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Health behavior: a dynamic analysis with regard to poverty and social inequality

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ACL	American Changing Lives Longitudinal Survey
ALLBUS	German General Social Survey
AVTK	Health Behavior among Finnish Adult Population
BGS	Health Report for Germany
BHPS	British Household Panel Survey
BMI	Body Mass Index
CAPI	Computer Assisted Personal Interviewing
CCSD	Canadian Council of Social Development
cf.	confer
d	day
DEGS	German Health Interview and Examination Survey for Adults
DGA	Dietary Guidelines for Americans
DGE	German Nutrition Society
DHHS	Department of Health and Human Services
DKFZ	Deutsches Krebsforschungszentrum
DSM	Diagnostic and Statistical Manual
ECHP	European Community Household Panel
EFSA	European Food Safety Authority
et al.	lat. et alii (and others)
e.g.	lat. exempli gratia
etc.	Lat. et cetera
EU	European Union
FE	Fixed effects
FFQ	Food Frequency Questionnaire
FRG	Federal Republic of Germany
g	gram
GEDA	German Health Update
GESIS	Former ‘Gesellschaft Sozialwissenschaftlicher Infrastruktureinrichtungen’, today ‚Leibniz-Institut für Sozialwissenschaften‘
GDR	German Democratic Republic
GSOEP	German Socio-Economic Panel
HDI	Human Development Index
HHS	Helsinki Health Study

HSE	Health Survey for England
ICD	International Classification of Diseases
i.e.	lat. id est
ILO	International Labour Organization
JACS	The Japanese Civil Servants Study
m	million
MONICA	Multinational **MONI**toring of trends and determinants in **CA**rdiovascular disease
NHANES	National Health and Nutrition Examination Survey
NHIS	National Health Interview Survey
NVS II	National Nutrition Survey II
OECD	Organisation for Economic Co-operation and Development
OMB	Office of Management and Budget
OR	Odds Ratios
PAPI	Paper and Pencil Interviewing
PPP	purchasing power parity
RE	Random effects
RKI	Robert Koch Institute
SES	Socio-Economic Status
SHARE	Survey of Health, Ageing and Retirement in Europe
UK	United Kingdom (of Great Britain and Northern Ireland)
UNDP	United Nations Development Programme
US	United States (of America)
WHO	World Health Organization
WZB	Wissenschaftszentrum Berlin für Sozialforschung

1. Introduction

1.a Background

Studies in the area of health economics and public health have shown that poverty and a low socio-economic status (SES) are related to lower levels of health (Benzeval and Judge 2001; Cohen et al. 2003; Helmert 2003; Mackenbach et al. 2008; Mielck 2000). Inequality in the 'healthy life expectancy' can be observed. For example, rates of premature mortality are higher among those with lower levels of education, occupational status or income. Additionally, rates of morbidity are higher (Lampert and Kroll 2009; Mackenbach 2006a).

Attempts to explain these differences have often made reference to the observation that poor health behavior, such as unhealthy dietary behavior, smoking, or physical inactivity, clusters in poverty groups or low SES (Contoyannis and Jones 2004; Lynch et al. 1997a; Martikainen et al. 2003; Max Rubner-Institute 2008b; McGinnis and Foege 1993; Robert Koch-Institute 2010). For instance, McGinnis and Foege (1993) have shown that approximately 38% of all deaths in the US were caused by behavior-related factors. Also Mokdad (2004) confirm this relationship for the US in 2004. Likewise in Europe, the World Health Organization (WHO) (2002) reports that the total burden of disease in Europe is considerably influenced by health behavior and by poverty and income inequalities. This is because, on the one hand risk factors for diseases are *explicit behaviors* like smoking, misuse of alcohol, a low fruit and vegetable intake or physical activity. On the other hand there are risk factors that are mainly *related to health behavior* like high blood pressure, high cholesterol levels, overweight, or iron deficiency.

Furthermore, not only single types of health behavior are a concern, but also the impact of multiple behavioral risks gains in importance for health research (Fine et al. 2004; Reeves and Rafferty 2005). In this regard, only a minority of individuals follows a consistent health-promoting behavior pattern. It is more likely, that individuals show contradictory behavioral patterns that may include simultaneously health-promoting and health-damaging behavior (Patterson et al. 1994).

