effect expected

A high number of working hours correlates with a high household income. In households with a high number of working hours, household and care activities may be outsourced to "buy" time for activities with their children (Hallberg and Klevmarken, 2003). Therefore, working hours are expected to have a negative relationship with household and care time, but to have a positive relationship with outsourcing. Because of their lower income levels, immigrants are expected to outsource less than the native Dutch.

Education is also be an indication of high working hours and a high income and therefore lower household and care time, but higher expenditures on outsourcing.

The effect of age on household and care time can be either positive or negative. Older people have more time for household and care tasks, but a poorer health situation can cause a decrease in household and care time. Younger people could outsource more, because they work more hours on the labour market and have less time for household and care tasks. On the other hand, older people can have more money to outsource household and care tasks and may have a larger need for it.

As discussed in section 5.2, earlier research shows that household and care time is higher when having (young) children in the household. Households with (young) children are expected to outsource more, for example childcare.

People who own their home are assumed to have a higher income; therefore, a positive effect on time spent on household and care activities is hypothesised. A positive relation between living in an urban area and outsourcing is expected, since living in an urban area will give more opportunities to outsource childcare and household tasks.

People with a religious background may have a more traditional time division between men and women, and therefore spend more time on household and care activities and make less use of outsourcing facilities. The effect of health can be either positive or negative, since people with a poor

health need more time to do household and care activities or need to outsource many of these activities.

5.5 Estimation results

5.5.1 The determinants of household and care time and the effect of outsourcing

In order to be able to estimate the demand for outsourcing, we have only included the respondents in the sample who reported making use of the several outsourcing options and have expenditures on outsourcing (this means that we leave out people who have no expenditures on outsourcing) (n=2170). In order to investigate the effect of outsourcing on the total time households spend on household and care both demand equations are estimated. For the estimations of (5.1) and (5.2), the Ordinary Least Squares regression method is used[15].

$$H = \alpha_0 + \alpha_1 Y + \alpha_2 \overline{N}_f + \alpha_3 \overline{N}_m + \alpha_4 D + \varepsilon_1 \quad (5.1)$$

$$O = \beta_0 + \beta_1 Y + \beta_2 \overline{N}_f + \beta_3 \overline{N}_m + \beta_4 D + \varepsilon_2 \quad (5.2)$$

where H is the household and care time of both partners, O are the expenditures on outsourcing, Y is the household income per month, and $\overline{N}_f$ and $\overline{N}_m$ are the market working hours for female and male per week. D is a vector of socio-economic and demographic variables and including ethnicity, age of each partner, level of education of each partner, children living at home (to study the effect of young children, children aged > 25 living at home is taken as reference group), living in an urban area, being a homeowner, religious affiliation, and health.

Table 5.10 gives the estimation results for couples living in a household (with or without children) for both equation (5.1) and (5.2). Besides the estimations, the standardized coefficients are presented as well to give a one-sight overview of the importance of the variables.

[15] Appendix I comprises a list of the variables used in the estimations. Appendix II gives the distribution of the variables used.

Table 5.10 Estimation results of OLS regression on the demand for household and care time and the demand for outsourcing for couples with or without children (t-values in parentheses)

	Total household and care time (5.1)			**Log total outsourcing expenditures (5.2)**		
			stand.coeff			**stand.coeff**
Constant	5.175	*(6.231)***		4.185	*(15.503)***	
Native Dutch	*ref.*	*group*		*ref.*	*group*	
Surinamese/Antilleans	0.758	*(2.241)***	0.067	-0.282	*(-2.569)***	-0.078
Moroccans	1.299	*(3.126)***	0.102	-0.370	*(-2.742)***	-0.089
Turks	0.503	*(1.392)*	0.050	-0.412	*(-3.516)***	-0.126
Working hours female	-0.055	*(-3.842)***	-0.190	-0.001	*(-0.158)*	-0.008
Constant for wrk hrs female not obs.	-0.005	*(-0.011)*	-0.001	-0.214	*(-1.448)*	-0.071
Working hours male	-0.028	*(-2.385)***	-0.111	0.005	*(1.349)*	0.063
Constant for wrk hrs male not obs.	0.513	*(0.896)*	0.044	-0.085	*(-0.545)*	-0.022
Household income	0.005	*(0.793)*	0.024	0.000	*(4.897)****	0.152
Children at home 0-3	2.111	*(7.204)****	0.206	0.207	*(2.174)***	0.062
Children at home 4-11	1.122	*(4.131)****	0.118	-0.063	*(-0.711)*	-0.020
Children at home 12-15	0.612	*(1.890)**	0.053	0.143	*(1.356)*	0.038
Children at home 16-25	0.078	*(0.232)*	0.006	0.068	*(0.621)*	0.017
Children at home > 25	*ref.*	*group*		*ref.*	*group*	
Low level of education female	*ref.*	*group*		*ref.*	*group*	
Medium level of education female	0.485	*(1.656)**	0.051	0.265	*(2.780)****	0.087
High level of education female	0.079	*(0.201)*	0.007	0.498	*(3.876)****	0.127
Low level of education male	*ref.*	*group*		*ref.*	*group*	
Medium level of education male	0.197	*(0.690)*	0.021	0.330	*(3.556)****	0.106
High level of education male	-0.502	*(-1.414)*	-0.046	0.283	*(2.457)***	0.080
Living in an urban area	0.292	*(1.099)*	0.028	0.140	*(1.623)*	0.041
Religious affiliation	0.329	*(1.312)*	0.033	0.009	*(0.108)*	0.003
Health	0.500	*(4.156)****	0.106	-0.001	*(-0.036)*	-0.001
Homeowner	-0.095	*(-0.365)*	-0.010	0.063	*(0.749)*	0.021
Age female 18 – 34	*ref.*	*group*		*ref.*	*group*	
Age female 35 – 44	0.666	*(1.757)**	0.065	0.103	*(0.833)*	0.031
Age female 45 – 64	-0.480	*(-0.840)*	-0.040	-0.051	*(0.277)*	-0.013
Age female ≥ 65	-2.378	*(-2.343)***	-0.094	-0.318	*(-0.965)*	-0.039
Age male 18 – 34	*ref.*	*group*		*ref.*	*group*	
Age male 35 – 44	0.121	*(0.348)*	0.012	-0.206	*(-1.813)**	-0.064
Age male 45 – 64	0.231	*(0.443)*	0.021	-0.391	*(-2.305)***	-0.110
Age male ≥ 65	-0.031	*(-0.036)*	-0.002	-0.275	*(-0.985)*	-0.042
# Observations	1452			1452		
Adjusted R^2	0.169			0.163		
F statistic	12.351			11.901		

** p< 0.10 ** p<0 .05 *** p<0.01*

The working hours of both males and females have a significantly negative effect on the household and care time. The expenditures on outsourcing do change significantly due to working hours of each partner.

Having (very) young children in the household increases the household and care time and the expenditures on outsourcing significantly. As children are older (from the age of 12), these effects become smaller. And as the standardized coefficients show, the effect of having (very) young children is larger on household and care time than on outsourcing. Very young children need more care than older children. And as children become older they will be able to help in the household, which decreases the need for outsourcing.

Lower educated women spend more hours on household and care time. There could be several reasons to explain this effect: 1) in general, lower educated women have less working hours on the market; 2) lower educated women may find it important to take care of their husband or may spend more time on preparing meals that will be shared with families and friends, while higher educated women may not consider a clean house as very important; and 3) there might also be a slight change that lower educated women are less efficient in their household and care tasks, although this cannot be proved.

The level of education of both females and males positively affects the total amount spent on outsourcing. A social-class effect could explain this result; in higher social classes it is more common (and more accepted) that females work and more household and care activities need to be outsourced. This social-class effect explains the higher household and care time hours for Moroccans. Compared to the native Dutch, Moroccan have a lower socio-economic status and less female labour participation. A culture where women are expected to stay at home and take care of the children can also be an explanation for the higher household and care time of Moroccans. Surinamese/Antilleans also have more household and care time than the native Dutch, but their socio-economic situation is quite comparable to that of the Dutch. This result could suggest that compared to the native Dutch, the Surinamese/Antilleans consider other things to be important (like a clean house, or preparing meals). All immigrant groups spend significantly less on outsourcing than the native Dutch.

Healthy people spend more time on household and care activities than people with a poorer health (who are not able to do all these activities themselves). Nevertheless, no significant effect is found for health and the expenditures on outsourcing. This indicates that people with a poorer health do not spend more money on outsourcing than healthy people.

Although expected, people living in urban areas do not spend more on outsourcing. Also, no effects were found for religious affiliation and being a homeowner.

Younger females have significant more household and care time, which is explained by having young children. Women aged above 65 have significant less household and care time, which can be ascribed to the fact that as people become older, it becomes physically harder (and usually health becomes poorer) to do household and care tasks. Women aged above 65 have also less household and care tasks, since no children live at their home anymore.

The household and care time of males is not affected by their age. The expenditures on outsourcing decrease significantly with male's age (in many cases the main provider for household income). Of course, partly this could be explained by the fact that older people do not have (young) children living at home and have fewer working hours (or do not work at all), which decreases the need for outsourcing. Also, older men may have a traditional household where the wife does not do paid labour and does (almost) all household and care activities. For couples (with or without children), income does not affect the total time spent on household and care activities. Income has a

significantly positive effect on the expenditures on outsourcing, which was also found in earlier research (Lambriex and Siegers, 1993).

For a one-person household (or, better is to speak of 'singles' since children could also be present in the household), these results are different, because in such households there is only one person to do all household and care activities and to generate income. Therefore, we have repeated the estimations for singles (including one-person households and one-parent families). Because there is no partner in households of singles, only the working hours, level of education, and age of the respondent are included in the demand functions (5.1) and (5.2). The results are shown in Table 5.11.

Table 5.11 Estimation results of OLS regression on the demand for household and care time and the demand for outsourcing for singles with or without children (t-values in parentheses)

	Total household and care time (5.2)			**Log total outsourcing expenditures (5.2)**		
			stand.coeff			**stand.coeff**
Constant	0.811	*(2.107)***		4.200	*(14.505)****	
Female	0.552	*(3.608)****	0.119	-0.055	*(-0.479)*	-0.018
Native Dutch	*ref.*	*group*		*ref.*	*group*	
Surinamese/Antilleans	0.654	*(3.483)****	0.139	0.248	*(1.756)**	0.081
Moroccans	0.757	*(3.084)****	0.120	-0.120	*(-0.649)*	-0.029
Turks	0.443	*(1.837)**	0.075	0.219	*(1.211)*	0.057
Working hours	0.001	*(0.102)*	0.006	-0.004	*(-0.641)*	-0.044
Constant for wrk hrs not obs.	1.551	*(5.666)*	0.321	-0.403	*(-1.957)**	-0.127
Household income	-0.008	*(-1.048)*	-0.042	0.000	*(4.771)****	0.222
Children at home 0-3	2.420	*(6.575)****	0.204	-0.261	*(-0.942)*	-0.034
Children at home 4-11	2.533	*(8.651)*	0.289	-0.306	*(-1.389)*	-0.053
Children at home 12-15	0.405	*(1.167)*	0.038	0.249	*(0.955)*	0.036
Children at home 16-25	-0.156	*(-0.499)*	-0.016	-0.298	*(-1.266)*	-0.046
Children at home > 25	*ref.*	*group*		*ref.*	*group*	
Medium level of education	-0.186	*(-0.960)*	-0.040	0.308	*(2.109)***	0.102
High level of education	-0.223	*(-0.974)*	-0.043	0.279	*(1.615)*	0.082
Living in an urban area	-0.099	*(-0.658)*	-0.021	0.160	*(1.419)*	0.051
Religious affiliation	0.203	*(1.255)*	0.038	-0.041	*(-0.327)*	-0.012
Health	-0.113	*(1.505)*	-0.047	-0.049	*(-0.873)*	-0.032
Homeowner	0.232	*(1.197)*	0.040	0.436	*(2.995)****	0.114
Age 18 – 34	*ref.*	*group*		*ref.*	*group*	
Age 35 – 44	0.759	*(3.363)****	0.116	-0.483	*(-2.842)****	-0.113
Age 45 – 64	0.830	*(3.565)****	0.140	-0.622	*(-3.533)****	-0.161
Age $\geq$ 65	-0.077	*(-0.245)*	-0.010	-1.110	*(-4.674)****	-0.215
# Observations	715			715		
Adjusted R^2	0.375			0.174		
F statistic	22.482			8.554		

** p< 0.10 ** p< 0.05 *** p< 0.01*

The results of the estimations in Table 5.11 give some interesting additional information. It shows that single females spend significantly more hours on household and care tasks. This effect could have overruled the effect for working hours in this analysis. These women could also be single mothers who have to take care of children by themselves.

Also in households of singles (with or without children), the household and care time increases when having (very) young children. But no significant effect of children is found for

expenditures on outsourcing. The single-parent households can have less money to spend on outsourcing. Still, they will also need childcare if they want to do paid labour. It is therefore interesting to repeat the estimations of outsourcing separated by type as mentioned in section 5.3 (these results will be presented in Table 5.13).

In households of singles, the level of education does not affect household and care time. While in households of couples lower educated women spend more hours on household and care time. This effect could have been diminished, because there was controlled for gender in the analyses of singles. Also, in households of singles, level of education may not be important, because the household and care tasks should be done anyway since there is no partner to help with the tasks. The expenditures on outsourcing increase with the level of education.

While Table 5.10 shows that all immigrant groups spend less on outsourcing, in the households of singles (with or without children) this effect was not found. And in households of singles (with or without children), Surinamese/Antilleans spend even significantly more on outsourcing than the native Dutch. This result shows that outsourcing behaviour between couples and singles (with or without children) is very different.

Health does not affect households and care time of singles (with or without children), while it affects households and care time for couples (with or without children). If there is only one adult in a household, that person will have to do all household and care activities, also when (s)he is ill.

Household income increases the expenditures on outsourcing significantly. Although not significantly, contrary to the results in Table 5.10, household income decreases the household and care time.

Also in the estimations for singles it is found that the expenditures on outsourcing decrease with age, which could be explained by the fact that in small households, less household and care activities need to be done. It is useful to split up the expenditures into different categories, which we will do later.

First, we re-estimate the demand functions for households with children and households without children. Table 5.12 shows the results for couples, with and without children.

Table 5.12 Estimation results of OLS regression on the demand for household and care time and the demand for outsourcing for couples households with and without children (t-values in parentheses)

	Total household and care time (5.1)				**Log total outsourcing expenditures (5.2)**			
	without children		**with children**		**without children**		**with children**	
Constant	4.566	*(3.406)***	6.362	*(6.103)***	4.552	*(9.441)***	3.946	*(11.856)***
Native Dutch	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Surinamese/Antilleans	1.754	*(3.470)***	0.088	*(0.201)*	-0.345	*(-1.895)**	-0.235	*(-1.686)**
Moroccans	0.446	*(0.582)*	1.230	*(2.443)***	-0.371	*(-1.346)*	-0.408	*(-2.536)***
Turks	1.048	*(1.493)*	0.020	*(0.046)*	-0.568	*(-2.251)***	-0.408	*(-2.909)****
Working hours female	-0.044	*(-1.679)**	-0.048	*(-2.686)****	0.007	*(0.689)*	-0.001	*(-0.222)*
Constant for wrk hrs female not observed	0.100	*(0.108)*	0.203	*(0.378)*	0.305	*(0.914)*	-0.279	*(-1.626)*
Working hours male	-0.040	*(-1.841)**	-0.026	*(-1.874)**	-0.009	*(-1.099)*	0.010	*(2.242)***
Constant for wrk hrs male not observed	-0.636	*(-0.635)*	1.042	*(1.495)*	-0.870	*(-2.418)***	0.194	*(0.872)*
Household income	0.001	*(0.048)*	0.006	*(0.743)*	0.007	*(1.868)**	0.000	*(4.470)****
Children at home 0-3	-		1.345	*(3.740)****	-		0.244	*(2.127)***
Children at home 4-11	-		0.437	*(1.348)*	-		-0.040	*(-0.390)*
Children at home 12-15	-		0.347	*(1.005)*	-		0.165	*(1.499)*
Children at home 16-25	-		-0.788	*(-1.981)**	-		0.064	*(0.505)*
Children at home > 25	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Low level of education female	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Medium level education female	0.372	*(0.669)*	0.614	*(1.779)**	0.218	*(1.089)*	0.252	*(2.288)***
High level education female	0.463	*(0.695)*	0.046	*(0.093)*	0.368	*(1.538)*	0.513	*(3.275)****
Low level of education male	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Medium level education male	-0.186	*(-0.338)*	0.309	*(0.922)*	0.308	*(1.558)*	0.334	*(3.117)****
High level education male	-0.754	*(-1.231)*	-0.397	*(-0.917)*	0.378	*(1.716)**	0.256	*(1.847)**
Living in an urban area	0.135	*(0.272)*	0.352	*(1.127)*	0.020	*(0.112)*	0.154	*(1.546)*
Religious affiliation	0.254	*(0.560)*	0.398	*(1.329)*	-0.086	*(-0.525)*	0.075	*(0.780)*
Health	0.677	*(3.272)****	0.441	*(3.024)****	0.080	*(1.079)*	-0.016	*(-0.345)*
Homeowner	-0.004	*(-0.010)*	-0.182	*(-0.569)*	0.057	*(0.376)*	0.035	*(0.346)*
Age female 18 – 34	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Age female 35 – 44	0.576	*(0.624)*	0.677	*(1.579)*	0.655	*(1.973)***	0.020	*(0.147)*
Age female 45 – 64	-0.117	*(-0.108)*	-0.455	*(-0.646)*	0.648	*(1.659)**	-0.199	*(-0.844)*
Age female ≥ 65	-1.330	*(-0.931)*	-3.296	*(-1.816)*	0.318	*(0.618)*	-0.519	*(-0.895)*
Age male 18 – 34	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Age male 35 – 44	-0.193	*(-.0246)*	0.086	*(0.215)*	-0.280	*(-0.990)*	-0.181	*(-1.42)*
Age male 45 – 64	-0.210	*(-0.190)*	0.223	*(0.369)*	-1.218	*(-3.067)*	-0.221	*(-1.142)*

Table 5.12 (continued)

Age male ≥ 65	0.162	*(0.118)*	0.138	*(0.105)*	-1.047	*(-2.188)*	0.020	*(0.047)*
# Observations	366		1085		366		1085	
Adjusted R^2	0.078		0.107		0.221		0.145	
F statistic	2.409		6.019		5.729		8.050	

** p< 0.10 ** p< 0.05 *** p< 0.01*

Having (very) young children significantly increases household and care times as well as the expenditures on outsourcing. As earlier mentioned, very young children need a lot of care, which will be the reason on the increase in household and care time when there are children. A large part of the increase in outsourcing expenditures is caused by the expenditures on childcare.

Only in household with children, lower female's level of education increases household and care time, while both female's and male's level of education increase the outsourcing expenditures. A higher level of education is associated with higher income and higher working hours, and therefore a larger demand for outsourcing.

If we compare immigrants to the native Dutch, we see that in almost all cases, in both types of households, they spend less on outsourcing (only not significant for Moroccan households without children). As also seen in Table 5.10 and 5.11, Surinamese/Antilleans have more household and care time. Table 5.12 shows that compared to the native Dutch, mainly Surinamese/Antillean households without children have more household and care time. They also spend less on outsourcing, which could indicate that these are households with lower incomes.

Household income is significantly positively related to outsourcing expenditures. When looking at the t-values, we see that income is more important in households with children than in households without children. Compared to households without children and about the same income level, there is relatively less income to spend in households with children (because it needs to be shared with more persons). It is expensive to have children, thus households without children have fewer costs and more money to spend. This explains the relative higher importance of household income with respect to outsourcing expenditures in households with children.

The determinants of outsourcing home cleaning and childcare can be different than for outsourcing meal preparation. Therefore, separate analyses for different outsourcing categories are performed. This could be done by further subdividing the demand equation for outsourcing (5.3) into separate equations for different outsourcing categories:

$$O_1 = \gamma_{10} + \gamma_{11}Y + \gamma_{12}\overline{N}_f + \gamma_{13}\overline{N}_m + \gamma_{14}D + \varepsilon_{12} \quad (5.3)$$

$$O_2 = \gamma_{20} + \gamma_{21}Y + \gamma_{22}\overline{N}_f + \gamma_{23}\overline{N}_m + \gamma_{24}D + \varepsilon_{22} \quad (5.4)$$

$$O_3 = \gamma_{30} + \gamma_{31}Y + \gamma_{32}\overline{N}_f + \gamma_{33}\overline{N}_m + \gamma_{34}D + \varepsilon_{32} \quad (5.5)$$

where O_1 represents the expenditures per month on childcare, the household help, and the window cleaner; O_2 the expenditures per month on takeaway food, delivery food, and eating out; and O_3 the rest of outsourcing expenditures per month, including the carwash and the laundrette/dry cleaner's. The γ's are coefficients to be estimated and $\varepsilon_{12} - \varepsilon_{32}$ are stochastic disturbance terms and normally distributed. We have focused on the main outsourcing categories (home cleaning, childcare, and

outsourcing meal preparation), so equation (5.5) was not used. Again, the estimations are done both for couples and for singles, with or without children. The results are shown in Table 5.13.

Table 5.13 Estimation results of OLS regression on two categories of outsourcing for couples and singles with or without children (t-values in parentheses)

	Log outsourcing home cleaning and childcare (5.3)				**Log outsourcing food preparation (5.4)**			
	couples		**singles**		**couples**		**singles**	
Constant	0.694	*(1.812)**	-0.215	*(-0.624)*	4.022	*(10.958)****	4.576	*(12.489)****
Female	-		0.144	*(1.052)*	-		-0.092	*(0.633)*
Native Dutch	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Surinamese/Antilleans	-0.096	*(-0.618)*	0.256	*(1.525)*	-0.570	*(-3.818)****	-0.022	*(-0.121)*
Moroccans	-0.344	*(-1.794)**	-0.110	*(-0.502)*	-0.749	*(-4.078)****	-0.441	*(-1.889)**
Turks	-0.432	*(-2.594)****	-0.028	*(-0.130)*	-0.569	*(-3.558)****	0.210	*(0.877)*
Working hours female	-0.005	*(-0.796)*	-		-0.004	*(0.576)*	-	
Wrk hrs fem. not obs.	-0.694	*(-3.301)****	-		-0.140	*(0.693)*	-	
Working hours male	0.000	*(-0.031)*	-		0.002	*(0.475)*	-	
Wrk hrs male not obs.	0.085	*(0.323)*	-		-0.385	*(-1.519)*	-	
Working hours	-		-0.013	*(-1.992)***	-		-0.009	*(-1.263)*
Wrk hrs not observed	-		-0.343	*(-1.402)*	-		-0.521	*(-2.001)***
Household income	0.000	*(4.558)****	0.000	*(5.094)****	0.000	*(4.478)****	0.000	*(3.040)****
Children at home 0-3	1.339	*(9.902)****	1.071	*(3.253)****	-0.320	*(-2.467)***	-0.839	*(-2.394)***
Children at home 4-11	0.227	*(1.812)**	0.905	*(3.453)****	-0.070	*(-0.587)*	-0.809	*(-2.901)****
Children at home 12-15	-0.198	*(-1.326)*	-0.010	*(-0.034)*	0.319	*(2.229)***	0.651	*(1.972)***
Children at home 16-25	-0.122	*(-0.788)*	-0.596	*(-2.131)***	0.261	*(1.754)**	-0.091	*(-0.304)*
Children at home > 25	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Low level educ. female	*ref.*	*group*	-		*ref.*	*group*	-	
Medium level educ. fem.	0.072	*(0.531)*	-		0.316	*(2.444)***	-	
High level educ. fem.	0.549	*(4.010)****	-		0.421	*(2.412)***	-	
Low level educ. male	*ref.*	*group*	-		*ref.*	*group*	-	
Medium level educ. male	0.061	*(0.461)*	-		0.323	*(2.557)***	-	
High level educ. male	0.460	*(2.812)****	-		0.295	*(1.881)**	-	
Low level of education	-		*ref.*	*group*	-		*ref.*	*group*
Medium level of educ.	-		0.487	*(2.807)****	-		0.150	*(0.812)*
High level of educ.	-		0.453	*(2.204)***	-		0.243	*(1.111)*
Living in an urban area	0.039	*(0.321)*	-0.097	*(-0.722)*	0.125	*(1.065)*	0.156	*(1.094)*
Religious affiliation	-0.007	*(-0.062)*	0.050	*(0.338)*	-0.138	*(-1.247)*	-0.290	*(-1.842)**
Health	-0.090	*(-1.6230*	-0.110	*(-1.628)*	0.064	*(1.201)*	-0.042	*(-0.590)*
Homeowner	0.195	*(1.634)*	0.369	*(2.219)***	-0.013	*(-0.115)*	0.365	*(1.982)***
Age female 18 – 34	*ref.*	*group*	-		*ref.*	*group*	-	
Age female 35 – 44	0.250	*(1.427)*	-		0.011	*(0.066)*	-	
Age female 45 – 64	0.083	*(0.316)*	-		-0.164	*(-0.649)*	-	
Age female ≥ 65	0.334	*(0.721)*	-		-0.674	*(-1.503)*	-	
Age male 18 – 34	ref.	*group*	-				-	
Age male 35 – 44	0.178	*(1.103)*	-		-0.568	*(-3.678)****	-	
Age male 45 – 64	0.087	*(0.362)*	-		-0.873	*(-3.784)****	-	
Age male ≥ 65	0.163	*(0.411)*	-		-0.750	*(-1.973)***	-	
Age 18 – 34	-		*ref.*	*group*	-		*ref.*	*group*
Age 35 – 44	-		0.248	*(1.230)*	-		-0.678	*(-3.157)****
Age 45 – 64	-		0.702	*(3.368)****	-		-1.157	*(-5.222)****
Age ≥ 65	-		1.527	*(5.405)****	-		-2.341	*(-7.792)****
# Observations	1452		715		1452		715	
Adjusted R^2	0.184		0.171		0.136		0.202	
F statistic	13.563		8.356		9.822		10.031	

** p< 0.10 ** p< 0.05 *** p< 0.01*

Table 5.12 already showed that for households that make use of outsourcing, household income is significantly positively related to outsourcing expenditures for both types of households. In Table 5.13 we also see, that for couples (with or without children), where the woman does not do paid labour (no observed working hours), the household spends less money on outsourcing home cleaning and childcare. These households will have less money to spend, and there is less necessity to outsource childcare, because the mother is at home. For singles (with or without children), the expenditures on childcare and outsourcing home cleaning decrease with working hours. These households might make more use of informal (or subsidised) childcare in stead of formal (more expensive) childcare.

As could be expected, the expenditures on childcare and outsourcing home cleaning and childcare increase significantly when they have (very) young children in the household. Very young children need more care than other children, and older children can help the parent(s) with household and care tasks.

If households have children between aged between 4 and 11 and/or aged between 12 and 15, the expenditures on outsourcing meal preparation increase significantly. For having children aged between 4 and 11 this can be ascribed to the fact that these children cannot help as much in the household as children aged between 12 and 15. There could also be a generation-effect for having children aged between 12 and 15, since children in this age-category in general like takeaway food (like MacDonald's) a lot. When couples have very young children the expenditures on outsourcing meal preparation increase, while for singles with very young children these expenditures decrease, which could be explained by a lower income in households of singles.

Moroccans as well as Turks spend less on outsourcing home cleaning and childcare than the native Dutch. As discussed earlier, this could be explained by a lower socio-economic status and a culture-effect. Moroccans, Turks, and Surinamese/Antilleans spend less on outsourcing meal preparation than the native Dutch. For the Turks and Moroccans this could be explained by less income (or lower socio-economic) status as well. However, the analyses have controlled for socio-economic status by income, level of education, and working hours. This indicates that the culture-effect could be stronger than the effect of socio-economic status.

In all households the expenditures on outsourcing meal preparation decrease with age. This indicates that outsourcing (probably, mostly in the case of delivery food and takeaway food) meal preparation is mainly done by younger people.

In order to calculate the elasticity of outsourcing, the regression on outsourcing expenditures is repeated for the four groups including the log of household income. The two main outsourcing categories are taken: 1) expenditures in childcare, household help, and window cleaner; 2) the expenditures on outsourcing meal preparation (both in log). The analyses as presented in Table 5.13 are repeated excluding working hours, level of education, and own home (which are related to income). The results are presented in Table 5.14.

Table 5.14 Elasticity of expenditures on outsourcing for the native Dutch and immigrant couple (standard errors in parentheses)

	Native Dutch	**Surinamese/ Antilleans**	**Moroccans**	**Turks**
Expenditures on childcare, household help, and window cleaner	0.665 (0.186)	1.090 (0.240)	1.000 (0.303)	0.350 (0.170)
Expenditures on outsourcing meal preparation	0.441 (0.144)	0.887 (0.217)	0.738 (0.314)	0.871 (0.194)

The elasticities shown in Table 5.14 indicate that outsourcing childcare and home cleaning is a luxury good for Surinamese/Antilleans (elasticity $\geq$ 1). For the native Dutch, Moroccans and Turks outsourcing childcare and home cleaning is a normal good (elasticity between 0 and 1). This means that contrary to the Surinamese/Antilleans, for the native Dutch, Moroccans, and Turks outsourcing childcare and home cleaning does not depend very much on household income.

The elasticity for outsourcing childcare and home cleaning is the smallest for the Turks. Table 5.8 and 5.9 explain this elasticity. These tables show that Turks outsource childcare and home cleaning not very frequently compared to the native Dutch and the Surinamese/Antilleans. And if they outsource these activities, they pay a relatively low amount (due to subsidies for childcare and other/cheaper ways of outsourcing home cleaning).

The elasticities for outsourcing meal preparation indicate that it is a normal good for both the native Dutch and the studied non-western immigrant groups. Their expenditures on outsourcing meal preparation are not very much affected by a decrease or an increase in income.

5.5.2 Outsourcing and quality-time with children

As mentioned before, in households with children, working parents may "buy" time to do activities with their children (Hallberg and Klevmarken, 2003). This means that parents outsource certain household and care activities which results in more time left to spend with their children. A relation exists between the expenditures on outsourcing and quality-time with children. Quality-time is different than care time. Care time is changing diapers, feeding the children, or watching them while playing. Quality-time is taking the children to the zoo, reading to the children, or playing games with them. Parents with a higher income may outsource more and spend more quality-time with their children.

In order to test this hypothesis, we specify a new demand function for quality-time where we include D with socio-economic and demographic characteristics as used in section 5.6.1:

$$Q = \delta_0 + \delta_1 Y + \delta_2 \overline{N}_f + \delta_3 \overline{N}_m + \delta_4 D + \varepsilon_3 \qquad (5.6)$$

where the δ'are coefficients to be estimated and ε_3 is the error term.

The care for children aged between 0 and 11 is more often outsourced than the care for older children. In order to investigate the relationship between quality-time and outsourcing, we have focused on the quality-time parents spend with their children aged between 0 and 11. We do not know the number of hours parents spend on quality-time with their children, but we do know how many times per month parents play games with their children, read to them, and help them with homework. With this information, a quality-time indicator is constructed.

This indicator includes the following activities parents do with their children aged between 0 and 11: 1) reading to the children, 2) playing games with the children, and 3) helping the children with their homework[16]. A factor-analysis showed that there are two factors, one on which reading and playing games loaded, and another one on which helping with homework loaded. Therefore, two quality-time indicators should be constructed: 1) a quality-time indicator including reading to children and playing games with children, and 2) a quality-time indicator only including helping with homework.

The results of these estimations on the demand for quality-time for both singles and couples households with children are shown in Table 5.15. In this case, we have taken children aged above 16 as a reference group, since parents will not spend much time with their older children playing games, reading to them, or helping them with their homework. The second and third column shows the results for the first and the second quality-time indicator for couples with children, the fourth and fifth column shows the result for single-parent families.

[16] These 3 variables were all divided in 4 categories: 1) seldom/never, 2) monthly, 3) weekly, and 4) daily. The variables were re-scaled to a monthly time indicator (seldom/never = 0, monthly = 1, weekly = 4.3, and daily = 30). After re-scaling the 3 variables were added up to one indicator.

Table 5.15 Estimation results of OLS regression on the demand for quality-time for couples and singles with children (t-values in parentheses)

	Couples with children				Single parent families			
	Indicator 1		**Indicator 2**		**Indicator 1**		**Indicator 2**	
Constant	-0.536	*(-0.189)*	-2.261	*(-1.065)*	2.121	*(0.318)*	-3.356	*(-0.579)*
Female	-		-		2.471	*(0.843)*	1.657	*(0.651)*
Native Dutch	*ref.*	*group*	*ref.*	*group*	*ref.*	*Group*	*ref.*	*group*
Surinamese/Antilleans	-0.937	*(-0.783)*	0.403	*(0.414)*	-1.200	*(-0.479)*	0.533	*(0.245)*
Moroccans	-0.985	*(-0.717)*	1.608	*(1.434)*	2.498	*(0.557)*	-4.937	*(-1.267)*
Turks	-2.179	*(-1809)**	1.047	*(1.066)*	0.557	*(0.171)*	-0.159	*(-0.056)*
Working hours female	-0.010	*(-0.209)*	0.040	*(0.995)*	-		-	
Wrk hrs fem. not obs.	-1.005	*(-0.682)*	0.299	*(0.2492)*	-		-	
Working hours male	-0.060	*(-1.553)*	0.003	*(0.108)*	-		-	
Wrk hrs male not obs.	-0.416	*(-0.218)*	-0.260	*(-0.167)*	-		-	
Working hours	-		-		0.052	*(0.372)*	0.200	*(1.661)**
Wrk hrs not obs.	-		-		1.350	*(0.315)*	2.426	*(0.651)*
Household income	0.000	*(1.589)*	-0.009	*(-0.491)*	-0.010	*(0.556)*	0.000	*(-0.420)*
Children at home 0-3	42.851	*(44.607)****	-0.661	*(-0.843)*	40.608	*(15.734)****	-2.630	*(-1.173)*
Children at home 4-11	-0.748	*(-0.897)*	10.754	*(15.816)****	1.070	*(0.473)*	11.318	*(5.755)****
Children at home 12-15	0.385	*(0.409)*	2.369	*(3.083)****	-1.907	*(-0.875)*	3.617	*(1.893)**
Children at home ≥ 16	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Low level of edu. fem.	*ref.*	*group*	*ref.*	*group*	-		-	
Medium level edu. fem.	2.515	*(2.657)****	2.032	*(2.633)****	-		-	
High level edu. female	3.401	*(2.525)***	1.944	*(1.770)**	-		-	
Low level of edu. male	*ref.*	*group*	*ref.*	*group*	-		-	
Medium level edu. male	0.287	*(0.312)*	0.409	*(0.545)*	-		-	
High level edu. male	-0.444	*(-0.374)*	-0.332	*(-0.342)*	-		-	
Low level of education	-		-		*ref.*	*group*	*ref.*	*group*
Medium level of edu.	-		-		-0.082	*(-0.031)*	1.661	*(0.734)*
High level of education	-		-		-0.536	*(-0.172)*	-1.796	*(-0.663)*
Living in an urban area	-2.232	*(-2.606)****	0.960	*(1.373)*	-1.168	*(-0.596)*	1.380	*(0.809)*
Religious affiliation	0.260	*(0.316)*	-0.106	*(-0.159)*	-0.739	*(-0.351)*	0.357	*(0.195)*
Health	0.840	*(2.104)***	0.043	*(0.131)*	-0.500	*(-0.520)*	-1.195	*(-1.432)*
Homeowner	-0.289	*(-0.329)*	-1.418	*(-1.981)***	0.177	*(0.066)*	2.980	*(1.286)*
Age female 18 – 34	*ref.*	*group*	*ref.*	*group*	-		-	
Age female 35 – 44	1.714	*(1.468)*	-0.705	*(-0.740)*	-		-	
Age female 45 – 64	0.855	*(0.444)*	-1.057	*(-0.674)*	-		-	
Age female ≥ 65	-1.846	*(-0.372)*	-0.591	*(-0.146)*	-		-	
Age male 18 – 34	ref.	*group*	ref.	*group*	-		-	
Age male 35 – 44	-0.505	*(-0.463)*	0.137	*(-0.154)*	-		-	
Age male 45 – 64	-1.987	*(-1.202)*	1.618	*(1.200)*	-		-	
Age male ≥ 65	2.857	*(0.797)*	1.813	*(0.620)*	-		-	
Age 18 – 34	-		-		*ref.*	*group*	*ref.*	*group*
Age 35 – 44	-		-		-2.151	*(-0.902)*	-0.109	*(-0.053)*
Age 45 – 64	-		-		-1.936	*(-0.649)*	-1.734	*(-0.669)*
Age ≥ 65	-		-		-1.488	*(-0.227)*	-5.129	*(-0.902)*
# Observations	1085		1085		135		135	
Adjusted R^2	0.749		0.226		0.739		0.336	
F statistic	130.241		13.161		21.093		4.595	

Indicator 1: reading to children and playing games with children, times per month
Indicator 2: helping children with homework, times per month

As expected, having children is a strong determinant for the demand for quality-time. Parents play games and read to their children aged between 0 and 3, and they help them with their homework when they are aged between 4 and 15. When a child is 16 years or older, quality-time decreases. Older children are less at home and spend more time with their friends. The outcomes could also have been

affected by our quality measure that is age-sensible, only including reading, playing games and helping with homework.

All immigrant couples with children spend less on playing games and reading to their children, but it is only significant for Turks.

Couples with children who own their home spend less time on helping their children with their homework. They need more time to do things in or around their house and have to make more hours on the labour market to earn enough income. Couples living in the city spend less on reading to their children and playing games with them. The city offers more opportunities for children to meet with other children and spend their time with them, while children in rural areas are more dependent on their parents. The estimation for single-parent families shows that compared to males, females do not differ significantly in their quality-time spent with children.

The demand for quality-time is not affected by household income. In section 5.6.1 we learned that income significantly increases the demand for outsourcing. This means that higher income households outsource more than lower income households.

Table 5.15 shows that the mother's level of education positively affects the demand for quality-time, which was also seen in the demand for outsourcing estimations, meaning that higher educated females outsource more and spend more quality-time with their children than lower educated females. This could indicate an indirect effect of income and outsourcing on quality-time: higher educated females will have more working hours (and a higher income) and outsource more household and care activities, while they spend more quality-time with their children. For both single-parent families and two-parent families, the analyses show that working hours do not affect quality-time.

For single-parent families, no effect is found for level of education. This implies that higher educated singles with children do not spend more quality-time with their children, as seen for females in the estimations for couples. Singles with children have less time for quality-time, since they have to earn the income and have to do the household and care tasks by themselves.

5.6 Conclusions and discussion

In this chapter, we have studied: 1) the determinants of the demand for household and care time and the demand for outsourcing household and care activities; 2) differences between non-western immigrants and the native Dutch in time allocation and outsourcing behaviour; and 3) whether outsourcing contributes to quality-time spent with children. Scheme 5.2 show the expected and confirmed effects of the estimations.

Scheme 5.2 Expected and confirmed (significant) effects of the estimations

	Household and care time (5.1)		Outsourcing expenditures (5.2)	
Variable	**expected**	**confirmed**	**expected**	**confirmed**
Surinamese/Antilleans	+/–	Yes (+)	–	Yes
Moroccans	+/–	Yes (+)	–	Yes
Turks	+/–	No	–	Yes
Gender (female)	+	Yes	+/–	No
Working hours female	–	Yes	+	No
Working hours male	–	Yes	+	No
Household income	–	No	+	Yes
Children living at home	+	Yes	+	Yes
Level of education female	–	No	+	Yes
Level of education male	–	No	+	Yes
Living in an urban area	–	No	+	No
Religious affiliation	+	No	–	No
Health	–	Yes	+	No
Homeowner	+	No	+	No

+ positive effect, – negative effect, +/– either positive or negative effect expected

For all groups, households have more household and care time when they have (very) young children at home. The native Dutch and the Surinamese/Antilleans work longer when they have children, while for Moroccans and Turks the reverse is true. This can be explained by the fact that the Surinamese/Antilleans and the native Dutch have to compensate for the income-loss due to less working hours of the mothers, or want to earn more money to raise their children. The Turks and Moroccans have fewer possibilities to increase their income, since they are more often unemployed and have less good chances on the labour market.

Females spend significantly more hours on household and care tasks than males. For couples (with or without children), Moroccans have more household and care time than the native Dutch, while all immigrant singles (with or without children) have more household and care time. This could be explained by less working hours (for Moroccans and Turks), or by the fact that these groups put more value on other things (taking a lot of time to prepare the meal, or for wives to take care of their husbands and children).

In correspondence with the literature, we have found that having (very) young children, level of education, and household income are important determinants for the demand for outsourcing (Sousa-Poza *et al.*, 2001; Spitze, 1999; Cohen, 1998; Manrique and Jensen, 1998; Lambriex and Siegers, 1993; Oropesa, 1993; Soberon-Ferrer and Dardis, 1991; Kim, 1989; and Bellante and Forrester, 1984). In our estimations, income is a more important factor in households with children, compared to households without children. In households with children, relatively less money can be spent, which makes a higher income more important to be able to outsource household and care activities.

As expected, all immigrant groups spend less on outsourcing than the native Dutch, which could be explained by their lower socio-economic status (measured by household income and level of education). For singles (with or without children) however, these effects are not found, and in these

households Surinamese/Antilleans spend even more on outsourcing than the native Dutch. This indicates that single immigrants differ from couples in their decision to outsource household and care tasks. Generally, not many differences in outsourcing behaviour were found in the four studied groups. Immigrants make less use of childcare, but outsource meal preparation more frequently to takeaway food or delivery food (and spend more on these outsourcing categories) than the native Dutch. The native Dutch spend the most on childcare and eating out, but they spend less on the carwash than immigrants.

When people become older, their expenditures on outsourcing decrease. Mainly their expenditures on outsourcing meal preparation decrease. Particularly people younger than 35 outsource meal preparation. For singles (with or without children) the demand for home cleaning and childcare increases from the age of 45.

Although working hours of both partners decrease household and care time, they do not decrease the quality-time spent with children. An indirect relation between outsourcing and quality-time is found: females with a higher level of education (associated with more working hours and a higher income) spend more on outsourcing, but they also spend more quality-time with their children.

The calculated elasticities show outsourcing home cleaning and childcare is a normal good for the native Dutch, Moroccans, and Turks (especially for the immigrants the latter can be attributed to subsidies for childcare) and a luxury good for the Surinamese/Antilleans. For non-western immigrants as well as for the native Dutch outsourcing meal preparation is a normal good.

Appendix I Definition of variables used in the estimations

Dependent variables:

1. Total time allocated to household and care activities of both partners
2. Total outsourcing expenditures per month (ln)
3. Expenditures per month on home cleaning and childcare (including household help, window cleaner, and childcare) (ln)
4. Expenditures per month on outsourcing meal preparation (including takeaway food, delivery food, and eating out) (ln)
5. Expenditures per month on rest categories of outsourcing (including carwash and launderette/ dry cleaner's) (ln)
6. Quality-time with children: reading, playing games, help with home work (times per month)

Independent variables:

1. Working hours female,
2. constant for unknown working hours female
3. Working hours male,
4. constant for unknown working hours male
5. Children living at home in age categories 0 – 3, 4 – 11, 12 – 15, 16 – 25, >25 (reference group)
6. Level of education female: low (reference group), medium, high
7. Level of education male: low (reference group), medium, high
8. Living in an urban area y/n
9. Homeowner y/n
10. Religious affiliation (going to church, mosque, synagogue or temple > 1 per month) y/n
11. Dummy Surinamese/Antilleans with the native Dutch as reference
12. Dummy Moroccans with the native Dutch as reference
13. Dummy Turks with the native Dutch as reference
14. Health status (0 poor, 4 excellent)
15. Age female in categories: 18 – 34 (lowest is reference group), 35 – 44, 45 – 64, $\geq$ 65
16. Age male in categories: 18 – 34 (lowest is reference group), 35 – 44, 45 – 64, $\geq$ 65
17. Monthly net household income

Appendix II Distribution of the variables N=2170 (standard deviations in parentheses)

Total time spent on household and care activities by both partners in 24 hours	7.86 (4.95)
(ln) Total outsourcing expenditures per month	4.74 (1.51)
(ln) Expenditures per month on home cleaning and childcare	1.25 (2.07)
(ln) Expenditures per month on outsourcing meal preparation	4.10 (2.00)
(ln) Expenditures per month on rest categories of outsourcing (carwash and launderette/ dry cleaner's)	1.32 (1.68)
Quality-time with children (times per month)	34.08 (25.31)
Working hours female	12.92 (16.11)
Working hours male	24.75 (20.89)
Children at home 0-3 y/n	21.2%
Children at home 4-11 y/n	31.3%
Children at home 12-15 y/n	15.5%
Children at home 16-25 y/n	14.0%
Children at home >25 y/n	3.3% (reference group)
Level of education female*	
Low	24.5% (reference group)
Medium	39.6%
High	17.5%
Level of education male	
Low	21.6% (reference group)
Medium	33.9%
High	20.3%
Age female	
18 – 34	47.2% (reference group)
35 – 44	26.9%
45 – 64	19.0%
≥ 65	5.4%
Age male	
18 – 34	39.3% (reference group)
35 – 44	30.7%
45 – 64	22.5%
≥ 65	5.8%
Surinamese/Antilleans	28.0%
Moroccans	15.9%
Turks	27.6%
Living in an urban area	30.3%
Religious affiliation**	30.4%
Health***	2.69 (0.98)
Homeowner	40.1%
Net monthly household income (in Euro)	1613.50 (930.25)

* A low level of education: primary school and vocational education.
Medium level of education: lower and higher secondary education, pre-university education, and intermediate vocational education.
High level of education: people holding a bachelor's or a master's degree.
** going to a church, temple, mosque, or synagogue more than once per month
*** scale, 4 = excellent – 0 = poor.

6

Happiness in relation to lifestyle, overweight, health, and household production

6.1 Introduction

Although the importance of personal happiness may be different across cultures, it seems that in general, happiness is considered to be the ultimate goal of life, or at least desirable (Veenhoven, 2004; Frey and Stutzer, 2002). According to Kahneman *et al*. (1999) there are several levels in the analysis of quality of life. The upper level is the cultural and social context (definitions of the good life), the second level can be split into two: 1) subjective well-being (judgement, measurement); and 2) other aspects of quality of life (values, capacities, and tasks). In this chapter, we focus on (subjective) well-being. Let us first discuss the existing definitions of well-being, happiness, and quality of life.

Well-being implies satisfaction and happiness in a broad sense, including happiness with the society, the environment, health, housing, leisure, friends, marriage, and family life (Van Praag and Frijters, 1999; Antonides and Van Raaij, 1998). *Welfare* is defined as the evaluation, assigned by the individual, to income or to the contribution to his/her well-being from those goods and services that (s)he can buy with money, whereas *material welfare* considers material issues such as income and property (Van Praag and Frijters, 1999; Antonides and Van Raaij, 1998). *Happiness* is defined as the degree to which people positively evaluate their overall life situation (Veenhoven, 1997).

Although happiness is not identical to the economic concept of *utility* (as used in Chapter 4 and 5), it is closely related. In traditional economic theory an individual's utility is assumed to be an increasing function of present consumption of goods, leisure, and other amenities, with the income as a constraint for maximising utility (Frank, 1997). The analogue for utility constructed in psychological literature is *subjective well-being*, which is a measure of life satisfaction, although it includes more aspects of human well-being than utility (Frey and Stutzer, 2002; Frank, 1997).

According to Veenhoven (2000), quality of life, well-being, and happiness should not be used interchangeably, since they have a different meaning. Easterlin (2001), however, uses the terms interchangeably. In this chapter, we use the term '*happiness*', because in our view it fits people's overall judgement of life.

Earlier research shows that demographic and socio-economic indicators are significant predictors of happiness. Demographic factors like marriage and children affect happiness (Frey and

Stutzer, 2004; Argyle, 1999; Oswald, 1997; and Plug, 1997). Socio-economic factors like income and level of education are relevant as well (Frey and Stutzer, 2002; Bowler and Windsor, 2001; Easterlin, 2001; Gerdtham and Johannesson, 2001; Argyle, 1999; and Oswald and Frank, 1997). In addition, factors like health, religion, and culture have an influence on happiness (see among others Van Praag and Ferrer-i-Carbonell, 2004; Cohen, 2002; and Easterlin, 2001a).

In short, we could say that family relationships and finances are the most important areas in people's life, followed by one's own health, other people's health, work and social life (Bowling and Windsor, 2001).

In the previous chapters we have investigated the determinants of overweight, the demand for health, and household and care time in relation to outsourcing in the Netherlands, and we have studied differences between ethnic groups on these issues. In this chapter we integrate the topics of Chapters 3, 4, and 5 with the concept of happiness to study the effects of overweight, health, household and care time, and outsourcing on happiness and to study differences between immigrants and the native Dutch.

From the existing literature, we can learn a few things about overweight – happiness and health – happiness relationships. However, little is known about the relation between outsourcing household and care tasks and happiness. This chapter will show whether household and care time and outsourcing contributes to people's happiness, or not.

The purpose of this chapter is twofold. Firstly, to study whether socio-economic and demographic factors affect people's personal happiness and whether there are differences between native Dutch and immigrants. 'Classic' determinants of happiness, such as income, level of education, marital status, and gender are included in the research.

Secondly, new determinants are added to the research. The determinants studied in the previous chapters are included in the analyses in order to determine whether overweight, health, household and care time, and outsourcing predict happiness. We will also study whether immigrants differ from native Dutch in the effects of these topics on happiness.

For the measurement of people's happiness we use the Cantril question (1965), which is a 'ladder of life' where the bottom stands for the worst possible life situation and the tenth step is the best possible life. This makes the Cantril question very similar to *life satisfaction* or *happiness* (Van Praag and Frijters, 1999).

Section 6.2 includes a literature survey on happiness in relation to socio-economic and socio-demographic variables, overweight and health, time allocation, and outsourcing. Section 6.3 describes the data used for the analyses and measures of happiness among the native Dutch and immigrants. Section 6.4 gives estimations on self-reported happiness. Section 6.5 finishes with the conclusions and discussion.

6.2 Literature survey on happiness

6.2.1 Socio-economic factors of happiness

On average, people with more income are happier than those with less income. However, the average happiness across the life cycle remains constant, despite a substantial growth in income (Easterlin, 2001). At any given point in time in a specific country, people with higher incomes are happier than people with lower incomes. Nevertheless, over time, despite a considerable increase in income, happiness does not increase, due to the rise in aspirations (Frey and Stutzer, 2002; Easterlin, 2001; Ferrer-i-Carbonell and Van Praag, 2001; Groot and Maassen van den Brink, 1999). This is called preference drift (Van Praag, 1971).

In the US and the EU, the correlation between happiness and income is quite small but positive (Argyle, 1999; Oswald, 1997). And there are also "happy poor" people who are satisfied with what they have and who are adapted to their situation. Income has a great influence on subjective well-being for poor people; in poor countries a higher correlation exists between income and happiness compared to rich countries (Argyle, 1999; Veenhoven, 1997).

However, according to Cummins (2000) money makes people better of, but more money not always increases well-being. Rich people have a higher level of subjective well-being, but there is a ceiling beyond which income can no longer affect subjective well-being. Through increasing national wealth, if well distributed, the levels of a complete population may rise, but mainly for the poor (Cummins, 2000). According to Veenhoven (2002) not only objective indicators, like income, are needed to have an indication of happiness in society. Social indicators like 'civic moral' or 'perceived safety in the streets' matter as well if policymakers want to increase the happiness in society.

Others, conclude that in a wealthy society, investment in social capital will contribute more directly to happiness than efforts directed at generating income (Bjørnskov, 2003). And it may also be true that with respect to happiness, in rich countries, relative income is more important than absolute income (Frank, 1997; and Oswald, 1997). Cummins (2000) even suggests the opposite relation between income and happiness, meaning that people with a naturally high happiness score are more likely to become rich.

Also the relationship between education and happiness is somewhat mixed. Education has a positive effect on happiness (Gerdtham and Johannesson, 2001; Easterlin, 2001a). In several studies however, higher education is associated with a lower self-rated quality of life. This corresponds to the theory that people with higher levels of education have higher expectations of life and will therefore experience more dissatisfaction with their income, work and life than people with lower levels of education (Bowling and Windsor, 2001; Oswald, 1997). The relative unhappiness among higher educated may also be attributed to a lack of jobs at that level (Veenhoven, 1997).

The positive effect of education on happiness could be explained by its effects on income and occupational status (which is also positively related to happiness). Nevertheless, education could also

have a negative effect on happiness because of higher aspirations leading to an increased goal-achievement gap (Argyle, 1999).

Argyle (1999) also suggests the opposite direction between happiness and education: it is possible that happiness enhances success in education through its components of optimism and self-esteem. Both personally and in a society as a whole, unemployment decreases happiness (Frey and Stutzer, 2002). Also in other studies unemployment is negatively related to happiness (Gerdtham and Johannesson, 2001). Unemployment may even lead to suicidal behaviour (Oswald, 1997).

Now that we have studied the socio-economic determinants of happiness in the literature, we will study the effect of gender, marriage, and children on happiness.

6.2.2 Gender, marriage, children, and happiness

In general, women are happier than men (Easterlin, 2001a; Oswald, 1997). However, over the cohorts, women's happiness declines relative to men's (Easterlin, 2001a). Others state that the happiness of men and women does not differ much (Veenhoven, 1997). Some authors suggest a relationship between women's labour market discrimination and their life satisfaction (Frey and Stutzer, 2002). Women are also more extreme; if they are happy they are extremely happy, and if unhappy, they are extremely unhappy (Groot and Maassen van den Brink, 2000)

Married people are generally happier than unmarried people and also have a better mental health (Argyle, 1999; Oswald, 1997). In many cultures the husband tends to be older and somewhat higher educated than his wife. It is found that both men and women are happier in a marriage where the husband is older and higher educated than the wife (Groot and Maassen van den Brink, 2002).

There are, however, also studies that show a decline in happiness after marriage. An explanation could be that people get used to pleasant stimuli and therefore, their happiness decreases (Frey and Stutzer, 2004). Another study found that, when the marriage lasts longer, women's happiness score decreases from 9 to 7, while men's happiness score stays stable at 7 on a scale from 1 to 10 (Groot and Maassen van den Brink, 2000)

The effect of having children is rather small, but overall negative (Plug, 1997). Psychological factors like anxiety, stress, and disappointment over their children, but also economic factors (children cost money) are important for parents (Plug, 1997). On the other hand, the effect of having children on happiness could also be positive when parents enjoy their children growing up and receive love and affection from them (Argyle, 1999). The effect of children on happiness also depends on the age of children; young children affect the parents' happiness negatively (Argyle, 1999)

Happiness depends on the phase of the family life cycle, with having children under 5 and having adolescents being worst for marital satisfaction. Children are a source of satisfaction, affection and fun, but also a source of stress. In developing countries, children are a source of social security: the more the better (Argyle, 1999).