Finally, it has to be considered that health and health behavior differ regarding timing. Health behavior may change immediately whereas health status develops in time and may be the result of long-term effects of health behavior over time (Kroll 2010; Knoops et al. 2004; Olshansky and Ault 1986; Osler 2006).

While most poor individuals in Germany are not affected by physical deprivation or hunger, relative poverty, mostly defined by low income status, still affects many people to this day (Bundesregierung 2008; European Union 2010; OECD 2008). In many developed countries like Germany, poverty is still a persistent problem, so that the health and health behavior issues described are of great importance. Between 13–18%[1] of the German population is affected by income poverty based on the at-risk-of-poverty rate in 2005 (Bundesregierung 2008). Income poverty risk groups are individuals who are affected by permanently low income and/or permanent unemployment as well as single mothers. Furthermore, typical relevant risk factors are educational and occupational status (Bundesregierung 2008; Destatis and WZB 2011; Lampert 2005).

However, poverty can also be measured based on aspects of lifestyle and standard of living. Therefore approaches exist that combine monetary and non-monetary concepts of poverty. Using multidimensional concepts of poverty shows, that individuals may be deprived, but not at risk of poverty or vice versa (Groh-Samberg 2009; Halleröd 1995). Multidimensional concepts also emphasize that the concept of poverty should not only distinguish between being poor or not poor, but also between situations of precarity, which is associated with strains for an individual (Groh-Samberg 2009).

Next to poverty measurements, the SES is often used in social epidemiology to describe social inequalities. Nevertheless, relatively little attention has been paid to the definition of SES and its appropriate measurement: there is neither consensus on a definition of SES nor a widely accepted SES measurement tool (Oakes and Rossi 2003). Traditional components of SES are income, education and occupation (Adler and Ostrove 1999).

[1] Variation depends on data sources used.

These indicators are often used interchangeably, even if they are only moderately correlated with one another (Mackenbach 2006a; Ostrove and Adler 1998; Winkleby et al. 1992).

Poverty is not static but dynamic regarding duration and continuity. (Ashworth et al. 1994; Smith and Middleton 2007). Thus poverty may be persistent or transient (Duncan et al. 1993). These findings may also be applied to the SES dimension which is rarely studied at the dynamic level.

To the best of the author's knowledge, no study exists in the area of health economics or epidemiology that focuses on the development of dynamics of multidimensional poverty and its implications for health behavior. The majority of epidemiological studies analyze the health status with regard to data on income as well as educational and occupational status. Information on other dimensions or multidimensional measurements is seldom used. Additionally, most data is only available at a cross-sectional level so that analyzing causal effects is not possible (Benzeval and Judge 2001). Cross-sectional data does also not allow identifying behavior changes (Berrigan et al. 2003).

1.b Objectives

Against this background, this thesis aims at analyzing the importance of poverty and low SES for health behavior. Therefore, following research questions can be outlined:

1. Do poverty situations or a low SES affect risky and health-damaging behavior directly?
2. Poverty and SES are multidimensional phenomena. What dimensions – apart from income – need to be taken into account?
3. Are individuals in precarious situations more likely to show more health-damaging behavior in comparison to their prosperous counterparts?
4. Periods of poverty are time-varying for each individual. Do patterns of health behavior differ depending on the length of a poverty period? Is the SES also varying over time?

5. What type of health behavior is most responsive to situations of poverty?

6. With regard to poverty situations respectively SES: Are there differences between individual dimensions of health behavior and combined health behavior patterns?

7. What other determinants influence health behavior and thus have to be taken into account?

To answer these questions, data of the German Socio-Economic Panel (GSOEP) is analyzed. Multivariate analyses are conducted in a cross-sectional context and as panel analysis. Health behavior dimensions considered are dietary behavior, smoking, alcohol consumption, and physical activity. Additionally, a combined health behavior index is developed and used.

Three measurements of poverty are included. Firstly, health behavior is examined with regard to the at-risk-of-poverty rate according to the Laeken indicators of the European Union (Dennis and Guio 2003). Secondly the combined poverty indicator according to Groh-Samberg (2009) is applied. This measurement includes information on income poverty as well as on deprivations within four life domains. This indicator allows identifying poor and precarious individuals. Finally, an index describing the SES including information on income, education and occupation according to Winkler and Stolzenberg (1999) is used.