In short, the females' and males' happiness does not differ much and married people are happier than singles. In general, the effect of children on happiness is slightly negative (but small) and depends on the age of the children.

6.2.3 Health, age, and religion in relation with happiness

Health is one of the dominant concerns in most people's lives (Easterlin, 2001a; Veenhoven, 1997). However, the relationship between health and happiness is complicated. Bedranek *et al*. (2003) conclude that in the US, a healthy person may not be a happy person, and a happy person may not be a healthy person. Still, some factors seem to be of clear importance in the relationship between health and happiness. Health status has a strong positive effect on happiness (Van Praag and Ferrer-i-Carbonell, 2004; Ruhm, 2003).

People adapt to situations of discomfort and illness. For example, in general, chronically ill patients report higher levels of quality of life than could be expected given their condition. It may be true that these people relate their situation to a certain reference group in a familiar situation and find themselves in a better condition (Groot, 2000).

As discussed in Chapter 4, smoking decreases people's health. However, does smoking – which could also be seen as a 'pleasure' – also have a negative effect on happiness (maybe indirect through the negative effect on health)? In an US-study, compared to their happier counterparts, less happy people report a greater temptation to smoke (Rabois and Haaga, 2003) showing a relation between happiness and smoking. Another study finds that smoking is positively associated with female's happiness (Delfino *et al*., 2001). Others, however, find that unhappiness is associated with smoking (Koivumaa-Honkanen *et al*., 2003 in a Finnish study). These results indicate a vice-versa relationship between smoking and happiness and a positive as well as a negative relation between happiness and smoking could be hypothesised.

The relationship between age and happiness is U-shaped (Gerdtham and Johannesson, 2001; Oswald, 1997). People are the least happy between the age of 45 and 65 (Gerdtham and Johannesson, 2001). Being retired is positively associated with happiness in the EU and the US (Oswald, 1997). Another study shows that over the lifetime, happiness is quite constant in a (US) population (Easterlin, 2001a). Veenhoven (1997) suggests that old and young are about equally happy.

Although older people are objectively worse off (poorer health, lower income, partner deceased, etc.), they are more satisfied than younger people. A reason may be their adaptation to the situation they live in. Or they may have lower aspirations. Another reason might be an increase of religious activities and beliefs when people are older, because religion is more important for the elderly (Argyle, 1999).

With respect to happiness in the Netherlands, religion may be more important for immigrants as compared to the native Dutch. The non-western immigrants are more religious than the native Dutch. About 40 percent of the native Dutch is religious, against about 97 percent of the Moroccans

and Turks, and 75 percent of the Surinamese/Antilleans (SCP, 2004; SCP, 2000a; and Tubergen, 2003).

Many studies show a positive impact of religion on well-being, joy, and mental health (see for example review studies of Koenig *et al*., 2001; Cohen, 2002; Levin and Chatters, 1998; and Myers and Diener, 1995). Happiness is positively associated with the frequency of attendance at worship services (Ferris, 2002). Religiosity causes happiness, but it is difficult to determine why and the direction of the relationship is unclear (Cohen, 2002).

6.2.4 Happiness and overweight

As discussed in Chapter 3, overweight is negatively associated with socio-economic status (Grabauskas *et al.*, 2003; Visscher *et al.*, 2002; Van Lenthe *et al*., 2000; Averett and Korenman, 1996). There are several studies from different countries that indicate a negative relationship between overweight and happiness, although the severity of overweight seems to be of importance.

It is shown that in the US, females with a lack of perceived eating control (which is associated with more weight and a higher Body Mass Index (BMI)) have less life satisfaction (satisfaction with 1) friends; 2) work, schoolwork, or housework; 3) finances; 4) health; and 5) marriage or love relationship). For men, also a lack of perceived eating control is associated with less life satisfaction. Women report less eating control than men. For females life satisfaction is positively associated with age. Older, heavier men report a higher life satisfaction than younger, lighter men (Greeno *et al*., 1998).

A UK study shows that overweight people have significantly lower scores for physical well-being than people with normal weight. Overweight and obesity are associated with decreasing levels of both physical and emotional well-being. But this deterioration in health status is more evident in physical than emotional well-being, indicating that the burden of overweight is primary perceived as physical in nature (Doll *et al*., 2000).

There are studies that show a correlation between obesity and depression, other studies however, do not find this relationship. The relationship between depression and overweight may depend on the severity of the obesity (Groessl *et al*., 2004; Onyike *et al*., 2003; and Larsson *et al*., 2002).

There may be ethnic differences in the effect of overweight on happiness. In Chapter 4 we discussed that people from non-western cultures may associate overweight with welfare, peace, and having a good life. Research among students from South Asian, African and mixed ethnicity in Trinidad (Caribbean) shows that thin South Asians are more likely to be satisfied with their size than other thin adolescents in the study. Overweight Africans however, are more likely to be satisfied with their size than other overweight persons. The majority of the sample associated normal body size with good health, but also associated overweight and obese body size with wealth, while about 40 percent of them associate male overweight and obesity with happiness (Simeon, *et al*., 2003).

With respect to happiness, more cultural aspect may be of importance. We will discuss them separately.

6.2.5 Cultural differences, household tasks, and causes of (un)happiness

It is found that Northern European countries report the highest well-being, while southern European countries report the lowest well-being, and the central European countries are in between. In the EU, satisfaction levels are to a large extent affected by objective individual living conditions. But it is assumed that national or cultural characteristics, like cultural traits and value orientations, are also important in explaining satisfaction (Christoph and Noll, 2003).

Whites are happier than blacks (in the US), although in recent years, the differential has narrowed (Easterlin, 2001a). The Netherlands is among the countries with the happiest people in the world (Bjørnskov, 2003 and Veenhoven, 2001). A comparison of the happiness of the native Dutch and the non-western immigrants shows the following. In the Netherlands about twenty years ago (unfortunately there is no recent data), the Dutch were found to be the happiest, followed by the Moroccans, the Surinamese, and the Turks. Immigrants seem to be less happy than the Dutch (Verkuyten, 1986). This may be partly explained by their lower socio-economic status.

In general, in urban areas, blacks are less well-off than whites. Living in the largest urban areas may not necessarily ensure the highest quality of life (Geronimus, 1999). People living in urban areas may be unhappier than people living in rural areas. Urban areas have a higher mortality rate, a higher incidence of early deaths, and people have an (unhealthy) urban lifestyle (Claret *et al*., 2003; Mills, 1999; and Geronimus, 1999).

In Western countries, people tend to see personal happiness as the most important in life and often consider it as a fundamental right to pursue. Enjoyment in life may be more apparent in individualistic societies, whereas Asian cultures attach greater importance to meet their social obligations than to be happy (Ahuvia, 2002). This may (partly) explain differences in happiness between people from different cultures. Veenhoven (2004) shows that in present day developed nations, individualisation adds to people's happiness, contrary to what people might expect.

Earlier studies do not mention much about a possible relation between household and care time, outsourcing, and happiness. However, some is known about the effect of time-pressure within households and people's tendency to seek comfort, which may explain why people tend to outsource household and care activities.

According to Scitovsky (1978), Western people are pleasure-seekers. There is a conflict between comfort and pleasure. Scitovsky claims that novelty is an object of desire and a source of satisfaction, and this novelty-stimulus is among the most fundamental human needs. In seeking novelty, conflicts arise. Pleasant activities are positive and stimulating, while aiming at comfort is trying to avoid pain and discomfort, and skills need to be acquired.

In our wealthy society, the costs of comfort have decreased, whereas pleasure has not increased because it is crowded out by comfort (Bianchi, 2003). Scitovski (1978) gives the following reason: comfort is not only pleasurable, but also addictive. Therefore, people get and pay for more comfort than is necessary for a good life, and some comforts even crowd out some happiness in life.

The Netherlands is among the countries that work at very high speed and have tight deadlines (besides Sweden, Finland, and Germany), make long working days, and have a relatively high GNP per capita (Garhammer, 2002). In the EU, more and more people feel time stress. People tend to carry out more activities within the given time and try to do more things simultaneously, like watching TV, taking care of children, and cooking. All of this results in feeling a time-crunch which leads to consumers looking for experiences that save time. This constant rush through simultaneous tasks, role overload, and novel experiences is associated with a sense of stimulation, which could even lead to stress-related health problems. Leisure becomes more and more subject to the time economy and becomes an activity that is similar to work (Garhammer, 2002).

Despite this constant time-pressure, the Netherlands is third highest in happiness rank (just after Denmark and Sweden) (Garhammer, 2002). This could be explained by the fact that quality of life is associated with economic advancement of societies. Still, happiness is always determined by culture as well (Sirgy, 2001). Garhammer (2002) explains the relatively high levels of happiness in societies like the Netherlands from the fact that people are able to adapt to time pressure and seek for time policies to diminish the social causes of stress. This brings us to the relation between happiness and outsourcing of household and care tasks.

In Chapter 5 we learned that according to the household production theory people gain utility from household and care time. Outsourcing might contribute to people's happiness (utility and happiness are closely related as discussed earlier), because it relieves their time-pressure. The effect, however, may be different for males and females. For the latter, the effect may be greater, since mostly women combine market labour with household labour causing time-pressure. Outsourcing household and care tasks cost money, which lowers the household budget. Therefore, the type of relation between outsourcing and happiness could either be positive or negative.

Based on the literature, hypotheses can be formulated with respect to the variables used in this research. Scheme 6.1 depicts the hypothesized effect of each variable on happiness.

Scheme 6.1 Expected effects of happiness determinants

Gender (female)	+/–
Surinamese/Antilleans	–
Moroccans	–
Turks	–
Level of education	+/–
Age	+/–
Smoking y/n	–
BMI ≥ 25.00	+/–
Health	+
Married/cohabiting	+
Children living at home	+/–
Working hours	+/–
Household income	+
Unemployment	–
Total outsourcing expenditures	+
Total household and care time	+/–
Homeowner	+
Living in an urban area	–
Religious affiliation	+

+ positive effect, – negative effect, +/– either positive or negative effect expected

In agreement with the literature, it is expected that between the sexes, happiness will not differ much (Veenhoven, 1997). Some studies show a higher happiness of females (Easterlin, 2001a; Oswald, 1997). However, women's poorer health and usually lower socio-economic status compared to men, they may however, be less happy than men.

Based on an earlier study (Verkuyten, 1986), a lower mean happiness is hypothesised for the immigrant groups (the Surinamese/Antilleans, Moroccans, and Turks) compared to the native Dutch.

A mixed effect of education on happiness is expected. A higher level of education is related to a higher income, which affects happiness. But as aspirations rise with the level of education, the effect on happiness may as well be negative. More working hours generates more income, which is positively related to happiness. But more working hours may also cause more stress, and may therefore have a negative effect on happiness. Literature shows that unemployment makes people unhappy (Frey and Stutzer, 2002; Gerdtham and Johannesson, 2001; and Oswald, 1997).

The effect of age could also be either positive or negative. People can be more satisfied at an older age, but there are studies showing that people are the least happy when aged between 45 and 65.

Although the relation between health and happiness is somewhat complicated (as discussed earlier), the overall effect of health on happiness will be positive. Based on the literature, the effect of overweight on happiness is expected to be small. In Chapter 4 we showed, overweight affects health negatively (only for the native Dutch and the Surinamese/Antilleans in our sample).

People who are married or live together are expected to be happier than people who live alone. The effect of having children could be small and negative, as found in earlier studies. On the other hand, the effect might also be positive as parents enjoy seeing their children growing up and receiving love and affection from them.

As discussed in Chapter 5, people may outsource household and care activities in order to have less stress in the combination of market labour and household and care time. Therefore, we expect a positive relation between outsourcing and happiness. A mixed relation between time spent on household and care activities and happiness is assumed. People staying at home to take care of (small) children might like household and care activities, since it was their rational choice (temporarily) not to work on the labour market (selection effect). These people may be happy with their situation, whereas others also dislike the household and care activities, because of the stress of combining household and market labour.

6.3 Data and descriptive analyses of happiness

See Chapter 2 for a detailed description of the data and the data gathering. To measure happiness, respondents were asked to grade their over-all happiness on a 10-point scale according to Cantril (1965). Since all variables used in this chapter have been extensively described in other chapters, we only consider happiness and give some descriptives of this variable from the sample[1].

Table 6.1 gives the mean values of happiness for males and females in the sample.

Table 6.1 Mean self-reported happiness of males and females in whole sample (standard error in parentheses)

	Native Dutch (n= 697)	**Surinamese/ Antilleans (n= 687)**	**Moroccans (n= 423)**	**Turks (n=676)**
Females[b]	7.56 *(0.07)*	7.35 *(0.07)*	7.41 *(0.10)*	7.05 *(0.07)*
Males[b]	7.58 *(0.09)*	7.37 *(0.08)*	7.37 *(0.09)*	7.23 *(0.08)*

ANOVA:
a: significant main effects of gender across the four groups; effect not found
b: significant main effects of ethnicity among males and females
c: significant interaction effects; effect not found (ANOVA)

With respect to happiness, males and females do not differ significantly and there is no interaction effect found between gender and ethnicity either. However, some differences between the four groups and between the genders can be found.

On average, the native Dutch are happier than people from the non-western immigrant groups. The differences in happiness between the four groups are significant ($F = 10.646$, $p < 0.01$). The Moroccans are the most similar to but also unhappier than the native Dutch, followed by the Surinamese/Antilleans, whereas the Turks are the least happy.

The native Dutch and the Surinamese/Antillean females and males report about the same happiness. For Moroccan and Turkish males and females the figures are more different. Moroccan

[1] See Chapter 2 (section 2.5) for the distribution of the variables age, household income, level of education, working hours, religious affiliation, living in an urban area, marital status, and children living at home. See Chapter 3 (section 3.3) for the distribution of overweight. See Chapter 4 (section 4.4) for a description of health. See Chapter 5 (section 5.5) for a description of outsourcing household and care activities.

women are happier than Moroccan men, while for Turks the reverse it true; Turkish women are less happy than Turkish men.

Table 6.2 gives the mean happiness of people who are married/living together, single, or divorced. Singles include one-parent families as well as people living alone. The happiness of divorced people is also shown separately in the last column.

Table 6.2 Mean self-reported happiness of males and females in whole sample (standard error in parentheses)

	Married/ cohabiting	**Single**	**Divorced** [b]
No children	7.26 *(0.10)*	7.16 *(0.08)*	7.02 *(0.15)*
Children	7.31 *(0.12)*	7.22 *(0.11)*	7.20 *(0.18)*

ANOVA:
a: significant main effects of having children across the three groups; effects not found
b: significant main effects being married, single, or divorced among household with and without children
c: significant interaction effects between married/living together and having children; effects not found
d: significant interaction effects between divorced and having children; effects not found

There is no interaction effect between being married/living together and having children, or between being divorced and having children. There is no significant effect for having children in the three above-mentioned groups either. However, divorced people are significantly less happy than people who are not divorced ($F = 3.647$, $p < 0.10$). For singles, as well as for divorced people or people who are married or live together, having children makes them happier.

Table 6.3 shows whether there are differences in happiness between people with and without overweight (defined as Body Mass Index ≥ 25.00).

Table 6.3 Mean self-reported happiness of respondents with or without overweight* (standard error in parentheses)

	Native Dutch	**Surinamese/ Antilleans**	**Moroccans**	**Turks**
Overweight [a]	7.47 *(0.08)*	7.22 *(0.08)*	7.26 *(0.11)*	7.10 *(0.08)*
Normal weight	7.64 *(0.07)*	7.47 *(0.07)*	7.50 *(0.09)*	7.10 *(0.08)*

ANOVA:
a: significant main effects of being overweight across the four groups
b: significant main effects of ethnicity among respondents with or without overweight
c: significant interaction effects

All groups report a lower mean value of happiness when overweight, except for the Turks. The effect of overweight on happiness differs significantly between the four groups ($F = 4.189$, $p < 0.05$). But the Turks do not seem to 'suffer' from their overweight.

As discussed in Chapter 4 and in section 6.2, people from non-western cultures may not experience overweight as unhealthy, but rather associate it with a life in peace and welfare. But then, we could also expect no (or only a little) effect from overweight on happiness for the other immigrant groups. In Chapter 4 we mentioned that in their behaviour and lifestyle, the Surinamese/Antilleans women are quite comparable to the native Dutch.

The lower mean value of happiness for overweight Moroccans may have been caused by the relative over-representation of young Moroccans in our sample. Especially women in western countries may suffer from discrimination because of overweight, which causes a lower mean value of happiness. Young immigrants are more 'adapted' to the Dutch society than older Moroccans and may be less happy due to overweight (because of discrimination), whereas older Moroccans associate overweight with a good life in peace and welfare (see Chapter 3 for a discussion in this topic).

Table 6.4 shows the happiness of our respondents over the different health categories.

Table 6.4 Mean self-reported happiness of whole sample per self-reported health category (standard error in parentheses)

	Happiness[a]
Excellent health	7.99 *(0.06)*
Very good health	7.53 *(0.04)*
Good health	7.14 *(0.06)*
Fair health	6.58 *(0.09)*
Poor health	5.66 *(0.13)*

ANOVA: a: significant main effects of health

Table 6.4 clearly shows that with a decrease in health, people become less happy. The differences in health in relation to happiness are significant ($F = 99.050$, $p < 0.01$). As health decreases, the variation in self-reported happiness increases (higher standard error). This indicates that, although people in poor health are less happy, there are also people in poor health who report being quite happy. These people seem to put up with their health situation.

Table 6.5 gives the values for reported happiness over different age categories.

Table 6.5 Mean self-reported happiness per ethnic group for each age category (standard errors in parentheses)

	Native Dutch [b, c]	**Surinamese/ Antilleans** [b, c]	**Moroccans** [b, c]	**Turks** [b, c]
Aged 18 – 34 [a]	7.59 (0.100)	7.40 (0.092)	7.59 (0.086)	7.13 (0.069)
Aged 35 – 44 [a]	7.75 (0.108)	7.52 (0.097)	7.11 (0.146)	7.13 (0.101)
Aged 45 – 64 [a]	7.50 (0.094)	7.22 (0.094)	7.13 (0.185)	7.18 (0.164)
Aged $\geq$ 65 [a]	7.42 (0.124)	6.97 (0.228)	6.40 (0.439)	6.91 (0.418)

ANOVA:
a: significant main effects of age across the four groups, effects not found
b: significant main effects of ethnicity across the different age categories
c: significant interaction effects

Our sample does not show the U-shaped effect for age as described in section 6.2. In fact, all groups, when people become older, become less happy, although the native Dutch and the

Surinamese/Antilleans have a small 'revival' in happiness between the ages of 35 and 44. The differences in happiness across the age-brackets are significant ($F = 3.817$, $p < 0.01$). The differences in happiness between the age-brackets across the four groups are also significant ($F = 1.750$, $p < 0.10$), implying that the native Dutch and immigrants differ significantly in their happiness across the age-brackets. Here also the native Dutch and immigrants differ significantly in their happiness ($F = 8.951$, $p < 0.01$).

In our sample, people who outsource home cleaning, childcare, meal preparation, and/or make use of the car wash or launderette/dry cleaner's have a higher mean happiness (7.38 with a standard error of 0.030, results not in table) than people who do not outsource (7.24 with a standard error of 0.076, results not in table)[2]. The relation between outsourcing and happiness could be indirect, because income is an important determinant of outsourcing (as learned in Chapter 5). In Chapter 7, we will study also the reverse relationship between happiness and outsourcing.

The single-variate analyses of our data do not show that women are happier than man, as suggested in the literature (Easterlin, 2001a; Oswald, 1997). Veenhoven (1997) however, suggest that males' and females' happiness does not differ much.

The literature finds a (small) negative effect of having children on happiness (Plug, 1997). Single and divorced respondents in our sample are happier when they have children. Married or cohabiting respondents are happier as well when they have children, but the effect is much smaller.

In the literature, mixed effects are found between overweight and health. Our sample shows that all groups, except the Turks, are happier when not being overweight. The U-shaped relation between age and happiness (Gerdtham and Johannesson, 2001; Oswald, 1997) is not found in our sample. The native Dutch and Surinamese/Antilleans are the happiest between the age of 35 and 44. Moroccans are the happiest when aged between 18 and 34, whereas the happiness of the Turks is quite constant over the age categories.

6.4 Multivariate analysis of happiness determinants

To study the effects of the classical socio-economic and demographic determinants of happiness and the 'new' determinants of happiness (overweight, health, household and care time and outsourcing), a linear regression is conducted. Self-reported happiness on an ordinal 10-point scale (Cantril, 1965) is used as a dependent variable. Because the ordinal 10-point scale is not very different from a normal distribution[3], it can be used as a continuous variable on which Ordinary Least Squares Regression can be performed.

[2] The effect is significant with $F = 2.994$, and $p < 0.10$.

[3] To measure whether the Cantril-scale is normally distributed, the following rule is taken: $\mu \pm 1 \cdot \sigma$: 70 % of the sample and $\mu \pm 2 \cdot \sigma$: 95% of the sample. In our case these figures are 86% and 100%, indicating that compared to a normal distribution, the Cantril-scale slightly right-sided distributed.

A few of the studied relationships of happiness may be reverse. These reverse relationships will be studied in Chapter 7.

Because the respondent's happiness is measured, we only include the respondent's characteristics (and not for a partner as done in the previous chapter). As independent variables the following variables are used: gender (female), dummies for ethnicity (Surinamese/Antillean, Moroccan, and Turkish, with the native Dutch as a reference group), level of education, age, smoking, overweight (BMI $\geq$ 25.00), health (on a 5-point scale, 4 excellent, 0 poor), married/living together, dummies for children living at home (in different age categories), working hours of the respondent, household income, unemployment, total outsourcing expenditures, household and care time of the respondent, being a homeowner, living in an urban area, and religious affiliation. See Appendix I for a definition of these variables.

First, an Ordinary Least Squares (OLS) regression is done for the whole sample. The results are shown in Table 6.6.

Table 6.6 OLS regression on self-reported happiness for whole sample (t-values in parentheses)

			St. coeff.
Constant	6.043	*(38.910)***	
Female	0.110	*(1.760)**	0.039
Native Dutch	*ref.*	*group*	
Surinamese/Antilleans	-0.195	*(-2.516)***	-0.062
Moroccans	-0.128	*(-1.331)*	-0.034
Turks	-0.268	*(-3.120)****	-0.086
Low level of education	*ref.*	*group*	
Medium level of education	-0.024	*(-0.354)*	-0.008
High level of education	-0.075	*(-0.893)*	-0.022
Age 18 – 34	*ref.*	*group*	
Age 35 – 44	0.032	*(0.419)*	0.010
Age 45 – 64	-0.092	*(-1.074)*	-0.027
Age ≥ 65	-0.172	*(-1.318)*	-0.031
Smoking y/n	-0.120	*(-2.376)***	-0.047
BMI ≥ 25.00	0.014	*(0.758)*	0.014
Health	0.484	*(17.181)****	0.347
Married/cohabiting	0.092	*(1.146)*	0.031
Single parents with children 0 – 3	-0.298	*(-1.147)*	-0.022
Single parents with children 4 – 11	0.180	*(0.926)*	0.019
Single parents with children 12 – 15	0.187	*(0.802)*	0.016
Single parents with children 16 – 25	-0.351	*(-1.720)**	-0.034
Single parents with children > 25	*ref.*	*group*	
Couples with children 0 – 3	-0.142	*(-1.750)**	-0.040
Couples with children 4 – 11	-0.114	*(-1.507)*	-0.037
Couples with children 12 – 15	-0.034	*(-0.382)*	-0.009
Couples with children 16 – 25	0.096	*(1.056)*	0.023
Couples with children > 25	*ref.*	*group*	
Working hours 1 – 20	0.165	*(1.764)**	0.039
Working hours 21 – 40	-0.005	*(-0.061)*	-0.002
Working hours 41 – 60	0.063	*(0.446)*	0.010
Working hours > 60	*ref.*	*group*	
Household income	0.004	*(2.095)***	0.051
Total outsourcing expenditures	0.002	*(0.159)*	0.003
Total household and care time	-0.018	*(-1.501)*	-0.035
Homeowner	0.091	*(1.447)*	0.032
Living in an urban area	0.082	*(1.356)*	0.027
Unemployed	-0.124	*(-0.761)*	-0.015
Religious affiliation	0.134	*(2.228)***	0.044
# Observations	2407		
Adjusted R^2	0.150		
F statistic	14.748		

** p < 0.10, ** p < 0.05, *** p < 0.01*

The female respondents in our sample are significantly happier than the males. The Surinamese/Antilleans and Moroccans are significantly less happy than the native Dutch. This could be caused by their lower socio-economic status as compared to the native Dutch. Although figures in section 6.3 show a lower mean happiness for the Turks, the regression shows that they are not significantly less happy than the native Dutch, when other determinants are accounted for.

The older respondents in our sample are not significantly less happy than the younger respondents. Being married or living together does not contribute significantly to personal happiness. Having very young children negatively affects the happiness of people who are married or living

together. The happiness of single parents is significantly lower when they have children aged between 16 and 25 living at home.

According to the standardised coefficients in Table 6.6, health is by far the most important determinant of happiness. Smokers are less happy than non-smokers, although this effect may partly go via health (because they report a poorer health, see also Chapter 4). There is no significant relationship between overweight and happiness.

As expected, household income is an important determinant of happiness. Working hours do not contribute significantly to happiness, except for 1 to 20 working hours per week. This may be an effect for women, who combine market labour with household and care activities.

Household and care time, and outsourcing do not contribute significantly to happiness. The effect of outsourcing may be indirect and may be overruled by income. Religious people are happier than irreligious people. This effect is mainly caused by the immigrants (mainly Moroccans and Turks), who are in general more religious than the native Dutch (see Chapter 2)

The determinants of happiness may differ between the sexes. Therefore, the above-described OLS regression is re-estimated separately for males and females. Table 6.7 shows the results.

Table 6.7 OLS regression on self-reported happiness for males and females (t-values in parentheses)

	females		males	
Constant	6.118	*(31.114)***	6.079	*(26.363)***
Native Dutch	*ref.*	*group*	*ref.*	*group*
Surinamese/Antilleans	-0.157	*(-1.517)*	-0.248	*(-2.052)***
Moroccans	0.066	*(0.484)*	-0.288	*(-2.032)***
Turks	-0.241	*(-2.082)***	-0.267	*(-1.987)***
Low level of education	*ref.*	*group*	*ref.*	*group*
Medium level of education	0.107	*(1.171)*	-0.169	*(-1.651)**
High level of education	0.075	*(0.646)*	-0.235	*(-1.907)**
Age 18 – 34	*ref.*	*group*	*ref.*	*group*
Age 35 – 44	0.058	*(0.564)*	-0.003	*(-0.028)*
Age 45 – 64	-0.079	*(-0.656)*	-0.101	*(-0.790)*
Age ≥ 65	-0.225	*(-1.221)*	-0.005	*(-0.025)*
Smoking y/n	-0.095	*(-1.145)*	-0.196	*(-2.290)***
BMI ≥ 25.00	0.030	*(1.456)*	-0.057	*(-1.258)*
Health	0.441	*(11.987)****	0.541	*(12.188)****
Married/cohabiting	0.177	*(1.556)*	-0.008	*(-0.067)*
Single parents with children 0 – 3	-0.315	*(-1.171)*	0.105	*(0.066)*
Single parents with children 4 – 11	0.156	*(0.761)*	-0.252	*(0.272)*
Single parents with children 12 – 15	0.248	*(1.012)*	-0.472	*(-0.503)*
Single parents with children 16 – 25	-0.492	*(-2.184)***	0.231	*(0.460)*
Single parents with children > 25	*ref.*	*group*	*ref.*	*group*
Couples with children 0 – 3	-0.385	*(-3.492)****	0.192	*(1.537)*
Couples with children 4 – 11	-0.092	*(-0.927)*	-0.192	*(-1.6`7)*
Couples with children 12 – 15	-0.161	*(-1.341)*	0.126	*(0.919)*
Couples with children 16 – 25	-0.055	*(-0.446)*	0.263	*(1.900)**
Couples with children > 25	*ref.*	*group*	*ref.*	*group*
Working hours 1 – 20	0.180	*(1.601)*	0.174	*(0.970)*
Working hours 21 – 40	-0.074	*(-0.704)*	0.088	*(0.747)*
Working hours 41 – 60	-0.208	*(-0.702)*	0.177	*(1.011)*
Working hours > 60	*ref.*	*group*	*ref.*	*group*
Household income	0.004	*(1.366)*	0.001	*(1.757)**
Total outsourcing expenditures	0.006	*(0.303)*	-0.005	*(-0.220)*
Total household and care time	-0.009	*(-0.628)*	-0.050	*(-2.138)***
Homeowner	0.084	*(0.995)*	0.097	*(1.006)*
Living in an urban area	0.059	*(0.730)*	0.083	*(0.906)*
Unemployed	-0.516	*(-2.042)***	0.254	*(1.137)*
Religious affiliation	0.194	*(2.305)***	0.073	*(0.798)*
# Observations	1347		1059	
Adjusted R^2	0.149		0.164	
F statistic	8.837		7.900	

** p < 0.10, ** p < 0.05, *** p < 0.01*

Only Turkish females are significantly less happy than native Dutch females, whereas for males, all immigrants are less happy than the native Dutch. While level of education does not contribute to happiness in the regression for the whole sample, the results of the regression for males are different. Males' happiness decreases with the level of education. In the literature this effect is explained by the rise of aspirations along with an increased level of education. This effect is not found for females.

Having very young children is only significantly negatively related to happiness for females who are married or live together. In most cases, females do less market labour or even stop working, when children enter the household. This may have a negative effect on their happiness, because of

regret lack of self-efficacy and having to deal with the largest part of raising the children. For males, there is no negative effect of having children, but a positive effect of children aged above 15.

Especially males become less happy from household and care activities, while for women no significant effect is found. We will come back to this issue in the discussion.

Unemployed women are less happy than employed women. No significant unemployment effect for men is found. Women are significantly happier when they are religious. This effect is not found for males. Literature shows that in general, females are more religious than males. This may be an explanation for the higher mean happiness of the women in our sample.

Only males are significantly more happy when household income increases. And men are less happy when higher educated. These findings may be related to the earlier mentioned 'preference drift'.

For males and females, no significant effect is found for outsourcing. As mentioned above, the outsourcing effect may be indirect via income.

To study the effect of outsourcing further, the OLS regression was repeated, with the expenditures on outsourcing separated in three categories (see also Chapter 5): 1) expenditures on home cleaning and childcare; 2) expenditures on outsourcing meal preparation; and 3) expenditures on the carwash and the launderette/dry cleaner's. Again, neither of the outsourcing categories is significant (results not shown). This means that people do not become happier from outsourcing household and care activities. The outsourcing effect however, may have been overruled by the effect of income.

The determinants of happiness may differ across the four ethnic groups. Table 6.8 shows the estimation for the native Dutch, the Surinamese/Antilleans, Moroccans, and Turks.

Table 6.8 OLS regression on self-reported happiness for the native Dutch and the immigrant groups (t-values in parentheses)

	native Dutch		**Surinamese/Antilleans**		**Moroccans**		**Turks**	
Constant	6.579	*(31.032)***	5.782	*(25.306)****	5.690	*(16.616)****	5.302	*(15.484)****
Gender (female)	0.013	*(0.145)*	0.003	*(0.026)*	0.338	*(1.825)**	0.186	*(1.055)*
Low level of education	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Medium level of education	-0.042	*(-0.427)*	-0.104	*(-0.875)*	-0.104	*(-0.607)*	0.055	*(0.340)*
High level of education	-0.120	*(-1.061)*	-0.075	*(-0.564)*	-0.325	*(-1.495)*	-0.026	*(-0.101)*
Age 18 – 34	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Age 35 – 44	0.209	*(1.794)**	0.073	*(0.600)*	-0.293	*(-1.524)*	-0.004	*(-0.024)*
Age 45 – 64	-0.097	*(-0.854)*	-0.012	*(-0.091)*	-0.222	*(-0.909)*	0.148	*(0.529)*
Age ≥ 65	-0.186	*(-1.263)*	-0.073	*(-0.319)*	-0.869	*(-1.532)*	-0.133	*(-0.236)*
Smoking y/n	-0.116	*(-1.446)*	-0.270	*(-2.757)****	-0.155	*(-0.840)*	-0.063	*(-0.448)*
BMI ≥ 25.00	-0.020	*(-0.575)*	-0.044	*(-1.103)*	-0.014	*(-0.272)*	0.039	*(1.138)*
Health	0.327	*(7.485)****	0.459	*(9.960)****	0.514	*(6.841)****	0.558	*(8.533)****
Married/cohabiting	0.183	*(1.822)**	-0.013	*(0.104)*	-0.082	*(-0.329)*	0.255	*(1.056)*
Single parents with children 0 – 3	0.611	*(1.189)*	-0.636	*(-2.280)***	-1.235	*(-0.928)*	0.008	*(0.008)*
Single parents with children 4 – 11	-0.897	*(-2.585)****	0.356	*(1.616)*	0.184	*(0.257)*	0.114	*(0.151)*
Single parents with children 12 – 15	0.702	*(1.572)*	0.215	*(0.838)*	0.123	*(0.158)*	-0.378	*(-0.426)*
Single parents with children 16 – 25	-0.735	*(-2.287)***	0.182	*(0.785)*	-2.680	*(-2.611)****	-0.654	*(-0.984)*
Single parents with children > 25	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Couples with children 0 – 3	0.208	*(1.576)*	-0.287	*(-1.759)**	-0.285	*(-1.575)*	0.081	*(0.441)*
Couples with children 4 – 11	-0.137	*(1.152)*	-0.165	*(1.180)*	0.049	*(0.271)*	-0.152	*(-0.165)*
Couples with children 12 – 15	-0.141	*(-0.983)*	0.047	*(0.307)*	-0.090	*(-0.382)*	-0.033	*(-0.165)*
Couples with children 16 – 25	-0.218	*(-1.589)*	-0.080	*(-0.547)*	0.164	*(0.711)*	0.399	*(1.754)**
Couples with children > 25	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Working hours 1 – 20	0.073	*(0.573)*	0.538	*(3.214)****	0.147	*(0.629)*	0.033	*(0.136)*
Working hours 21 – 40	-0.044	*(-0.396)*	0.335	*(2.577)****	-0.012	*(-0.068)*	-0.162	*(-0.877)*
Working hours 41 – 60	0.036	*(0.188)*	0.514	*(2.307)***	-0.159	*(-0.454)*	-0.126	*(-0.334)*
Working hours > 60	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*	*ref.*	*group*
Household income	0.004	*(1.809)**	0.011	*(0.472)*	0.007	*(1.429)*	0.008	*(1.489)*
Total outsourcing expenditures	-0.020	*(-0.929)*	0.016	*(0.694)*	0.035	*(1.090)*	-0.003	*(-0.087)*
Total household and care time	0.002	*(0.104)*	0.036	*(1.634)*	-0.005	*(-0.165)*	-0.068	*(-2.508)***
Homeowner	0.141	*(1.612)*	0.143	*(1.439)*	0.353	*(1.986)***	-0.004	*(-0.027)*
Living in an urban area	0.008	*(0.066)*	0.057	*(0.672)*	0.075	*(0.538)*	0.161	*(1.102)*
Unemployed	0.484	*(1.411)*	-0.402	*(-1.472)*	-0.215	*(-0.453)*	-0.122	*(-0.384)*
Religious affiliation	0.080	*(0.886)*	-0.054	*(-0.553)*	0.267	*(1.705)**	0.333	*(2.178)***

Table 6.8 (continued)

# Observations	678	664	398	664
Adjusted R^2	0.131	0.214	0.219	0.115
F statistic	4.657	7.450	3.705	4.081

** p < 0.10, ** p < 0.05, *** p < 0.01*

The OLS regressions for the separate groups reveal some differences between the native Dutch and immigrants. In the earlier regressions, no significant effect for age is found. In this regression native Dutch respondents aged between 35 and 44 are significantly happier than older people. For the immigrant groups no relation is found between age and happiness.

For all groups, health is a very important determinant for happiness. Again for being married/living together no significant effect on happiness is found. However, native Dutch respondents who are married or live together are happier than native Dutch singles. In the discussion, we will come back to this issue.

Across the four groups, there are mixed effects of having children. Native Dutch single-parents are less happy when they have children aged between 4 and 11, or between 16 and 25 (no effects for couples). Both Surinamese/Antillean single-parents and couples are less happy when they have very young children. Moroccan single-parents are less happy when they have children aged between 16 and 25, while Turkish couples are happier when they have children living at home aged between 16 and 25.

The Surinamese/Antilleans are happier when they have a paid job. Only for the native Dutch household income is significantly related to happiness. The effect is also positive for the other groups, but not significant (although the positively significant effect for owning a home for Moroccans may be an indirect effect of income).

Only the Moroccans and Turks are happier when they have a religious affiliation. This could be explained by the fact that for these groups, religion is far more important than for the native Dutch (SCP, 2004; Tubergen, 2003).

In Chapter 5 together with the demand for household and care time and the demand for outsourcing, we have estimated the demand for quality-time. We found that women who have more working hours (and who are higher educated) have less household and care time, while they outsource more and spend more quality time with their children.

This brings us to the question when people outsource household and care activities which give them the opportunity to spend more quality-time with their children, will this quality-time with their children also make them happier? Therefore, we include our quality-time indicators as used in Chapter 5[4] and repeat the estimation for households with children. The result is shown in Table 6.9.

[4] See section 5.6.2 for a description of these indicators.

Table 6.9 OLS regression on self-reported happiness for households with children, including quality-time (t-values in parentheses)

Constant	6.208	*(18.942)***
Female	0.140	*(1.376)*
Native Dutch	*ref.*	*group*
Surinamese/Antilleans	-0.124	*(-1.013)*
Moroccans	-0.138	*(-0.961)*
Turks	-0.223	*(-1.771)**
Low level of education	*ref.*	*group*
Medium level of education	0.006	*(0.067)*
High level of education	-0.021	*(-0.168)*
Age 18 – 34	*ref.*	*group*
Age 35 – 44	0.051	*(0.511)*
Age 45 – 64	-0.040	*(-0.301)*
Age ≥ 65	-0.128	*(-0.373)*
Smoking y/n	-0.043	*(-0.505)*
BMI ≥ 25.00	0.028	*(1.238)*
Health	0.481	*(11.673)****
Married/cohabiting	-0.036	*(-0.141)*
Singles with children 0 – 3	-0.472	*(-1.342)*
Singles with children 4 – 11	-0.193	*(-0.698)*
Singles with children 12 – 15	-0.003	*(-0.013)*
Singles with children 16 – 25	-0.630	*(-2.168)***
Singles with children > 25	*ref.*	*group*
Couples with children 0 – 3	-0.210	*(-1.216)*
Couples with children 4 – 11	-0.342	*(-3.271)****
Couples with children 12 – 15	-0.099	*(-0.986)*
Couples with children 16 – 25	-0.041	*(-0.359)*
Couples with children > 25	*ref.*	*group*
Working hours 1 – 20	0.173	*(1.307)*
Working hours 21 – 40	-0.114	*(-1.014)*
Working hours 41 – 60	-0.039	*(-0.198)*
Working hours > 60	*ref.*	*group*
Household income	0.005	*(1.907)**
Total outsourcing expenditures	0.009	*(0.425)*
Total household and care time	-0.029	*(-1.894)**
Homeowner	0.048	*(0.531)*
Living in an urban area	0.126	*(1.453)*
Unemployed	-0.051	*(-0.213)*
Religious affiliation	0.238	*(2.778)****
Quality time indicator 1[a]	-0.001	*(-0.014)*
Quality time indicator 2 [b]	0.013	*(3.199)****
# Observations	1356	
Adjusted R^2	0.132	
F statistic	7.240	

* p < 0.10, ** p < 0.05, *** p < 0.01

a: Quality time indicator 1 includes reading to children and playing games with children

b: Quality time indicator 2 includes helping children with homework

In households with children, people become less happy from household and care time. The household and care time in households with children will be relatively high, as compared to households without children.

People living in an urban area are happier than people living in rural areas. People living in the city may work more and have more opportunities to outsource their household and care activities, which gives them more leisure and more time to spend with their children.

The quality indicators show that people do not become happier from reading to their children or playing with them. However, people are happier when they help their children with their homework. Apparently, people like to spend quality-time with their children, but like certain "quality-time activities" more than others. The relationship may also be reverse. Happy parents may like helping their children with their homework, while less happy parents do not like that.

6.5 Conclusions and discussion

The purpose of this chapter was to study whether the 'classic' determinants of happiness as well as health, overweight, household and care time, and outsourcing affect peoples' happiness. We also studied whether non-western immigrants differ from native Dutch in the effects of these topics on happiness. Scheme 6.2 gives an overview of the expected and confirmed effects of happiness determinants.

Scheme 6.2 Expected and confirmed effects of happiness determinants

	expected	**confirmed**	
Gender (female)	+/–	Yes	
Surinamese/Antilleans	–	Yes	
Moroccans	–	Yes	(only males)
Turks	–	Yes	
Level of education	+/–	Yes	(only for males)
Age	+/–	No	
Smoking y/n	–	Yes	
BMI ≥ 25.00	+/–	No	
Health	+	Yes	
Married/cohabiting	+	Yes	(only for the native Dutch)
Children living at home	+/–	Yes	
Working hours	+/–	No	(a positive effect for Surinamese/Antilleans)
Household income	+	Yes	
Unemployment	–	Yes	(only females)
Total outsourcing expenditures	+	No	
Total household and care time	+/–	Yes	(negative effect for males)
Homeowner	+	Yes	(only for Moroccans)
Living in an urban area	–	No	
Religious affiliation	+	Yes	(mainly for females)
Quality time with children		Yes	(only helping with homework)

+ positive effect, – negative effect, +/– either positive or negative effect expected

Not all expected effects based on the literature are found in the analyses. For example, Moroccans are not found to be significantly less happy than the native Dutch in some of the multivariate analyses. The analyses divided by gender show that only the Moroccan males, and not the Moroccan females, are less happy than the native Dutch. From the literature we already learned that their mean happiness is closer to the native Dutch than the mean happiness of Surinamese and Turks (Verkuyten, 1986).

The Turks and Surinamese/Antilleans are less happy than the native Dutch, especially males. In the non-western immigrant groups, males may suffer more from unemployment and the lower socio-economic status when compared to the native Dutch than the non-western immigrant females. Psycho-social stress may be another reason for less happiness. For immigrants it can be difficult to cope with a different culture. Immigrants may also miss their family and friend in their home country.

In general, higher educated males are significantly less happy than lower educated males. For females, this effect is not found. Apparently, males' aspirations and expectations of their life (and goals to achieve) rise with their level of education. Women's aspirations however, are less affected by their level of education.

Women are less happy when unemployed, while men are not. Although women may suffer more from stigmatisation or discrimination because of unemployment than men, it is difficult to explain why this effect is not found for males.

People with a higher income are happier than people with lower incomes. This effect is mainly found for males and for native Dutch. With respect to happiness, income and level of education is more important for males than for females. The same is true for the non-western immigrants. In these groups, household income and level of education is much less important for their personal happiness compared to the native Dutch.

The separate analyses per group show that the native Dutch are significantly happier when they are married or live together. This could also indicate, that the marriages of the immigrants in our sample are less happy then the marriages of the native Dutch. It is known that especially Turks and Moroccans take a spouse from their country of origin (WRR, 2001b). In many cases, these marriages are arranged marriages. In general, these arranged marriages may be less happy than marriages where the men and women are allowed to choose their spouses by themselves.

People are less happy when they have (very) young children, especially women. This could be for psychological reasons (sorrows about their children, coping with a different life situation), or economic reasons (children cost money). The happiness of single parents is significantly lower when they have children aged between 16 and 25 living at home. In these families, children aged between 16 and 25 may cause problems and sorrows over their education, friends, or finding a job.

The happiness of males in our sample decreases due to household and care time. For females, this effect is not found. Females may be expected to do these kinds of tasks, whereas traditionally, these activities are not expected from males. During the past decades, female labour participation has increased and time males spend on household and care tasks has increased. Probably women have adjusted themselves to a situation where they have to do most of the household and care tasks whereas males are not (yet) adjusted to a situation where they have to do more household and care tasks than in the past.

Outsourcing household and care activities does not make people happier as such, but a higher household income does. The latter may have overruled the effect of outsourcing. As we learned in

Chapter 5, people with higher incomes outsource more and spend more quality-time with their children. As shown in our analysis in the current chapter, people become happier from quality-time with their children, which may indicate an indirect effect of outsourcing on people's happiness.

Although overweight does not affect happiness significantly, health appears to be an important determinant of happiness, both for males and females. The effect of overweight on happiness may partly go via health, since overweight is negatively associated with health (see Chapter 4).

People are happier when they visit a church, mosque etc. more than once per month. In particular (Turkish and Moroccan) women are happier when they visit a church, mosque etc. regularly. Chapter 2 already showed that especially Turks and Moroccans in our sample are religiously active. As earlier mentioned, 95 percent of the Turks and Moroccans is religious, against 75 percent of the Surinamese/Antilleans and 40 percent of the native Dutch (SCP, 2004; SCP, 2000; and Tubergen, 2003).

For the non-western immigrant groups, religion may be more important compared to the native Dutch and for the Surinamese/Antilleans. However, our measure of religious affiliation may have affected the result. Respondents who go to church/mosque/temple/synagogue were 'labelled' as religiously active. Another measure (like, the times per week people pray) may give other results.

In agreement with the literature, in our research the 'classic' determinants affect people's happiness. With respect to happiness, the 'new' determinants we added (overweight, health, household and care time, and outsourcing) matter as well. The next chapter studies a structural equation model dealing with the correlations between happiness, health, and household and care time.

7

Integration of findings, conclusions, and recommendations

7.1 Introduction

Before we discuss the main results and conclusions of the research performed in this thesis, a structural equation model is developed. The purpose of this model is to study whether the topics studied in the earlier chapters of this thesis are interrelated and whether a structural equation model including health, overweight, household and care time, outsourcing, and happiness in one model confirms the earlier findings.

With a structural model we investigate whether the equations of health, overweight, household and care time, outsourcing, and happiness are correlated with each other. The structural equation model synthesises all analyses performed before in this research and tests whether the hypothesised correlations between overweight, health, outsourcing, time spent on household and care tasks, and happiness as found in earlier chapters can be looked upon as causal relations.

In this chapter, also the main findings and conclusions of the research are discussed. Recommendations and suggestions for further research are given as well.

The chapter is structured as follows. Section 7.2 shows the structural equation model and discusses the results of the estimations. Section 7.3 discusses the main results and conclusions. In section 7.4 recommendations are given and suggestions for further research are made.

7.2 Structural equation modelling for household production, health, and happiness

A structural model is developed including the relationships between health, overweight, household and care time, outsourcing, and happiness, and including socio-economic and socio-demographic variables. The structural equation model is estimated using LISREL (LInear Structural RELations) (Jöreskog and Sörbom, 1996).

The relation between the observed endogenous and exogenous variables could be represented as follows:

$$Y = \mathrm{B}Y + \Gamma X + \varepsilon \qquad (7.1)$$

where Y is a vector of the observed endogenous variables, B is a $(q \times n)$ matrix of regression coefficients, Γ is also a matrix of regressor coefficients, X is the vector of the observed exogenous variables, and ε is a vector of error terms.

Our structural model consists of a set of relationships among 5 endogenous variables and 23 exogenous variables. Scheme 7.1 gives an overview of the variables in the structural model.

Scheme 7.1 Endogenous and exogenous variables studied in the LISREL model

Endogenous variables	Y_1	Outsourcing (monthly expenditures)
	Y_2	Household and care time
	Y_3	Body Mass Index (BMI)
	Y_4	Health
	Y_5	Happiness
Exogenous variables	X_1	Surinamese/Antilleans
	X_2	Moroccans
	X_3	Turks
	X_4	Gender (female)
	X_5	Age 35 – 44
	X_6	Age 45 – 64
	X_7	Age $\geq$ 65
	X_8	Married/ cohabiting
	X_9	Children aged between 0 – 3
	X_{10}	Children aged between 4 – 11
	X_{11}	Children aged between 12 – 15
	X_{12}	Children aged between 16 – 25
	X_{13}	Level of education medium
	X_{14}	Level of education high
	X_{15}	Net household income per month
	X_{16}	Unemployment
	X_{17}	Working hours 1 – 20 per week
	X_{18}	Working hours 21 – 40 per week
	X_{19}	Working hours 41 – 60 per week
	X_{20}	Living in an urban area
	X_{21}	Religious affiliation
	X_{22}	Homeowner
	X_{23}	Smoking

In our structural model, the following relations are assumed:

$$Y_1 = \gamma_1' X + \varepsilon_1 \tag{7.2}$$

$$Y_2 = \gamma_2' X + \beta_{21}' Y_1 + \varepsilon_2 \tag{7.3}$$

$$Y_3 = \gamma_3' X + \beta_{31}' Y_1 + \beta_{32}' Y_2 + \varepsilon_3 \tag{7.4}$$

$$Y_4 = \gamma_4' X + \beta_{41}' Y_1 + \beta_{42}' Y_2 + \beta_{43}' Y_3 + \varepsilon_4 \tag{7.5}$$

$$Y_5 = \gamma_5' X + \beta_{51}' Y_1 + \beta_{52}' Y_2 + \beta_{53}' Y_4 + \beta_{52}' Y_4 + \varepsilon_5 \tag{7.6}$$

where outsourcing (Y_1) is determined only by the exogenous variables. Household and care time (Y_2) is determined by the exogenous variables and outsourcing, since outsourcing can decrease household and care time. Body Mass Index (Y_3) is determined by outsourcing, household and care time, and the exogenous variables. As we learned in Chapter 3, outsourcing meal preparation affects BMI. Based on what we learned in Chapter 4 and 5, we assume that health (Y_4) is determined by outsourcing, household and care time, Body Mass Index, and the exogenous variables. The exogenous variables, as well as outsourcing, household and care time, Body Mass Index, and health determine happiness (Y_5).

To have a visual overview of the investigated relations, the structural relationships are depicted in Figure 7.1. The variables on the left-hand side of the model are the independent (X) variables. The variables on the right-hand side are the dependent variables in the structural equation model; Y_1 up to Y_5. The arrows in the model show the relationships studied in the structural equation model, including the correlations between the error terms of the dependent variables.

Model 7.1 LISREL model relations studied: health, BMI, household and care time, outsourcing, and happiness (for a legend, see Appendix I)

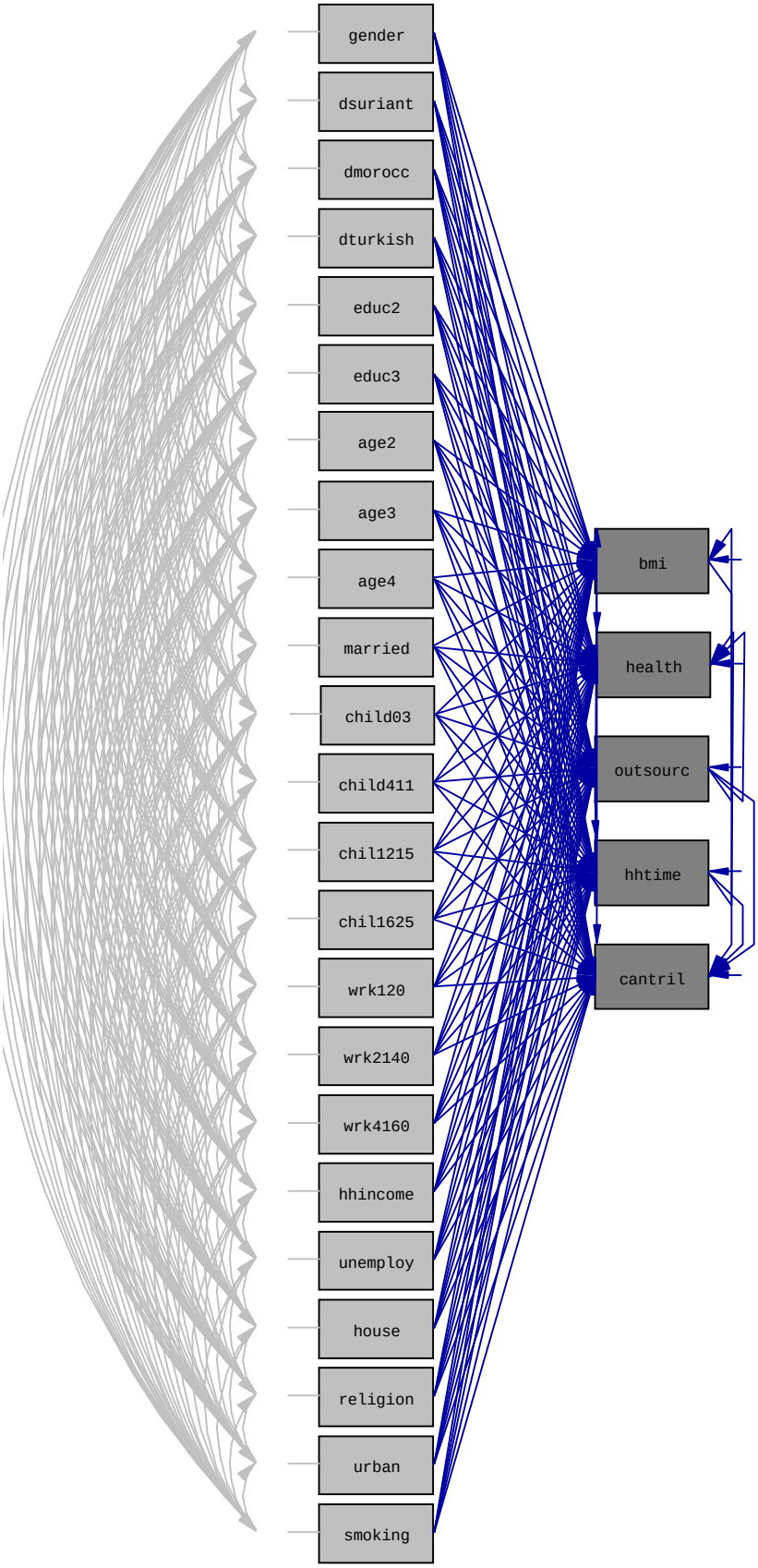


Figure 7.1 shows that in the structural equation model all socio-economic and socio-demographic variables are related to the dependent variables: outsourcing, household and care time, BMI, health, and happiness. The dependent variables are also related to one another.

We have used the Maximum Likelihood method to estimate the parameters, assuming a multi-normal distribution of the observed variables. The estimation is accomplished in three steps.

First, we allow correlation between the error terms of the equations. Furthermore, we specify an over-identified model in order to estimate modification indices for the elements in the B matrix that are set to zero.