1.c Outline

The thesis is divided into 9 chapters. After this introduction, chapter 2 presents the current state of empirical research on health and health behavior. As **figure 1** shows, chapter 2 introduces the topics of health and health inequalities (2.a) and thematises the relevance of health behavior in general, but also in detail on dietary behavior, physical activity, smoking, alcohol consumption, and combined health behavior. Additionally this section discusses the relationship between health behavior and health as well as impact factors on health behavior (2.b).

Chapter 3 presents economic and social theories of health, health behavior, and health inequality.

Section 3.a focuses on social theories at society level (3.a.i) and at an individual level (3.a.ii). The following section 3.b deals with Grossmann's 'Human capital model of the demand for health' with special regard to health behavior and its implementation in empirical analyses. Health psychology theories to particularly explain individual health behavior are presented in section 3.c. Finally, chapter 3 concludes with elaborating hypotheses for this thesis (3.d).

The theoretical chapter leads over to chapter 4 on poverty and SES. First, concepts of poverty and SES (4.a) as well options to measure poverty and SES (4.b) are presented. Since poverty and SES are dynamic phenomena, section 4.c presents the state of research in this area. Chapter 5 connects the two main areas of the thesis, namely health behavior and poverty/SES by giving an overview of current research at a cross-sectional level (5.a) and at a longitudinal level (5.b).

Next, the empirical part of this thesis starts by describing the dataset (6.a), indicators to describe poverty and SES (6.b) as well as dependent (6.c) and additional explanatory variables (6.d). Finally, steps of the multivariate analyses are presented in section 6.e. Chapter 7 is devoted to results of the empirical analyses. Section 7.a presents the dataset used as well as distribution of health behavior and poverty status and SES in the SOEP population.

The analyzed types of health behavior are dietary behavior, smoking, physical activity, and alcohol consumption as well as a combined health behavior index. The relevance of the selected poverty and SES measurements on different types of health behavior is examined and discussed at cross-sectional and longitudinal level using logistic regression models (7.b.i-ii) and fixed effects logistic regression models (7.b.iii-iv). Here, the at-risk-of-poverty rate, a combined poverty indicator, and an SES index are applied in the multivariate analyses. Analytical steps 7.b.i and 7.b.iii use information on these indicators for single years while models described in sections 7.b.ii and 7.b.iv consider the permanent status over five years.

Section 7.b.v compares the four types of models (7.b.i-iv) with each other. Section 7.b.vi presents results on confounding variables.

The last section of this chapter concludes with a final discussion (7.c) that takes up the presented research questions (1.b) and the theoretical framework presented in chapter 3. Furthermore methodical limitations of this thesis are discussed.

Finally, chapter 8 and chapter 9 summarize the thesis by giving an overview about the background and the most important outcomes of the empirical analyses.