In this way, we test the assumption of the recursive relationships among the endogenous variables Y, as presented in equations (7.2) – (7.5). In order to identify the model, a number of coefficients in the Γ matrix have to be set to zero[1].

In this model, the following relations are fixed, because these relations were not significant in the earlier chapters: $\gamma(1, 12)$[2] outsourcing – children aged between 16 and 25; $\gamma(1, 21)$ outsourcing – religious affiliation; $\gamma(2, 20)$ household and care time – urban area; $\gamma(2, 21)$ household and care time – religious affiliation; $\gamma(3, 9)$ and $\gamma(3, 10)$ BMI – children aged between 0 and 15; $\gamma(3, 15)$ BMI – household income; $\gamma(4, 9)$ and $\gamma(4, 10)$ and $\gamma(4, 11)$ health – children living at home; $\gamma(4, 20)$ health – urban area; $\gamma(5, 17)$ and $\gamma(5, 18)$ and $\gamma(5, 19)$ happiness – working hours; and $\gamma(5, 22)$ happiness – homeowner. The results are presented in Appendix II.

The modification indices show the changes in Chi-squared if the fixed coefficient were set free. Appendix II shows that the modification indices in the B matrix only show minor changes in the Chi-squared if the parameters are assumed to be non-zero. The standardised expected changes in the parameters are all less than 0.5, indicating non-significant changes if the assumption of the zero coefficients are relaxed. These results indicate that the assumed relations between the Y's as presented in equations (7.2) – (7.6) are likely to hold.

In this model, the error terms of equation (7.4) and (7.3) and the error terms of equation (7.6) and (7.2) show a (small) significant relationship. The R-squared of equation (7.5) and equation (7.6) are negative, indicating a better model needs to be constructed, which we have done in the second step.

[1] A known difficulty in structural equation modeling is the identification problem. The number of parameters needed to identify the model should not exceed, or should not be less than the number of degrees of freedom. When the number of degrees of freedom is more than the number of parameters, the model is under-identified. The model is over-identified when the number of degrees of freedom is less than the number of parameters needed to be estimated to identify the model. The number of degrees of freedom is a necessity; it is however, not a sufficient criterion for identification.

[2] For example, $\gamma(1, 12)$ means the 1st row and the 12th column in the Γ matrix.

Second, based on the model estimations as described above, a new model could be constructed without the possibility of modification indices in the B matrix. In this model, fewer parameters in the Γ matrix are fixed: $\gamma(3, 12)$ BMI – having children at home between 16 and 25; $\gamma(4, 9)$ and $\gamma(4, 10)$ and $\gamma(4, 11)$ and $\gamma(4, 12)$ health – children at home; $\gamma(3, 15)$ BMI – household income; $\gamma(2, 21)$ household and care time – religious affiliation; $\gamma(5, 17)$ and $\gamma(5, 18)$ and $\gamma(5, 19)$ happiness – working hours; and $\gamma(5, 22)$ happiness – homeowner. The results of this model are presented in Appendix III.

The outcomes of this estimation (results in Appendix III) show almost no correlation between the equations, only a very small negative correlation between the error terms of the outsourcing equation (7.3) and the happiness equation (7.6) (significant only at the 10% level). This model is identified completely, so all fit measures show perfect fit and are not reported here. Again in this estimation, a negative R-squared is found, now only for equation (7.6).

In the third step, because there is no significant correlation between the error terms of equations $Y_1 - Y_5$, the structural model could be re-estimated, including zero correlations between the error terms of the equations and without fixing any coefficients in the Γ matrix, treating them as separate equations.

The results are shown in Table 7.1. In this estimation, the R-squared of all equations are positive. This model is also identified completely, so all fit measures show perfect fit and are not reported here.

Table 7.1 ML estimation of 5 equations in one model (standard errors in parentheses)

	Outsourcing expenditures	HH & care time	BMI	Health	Happiness
Outsourcing		-0.035 (0.025)	-0.149 (0.043)***	-0.007 (0.010)	-0.001 (0.014)
HH & care time			0.061 (0.036)**	0.007 (0.008)	-0.016 (0.001)*
BMI				-0.023 (0.005)***	-0.007 (0.007)
Health					0.474 (0.028)***
Gender (female)	-0.282 (0.085)***	1.477 (0.103)***	-0.279 (0.189)*	-0.192 (0.044)***	0.098 (0.061)*
Native Dutch	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Surinamese/Antilleans	-0.244 (0.110)**	0.136 (0.134)	0.677 (0.237)***	-0.130 (0.055)***	-0.175 (0.077)***
Moroccans	-0.752 (0.134)***	0.013 (0.163)	0.022 (0.289)	-0.126 (0.068)**	-0.116 (0.093)
Turks	-0.349 (0.122)***	-0.207 (0.149)**	0.676 (0.263)***	-0.266 (0.062)***	-0.248 (0.085)***
Age 18-34	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Age 35-44	-0.416 (0.107)***	0.362 (0.130)***	1.166 (0.230)***	-0.160 (0.054)***	0.024 (0.074)
Age 45-64	-1.029 (0.119)***	0.083 (0.147)	2.120 (0.259)***	-0.234 (0.061)***	-0.092 (0.085)
Age ≥ 65	-1.302 (0.176)***	-0.9121 (0.217)***	2.908 (0.384)***	-0.121 (0.091)*	-0.162 (0.125)*
Married/cohabiting	-0.207 (0.104)**	0.288 (0.127)**	0.263 (0.224)	0.042 (0.052)	0.117 (0.072)*
Child 0-3	0.226 (0.108)**	1.378 (0.132)***	0.502 (0.238)**	-0.051 (0.056)	-0.187 (0.077)***
Child 4-11	-0.120 (0.100)	1.179 (0.122)***	0.502 (0.219)**	-0.016 (0.051)	-0.096 (0.071)*
Child 12-15	0.271 (0.119)**	0.389 (0.145)***	0.360 (0.255)*	-0.013 (0.060)	0.005 (0.082)
Child 16-25	-0.126 (0.119)	0.046 (0.145)	-0.018 (0.255)	-0.087 (0.060)*	0.022 0.082)
Child ≥ 25	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Education low	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Education medium	0.874 (0.094)***	-0.263 (0.117)**	-1.190 (0.206)***	0.141 (0.049)***	-0.065 (0.067)
Education high	1.003 (0.118)***	-0.489 (0.145)***	-1.634 (0.257)***	0.244 (0.061)***	-0.108 (0.084)*
Household income	0.001 (0.001)***	-0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)**
Unemployment	-0.393 (0.233)**	-0.540 (0.284)**	0.075 (0.501)	-0.153 (0.117)*	-0.180 (0.161)
Wrk hrs 1-20	0.622 (0.131)***	-1.172 (0.61)***	-0.433 (0.287)*	0.242 (0.067)***	-0.014 (0.074)
Wrk hrs 21-40	0.506 (0.101)***	-1.834 (0.124)***	-0.265 (0.228)	0.402 (0.053)***	-0.014 (0.074)
Wrk hrs 41-60	0.451 (0.198)***	-2.051 (0.242)***	0.832 (0.432)**	0.405 (0.101)***	0.057 (0.140)
Wrk hrs > 60	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Urban area	0.157 (0.086)**	-0.039 (0.104)	-0.069 (0.184)	-0.034 (0.043)	0.068 (0.059)
Religious	-0.068 (0.086)	0.023 (0.104)	0.221 (0.184)	0.105 (0.043)***	0.120 (0.059)**
Homeowner	0.400 (0.090)***	0.063 (0.111)	-0.334 (0.200)**	0.146 (0.046)***	0.087 (0.063)*
Smoking	0.336 (0.084)***	0.063 (0.103)	-0.627 (0.181)***	-0.214 (0.043)***	-0.155 (0.059)***

Table 7.1 (continued)

# of observations	2474				
R^2	0.274	0.350	0.148	0.140	0.156
Degrees of freedom	0				
Minimum fit function χ^2	0 (p=1.000)				

** p<0.10 ** p<0.05 *** p<0.01*

In general, the results shown in Table 7.1 confirm the results of earlier estimations in this thesis. We will discuss the main results as found in previous chapters and explain a few differences found in the LISREL analysis.

Chapter 3 shows that the Turks and the Surinamese/Antilleans have a significantly higher BMI than the native Dutch. We already learned that the mean BMI of Moroccans is close to the mean BMI of the native Dutch. The results in Table 7.1 show that higher educated people and people working 21 to 40 hours per week have a significantly lower BMI, which can be ascribed to more diet-disease knowledge and a healthier diet (people with a higher income can afford healthy foods). However, people's BMI increases if they work 41 to 60 hours per week. In that case, people might pay less attention to healthy food, because of lack of time (and outsource more as shown in the estimation).

Chapter 3 shows no effect of having children at home on BMI[3]. If the presence of children in the household is measured by dummies for the age of children (as done in the LISREL model), BMI increases when having children up to the age of 15. Parents may work less (mainly the mothers) and pay less attention to their own caloric intake and physical activity (including doing sports) when taking care of the children.

The LISREL analysis shows that more household and care time leads to a higher BMI. People with more household and care time have more time to eat, which explains this positive significant relationship. The higher people are educated, the less household and care time they have (mainly because of more working hours) and the more household and care activities are being outsourced. This means that the relationship between household and care time and BMI runs indirectly through education.

Immigrants are in significantly poorer health[4] than the native Dutch. This is mainly be explained by their lower socio-economic status (measured by income, level of education, working hours, homeownership, and unemployment), which is negatively related to health (as discussed in Chapter 4). A new finding in the LISREL estimation is that religious people are healthier than people who are not religious. This is mainly true for non-western immigrants. Chapter 6 showed that predominantly for the non-western immigrants (mainly Turkish and Moroccan women) religion is a determinant of happiness.

[3] In Chapter 3 a dummy was included for having children at home. If dummies were included for having children in different age categories, as is done here, the outcomes could have been different. The fact that the current estimation also corrects for outsourcing and household and care time (both significantly affected by having children) may be another explanation of the effect for having children on BMI.

[4] In Chapter 4, health is estimated ordinally with ordered probit analyses, whereas in the LISREL model ML-estimations are used (which treat health as a continuous variable). Therefore, the LISREL results for health may have been different compared to results in Chapter 4. To test this, the estimations of Chapter 4 are repeated with an OLS-regression (which also treats health as a continuous variable). These results are not significantly different from the ordered probit results, which means that the results are quite robust.

Contrary to the findings in Chapter 4, in the LISREL model married/cohabiting people are not happier than singles. Religion can indirectly affect happiness through marriage, because Chapter 6 shows that native Dutch respondents are healthier when married, whereas non-western immigrant respondents are not healthier when married. If the estimation of health is repeated excluding religion, the results do not change. However, if the health estimation is repeated excluding household income and own home (both indicators of income and not included in the estimations in Chapter 4), people are significantly happier when they are married/live together. This suggests that the effect of being married/cohabiting on health runs through income, because married/ cohabiting people will have a higher household income than singles. The LISREL results (as well as the results in Chapter 6) show that people with a higher income are happier than people with a lower income.

The LISREL model confirms the findings from Chapter 5[5] that people with a lower socio-economic status have more household and care time and spend less money on outsourcing. In the LISREL model however, Turks have less household and care time than the native Dutch.

Two reasons explain this finding: 1) in Chapter 5, the estimation on household and care time and outsourcing are performed for couples and singles separately (where the overall household and care time of the Turks does not differ from the native Dutch). The LISREL model estimates household and care time and outsourcing for both couples and singles (including a dummy for being married/cohabiting); and 2) the LISREL model includes the expenditures on outsourcing in the household and care time equation, which is not the case in Chapter 5.

Married or cohabiting people use more household and care time, probably they have more children than people living alone. However, married/cohabiting people spend less money on outsourcing. This can be ascribed to the fact that these people have more opportunities to divide their household and care tasks or do them together, while singles have to do all activities by themselves.

[5] As opposed to the analyses in Chapter 5, in the LISREL estimation also people who do not make use of outsourcing are included (about 200 additional respondents). The results of the LISREL model are not very different than the results in Chapter 5.

Unexpected and contrary to Chapter 5 is the result that females spend less money on outsourcing than males. Perhaps women underestimate the expenditures on outsourcing (if mainly the males pay the accounts). As women spend more hours on household and care time, they may outsource relatively fewer household and care activities than men. The latter will not be true for childcare if the mother works on the labour market. This indicates an indirect effect for household type. For example, in single-parent households, females do more household and care activities themselves compared to males.

The LISREL model shows that overweight people outsource less and spend significantly more time on household and care activities. A lower socio-economic status (associated with a higher weight and lower outsourcing expenditures) can indirectly have caused this effect. People with a lower socio-economic status have a higher prevalence of overweight and people with a lower socio-economic status have less money to spend on outsourcing household and care activities. Therefore, people with a lower socio-economic status have to do more of these activities by themselves.

In Chapter 6 we learned that the Turks and the Surinamese/Antilleans are less happy than the native Dutch. The current model gives the same result. While married or cohabiting people were not happier in our models estimated in Chapter 6, in the LISREL model a small positive effect for being married/ cohabiting is found. Earlier we already mentioned that the marriages of Turks and Moroccans (which in some cases are arranged marriages) may be less happy, which explains the small positive effect of marriage/cohabiting on happiness for the whole sample.

The LISREL model as discussed in this section supports most of the findings in previous chapters and shows that the separate equations of health, overweight, household and care time, outsourcing, and happiness are not correlated with each other. The LISREL-findings also indicate that the assumptions concerning the causality of the relations found in the earlier chapters are likely to hold.

7.3 Main findings from the research and conclusions

This thesis studies the socio-economic determinants of health, overweight, outsourcing, and happiness and studies the effect of the 'modern lifestyle' (outsourcing behaviour) on health, overweight, and happiness.

Therefore, new data have been collected. This data collection was performed at the end of 2001. The data set included the native Dutch, Surinamese/Antilleans, Moroccans, and Turks and has been used for the empirical estimations in this research (N=2,551).

Scheme 7.1 gives an overview of the studied topics with their expected effects (based on the literature) and their confirmed effects from the estimations.

Scheme 7.1 Expected and confirmed effects of investigated topics[6]

Variable	BMI		Health		Household and care time		Outsourcing expenditures		Happiness	
	hypothesis	*confirmed*	*hypothesis*	*confirmed*	*hypothesis*	*confirmed*	*hypothesis*	*confirmed*	*hypothesis*	*confirmed*
Surinamese/Antilleans	+	Yes	–	No	+/–	Yes (+)	–	Yes	–	Yes
Moroccans	+	Yes	–	Yes	+/–	Yes (+)	–	Yes	–	No
Turks	+	Yes	–	Yes	+/–	No	–	Yes	–	Yes
Gender (1=female)	–	No/Yes	–	Yes	+	Yes	+/–	No	+/–	Yes
Takeaway food	+	No (–)	–	No/Yes						
Delivery food	+	No	–	No/Yes						
Eating out	+/–	Yes (–)	+/–	Yes						
Convenience food	+/–	Yes (+)	–	No/Yes						
Ready-to-eat meals	+/–	Yes	–	No/Yes						
Fresh vegetables	–	No	+	No						
Smoking y/n	–	Yes	–	Yes					–	Yes
Married/cohabiting	+	No/Yes	+	No/Yes					+	No/Yes
Children at home	–	No	+	No	+	Yes	+	Yes	+/–	Yes
Age	+	Yes	–	Yes	+/–	Yes	+/–	Yes (–)	+/–	No
Age squared	–	Yes								
Level of education	–	Yes	+	Yes/No	–	No	+	Yes	+/–	Yes (– m)
Household income	–	No			–	No	+	Yes	+	Yes
Working hours					–	Yes	+	No	+/–	No/Yes
BMI ≥ 25			–	Yes/No					+/–	No
Living urban area			–	No	–	No	+	No	–	No
Being a homeowner					+	No	+	No	+	No/Yes
Religious affiliation				Yes	+	No	–	No	+	Yes
Health					+	Yes	+	No	+	Yes
Intake extra vitamins			+	No/Yes						
Unemployment			–	No/Yes					–	No
Household & care time									+/–	Yes (– f)
Outsourcing expend.									+	No

[6] + positive effect, – negative effect, +/– either positive or negative effect expected (is yes, than both effects found). Yes/No: effect is partly confirmed (see also relevant chapter). m= male, f= female.

We will give the main findings of the research following the order of the research questions as mentioned in Chapter 1 (section 1.1). The research questions were:

1. What are the socio-economic and demographic determinants of health (and overweight) of non-western immigrants compared to the native Dutch in the Netherlands?
2. To what extent affects the outsourcing meal preparation the health and overweight of non-western immigrants and the native Dutch in the Netherlands?
3. What are the socio-economic, demographic, and ethnic determinants of the time spent on household and care activities?
4. a. To what extent does socio-economic background affect outsourcing of household and care time?

   b. What are the differences between the native Dutch and non-western immigrants with respect to outsourcing household and care time?
5. To what extent affects the socio-economic status the happiness of non-western immigrants in the Netherlands compared to the native Dutch?
6. What is the role of health and outsourcing household and care tasks with respect to happiness?

We have found a decrease in the demand for health for higher age, overweight, and smoking. The demand for health increases when not living alone and if the level of education rises.

In our research, level of education is an important determinant of health. Higher educated people have a better health condition than lower educated people. However, for the native Dutch, level of education is not a significant determinant of health. This suggests that the native Dutch are better informed of the healthcare system than lower educated immigrants.

The health of non-western immigrants is significantly poorer than the health of the native Dutch, except for the Surinamese/Antilleans. The latter could be explained by the higher socio-economic status of the Surinamese/Antilleans compared to the Moroccans and Turks.

Compared to the native Dutch, the prevalence of overweight is higher among non-western immigrants. However, for non-western immigrants as well as for the native Dutch, the prevalence of overweight is considerably high (40 to 50 percent of the respondents has a BMI $\geq$ 25.00).

In all studied groups, level of education is a strong determinant of Body Mass Index (BMI); higher educated respondents have a lower BMI than lower educated people. Household income, on the other hand, is not significantly related to BMI, which means that with respect to overweight, education is more important than income. This indicates that with respect to overweight, knowledge about a healthy diet is important. Especially lower educated people may have a lack of knowledge about a healthy lifestyle or prefer consumption in the present more (and without thinking about the

consequences of their behaviour) than consumption in the future. This is called time preference (Groot and Maassen van den Brink, 2004; Cornelisse *et al*., 2003).

Age is a very important determinant of health. Both the older native Dutch and the older non-western immigrants show a poorer health compared to their younger peers. Age is also a strong determinant of BMI for non-western immigrants and the native Dutch. The research shows that BMI increases up to the age of 62 and then decreases.

The native Dutch and the Surinamese/Antilleans experience a reduction in perceived health due to overweight. The Moroccans and Turks, however, do not experience a significant negative effect from overweight on their perceived health. The question arises whether there truly is no health damage caused by overweight for these groups, or whether they associate overweight with positive issues like a life in wealth and health.

Non-western immigrants do sports less frequently than the native Dutch (especially the Turks). 'Younger' immigrants however, do sports more frequently than 'older' non-western immigrants. In the whole sample, only one third of the people aged 65 and above exercises.

In general, non-western immigrants and the native Dutch spend 12.5 hours per week on watching TV. Our research shows that especially females watch TV at expense of the time they would spend on physical exercise.

The effect of doing sports on health is positive for native Dutch and Surinamese/Antillean females and for native Dutch, Surinamese/Antillean and Moroccan males. This means that they report a better health when doing sports. The health of Moroccan women and Turkish women and men does not improve by doing sports. These groups could have (traditionally or culturally) different opinions about doing sports and underestimate the positive relation between doing sports and health.

In general, non-western immigrants eat takeaway food more frequently than the native Dutch. The effects of modern food habits (outsourcing meal preparation) on overweight are mixed and are somewhat indirect through income. People with a higher income are more likely to outsource meal preparation. For Moroccans, eating ready-to-eat meals decreases BMI, whereas eating ready-to-eat meals increases the BMI of the Surinamese/Antilleans. Apparently, people make different (less or more healthy) choices with respect to outsourcing food preparation.

Contrary to our expectations, eating out generally decreases BMI (mainly for the native Dutch). An explanation could be twofold: mainly people with higher incomes (who are already more aware of a healthy diet) will go eating out, and once people go eat out, they might choose restaurants that serve lower caloric menus than the cheaper restaurants like MacDonald's, kebab restaurants etc. In general, healthy food is more expensive compared to fast-food.

In comparison with the non-western immigrants, Dutch men most frequently go eating out, most frequently eat convenience food, and most frequently eat ready-to-eat meals. It seems that compared to non-western immigrants and native Dutch females, Dutch men either do not like or do not have time to prepare complete meals for themselves.

Overweight people eat out less often than people with a normal weight. And as mentioned before, eating out decreases people's BMI. The other outsourcing categories do affect health or overweight neither negatively nor positively. Eating takeaway food decreases BMI. These findings suggest that not all modern food habits are bad for one's health and eating takeaway food or eating in restaurants is even healthier than preparing meals yourself. It also indicates that with respect to outsourcing food preparation, people are able to make 'healthy' choices.

The time spent on household and care activities is determined by working hours. The more working hours, the less time is spent on household and care activities. If there are children in the household more time is spent on household and care activities. Healthier people spend more time on household and care activities than people in a poorer health. Surinamese/Antilleans and Moroccans have more household and care time than the native Dutch. In all groups, females spend more time on household and care tasks than males.

In correspondence with the literature, we found that having (very) young children, level of education, and household income are important determinants for outsourcing. People with a higher socio-economic status spend more money on outsourcing household and care activities than people with a lower socio-economic status.

The non-western immigrant groups spend less money on outsourcing household and care activities than the native Dutch. In non-western as well as in native Dutch households, if (very) young children are present in the household, more money is spent on outsourcing. This is probably attributed to the relatively high costs of childcare.

The number of working hours of parents decreases household and care time. The question arises whether these parents spend less time with their children. Our research shows that working hours does not affect the quality-time (like reading to children and playing games with them) parents spend with their children.

Compared to the native Dutch, Turks spend less time reading to their children and playing games with them. The Moroccans and Surinamese/Antilleans do not differ from the native Dutch with respect to quality-time spent with their children. Higher educated non-western immigrant as well as native Dutch females (who have more working hours) outsource more household and care activities. On the other hand these women spend more quality-time with their children.

Parents, however, seem to prefer helping their children with their homework than reading to them and playing games with them. The happiness-analyses show that parents do not become happier from reading to their children and playing games with them, whereas they become significantly happier from helping their children with their homework.

Non-western immigrants are less happy than the native Dutch, especially the males. However, the males in all studied immigrant groups are less happy than the native Dutch males. For women, the results are different. Only the Turkish females are less happy than the native Dutch females. Since

income and level of education has been corrected for, the lower socio-economic status of the immigrants is not an explanation for their lower happiness.

The native Dutch and Surinamese/Antillean group do not differ much in happiness. Moroccan females are happier compared to Moroccan males. Turkish females are less happy than Turkish males.

People with a higher income are happier than people with lower income. This effect is mainly found for males and for the native Dutch. With respect to happiness, income and level of education is more important for males than for females. For non-western immigrants household income and level of education is less important for their personal happiness compared to the native Dutch. Their happiness is mainly defined by religion and health.

In the whole sample, especially for women, having (very) young children makes them less happy. This can be attributed to the fact that the mother's life changes more than the father's life. After birth of the first child their time allocation changes, there are fewer contacts at work, and/or more stress caused by combining care and market labour. The latter argument may not be true for Moroccan and Turkish women, because in general before the birth of their first child, their market labour participation is relatively low.

The native Dutch are significantly happier if they are married or live together. The non-western immigrants are not happier because of marriage or living together. It is known that especially Turks and Moroccans take spouses from their country of origin (WRR, 2001b). In many cases these marriages are arranged marriages. These arranged marriages might be less happy than the marriages where men and women are free to choose their spouses themselves.

Outsourcing does not increase one's happiness. The effect of outsourcing on happiness runs via household income. Higher income households spend more on outsourcing and people with higher incomes are happier.

The happiness of males in our sample decreases if household and care time is involved. For females, this effect is not found. Females are expected to do these kinds of tasks, whereas traditionally, these activities are not expected from males. Times are changing with an increase of labour participation by women and an increase of male participation in household and care activities, as seen in Chapter 5. Contrary to expectations, females do not become less happy when they use more household and care time. Probably they have adjusted themselves to the household situation. This is a matter of cognitive dissonance.

Health is an important determinant of happiness. And as the health of Moroccans and Turks is poorer than the health of the native Dutch, this explains their lower happiness. It is harder to explain the lower happiness for the Surinamese/Antilleans, since their socio-economic and health situation is comparable to that of the native Dutch. Discrimination may be another explanation for their lower happiness.

BMI does not affect the happiness of the respondents in our sample. This means that overweight people are not less happy than people with a normal weight. The effect of overweight on

happiness can however, run through health. In general, overweight is associated with a poor health and in turn a poor health decreases people's happiness.

People living in an urban area are happier than people living in rural areas. When living in the city, people work more and have more opportunities to outsource their household and care activities. The latter will give them leisure and more time to spend with their children.

As expected, immigrants are more religious than the native Dutch. Our research shows that being religious, especially visiting a mosque, church, synagogue, or temple has a positive effect on health, as well as on happiness. This implies that religious affiliation positively affects one's overall well-being. This effect however, is mainly found for (Islamic) Turkish and Moroccan women.

Our research shows that the behaviour of the Surinamese/Antilleans is comparable to that of the native Dutch with respect to health, household production, and happiness. They have the same level of education, income, and labour participation as the native Dutch.

The history of the Dutch colonisation in Surinam and the Dutch Antilles (including Aruba) could have led to a culture (including the Dutch language, educational and political system) that facilitates the Surinamese/Antilleans to integrate more easily into Dutch society.

The cultural and background of the Moroccan and Turkish immigrants in the Netherlands is very different from that of the Surinamese/Antilleans. The lower level of education, the lower participation on the labour market, and the language problems makes it more difficult to integrate into Dutch society. These are important reasons for the poorer health and lower perceived happiness of the Turks and Moroccans.

Socio-economic status is an important factor accounting for differences in health, overweight, outsourcing, and happiness. Culture, however, also seems to be an important factor. A cultural difference in the perception of overweight could account for the fact that contrary to the native Dutch and Surinamese/Antilleans, Moroccans and Turks do not perceive a decrease in health due to overweight. The latter can however also be ascribed to a lack of knowledge about a healthy lifestyle.

7.4 Recommendations and suggestions for further research

To find out why people eat too much and have too little physical activity further research has to be done. People with a lower time preference prefer consumption in the future more than consumption in the present and postpone consumption (Groot and Maassen van den Brink, 2004). This means that especially people with a higher time preference who prefer consumption in the present (and do not think about the long-term consequences of their consumption-pattern) may run the risk of becoming overweight. Time preferences could be a telling factor for overweight (Komlos *et al*., 2003; Frederick *et al*., 2000; Grossman, 1972).

The research shows that outsourcing household and care activities is quite common in the Dutch society. Immigrants, however, make less use of it than the native Dutch. Especially childcare is

outsourced less frequently by Moroccans and Turks. For these groups childcare is less necessary, because of lower female labour participation and because in these families it is more common for families to take care of each other's children. However, Moroccans and Turks may also be less familiar with the Dutch childcare system and would use it more frequently if they were well informed. Dutch policies should aim at cheaper childcare, more availability, and greater accessibility. This might encourage Turkish and Moroccan females to do more market labour, which will increase their socio-economic status, which in return will increase their personal happiness.

The estimations show that improvement of socio-economic status, health, and possibilities for outsourcing household tasks affects overall happiness of non-western immigrants. Further research on happiness or well-being could reveal the causes of the lower happiness of non-western immigrants compared to the native Dutch. A lower socio-economic status only partly explains the differences in happiness. There could exist other reasons like lack of integration and assimilation into Dutch society, difficulties with the Dutch language, lack of social cohesion, less social capital, stigmatisation, formation of ghettos in the big cities, etc. There is a world to win, if scientific research could find out the reasons for the lower happiness of our non-western fellow men. This thesis could be seen as a starting point.

Appendix I Variables used in the LISREL model

Dependent variables:

1. Body Mass Index (**bmi**)
2. Health (**health**)
3. Total costs of outsourcing per household per month (ln) (**outsourc**)
4. Household and care time of respondent (**hhtime**)
5. Cantril scale (1 = very bad, 10 = excellent) (**cantril**)

Independent variables:

1. Female (**gender**)
2. Dummy Surinamese/Antillean with the native Dutch as reference group (**dsuriant**)
3. Dummy Turkish with the native Dutch as reference group (**dturkish**)
4. Dummy Moroccan with the native Dutch as reference group (**dmorocc**)
5. Age category 18 – 34 (*reference group*)
6. Age category 35 – 44 (**age2**)
7. Age category 45 – 64 (**age3**)
8. Age category > = 65 (**age4**)
9. Married/cohabiting (**married**)
10. Children living at home aged between 0 – 3 (**child03**), 4 – 11 (**child411**), 12 – 15 (**chi1215**), 16 – 25 (**chil1625**), > 25 (*reference group*)
11. Respondent's level of education: low (*reference group*), medium (**opl2**), high (**opl3**)
12. Net household income per month (**hhincome**)
13. Unemployed (**unemploy**)
14. Respondent's working hours per week: 1 – 20 (**wrk120**), 21 – 40 (**wrk2140**), 41 – 60 (**wrk4160**), > 60 (*reference group*)
15. Smoking (**smoking**)
16. Living in an urban area (**urban**)
17. Being a homeowner (**house**)
18. Religious affiliation (going to church, mosque, temple, or synagogue more than once per month) (**religion**)

Appendix II ML estimation of structural equation model, relation between error terms included
(standard errors in parentheses)

	Outsourcing Y1	HH & care time Y2	BMI Y3	Health Y4	Happiness Y5
Outsourcing		-0.272 (0.664)	0.097 (0.275)	-0.137 (0.180)	0.568 (0.402)*
HH & care time			0.443 (0.199)***	-0.076 (0.157)	-0.028 (0.158)
BMI				0.118 (0.337)	0.067 (0.175)
Health					-0.261 (1.065)
Gender (female)	-0.277 (0.083)***	1.408 (0.207)***	-0.775 (0.1285)***	-0.084 (0.284)	0.155 (0.717)
Native Dutch	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Surinamese/Antilleans	-0.256 (0.1010)***	0.075 (0.190)	0.690 (0.254)***	-0.255 (0.232)	-0.188 (0.149)
Moroccans	-0.780 (0.132)***	-0.169 (0.515)	0.197 (0.380)	-0.244 (0.163)*	0.227 (0.270)
Turks	-0.376 (0.121)***	-0.294 (0.273)	0.852 (0.293)***	-0.435 (0.297)*	-0.298 (0.264)
Age 18-34	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Age 35-44	-0.437 (0.105)***	0.257 (0.320)	1.153 (0.268)***	-0.367 (0.408)	0.048 (0.190)
Age 45-64	-1.069 (0.115)***	-0.169 (0.726)	2.345 (0.398)***	-0.687 (0.810)	0.144 (0.311)
Age ≥ 65	-1.323 (0.175)***	-0.1221 (0.900)*	3.567 (0.554)***	-0.796 (1.217)	0.217 (0.452)
Married/cohabiting	-0.234 (0.102)**	0.234 (0.205)	0.214 (0.232)	-0.010 (0.107)	0.258 (0.194)*
Child 0-3	0.235 (0.106)**	1.425 (0.207)***	-- fixed --	-- fixed --	-0.395 (0.263)*
Child 4-11	-0.102 (0.978)	1.166 (0.139)***	-- fixed --	-- fixed --	-0.072 (0.247)
Child 12-15	0.240 (0.115)**	0.445 (0.220)**	0.170 (0.258)	-- fixed --	-0.168 (0.183)
Child 16-25	-- fixed --	-- fixed --	-0.040 (0.259)	-0.080 (0.069)	-0.039 (0.130)
Child ≥ 25	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Education low	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Education medium	0.872 (0.094)***	-0.056 (0.590)	-1.296 (0.336)***	0.419 (0.462)	-0.346 (0.248)*
Education high	1.004 (0.118)***	-0.251 (0.683)	-1.680 (0.434)***	0.587 (0.592)	-0.351 (0.269)*
Household income	0.001 (0.001)***	0.001 (0.001)	-- fixed --	0.001 (0.001)	-0.001 (0.001)
Unemployment	-0.402 (0.233)**	-0.634 (0.388)**	0.373 (0.530)	-0.262 (0.198)*	-0.079 (0.285)
Wrk hrs 1-20	0.612 (0.132)***	-1.026 (0.432)***	-0.128 (0.384)	0.306 (0.155)**	-- fixed --
Wrk hrs 21-40	0.502 (0.101)***	-1.716 (0.356)***	0.329 (0.381)	0.376 (0.186)**	-- fixed --
Wrk hrs 41-60	0.405 (0.198)**	-1.946 (0.387)***	1.521 (0.545)***	0.200 (0.548)	-- fixed --
Wrk hrs > 60	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Urban area	0.159 (0.085)**	-- fixed --	-0.099 (0.185)	-- fixed --	-0.038 (0.122)
Religious	-- fixed --	-- fixed --	0.224 (0.184)	0.073 (0.091)	0.176 (0.133)*
Homeowner	0.400 (0.091)***	0.156 (0.282)	-0.447 (0.242)**	0.256 (0.170)*	-- fixed --
Smoking	0.340 (0.084)***	0.142 (0.251)	-0.727 (0.208)***	-0.071 (0.256)	-0.445 (0.337)*
# of observations	2474				
R^2	0.273	0.326	0.098	-0.278	-0.710

Appendix II (continued)

Correlation $\varepsilon_2 - \varepsilon_1$	0.822 (2.304)
Correlation $\varepsilon_3 - \varepsilon_1$	-0.807 (0.968)
Correlation $\varepsilon_3 - \varepsilon_2$	-2.156 (0.845)***
Correlation $\varepsilon_4 - \varepsilon_1$	0.514 (0.669)
Correlation $\varepsilon_4 - \varepsilon_2$	0.504 (0.878)
Correlation $\varepsilon_4 - \varepsilon_3$	-2.517 (5.654)
Correlation $\varepsilon_5 - \varepsilon_1$	-1.948 (1.380)*
Correlation $\varepsilon_5 - \varepsilon_2$	-0.399 (1.504)
Correlation $\varepsilon_5 - \varepsilon_3$	-1.014 (2.662)
Correlation $\varepsilon_5 - \varepsilon_4$	0.561 (1.029)

** p<0.10 ** p<0.05 *** p<0.01*

Goodness of Fit Statistics

Chi-Square = 2.109966 (P = 0.833729) Degrees of Freedom = 5

Root Mean Square Error of Approximation (RMSEA) = 0.0

Modification Indices for BETA (expected change in Chi-square)

	Outsourcing Y1	HH & care time Y2	BMI Y3	Health Y4	Happiness Y5
Outsourcing Y1					
HH & care time Y2	1.177				
BMI Y3	0.635	0.045			
Health Y4	0.029	0.045	0.141		
Happiness Y5	0.596	0.045	0.141	0.018	

Appendix II (continued)

Standardized Expected Change for BETA (expected change in coefficient, normal distribution)

	Outsourcing Y1	HH & care time Y2	BMI Y3	Health Y4	Happiness Y5
Outsourcing Y1					
HH & care time Y2	-0.439				
BMI Y3	-0.032	0.008			
Health Y4	-0.056	0.079	0.481		
Happiness Y5	-0.128	0.034	0.127	-0.057	

Modification Indices for GAMMA (expected change in Chi-square)

* outsourcing – children aged 16 – 25: (1.176)
* outsourcing – religious affiliation: (0.741)
* hh & care time – religious affiliation: (0.045)
* bmi – children aged 0 – 3: (0.141)
* bmi – children aged 4 – 11: (0.141)
* bmi – household income: (0.140)
* health – children aged 0 – 3: (0.018)
* health – children aged 4 – 11: (0.018)
* health – children aged 12 – 15: (0.018)
* health – urban area: (0.018)

Standardized expected change for GAMMA (expected change in coefficient, normal distribution)

* outsourcing – children aged 16 – 25: (-0.021)
* outsourcing – religious affiliation: (-0.015)
* hh & care time – religious affiliation: (0.004)
* bmi – children aged 0 – 3: (-0.012)
* bmi – children aged 4 – 11: (0.012)
* bmi – household income: (0.032)
* health – children aged 0 – 3: (0.006)
* health – children aged 4 – 11: (-0.007)
* health – children aged 12 – 15: (-0.008)
* health – urban area: (-0.006)

Appendix III ML estimation of structural equation model, relation between error terms included
(standard errors in parentheses)

	Outsourcing Y1	HH & care time Y2	BMI Y3	Health Y4	Happiness Y5
Outsourcing		-0.365 (1.584)	0.130 (0.329)	-0.070 (0.197)	0.559 (0.389)*
HH & care time			0.390 (5.503)	-0.049 (0.143)	-0.021 (0.154)
BMI				0.050 (0.305)	0.070 (0.173)
Health					-0.214 (1.024)
Gender (female)	-0.281 (0.085)***	1.384 (0.441)***	-0.691 (8.155)	-0.115 (0.257)	0.154 (0.169)
Native Dutch	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Surinamese/Antilleans	-0.244 (0.110)**	0.055 (0.416)	0.698 (0.810)	-0.190 (0.225)	-0.193 (0.147)*
Moroccans	-0.752 (0.134)***	-0.235 (1.219)	0.219 (0.403)	-0.181 (0.176)	0.210 (0.257)
Turks	-0.349 (0.122)***	-0.322 (0.591)	0.838 (1.141)	-0.352 (0.283)	-0.303 (0.261)
Age 18-34	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Age 35-44	-0.416 (0.107)***	0.225 (0.678)	1.158 (2.054)	-0.257 (0.379)	0.037 (0.186)
Age 45-64	-1.029 (0.119)***	-0.257 (1.651)	2.368 (0.676)***	-0.459 (0.758)	0.117 (0.303)
Age ≥ 65	-1.303 (0.176)***	-1.342 (2.099)	3.557 (5.002)	-0.475 (1.139)	0.198 (0.442)
Married/cohabiting	-0.207 (0.104)**	0.219 (0.363)	0.224 (1.653)	0.022 (0.961)	0.237 (0.182)*
Child 0-3	0.226 (0.108)**	1.454 (0.386)***	-0.014 (7.566)	-- fixed --	-0.387 (0.254)*
Child 4-11	-0.120 (0.100)	1.140 (0.234)***	0.145 (6.462)	-- fixed --	-0.387 (0.254)*
Child 12-15	0.271 (0.119)*	0.479 (0.452)	0.159 (2.208)	-- fixed --	-0.185 (0.187)
Child 16-25	-0.126 (0.119)	0.005 (0.253)	-- fixed --	-0.092 (0.063)*	0.034 (0.129)
Child > 25	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Education low	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Education medium	0.874 (0.094)***	0.025 (1.391)	-1.337 (1.503)	0.277 (0.446)	-0.340 (0.242)*
Education high	1.003 (0.118)***	-0.158 (1.596)	-1.741 (2.747)	0.411 (0.568)	-0.343 (0.263)*
Household income	0.001 (0.001)***	0.001 (0.001)	-- fixed --	0.001 (0.001)	-0.001 (0.001)
Unemployment	-0.393 (0.233)**	-0.670 (0.693)	0.358 (2.995)	-0.215 (0.187)	-0.077 (0.280)
Wrk hrs 1-20	0.622 (0.132)***	-0.967 (0.996)	-0.213 (6.463)	0.258 (0.162)*	-- fixed --
Wrk hrs 21-40	0.506 (0.101)***	-1.667 (0.812)**	0.205 (10.020)	0.363 (0.173)**	-- fixed --
Wrk hrs 41-60	0.451 (0.198)	-1.902 (0.759)***	1.390 (11.296)	0.270 (0.492)	-- fixed --
Wrk hrs > 60	*reference group*	*reference group*	*reference group*	*reference group*	*reference group*
Urban area	0.157 (0.086)**	0.013 (0.272)	-0.098 (0.292)	-0.020 (0.063)	-0.035 (0.121)
Religious	-0.068 (0.086)	-- fixed --	0.232 (0.231)	0.085 (0.087)	0.209 (0.153)*
Homeowner	0.397 (0.091)***	0.194 (0.643)	-0.461 (0.416)	0.202 (0.168)	-- fixed --
Smoking	0.336 (0.841)***	0.174 (0.550)	-0.738 (0.398)**	-0.140 (0.239)	-0.428 (0.323)*
# of observations	2474				
R^2	0.274	0.303	0.105	0.023	-0.662

Appendix III (continued)

Correlation $\varepsilon_2 - \varepsilon_1$	1.144 (5.487)
Correlation $\varepsilon_3 - \varepsilon_1$	-0.927 (1.014)
Correlation $\varepsilon_3 - \varepsilon_2$	-2.001 (28.285)
Correlation $\varepsilon_4 - \varepsilon_1$	0.250 (0.732)
Correlation $\varepsilon_4 - \varepsilon_2$	0.349 (0.846)
Correlation $\varepsilon_4 - \varepsilon_3$	-0.132 (5.422)
Correlation $\varepsilon_5 - \varepsilon_1$	-1.909 (1.331)*
Correlation $\varepsilon_5 - \varepsilon_2$	-0.608 (3.112)
Correlation $\varepsilon_5 - \varepsilon_3$	-0.980 (2.627)
Correlation $\varepsilon_5 - \varepsilon_4$	0.572 (0.992)

** p<0.10 ** p<0.05 *** p<0.01*

REFERENCES

Agresti, A. (1996). *An introduction to categorical data analysis*. Wiley series in probability statistics. John Wiley & Sons, Inc. United States of America.

Ahuvia, A.C. (2002). Individualism/collectivism and cultures of happiness: a theoretical conjecture on the relationship between consumption, culture and subjective well-being at the national level. *Journal of Happiness Studies* 3, 23 – 36.

Álvarez, B. and Miles, D. (2003). Gender effect on housework allocation: evidence from Spanish two-earner couples. *Journal of Population Economics* 16, 227 – 242.

Antonides, G. and Van Raaij, W.F. (1998). *Consumer behaviour. A European Perspective*. John Wiley & Sons. England.

Argyle, M. (1999). Causes and correlates of happiness. In: Kahneman, D, Diener, E. and Schwarz, N (eds.). *Well-being: the foundations of hedonic psychology*. Russel Sage Foundation. New York.

Aronsson, T., Daunfeldt, S. and Wikström. M. (2001). Estimating intra household allocation in a collective model with household production. *Journal of Population Economics* 14, 569 – 584.

Averett, S., Korenman. S. (1996). The economic reality of The Beauty Myth. *The Journal of Human Resources* 31, 2, 304 – 330.

Becker, G. S. (1965). A theory of the allocation of time. *Economic Journal* 75, 493 – 517.

Bedranek, H., Pecchenino, R., and Stearns, S. (2003). Fat and happy: Health choices and health outcomes. *Working Paper Saint Louis University*.

Bedrijfschap Horeca en Catering (2001). *Allochtone consumenten in de horeca* [Immigrant consumers in the hotel and catering industry]. BH&C. Zoetermeer.

Bellante, D. and Foster, A.C. (1984). Working wives and expenditure on services. *Journal of Consumer Research* 11, 700 – 707.

Bianchi, M. If happiness is so important, why do we know so little about it? (2003). *Abstract for conference 'The paradoxes of happiness in economics' 21 – 23 March 2003*. Department of Economics. University of Milano-Bicocca, 1 – 2.

Bjørnskov, C. (2003). The happy few: crow-country evidence on social capital and life satisfaction. *KYKLOS*, 56, 1, 3 – 16.

Bittman, M., Meagher, G., Matheson, G. (1998). The changing boundary between home and market. Australian trends in outsourcing domestic labour. *Social Policy Research Centre Discussion Paper* 86, 1 – 29.

Black, D., Smith, C., and Whitebread, M. (1988). *Inequalities in health. The black report. The health divide*. Townsend, P., and Davidson, N. (eds.). Penguin Books. England.

Bleichrodt, H. and Johannesson, M. (1997). Standard gamble, time trade-off and rating scale: experimental results on the ranking properties of QALYs. *Journal of Health Economics* 16, 155 – 175.

Bleichrodt, H., Koopmanschap, M. (1999). Economische evaluatie. In: Lapré, R., Rutten, F. en Schut, E. (eds.). *Algemene economie van de gezondheidszorg. Leerboek voor universitair en hoger beroepsonderwijs en management opleidingen* [General economics of health care. Textbook for university, college, and management education]. Elsevier/Tijdstroom. Maarssen.

Bos, V., Mackenbach, J.P., Keij-Deerenberg, I.M., Kunst, A.E. (2002). Verschillen in levensverwachting naar land van herkomst [Differences in life expectancy according to country of origin]. In: Van Oers J.A.M. (ed.) *Gezondheid op koers? Volksgezondheid Toekomst Verkenningen*, 39-40.

Bowling, A. and Windsor, J. (2001). Towards the good life: a population survey of dimensions of quality of life. *Journal of Happiness Studies* 2, 55 – 81.

Breedveld, K. (2001). Sport en bewegen. Verschuivingen in de active vrijetijdsbesteding [Shifts in active leisure time allocation]. In*:* Breedveld, K. and Van den Broek, A. (eds.). *Trends in de tijd. Een schets van recente ontwikkelingen in tijdsbesteding en tijdsordening*. Sociaal en Cultureel Planbureau. Den Haag.

Browning, M. and Chiappori, P.A. (1998). Efficient intra-household allocations: a general chracterization and empirical tests. *Econometrica* 66, 6, 1241 – 1278.

Brussaard, J.H., Erp-Baart, M.A. van, Brants, H.A.M., Hulfshof, K.F.A.M. and Löwik. (2001). Nutrition and health among migrants in The Netherlands. *Public Health Nutrition* 4 (2B), 659 – 664.

Burke, V., Beilin, L.J., and Dunbar, D. (2001). Family lifestyle and parental body mass index as predictors of body mass index in Australian children: a longitudinal study. *International Journal of Obesity* 25, 147 – 157.

Cantril, H. (1965). *The pattern of human concerns*. N.J.: Rutgers University Press. New Brunwick.

Centraal Bureau voor de Statistiek (CBS) [Dutch Bureau of Statistics] (1999). *Met de sleet naar de meet. Zes miljoen mensen hebben een langdurige aandoening* [Six million people with a long-lasting disorder]. Index No. 9.

Centraal Bureau voor de Statistiek (CBS) (2000). *Standaarddefinitie allochtonen* [Standard definition of immigrants]. Webmagazine: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2000a). *Groentenconsumptie in Nederland neemt af* [De creasing vegetables consumption in the Netherlands]. Webmagazine: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2000b). *Gezondheidstoestand van de Nederlandse bevolking. Percentage personen met ernstig overgewicht* [Health situation of the Dutch population. Percentage of people with obesity]. Table made in Statline (www.statline.nl). Gegevens afkomstig uit Permanent Onderzoek Leefsituatie (POLS) 1997-2000.

Centraal Bureau voor de Statistiek (CBS) (2000c). *Polsslagen. Jaarlijks 57 miljoen huisartscontacten* [Pulse. Yearly 57 million GP contacts]. Index mei: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2000d). *Minder gezond in de stad. Veel drinkers in Utrecht, veel rokers in Amsterdam en Rotterdam* [Poorer health in the city. Many drinkers in Utrecht, many smokers in Amsterdam and Rotterdam]. Index No. 5: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2001). *Allochtonen in Nederland 2001* [Immigrants in the Netherlands 2001]. Centraal Bureau voor de Statistiek. Voorburg/ Heerlen.

Centraal Bureau voor de Statistiek (CBS) (2001a). *Meer mensen te zwaar, minder rokers* [More people with overweight, fewer smokers]. Webmagazine: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2001b). *Regionale gezondheidsverschillen. Minder goede gezondheid in de vier grote steden en in Zuid-Limburg* [Regional differences in health. Poorer health in four big cities and in Zuid-Limburg]. Index No. 9: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2002a). *Nederlanders zwaarder en langer* [Dutch are heavier and taller]. Webmagazine: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2002b). *Bevolking zwaarder* [Population heavier]. Webmagazine: www.cbs.nl.

Centraal Bureau voor de Statistiek (CBS) (2002c). *Vademecum gezondheidsstatistiek Nederland* [Health statistics Netherlands]. Centraal Bureau voor de Statistiek. Voorburg/ Heerlen/ Den Haag.

Centraal Bureau voor de Statistiek (CBS) (2003a). *Allochtonen in Nederland 2003* [Immigrants in the Netherlands 2003]. Centraal Bureau voor de Statistiek. Voorburg/ Heerlen.

Centraal Bureau voor de Statistiek (CBS) (2003b). *Statistisch Jaarboek 2003* [Statistic annual]. Centraal Bureau voor de Statistiek. Voorburg/Heerlen.

Centraal Bureau voor de Satistiek (CBS). Statline. Online data: www.statline.nl .

Chiappori, P.A. (1988). Nash bargained household decisions: a comment. *International Economic Review* 29, 791 – 796.

Chiappori, P.A. (1997). Introducing household production in collective models of labor supply. *Journal of Political Economy* 105, 1, 191 –209.

Christoph, B. and Noll, H. (2003). Subjective well-being in the European Union during the 90s. In: Vogel, J. (ed.). *European Welfare Production*. Institutional Configuration and Distributional Outcome. Reprinted from Social Indicators Research, 63, 3. Kluwer Academic Publishers. The Netherlands.

CIA (2004). The World Checkbook. www.cia.gov

Ciscel, D.H., Sharp, D.C., and Heath, J.A. (2000). Family work trend and practices: 1971 to 1991. *Journal of Family and Economic Issues* 21, 1, 23 – 36.

Cohen, P.N. (1998). Replacing housework in the service economy: gender, class, and race-ethnicity in service spending. *Gender & Society* 12, 219 – 231.

Cohen, A.B. (2002). The importance of spirituality in well-being for Jews and Christians. *Journal of Happiness Studies* 3, 287 – 310.

Cornelisse-Vermaat, J.R., Maassen van den Brink, H. and Groot, W. (2003). De Prijs van overgewicht [The price of overweight]. *Economische Statistische Berichten*. 21 februari 2003, 88e jaargang, nr. 4395, 92 – 94.

Cutler, D.M., Glaeser, E.L. and Shapiro, J.M. (2003). Why have Americans become more obese? *Journal of Economic Perspectives* 17, 3, 93 – 118.

Cutler, D. M. and McClellan, M. (2001). Is technological change in medicine worth it? *Health Affairs* 20, 5, 11 – 29.

Cutler, D.M., Richardson, E. (1998). The value of health: 1970 – 1990. *American Economic Review* 2, 97 – 100.

Cummins, R.A. (2000). Personal income and subjective well-being: a review. *Journal of Happiness Studies* 1, 133 – 158.

De Graaf, C. (1994). De voeding van gemak. In: Van Dam, Y.K., De Hoog, C. and Van Ophem, J.A.C. (eds.). *Eten in de jaren negentig. Reflecties op gemaksvoeding* [Eating in de 1990's. Refections on convenience food]. Landbouw Universiteit Wageningen.

Delfino, R.J., Jamner, L.D., and Whalen, C.K. (2001). Temporal analysis of the relationship of smoking behavior and urges to mood states in men versus women. *Nicotine and Tobacco Research* 3, 3, 235 – 248.

Dolan, P. (2000). The measurements of health-related quality of life for the use in resource allocation decisions in health care. In: Culyer, A.J., and Newhouse, J.P. (ed.). *Handbook of health economics*. Volume 1B. Elsevier Science B.V. Amsterdam.

DESAN (2001). Rapport inzake telefonisch onderzoek "Leefpatroon in vier bevolkingsgroepen" [Report telephone survey "Lifestyles in four groups of the Dutch population]. DESAN Marktonderzoek BV. Amsterdam

Doll, H., Petersen, S. and Stewart-Brown, S. (2000). Obesity and physical and emotional well-being: associations between Body Mass Index, Chronic Illness, and Physical and Mental Components of the SF-36 Questionnaire. *Obesity Research* 8, 2, 160 – 170.

Easterlin, R.A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization* 27, 35 – 47.

Easterlin, R.A. (2001). Income and happiness: towards a unified theory. *The Economic Journal* 111, 465 – 484.

Easterlin, R.A. (2001a). Life cycle welfare: trends and differences. *Journal of Happiness Studies* 2, 1 – 12.

Entzinger, H.B. and Stijnen, P.J.J. (eds.) (1990). *Etnische minderheden in Nederland* [Ethnic minorities in the Netherlands]. Open Universiteit. Heerlen.

Entzinger, H. (2002). *Voorbij de multiculturele samenleving* [Beyond the multi-cultural environment]. Een verkorte versie van de uitgesproken tekst bij de aanvaarding van het hoogleraarschap migratie- en integratiestudies aan de Faculteit der Sociale Wetenschappen van de Erasmus Universiteit Rotterdam op 8 maart 2002. Van Gorcum. Assen.

Ermisch, J.F. (2003). *An economic analysis of the family*. Princeton University Press. United States of America.

Ferrer-i-Carbonell, A. and Van Praag, B.M.S. (2001). Poverty in Russia. *Journal of Happiness Studies* 2, 147 – 172.

Ferrer-i-Carbonell, A. and Van Praag, B.M.S. (2002). Age-differentiated QALY losses. *Tinbergen Institute Discussion Paper*, TI2002-015/3, 1 – 23.

Ferriss, A.L. (2002). Religion and the quality of life. *Journal of Happiness Studies* 3, 1999 – 215.

Florkowski, W.J., Moon, W., Resurrection, A.V.A., Jordanov, J., Paraskova, P., Beuchat, L.R., Murgov, K., Chinnan, M.S. (2000). Allocation of time for meal preparation in a transition economy. *Agricultural Economics* 22, 173 – 183.

Fontaine, K.R., Redden, D.T., Wang, C., Westfall, A.O., Allison, D.B. (2003). Years of life lost due to obesity. *Journal of American Medical Association* 2, 289, 187 – 193.

Frank, R.H. (1997). The frame of reference as a public good. *The Economic Journal* 107, 1832 – 1847.

Frederick, S., Loewenstein, G., and O'Donoghue, T. (2002). Time discounting and time preference: a critical review, *Journal of Economic Literature* XL, 351 – 401.

Frey, B.S. and Stutzer, A. (2002). What can economists learn from happiness research? *Journal of Economic Literature* XL, 402 – 435.

Frey, B.S. and Stutzer, A. (2004). Happiness Research: State and Prospects. *Institute for Empirical Research in Economics. University of Zurich. Working Paper Series ISSN 1424, Working Paper No. 190*, 1 – 24.

Fryback, D., E. Dasbach, R. Klein, B. Klein, N. Dorn, K. Peterson & P. Martin (1993). The Beaver dam health outcomes study: initial catalog of health-state quality factors. *Medical Decision Making* 13, 89 – 102.

Gerdtham, U.G., Johannesson, M., Lundberg, L., Isacson, D. (1999). The demand for health: results from new measures of health capital. *European Journal of Political Economy* 15, 501 – 521.

Gerdtham, U. and Johannesson, M. (2001). The relationship between happiness, health, and socio-economic factors: results based on Swedish microdata. *Journal of Socio-Economics* 30, 553 – 557.

Greeno, C., Jackson, Chr., Williams, E., and Fortmann, S. (1998). The effect of perceived control over eating on the life satisfaction of women and men: results from a community sample. *International Journal of Eating Disorders* 24, 415 – 419.

Greene, W.H. (2000). *Econometric analysis.* Fourth edition. Prentice Hall International, Inc. Pearson Education, Inc. Upper Saddle River, New Jersey.

Geronimus, A.T. (1999). Economic inequality and social differentials in mortality. In: Unequal incomes, unequal outcomes? Economic inequality and measures of well-being: proceedings of a conference sponsored by the FRBNY. *Economic Policy Reviews* 3, 133 – 142.

Graham, F. and Green, C. (1984). Estimating the parameters of a household production function with joint products. *Review of Economics and Statistics* 66, 277 – 282.

Gronau, R. (1977). Leisure, home production, and work – theory of the allocation of time revisited. *Journal of Political Economy* 85, 1099 – 1123.

Gronau, R. (1980). Home production – a forgotten industry. *The Review of Economics and Statistics* 62, 3, 408 – 416.

Gronau, R. (1986). Home production – a survey. In: Ashenfelter, O. and Layard, R. (eds.). *Handbook of Labour Economics* Volume I. Elsevier Science Publishers BV.

Garhammer, M. (2002). Pace of life and enjoyment of life. *Journal of Happiness Studies* 3, 217 – 256.

Groessl, E., Kaplan, R., Barret-Connor, E., and Ganiats, Th. (2004). Body Mass Index and the quality of well-being in a community of older adults. *American Journal of Preventive Medicine* 26, 2, 126 – 129.

Groot, W. (1998). *Hebben we genoeg zorg?* [Is our health care sufficient?]. Openbare Rede bij de Aanaarding van het Ambt van Hoogleraar Gezondheidseconomie aan de Universiteit Maastricht op vrijdag 19 juni 1998.

Groot, W. (2000). Adaptation and scale of reference bias in self-assessments of quality of life. *Journal of Health Economics* 19, 403 – 420.

Groot, W. and Maassen van den Brink (1999). Job satisfaction and preference drift. *Economic Letters* 63, 363 – 367.

Groot, W. and Maassen van den Brink (2000). *Lusten en lasten: over economie en emotie* [Joys and burdens: about economy and emotion]. Uitgeverij Prometheus. Amsterdam.

Groot, W. and Maassen van den Brink, H. (2002). Age and education differences in marriages and their effects on life satisfaction. *Journal of Happiness Studies* 3, 153 – 165.

Groot, W., and Maassen van den Brink, H. (2003). De economische effecten van ongezond gedrag. Achtergrondstudie [Economic effects of unhealthy behaviour. Background study]. RVZ. Zoetermeer.

Groot, W. and Maassen van den Brink, H. (2003a). Sympathy and the value of health. The spill-over effects of migraine on household well-being. *Social Indicators Research* 61, 97 – 120.

Groot, W. and Maassen van den Brink, H. (2003b). The compensating income variation for functional disability. *Working paper* 1 – 27.

Groot, W. and Maassen van den Brink, H. (2004). The health effects of education: a survey and meta-analysis. Forthcoming.

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy* 80, 223-255.

Grossman, M. (2000). The human capital model. In: Culyer, A.J., and Newhouse, J.P. (eds.). *Handbook of health economics*. Volume 1A. Elsevier Science B.V. Amsterdam.

Haagsma, R. (1995). *Microeconomic models for gender discrimination in labour markets with assymmetric information*. Academisch Proefschrift. Universiteit van Amsterdam.

Hallberg, D. (2003). Synchronous leisure, jointness and household labour supply. *Labour Economics* 10, 185 – 203.

Hallberg, D. and Klevmarken, A. (2003). Time for children: a study of parent's time allocation. *Journal of Population Economics* 16, 205 – 226.

Health Council of the Netherlands (2003). *Overweight and obesity*. The Hague: Health Council of the Netherlands. Publication no 2003/07.

Heiman, A., Just, D.R., McWilliams, B., Zilberman, D. (2001). Incorporating family interactions and socio-economic variables into family production functions: the case of demand for meats. *Agribusiness* 17, 4, 455 – 468.

Hersch, J. and Stratton, L.S. (1994). Housework, wages, and the division of household time for employed spouses. *Economic Issues for Work and Family*. AEA papers and proceedings 84, 2, 120 – 125.

Homan, M.E. (1988). *The allocation of time and money in one-earner and two-earner families: an economic analysis*. Dissertatie. Erasmus Universiteit. Rotterdam.

Homan, E., Hagenaars, A., Van Praag, B. (1991). Income inequality between one-earner and two-earner households: is it real or artificial. *De Economist* 139, 4, 530 – 549.

Hulshof, K.F.A.M., Brussaard, J.H., Kruizinga, A.G., Telman, J., Löwik, M.R.H. (2003). Socio-economic status, dietary intake and 10 y trends: the Dutch National Food Consumption Survey. *European Journal of Clinical Nutrition* 57, 128 – 137.

Huysmans, F. and De Haan, J. (2001). Media en ICT. Omgaan met een overvloedig aanbod [Media and ICT. Associate with abundant supply]. In: Breedveld, K. and Van den Broek, A. (eds.). *Trends in de tijd. Een schets van recent ontwikkelingen in tijdsbesteding en tijdsordening*. Sociaal en Cultureel Planbureau. Den Haag.

Jacobs, D.R., Gottenborg, S. (1981). Smoking and weight: the Minnesota lipid research clinic. *American Journal of Public Health* 71, 4, 391 – 396.

Jeffery, R.W., French, S.A. (1996). Socio-economic status and weight control practices among 20- to 45- year old women. *American Journal of Public Health* 86, 7, 1005 – 1010.

Johnston, J. and DiNardo, J. (1997). *Econometric Methods*. Fourth Edition. The McGraw-Hill Companies, Inc. United States of America.

Jöreskog, K. and Sörbom, D. (1996). *LISREL 8: User's reference guide*. Scientific Software International.

Kahneman, D., Diener, E. and Schwarz, N. (1999). *Well-being: the foundations of hedonic psychology*. Russel Sage Foundation. New York.

Kahneman, D., Knetsch, J.L., and Thaler, R.H. (1990). Experimental tests of the endowment effect and the case theorem. *Journal of Political Economy* 98, 6, 1325 – 1348.

Kee, P. (1995). Native-immigrant wage differentials in the Netherlands: discrimination? Oxford *Economic Papers* 47, 302 – 317.

Kim, C. (1989). Working wives' time-saving tendencies: durable ownership, convenience food consumption, and meal purchases. *Journal of Economic Psychology* 10, 391 – 409.

Kirzner, I.M. (1999). Rationality, entrepreneurship and economic 'imperialism'. In: Dow, S.C.H. and Earl, P.E. (eds.). *Economic Organization and Economic Knowledge*. Cheltenham: Edward Elgar.

Koenig, H.G., McCullough, M.E., and Larsson, D.B. (2001). *Handbook of religion and health*. Oxford University Press. Oxford.

Koivumaa-Honkanen, H., Honkanen, R., Koskenvuo, M., and Kario, J. (2003). Self-reported happiness in life and suicide in ensuing 20 years. *Social Psychiatry and Psychiatric Epidemiology* 38, 244 – 248.

Komlos, J., Smith, P.K., and Bogin, B. (2003). Obesity and the rate of time preference: is there a connection? *Munich Economics. Discussion paper 2003-16*. Department of Economics. University of Munich.

Kooreman, P. and Kapteyn, A. (1987). A disaggregated analysis of the allocation of time within the household. *Journal of Political Economy* 95, 21.

Lambriex, G.E.E.M. and Siegers, J.J. (1993). *Een geintegreerde analyse van tijds- en inkomenbesteding* [Integrated analysis of time allocation and income allocation]. SWOKA. Instituut voor consumentenonderzoek. Onderzoeksrapport 136. Den Haag.

Larsson, U., Karlsson, J., and Sullivan, M. (2002). Impact of overweight and obesity on health-related quality of life – a Swedish population study. *International Journal of Obesity* 26, 417 – 424.

Leeflang, P., Wittink, D., Wedel, M., Naert, Ph. (2000). *Building models for marketing decisions*. International Series in Quantitative Marketing. Kluwer Academic Publishers. Dordrecht.

Levin, J.S. and Chatters, L.M. (1998). Research on religion and mental health: an overview of empirical findings and theoretical issues. In: Koenig, H.G. (ed.). *Handbook of religion and mental health*. Academic Press. San Diego.

Lindström, M., Isacsson, S. and Merlo, J. (2003). Increasing prevalence of overweight, obesity and physical inactivity. *European Journal of Public health* 13, 306 – 312.

Lundberg, S. and Pollak, R. (1993). Separate spheres bargaining and the marriage market. *Journal of Political Economy* 84, 2, 132 – 137.

Lundberg, S. and Pollak, R. (1994). Non-cooperative bargaining models of marriage. *American Economic Review* 101, 6, 988 – 1010.

Maassen van den Brink, H. (2001). *Aletta Jabobslezing. De prijs van emancipatie*. Universiteit Groningen. Groningen.

Maassen van den Brink, H. and Groot, W. (1997). A household production model of paid labour, household work and childcare. *De Economist* 145, 3, 325-343.

Maddox, G.L. (ed.), Atchley, R.C., Poon, L.W., Roth, G.S., Siegler, I.C., Steinberg, R.M., Corsini, R.J. (1987). *The encyclopedia of aging*. Springer Publishing Company. New York.

Manrique, J., and Jensen, H.H. (1998) Working women and expenditures on Food-Away-From-Home and At-Home in Spain. *Journal of Agricultural Economics* 49, 3, 321-333.

Maddala, G.S. (1983). *Limited-dependent and qualitative variables in econometrics*. Cambridge University Press. United States of America.

Mathus -Vliegen, E.M.H. (1998). Overgewicht. I. Prevalenties en trends [Overweight I. Prevalence and trends]. *Nederlands Tijdschrift voor Geneeskunde* 142, 36, 1982 – 1989.

Mathus –Vliegen, E.M.H (1998). Overgewicht. II. Determinanten van overgewicht en strategieën voor preventie [Overweight II. Determinants of overweight and prevention strategies]. *Nederlands Tijdschrift voor Geneeskune*. 142, 36, 1989 – 1995.

McGrinnis, J.M., Foege, W.H. (1993). Actual causes of deaths in the United States. *Journal of American Medical Association* 270, 18, 2207 – 2222.

Mihalopoulos, V.G., Demoussis, M.P. (2001). Greek household consumption of food away from home: a microeconometric approach. *European Review of Agricultural Economics* 28, 4, 421 – 432.

Mills, E.S. (1999). Earnings inequality and central-city development. In: Unequal incomes, unequal outcomes? Economic inequality and measures of well-being: proceedings of a conference sponsored by the FRBNY. *Economic Policy Reviews* 3, 133 – 142.

Ministerie van Volksgezondheid, Welzijn en Sport (VWS) (2004). *Preventie* [Prevention]. 1N. VWS. Den Haag.

Mokyr, J. Why more work for the mother? Knowledge and household behaviour, 1870-1945. *The Journal of Economic History* 60, 1, 1 – 41.

Moore, M. and Viscusi, W.K. (1988). The quantity adjusted value of life. *Economic Inquiry* 26, 369 – 388.

Myers, D.G. and Diener, E. (1995). Who is happy? *Psychological Science* 6, 1, 10 – 19.

Onyike, C., Crum, R., Lee, H., Lyketsos, C., and Eaton, W. (2003). Is obesity associated with major depression? Results from the Third National Health and Nutrition and Examination Survey. *American Journal of Epidemiology* 158, 1139 – 1147.

Nationaal Instituut voor Budgetvoorlichting (NIBUD) (2004). *De inkomsten, uitgaven en het financieel beheer van alochtone huishoudens* [Income, expenditures, and financial management in immigrant households]. NIBUD. Utrecht.

Nayga, R.M. (2000). Schooling, health knowledge and obesity. *Applied Economics* 32, 815 – 822.

Nieto-Garcia, F.J., Bush, T.J., Keyl, P.M. (1990). Body mass definitions of obesity: sensitivity and specificity using self-reported weight and height. *Epidemiology* 1, 146 – 152.

Ooijendijk, W., Hildebrandt, V., and Stiggelhout, M. (2002). Bewegen in Nederland 2000: eerste resultaten van de monitorstudie bewegen en gezondheid [Physical activity in the Netherlands 2000: first results of monitoring study]. In: Ooijendijk, W., Hildebrandt, V., and Stiggelbout, M. (eds.). *Trendrapport Bewegen en Gezondheid 2000/2001*. TNO Arbeid. PlantijnCasparie. Heerhugowaard.

Oswald, A.J. (1997). Happiness and economic performance. *The Economic Journal* 107, 1815 – 1831.

Pagán, J.A., Dávila, A. (1997). Obesity, occupational attainment, and earnings. *Social Science Quarterly* 78, 3, 756 – 769.

Peeters, A., Barendregt, J.J., Willekens, F., Mackenbach, J.P., Al Mamun, A., Bonneux, L. (2003). Obesity in adulthood and its concequences for life expectancy: a life table analysis. *Annals of Internal Medicine* 138, 1, 24 – 32.

Pels, T. and Veenman, J. (1996). Onderwijsachterstanden bij allochtone kinderen. Het ontbrekende onderzoek [Arrears in education among immigrant children]. *Sociologische Gids* 2, XLIII, 131 – 145.

Philipson, T. (2001). The world-wide growth of obesity: an economic research agenda. *Health Economics* 10, 1 – 7.

Philipson, T.J., Posner, R.A. (1999). The long-run growth in obesity as a function of technological change. *John M. Olin Program in Law & Economics Working Paper Number 78*. University of Chicago Law School.

Pinhey, T.K., Rubinstein, D.H., Colfax, R.S. (1997) Overweight and happiness: the reflected self-appraisal hypothesis reconsidered. *Social Science Quarterly* 78, 3, 747 – 755.

Plug, E. (1997). *Leyden welfare and beyond*. Tinbergen Institute Research Series. University of Amsterdam. Thesis Publishers. Amsterdam.

Rabois, D. and Haaga , D.A.F. (2003). The influence of cognitive coping and mooid on smokers'self-efficacy and temptation. *Addictive Behaviors* 28, 561 – 573.

Reidpath, D.D., Crawford, D., Tilgner, L., Gibbons, C. (2002). Relationship between Body Mass Index and the use of healthcare services in Australia. *Obesity Research* 10, 526 – 531.

Register, C.A. and Williams, D.R. (1990). The wage effects of obesity in young workers. *Social Science Quarterly* 71, 130 – 141.

Rijksinstituut voor Volksgezondheid en Milieu (RIVM) (2004). *Ons eten gemeten. Gezonde voeding en veilig voedsel in Nederland* [Measuring our food. Healthy and safe food in the Netherlands]. Van Kreijl, C.F. and Knaap, A.G.A.C. (eds.). Bohn Stafleu Van Loghum. Houten.

Reijneveld, S.A. (1998). Reported health, lifestyles, and the use of health care of first generation immigrants in the Netherlands: do socio-economic factors explain their adverse position? *Journal of Epidemiology and Community Health* 53, 298 – 304.

Ross, C.E., Bird, C.E. (1994). Sex stratification and health lifestyle: consequences for men's and women's perceived health. *Journal of Health and Social Behavior* 35, 161 – 178.

Ruhm, Chr. J. (2003). Good times make you sick. *Journal of Health Economics*, 22, 637 – 658.

Salmon, J., Owen, N., Bauman, A., Schmitz, K., and Booth, M. (2000). Leisure-time, occupational, and household activity among professional, skilled, and less-skilled workers and homemakers. *Preventive Medicine* 30, 1991 – 1999.

Sarlio-Lähteenkorva, S. and Lahelma, E. (1999). The association of body mass index with social and economic disadvantage in women and men. *International Journal of Epidemiology* 18, 445 – 449.

Sarlio-Lähteenkorva, S. and Lahelma, E. (2001). Food insecurity is associated with pas and present economic disadvantage and body mass index. *Journal of Nutrition* 131, 2880 – 2884.

Sawhill, J.V. (1980) Economic perspectives on the family. In: Amsden, A.H. (ed.*). The economics of women and work*. New York.

Scheffer, P. (2000). Het multiculturele drama [The multi-cultural drama]. *NRC Handelsblad* 29-01-2000.

Scheffer, P. (2000a). Het multiculturele drama: een repliek [The multi-cultural drama: a reply]. *NRC Handelsblad* 25-03-2000.

Schultz, T. P. (1994). Overview, theory, and measurement. Investment in schooling and health of women and men. Quantities and returns. *The Journal of Human Development* 28, 4, 694 – 733.

Segers, J.H.G. (1983). *Sociologische onderzoeksmethoden. Deel I; Inleiding tot de structuur van het onderzoeksproces en tot de methoden van dataverzameling* [Sociologic research methods]. Assen.

Seidell, J.C., Verschuren, W.M.M., Kromhout, D. (1995). Prevalence and trends of obesity in The Netherlands 1987 – 1991. *International Journal of Obesity* 19, 924 – 927.

Simeon, D., Rattan, R., Panchoo, K., Kungeesingh, K., Ali, A., and Abdool, P. (2003). Body image of adolescents in a multi-ethnic Caribbean population. *European Journal of Clinical Nutrition* 57, 157 – 162.

Sirgy, M.J. (2001). *Handbook of Quality-of-Life-Research. An ethical marketing perspective*. Kluwer. Dordrecht.

Smith, G.D. (2000). Learning to live with complexity: ethnicity, socio-economic position, and health in Britain and the United States. *American Journal of Public Health* 90, 11, 1694 – 1698.

Soberon-Ferrer, H. and Dardis, R. (1991). Determinants of household expenditures for services. *Journal of Consumer Research* 17, 385 – 397.

Sociaal en Culturaal Planbureau (1998). *Rapportage minderheden 1998* [Report on ethnic minorities 1998]. Cahier 153. Sociaal en Cultureel Planbureau. Voorburg/ Den Haag.

Sociaal en Cultureel Planbureau (2000). *Sociaal en Cultureel Rapport 2000. Nederland en Europa* [Social and Cultural Report 2000. The Netherlands and Europe]. SCP. Den Haag.

Sociaal en Cultureel Planbureau (2000a). *De kunst van het combineren. Taakverdeling onder partners* [The skill to combine. Division of tasks among partners]. Keuzekamp, S. and Hooghiemstra, E. (eds.). SCP. Den Haag.

Sociaal en Cultureel Planbureau (2001). *Trends in de tijd. Een schets van recente ontwikkelingen in tijdsbesteding en tijdsordening* [Trends in time. An outline of recent developments in time allocation]. Breedveld, K. and Van den Broek, A. (eds.). Sociaal en Cultureel Planbureau. Den Haag.

Sociaal en Cultureel Planbureau (SCP) and Centraal Bureau voor de Statistiek (CBS) (2002). *Emancipatiemonitor 2002* [Emancipation monitor 2002]. Portegijs, W., Boelen, A. and Keuzenkamp, S. (eds.) Sociaal en Cultureel Planbureau and Centraal Bureau voor de Statistiek. Den Haag.

Sociaal en Cultureel Planbureau (SCP) (2003). *Rapportage minderheden 2003. Onderwijs, arbeid en sociaal-culturele integratie* [Report on ethnic minorities. Education, market labour, and socio-cultural integration]. Dagevos, J. Gijsberts, M. and Van Praag, C. (eds.). Sociaal en Cultureel Planbureau. Den Haag.

Sociaal en Cultureel Planbureau (SCP) (2004). *Moslim in Nederland. Religie en migratie: sociaal - wetenschappelijke databronnen en literatuur* [Muslim in the Netherlands. Religion and migration: socio-scientific data and literature]. SCP-werkdocument 106a. Phalet, K. and Ter Wal, J. (eds.). Een onderzoek in opdracht van de minister voor Vreemdelingenzaken en Integratie. SCP. Ercomer-ICS Universiteit Utrecht. Den Haag.

Sociaal en Cultureel Planbureau (SCP) (2004a). www.tbo.nl . Table 5.1 and 5.2 were made on our request by the SCP.

Sociaal en Cultureel Planbureau (2004b). *Sociaal en Cultureel Rapport 2004. In het zicht van de toekomst* [Social and Cultural Report 2004. In view of the future]. SCP. Den Haag.

Sousa-Poza, A., Schmid, H., and Widmer, R. (2001). The allocation and value of time assigned to housework and childcare: analysis for Switzerland. *Journal of Population Economics* 14, 599 – 618.

Spitze, G. (1999). Getting help with housework. *Journal of Family Issues* 20, 6, 724 – 745.

Strober, M. and Miling Kaneko Chan, A. (1998). Husbands, wives, and housework: graduates of Stanford and Tokyo universities. *Feminist Economics* 4, 3, 97 – 127.

Stronks, K., Ravelli, A.C.J., Reijneveld, S.A. (2001). Immigrants in the Netherlands: equal access for equal needs. *Journal of Epidemiology Community Health* 44, 701 – 707.

Tijdens, K., Lippe, T. Van der, Ruijter, E. (2000). *Huishoudelijke arbeid en de zorg voor kinderen: herverdelen of uitbesteden?* [Household labour and childcare: redistribution or outsourcing?]. Serie wetenschappelijke Publicaties. Elsevier Bedrijfsinformatie b.v. 's Gravenhage.

Tubergen, F. (2003). Religieuze participatie en geloof van immigranten in Nederland. Nieuwe toetsingen van oude theorieën [Religious participation and faith among immigrants in the Netherlands]. *Mensch & Maatschappij* 78, 4, 331 – 354.

Tweede Kamer der Staten-Generaal (2004). *Onderzoek Integratiebeleid* [Research on integration policies]. Tweede Kamer, vergaderjaar 2003-2004, 28 689, nrs. 8-9. SDU Uitgevers. 's-Gravenhage.

Uniken Venema, H.P. Garretsen, H.F.L. and Maas, P.J. van der (1995). Health of migrants and migrant health policy, the Netherlands as an example. *Social Science Medicine* 41, 6, 809 – 818.

Van Dam, Y.K., Hoog, C. de, Ophem, J.A.C. van (1994). Ten geleide: reflecties op gemak bij voeding [Reflections on convenience and food]. In: Van Dam, Y.K., De Hoog, C., and Van Ophem J.A.C. (eds.). *Eten in de jaren negetig. Reflecties op gemaksvoeding* [Eating in the 1990's. Reflections on convenience food]. Landbouw Universiteit Wageningen.

Van Dorp, A. and Van Ophem, J. (1998). Inkomen en consumptie van allochtonen [Income and consumption among immigrants]. *Economisch Statistische Berichten*, 83, May 1st, 364 – 366.

Van Lenthe, F.J., Droomers, M. Schrijvers, C.T.M. and Mackenbach, J.P. (2000). Socio-demographic variables and 6 year change in body mass index: longitudinal results from the GLOBE study. *International Journal of Obesity* 24, 1077-1084.

Van der Meulen, R. (2003). Beoefening. In: Breedveld, K. (ed.). *Rapportage Sport 2003* [Report on sports 2003]. Sociaal en Cultureel Planbureau. Den Haag.

Van Ophem, J.A.C, and De Hoog, K. (1995). Monetarisering in de huishouding: een historische beschouwing [Monetarisation in households: a historic consideration]. *Huishoudstudies* 5, 2, 1 – 8.

Van Ophem, J.A.C, and De Hoog, K. (1995a). Monetarisering in de huishouding: een analyse van de relatief welgestelden [Monetarisation in households: an analysis of the relatively well-to-do]. *Huishoudstudies* 5, 2, 8 – 19.

Van Praag, B.M.S. (1971). The Welfare Function of Income in Belgium: an Empirical Investigation. *European Economic Review* 2, 337 – 369.

Van Praag, B. and Frijters, P. (1999). The measurement of welfare and well-being: the Leyden Approach. In: *Well-being: the foundations of hedonic psychology*. Kahneman, D., Diener, E. and Schwarz, N. (eds.). Russel Sage Foundation. New York.

Van Praag, B.M.S. and Ferrer-i-Carbonell, A. (2002). Age-differentiated QALY losses. *Tinbergen Institute Discussion Paper* TI 2002-015/3, 1 – 23.

Van Praag, B. and Ferrer-i-Carbonell, A. (2004). *Happiness quantified*. A satisfaction calculus approach. Oxford University Press. New York.

Van der Werf, S. (1998). *Allochtonen. Een inleiding in de multiculturele samenleving* [Immigrants. An introduction to the multi-cultural society]. Uitgeverij Coutinho. Bussum.

Veenhoven, R. (1997). Advances in understanding happiness. Published in French in: *Revue Québécoise de Psychologie* 18, 29 – 74.

Veenhoven, R. (1999). Quality-of-life in individualistic society. A comparison of 43 nations in the early 1990's. *Social Indicators Research* 48, 157 – 186.

Veenhoven, R. (2000). The four qualities of life. Ordering concepts and measures of the good life. *Journal of Happiness Studies* 1, 1 – 39.

Veenhoven, R. (2001). Are the Russians as unhappy as they say they are? Comparability of self-reports across nations. *Journal of Public Happiness Studies* 2, 111 – 136.

Veenhoven, R. (2002). Why social policy needs subjective indicators. *Social Indicators Research* 58, 33 – 45.

Veenhoven, R. (2004). The greatest happiness principle. Happiness as an aim in public policy. In: Linley, A. and Joseph, S. (eds.). *Positive psychology in practice*. John Wiley and Sons Inc. Hoboken, N.J. USA.

Veenman, J. (2001). *Urban Demographic Futures. The development and prospects of multicultural cities in the Netherlands.* Abstract. Urban Futures, Sodertalje, Sweden, 10-12 May, 1 – 5.

Verkuyten, M. (1986). The impact of ethnic and sex differences on happiness among adolescents in the Netherlands. *Journal of Science Psychology* 126, 259 – 260.

Viscusi, W.K. (1993) The value of risks to life and health. *Journal of Economic Literature* XXXI, 1912 – 1946.

Visscher, T.L.S., Kromhout, D., Seidell, J.C. (2002). Long-term and recent time trends in the prevalence of obesity among Dutch men and women. *International Journal of Obesity* 26, 1218 – 1224.

Wack, J.T., Rodin, J. (1982). Smoking and its effects on body weight and the systems of caloric regulation. *The American Journal of Clinical Nutrition* 35, 366 – 380.

Wannamethee, S.G. and Shaper, A.G. (1991). Self-assessment of health status and mortality in middle-aged British men. *International Journal of Epidemiology* 20, 1, 239 – 45.

Wannamethee, S.G., Shaper, A.G. and Walker, M. (2001). Weight change, body weight and mortality: the impact of smoking and ill health. *International Journal of Epidemiology* 30, 777 – 786.

Weide, M.G., Foets, M. (1998). Migranten in de huisartspraktijk: andere klachten en diagnosen dan Nederlanders [Immigrants visiting the GP: different complaints and different diagnoses than the native Dutch]. *Nederlands Tijdschrift voor Geneeskunde* 142, 38, 2105 – 2109.

Weijters, G. and Scheepers, P. (2003). Verschillen in sociale integratie tussen etnische groepen: beschrijving en verklaring [Differences in social integration between ethnic groups. Description and explanation]. *Mens & Maatschappij* 78, 2, 144 – 157.

Wetenschappelijke Raad voor het Regeringsbeleid (WRR) (2001a). *Perspectief op integratie. Over de sociaal-culturele en structurele integratie van etnische minderheden in Nederland* [Perspective on integration. On socio-cultural and structural integration of ethnic minorities in the Netherlands]. Dagevos, J. Werkdocumenten W121. Den Haag.

Wetenschappelijke Raad voor het Regeringsbeleid (WRR) (2001b). *Oude en nieuwe allochtonen in Nederland. Een demografisch profiel* [Old and new immigrants in the Netherlands. A demographic profile]. De Valk, H.A.G., Esveldt, I., Henkens, K. and Liefbroer, A.C. Werkdocumenten W123. Den Haag.

Wetenschappelijke Raad voor het Regeringsbeleid (WRR) (2001c). *Nederland als immigratiesamenleving* [The Netherlands as an immigration-society]. Rapporten aan de regering 60. SDU Uitgevers. Den Haag.

World Health Organization (2000). *Obesity: preventing and managing the global epidemic*. Report of WHO consultation. WHO Technical Report Series 894. Geneva.

World Health Organization (2003). *Diet, nutrition and the prevention of chronic diseases. Report of a joint WHO/FAO expert consultation*. World Health Organization. Geneva.

World Health Organization (2003a). *The solid facts. Social determinants of health*. Second Edition. Wilkinson, R. and Marmot, M. (eds.). WHO Europe. Denmark.

Yamada, Tadashi; Yamada, Tetsuji; Moonwon Kang, J. (1999). A study of time allocation of Japanese households. *Japan and the World Economy* 11, 41 – 55.

Nederlandse samenvatting (Dutch summary)

Inleiding

Bijna 10 procent van de Nederlandse bevolking bestaat uit niet-westerse allochtonen[1]. Naar verwachting zal in 2050 dat aandeel 20 procent zijn; 4 miljoen niet-westerse immigranten op een totale populatie van 18 miljoen. De vier grootste niet-westerse allochtone groepen in Nederland zijn de Turken, de Marokkanen, de Surinamers en de Antillianen.

In de afgelopen decennia heeft de integratie van allochtonen in de Nederlandse samenleving weinig aandacht gekregen. Maar de laatste paar jaar is die aandacht toegenomen en is er veel discussie in het kabinet en in de media over het al dan niet slagen van het integreren van allochtonen in de Nederlandse samenleving. Publicist Paul Scheffer was in 2000 een van de eersten die de discussie rondom de integratie van allochtonen en de islamisering in Nederland in de landelijke pers aan de orde stelde.

Naast de discussie over integratie zijn er grote zorgen over het lagere opleidingsniveau en de lagere arbeidsparticipatie van niet-westerse allochtonen in Nederland.

De Parlementaire Enquête Commissie concludeerde in het voorjaar van 2004 dat de Nederlandse overheid meer aandacht moet besteden aan het integratievraagstuk en meer integratiestimulerende maatregelen moet nemen.

De afgelopen jaren is er onderzoek geweest naar de sociaal-economische status (arbeidsparticipatie, inkomen en opleidingsniveau) van allochtonen in Nederland. Tot op heden is er echter niet veel onderzoek naar de gezondheid, het uitbesteden van huishoudelijke en zorgtaken en het welbevinden van niet-westerse allochtonen verricht. Er is ook weinig onderzoek naar verricht naar het effect van het uitbesteden van maaltijdbereiding op gezondheid en overgewicht.

In het algemeen wordt een lagere sociaal-economische status geassocieerd met een minder goede gezondheid. Allochtonen in Nederland rapporteren een slechtere gezondheid dan autochtonen. Behalve sociaal-economische achtergrond, spelen genetische en sociaal-culturele aspecten ook een rol bij gezondheidsverschillen.

Overgewicht is een gezondheidsthema dat de laatste jaren sterk in de belangstelling staat. Overgewicht heeft een negatief effect op de gezondheid, omdat het gerelateerd is aan hart- en vaatziekten, suikerziekte en bepaalde vormen van kanker. In 2000 heeft de World Health Organization overgewicht zelfs tot volksepidemie nummer 1 van de wereld verklaard.

In Nederland is er de laatste jaren ook veel aandacht voor het overgewichtprobleem. In 2003 kwam de Gezondheidsraad met een rapport over overgewicht en obesitas in Nederland. In de

[1] Een allochtoon is iemand waarvan tenminste 1 ouder in het buitenland geboren is (CBS, 2000).

achtergrondstudie van dit rapport hebben Groot en Maassen van den Brink (2003) onderzoek gedaan naar de economische effecten van (on-)gezond gedrag. In 2004 kwam het Rijksinstituut voor Volksgezondheid en Milieu (RIVM) met een onderzoeksrapport over gezond en veilig eten.

In veel gevallen is overgewicht het gevolg van een ongezonde levensstijl. Een te hoge calorische inname en te weinig beweging leiden tot overgewicht.

Gedurende de afgelopen decennia is er veel veranderd in de leefstijl van mensen in Nederland. Tegenwoordig kunnen huishoudelijke en zorgtaken uitbesteed worden aan een hulp in de huishouding, eten koken kan uitbesteed worden aan restaurants (of mensen kunnen van afhaaleten, kant-en-klaar maaltijden en bezorgeten gebruikmaken) en de zorg voor kinderen kan worden uitbesteed aan de kinderopvang. Steeds meer huishoudens maken gebruik van al deze of een combinatie van mogelijkheden.

Ten aanzien van het bovenstaande rijst de vraag of de sociaal-economische status en de veranderingen in de leefstijl van de Nederlandse bevolking ook gerelateerd zijn aan het persoonlijk welbevinden.

In de economische literatuur worden welvaart, geluk, welzijn en persoonlijk welbevinden als synoniemen gebruikt. Door hun minder goede sociaal-economische omstandigheden zouden allochtonen minder “gelukkig” kunnen zijn dan de autochtonen. Alhoewel het belang van persoonlijk welbevinden tussen culturen kan verschillen, wordt levensgeluk over het algemeen toch als het ultieme levensdoel gezien.

De doelstelling van dit onderzoek is om de gezondheid (en overgewicht), het uitbestedingsgedrag en het welzijn van niet-westerse allochtonen te bestuderen en te vergelijken met autochtonen in Nederland. In dit proefschrift worden de sociaal-economische determinanten van gezondheid, overgewicht, uitbesteding en geluk onderzocht en wordt het effect van de “moderne levensstijl” (uitbesteden van maaltijdbereiding etc.) op gezondheid, overgewicht en geluk bestudeerd.

De volgende onderzoeksvragen staan in het onderzoek centraal:

1. Wat zijn de sociaal-economische determinanten van gezondheid (en overgewicht) van niet-westerse allochtonen en autochtonen in Nederland?
2. In welke mate heeft het uitbesteden van maaltijdbereiding effect op de gezondheid en het overgewicht van niet-westerse allochtonen en autochtonen in Nederland?
3. Wat zijn de sociaal-economische, demografische en etnische determinanten van de tijd besteed aan huishoudelijke en zorgtaken?
4. a. In welke mate beïnvloedt de sociaal-economische status de vraag naar uitbesteding van huishoudelijke en zorgtaken?

   b. wat zijn de verschillen tussen niet-westerse allochtonen en autochtone Nederlanders ten aanzien van het uitbesteden van huishoudelijke en zorgactiviteiten?

5. Wat is het effect van de sociaal-economische status op het welzijn van niet-westerse allochtonen en autochtonen?
6. En wat is de rol van gezondheid en uitbesteding van taken ten aanzien van het persoonlijk welbevinden?

In het onderzoek worden niet-westerse allochtone groepen vergeleken met de autochtone Nederlanders. Deze groepen zijn: Surinamers, Antillianen (inclusief de Arubanen), Marokkanen en Turken. Vanwege hun vergelijkbare achtergrond zijn de Surinamers en Antillianen in 1 groep samengenomen.

Om voldoende waarnemingen te genereren en om de 4 groepen te kunnen vergelijken was het nodig om een gestratificeerde steekproef uit de populatie te trekken. Dit is aan het eind van 2001 door middel van een telefonische enquête gebeurd. Deze steekproef resulteerde in een dataverzameling onder 2551 respondenten, waarvan 701 Surinamaams/Antilliaanse, 700 Turkse, 449 Marokkaanse en 701 autochtone Nederlandse respondenten.

Opbouw van het proefschrift

De opzet van het proefschrift is als volgt. Hoofdstuk 1 introduceert de verschillende onderwerpen die in het proefschrift aan de orde komen en bespreekt de geschiedenis en de huidige situatie van niet-westerse allochtonen in Nederland.

In hoofdstuk 2 wordt de dataverzameling besproken en worden de verzamelde data vergeleken met data van het Centraal Bureau voor de Statistiek (CBS). Dit hoofdstuk geeft ook informatie over de achtergrondkenmerken van de genoemde groepen.

In hoofdstuk 3 wordt onderzocht in hoeverre sociaal-economische en demografische variabelen overgewicht beïnvloeden. Er wordt onderzocht of de Turkse, Marokkaanse en Surinaams/Antilliaanse respondenten hierin verschillen van autochtone Nederlandse respondenten. In dit hoofdstuk worden ook de effecten van het uitbesteden van maaltijdbereiding (zoals afhaaleten, kant-en-klaar maaltijden en buitenshuis eten) op overgewicht bestudeerd.

Hoofdstuk 4 bestudeert de factoren die gezondheid verklaren. Het ‘demand for health’ model van Grossman (1972) wordt gebruikt om het gezondheidskapitaal van de respondenten te meten. Naast sociaal-economische, demografische en etnische achtergrond wordt in dit hoofdstuk ook het effect van overgewicht op gezondheid onderzocht. Om het effect van overgewicht op gezondheid te meten wordt een berekening gemaakt met behulp van Quality Adjusted Life Years (QALY’s). Dit is een maat voor gezondheidseconomische effecten.

In hoofdstuk 5 wordt onderzocht in hoeverre de tijd besteed aan huishoudelijke en zorgtaken bepaald wordt door het aantal werkuren, het opleidingsniveau en de hoogte van het huishoudinkomen. Er wordt ook onderzocht wat het effect van het hebben van (jonge) kinderen is op huishoud- en zorgtijd. Dit hoofdstuk bestudeert ook welke factoren (zoals werkuren en het hebben van kinderen)

een rol spelen bij het uitbesteden van huishoudelijke en zorgtaken. Met als uitgangspunt de huishoudproductietheorie van Becker (1965) worden de sociaal-economische, etnische en demografische determinanten van huishoud- en zorgtijd en uitbesteding onderzocht.

Hoofdstuk 6 onderzoekt in hoeverre de sociaal-economische status van de niet-westerse allochtonen hun persoonlijk welbevinden beïnvloedt. Persoonlijk geluk kan worden gedefinieerd als de mate waarin mensen hun leven in het algemeen beoordelen. De Cantril-schaal (1965) is gebruikt om dit persoonlijk welzijn van mensen te meten. Naast sociaal-economische en demografische kenmerken, worden ook de gezondheid, het overgewicht, de huishoud- en zorgtijd en het uitbesteden meegenomen als determinanten van welzijn. Ook in dit hoofdstuk worden de Turkse, Marokkaanse en Surinaams/Antilliaanse respondenten met de autochtone Nederlandse respondenten vergeleken.

Hoofdstuk 7 synthetiseert de onderwerpen die in de voorafgaande hoofdstukken onderzocht zijn. In dit hoofdstuk is een model voor structurele vergelijkingen ontwikkeld waarmee met behulp van LISREL tegelijkertijd gezondheid, overgewicht, huishoud- en zorgtijd, uitbesteden en persoonlijk welbevinden is onderzocht. De onderlinge relaties tussen gezondheid, uitbesteding en geluk worden in dit model ook meegenomen. Hoofdstuk 7 sluit af met de belangrijkste bevindingen en conclusies van deze studie en doet aanbeveling voor verder onderzoek.

Uitkomsten van het onderzoek

Vergeleken met de autochtone Nederlanders, is de prevalentie van overgewicht onder de onderzochte allochtone groepen hoger. Maar zowel onder de autochtone als onder de allochtone bevolking in Nederland is sprake van relatief veel overgewicht (40 tot 50 procent van de totale bevolking heeft een Body Mass Index $\geq$ 25). Mannen hebben vaker overgewicht dan vrouwen. Dit geldt overigens niet voor de Surinaams/Antilliaanse groep, waar vrouwen een hogere prevalentie voor overgewicht hebben dan mannen.

In alle onderzochte groepen blijkt opleiding een belangrijke determinant van overgewicht te zijn; hoger opgeleiden hebben minder overgewicht dan lager opgeleiden. Huishoudinkomen heeft geen invloed op overgewicht. Dit geeft aan dat vooral kennis over een gezond dieet en een gezonde leefstijl belangrijk is. Scholing leidt tot meer kennis over gezondheid en gezondheidsbevordering en dit draagt bij aan een betere gezondheidstoestand.

Het effect van het uitbesteden van maaltijd bereiding (zoals de kant-en-klaar maaltijden, het afhaaleten en het eten in restaurants) is divers en soms indirect via inkomen. Zo zullen mensen met een hoger inkomen sneller maaltijdbereiding uitbesteden dan mensen met een lager inkomen.

Het eten van kant-en-klaar maaltijden verlaagt de Body Mass Index (BMI) van Marokkaanse respondenten, terwijl het bij de Surinaams/Antilliaanse respondenten de BMI verhoogt. Over het algemeen eten niet-westerse allochtonen vaker kant-en-klaar maaltijden dan autochtone Nederlanders. In de hele steekproef blijkt dat zowel het eten van afhaaleten als het eten in restaurants de BMI te verlagen. Dit betekent dat afhaaleten en het eten in restaurants, in tegenstelling tot de verwachting,

goed is voor het gewicht. Het geeft ook aan dat mensen blijkbaar in staat zijn tot het maken van goede keuzes ten aanzien van het uitbesteden van maaltijdbereiding.

Het onderzoekt toont aan dat de gezondheid slechter is naarmate men ouder wordt, als men overgewicht heeft en als men rookt. Hoger opgeleiden en mensen die getrouwd zijn of samenwonen hebben een betere gezondheid.

De gezondheid van de Marokkaanse en Turkse respondenten is slechter dan die van de autochtone Nederlandse respondenten. Voor Surinaams/Antilliaanse respondenten is dit effect niet gevonden. Dit laatste kan vooral verklaard worden uit het feit dat de sociaal-economische status van Surinamers/Antillianen overeenkomt met die van de autochtone Nederlanders.

De autochtone Nederlandse respondenten en de Surinaams/Antilliaanse respondenten rapporteren een minder goede gezondheid als ze overgewicht hebben. De Turken en Marokkanen ervaren dit gezondheidsverlies door overgewicht niet. Het is de vraag of deze groepen ook werkelijk geen gezondheidsklachten hebben die worden veroorzaakt door overgewicht, of dat dit resultaat gevonden is doordat deze groepen overgewicht positiever beoordelen en het associëren met een leven in welvaart en gezondheid. Dit kan te maken hebben met hoe overgewicht in de eigen cultuur wordt beoordeeld. Zo wordt op eilanden in de Grote Oceaan, waar overgewicht wereldwijd het meeste voorkomt, overgewicht gerelateerd aan rangen en standen. Dikke mensen ontvangen daar meer respect en aanzien dan hun dunne medemens.

Niet verrassend is de bevinding dat vrouwen meer tijd besteden aan huishoudelijke en zorgtaken dan mannen. Verder wordt de huishoud- en zorgtijd bepaald door het aantal werkuren van beide partners. Hoe meer de partners werken, hoe minder uren ze in het huishouden besteden. Als er jonge kinderen in het huishouden zijn wordt er meer tijd aan huishoudelijke en zorgtaken besteed dan wanneer er geen kinderen zijn. Naarmate men gezonder is, wordt er meer tijd besteed aan huishoud- en zorgactiviteiten. Surinaams/Antilliaanse en Marokkaanse respondenten (met name vrouwen) besteden meer tijd aan huishoudelijke en zorgtaken dan autochtone Nederlandse respondenten.

Zoals verwacht besteden mensen met een hogere sociaal-economische status meer geld aan het uitbesteden van huishoudelijke en zorgtaken dan mensen met een lagere sociaal-economische status. Alle onderzochte niet-westerse allochtone groepen besteden minder geld aan uitbesteden dan de autochtone Nederlandse respondenten. In de hele steekproef geldt dat als er in een huishouden jonge kinderen zijn, er significant meer geld wordt gespendeerd aan uitbesteding, met name door hogere kosten voor kinderopvang.

Het aantal uren dat men op de arbeidsmarkt werkt gaat ten koste van het aantal uren dat men aan huishoudelijke en zorgtaken besteedt. De vraag is natuurlijk of de respondenten dan ook minder tijd aan hun kinderen besteden. Uit het onderzoek blijkt dat dit niet geldt voor de ‘quality-time’ die ouders met hun kinderen doorbrengen. ‘Quality-time’ is gedefinieerd als het doen van spelletjes met kinderen, het voorlezen van kinderen en het helpen van kinderen bij hun huiswerk. Turkse respondenten besteden minder tijd aan het voorlezen en het doen van spelletjes met hun kinderen dan

autochtone Nederlandse respondenten. De Marokkaanse en Surinaams/Antilliaanse respondenten verschillen niet significant van de autochtone Nederlandse respondenten in de hoeveelheid 'quality-time' die ze met hun kinderen doorbrengen.

In de hele steekproef besteden zowel niet-westerse allochtone als autochtone Nederlandse hoger opgeleide vrouwen (die in het algemeen meer werkuren hebben) meer geld aan het uitbesteden van huishoudelijke en zorgtaken, terwijl ze meer tijd besteden aan 'quality-time' met hun kinderen. Dit betekent dat uitbesteding van de zorg voor kinderen geen substituut is voor de tijd die ouders zelf met hun kinderen doorbrengen.

Niet-westerse allochtone respondenten zijn ongelukkiger dan autochtone Nederlandse respondenten. Dit geldt vooral voor de allochtone mannen. Van de allochtone vrouwen zijn alleen de Turkse vrouwen ongelukkiger dan de autochtone Nederlandse vrouwen. Het is moeilijker om te verklaren waarom de Surinamers/Antillianen ongelukkiger zijn dan autochtone Nederlanders, vooral omdat hun sociaal-economische achtergrond vergelijkbaar is met die van de autochtone Nederlanders. Doordat er in de analyses gecorrigeerd is voor sociaal-economische status, is dat geen verklarende factor voor het verschil in persoonlijk welbevinden tussen deze groepen. Discriminatie of een gebrek aan integratie in de Nederlandse samenleving zouden hier een rol kunnen spelen.

Gezondheid is een belangrijke factor in het verklaren van welzijn. De gezondheid van de Turken en Marokkanen is minder goed dan die van de autochtone Nederlanders. Dit zou kunnen verklaren waarom met name de Turken minder gelukkig zijn dan de autochtone Nederlanders.

Autochtone Nederlanders zijn gelukkiger wanneer ze getrouwd zijn of samenwonen. Niet-westerse allochtonen zijn dat niet. Dit zou kunnen betekenen dat de huwelijken van niet-westerse allochtonen minder gelukkig zijn dan die van de autochtone Nederlanders. Het is bekend dat met name Turken en Marokkanen hun echtgenot(e) uit hun moederland halen. Vaak zijn deze huwelijken gearrangeerd. Waarschijnlijk zijn deze gearrangeerde huwelijken minder gelukkig dan de huwelijken waarbij de mannen en vrouwen zelf hun partner mogen kiezen.

Met name de vrouwen zijn in de steekproef ongelukkiger als ze jonge kinderen hebben. Dit wordt waarschijnlijk veroorzaakt door het feit dat vooral het leven van de vrouw verandert als er kinderen komen. Dit betekent een hele nieuwe dagindeling, minder contacten op het werk en/of de stress van het combineren van arbeid en zorg. Het laatste argument zal minder gelden voor de Marokkaanse en Turkse vrouwen, omdat hun arbeidsparticipatie voor de geboorte van hun eerste kind over het algemeen laag is.

In het algemeen worden mannen ongelukkiger van huishoud- en zorgtijd. Dit geldt met name voor de Turkse en Marokkaanse mannen. Voor de vrouwen in de steekproef is dit effect niet gevonden is. Van vrouwen wordt verwacht dat ze dergelijke taken verrichten. Gedurende de afgelopen decennia is de verdeling van huishoudelijke en zorgtaken tussen partners veranderd en zijn mannen meer tijd gaan besteden aan huishoudelijke en zorgtaken. In tegenstelling tot de verwachting

worden vrouwen niet ongelukkiger van huishoud- en zorgtaken. Zij hebben zich waarschijnlijk bij neergelegd dat van hen verwacht wordt dat ze deze taken uitvoeren.

Mensen die in de steden wonen zijn gelukkiger dan mensen die in rurale gebieden wonen. Mensen in de steden werken meer en zullen meer mogelijkheden hebben om huishoudelijke en zorgtaken uit te besteden. Het uitbesteden van huishoudelijke en zorgtaken geeft hen meer ruimte voor vrije tijd en tijd met hun kinderen.

De niet-westerse allochtone respondenten zijn religieus dan de autochtone Nederlandse respondenten. Ruim 40 procent van de Turkse en Marokkaanse respondenten bezoekt meer dan eens per maand een moskee. Ongeveer een kwart van de autochtone Nederlandse en Surinaams/Antilliaanse respondenten zegt meer dan eens per maand een kerk, moskee, synagoge of tempel te bezoeken. Uit het onderzoek wordt duidelijk dat religieuze mensen zich gezonder voelen en gelukkiger zijn. Dit effect wordt met name voor de Turkse en Marokkaanse vrouwen gevonden.

Aanbevelingen voor verder onderzoek

Het onderzoek in dit proefschrift toont aan dat gezondheid een belangrijke determinant van geluk is. Overgewicht heeft een negatief effect op de gezondheid en beïnvloedt via gezondheid ook het persoonlijk welbevinden. Wij hebben geen gegevens over het waarom van teveel eten en te weinig bewegen. Tijdsvoorkeuren kunnen hier een verklarende factor zijn. Vooral mensen met een preferentie voor consumptie in het heden hebben de kans overgewicht te krijgen. Zij maken zich vooralsnog geen zorgen over de gevolgen van hun eetpatroon in de toekomst.

Het onderzoek toont aan dat sporten een positief effect heeft op gezondheid van vooral de autochtone Nederlandse en de Surinaams/Antilliaanse respondenten. Marokkaanse en Turkse respondenten ervaren minder de positieve effecten van sporten op hun gezondheid. Vooral immigranten sporten weinig, met name de Turken. De jongere niet-westerse allochtone respondenten sporten echter wel vaker dan de oudere niet-westerse allochtone respondenten. Het zou kunnen zijn dat in de cultuur van niet-westerse immigranten sport minder belangrijk is. Sociaal-economische omstandigheden kunnen ook een reden zijn waarom er minder gesport wordt. Sporten kost vaak geld. Sportculturen is een onderwerp voor verder onderzoek

Het uitbesteden van huishoudelijke en zorgtaken is in Nederland onder zowel allochtonen als autochtonen ingeburgerd, hoewel allochtone respondenten er minder geld aan besteden dan autochtone Nederlanders. Vooral Turken en Marokkanen maken minder gebruik van kinderopvang. Voor deze groepen is minder noodzaak voor kinderopvang (omdat Turkse en Marokkaanse vrouwen vaak niet betaald werken), maar het kan ook komen doordat dat kinderopvang minder beschikbaar is (wellicht door een gebrek aan informatie). De Nederlandse overheid zou deze groepen beter kunnen informeren over de mogelijkheden voor kinderopvang. Dit zou Turkse en Marokkaanse vrouwen ook kunnen aansporen om actiever te worden op de arbeidsmarkt en dat zal hun sociaal-economische status verbeteren en een positief effect hebben op hun persoonlijk welbevinden.

Vervolgonderzoek zou kunnen uitwijzen wat de oorzaken zijn van het lagere welzijn of het persoonlijk welbevinden onder niet-westerse allochtonen in vergelijking met autochtone Nederlanders. Een lagere sociaal-economische status is maar een deel van de verklaring. Er zouden andere oorzaken kunnen zijn, zoals de slechte integratie, taalproblemen, gettovorming in de steden, lagere sociale cohesie, stigmatisering in de samenleving, minder sociaal kapitaal etc. Als we door verder wetenschappelijk onderzoek de determinanten van het persoonlijk geluk van de allochtone medemens kunnen achterhalen, dan is er een wereld te winnen. Dit proefschrift is daar een aanzet toe.

About the Author

Judith Cornelisse-Vermaat (1976) was born in Vlaardingen. She spent her youth in Vlaardingen, Veenendaal, and Maassluis. After finishing pre-university education she started to study Household and Consumer Sciences at the Wageningen University (at that time known as the Agricultural University) in 1994. In 1998 she finished her study after writing a thesis on quality management within Baan Development, a software company. She started working for Baan Development as Process Engineer in 1998. At the beginning of the year 2000 Judith won an award of the Society of Information Scientists (VRI) for the thesis she wrote on quality management. At that time she met people from the Wageningen UR and started thinking about doing a PhD. In May 2000 she started her PhD research at the WUR within the department of Economics of Consumers and Households. Since 2001 she is also affiliated as researcher at the Department of Economics and Econometrics at the University of Amsterdam.

Training and Supervision Plan

Name of the course	Department/ Institute		Year	Credits
I. General part				
English for AIO's	WU personnel department		2001	1
Basic Didactics	Onderwijsonder-steuning WU (OWU)		2001	3
3 extra didactic courses to obtain didactic qualification for university	Onderwijsonder-steuning WU (OWU)		2001/ 2003	1
			Subtotal part I	**5**
II. Mansholt-specific part				
Mansholt Multidisciplinary Seminar	Mansholt Graduate School			1
Other presentations at (international) conferences etc.:	Health Economics Conference University of Athens	The demand for health. Differences between the native Dutch and immigrants in the Netherlands	2004	2
	Congres Volksgezondheid Rotterdam	Poster on socio-economic determinants of health and overweight	2004	
	Migrant Health Conference Rotterdam	The effects of food habits and socioeconomic status on overweight	2004	
	NAKE-dag Amsterdam	The demand for health. Differences between the native Dutch and immigrants in the Netherlands	2003	
	Congres Allochtoon dus ongezond? Rotterdam	The demand for health	2003	
	WEVO TNO-Voeding Zeist	Overweight among native Dutch and immigrants	2003	
Writing and presenting a scientific paper	Mansholt Graduate School		2002	1
Mansholt multi-disciplinary course Chain responsiveness and the new economy	Mansholt Graduate School		2001	3
			Subtotal part II	**7**
III. Discipline-specific part				
Econometrics II	WUR		2001	3
Research Methodology	NOBO/LNBE		2001	10
			Subtotal part III	**13**
			TOTAL	**25**

IV. Teaching obligations

L050-217 Practicum economie van consument en huishouden I	40 hours	2001/ 2002
L050-234 Practicum economie van consument en huishouden II	40 hours	2001/ 2002
Supervision thesis of student on e-commerce in households	80 hours	2001

Cover design: Sander Koudijs © 2005

Financial support for publication of the thesis: Netherlands Heart Foundation, Scholten-Cordes Foundation, and NWO priority program SCHOLAR, University of Amsterdam