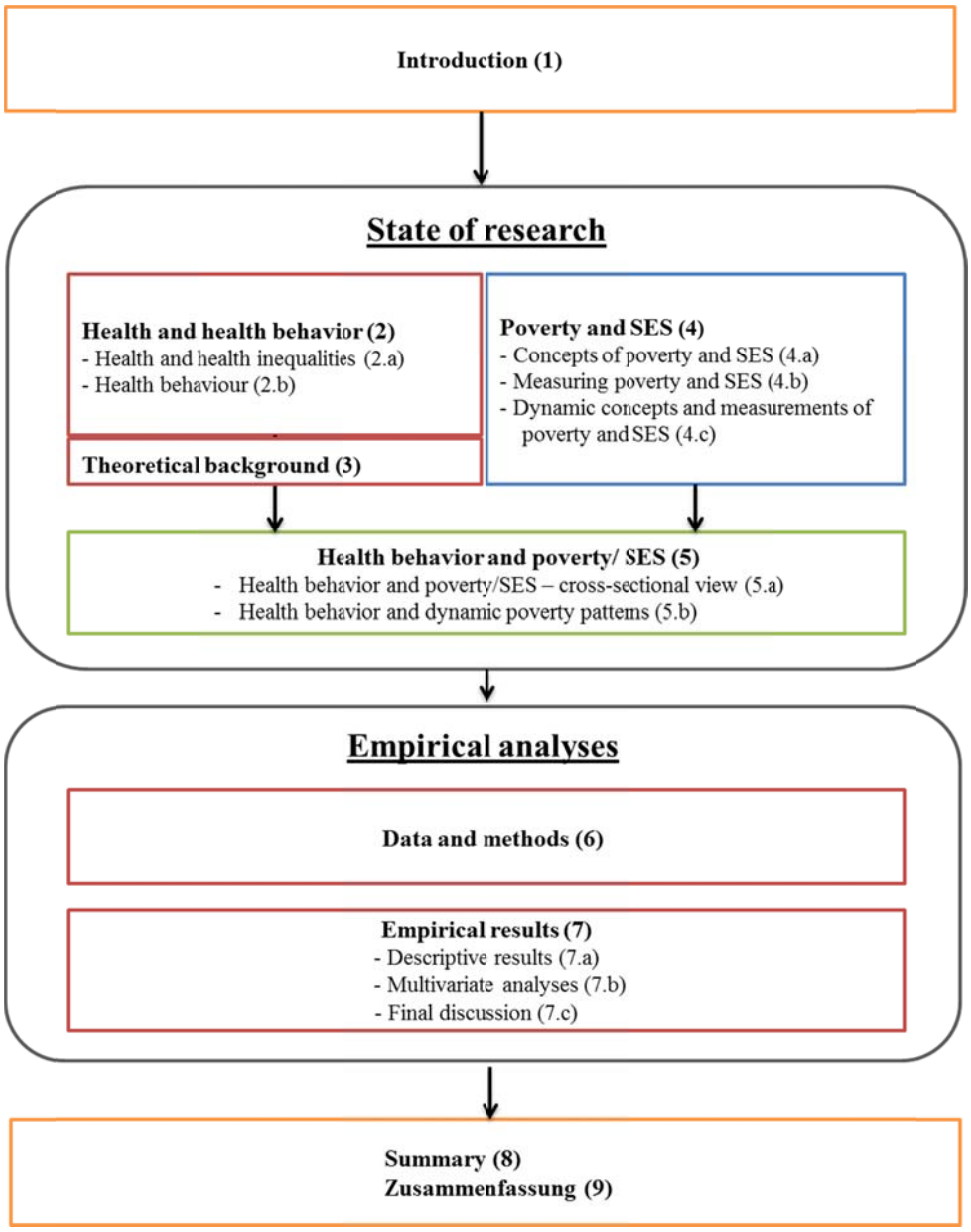

Figure 1: Organization of the thesis

Source: own illustration

2. State of research on health behavior and health

This chapter first gives an overview on the topic of health and health inequality (2a). Section 2.b focuses on health behavior. After presenting definitions of health behavior, the relationship between health behavior and health is detailed. Section 2.b.iii and 2.b.iv thematise empirical findings on health behavior and describes relevant impact factors.

2.a Health and health inequality

2.a.i Definitions of health

There are several approaches to defining health because of its multidimensional character (Erhart et al. 2009; Ross and Amanor-Boadu 2010). Generally, two distinct concepts on health exist. Within the western scientific medical model, the negative concept of health implies the absence of disease or illness (Naidoo and Wills 2003; Papas et al.). Measurements that are based on this concept are the life expectancy, age of death, total mortality, cause-specific mortality, and morbidity. (Smith et al. 2002; Erhart et al. 2009; Ross and Amanor-Boadu 2010).

In contrast, the WHO (1946) conceives a positive definition of health in its constitution in 1946: 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.' In the following this thesis is based on the WHO approach. This concept can be measured using the instrument of self-reported health. It is dependent not only on objective but also on subjective factors such as personal expectations of good health. These expectations may depend on social and cultural factors (Sen 2002). In addition, self-reported health is an indicator for usage of health care systems and is regarded as an independent predictor for mortality (Heidrich et al. 2002; Idler et al. 2000; Kawada 2003).

As summarized in **figure 2,** health is influenced by several determinants, including genetic disposition (here: constitutional factors), age and sex, individual life-style factors (e.g. health behavior), social and community networks, living and working conditions, and general socio-economic, cultural, and environmental conditions.

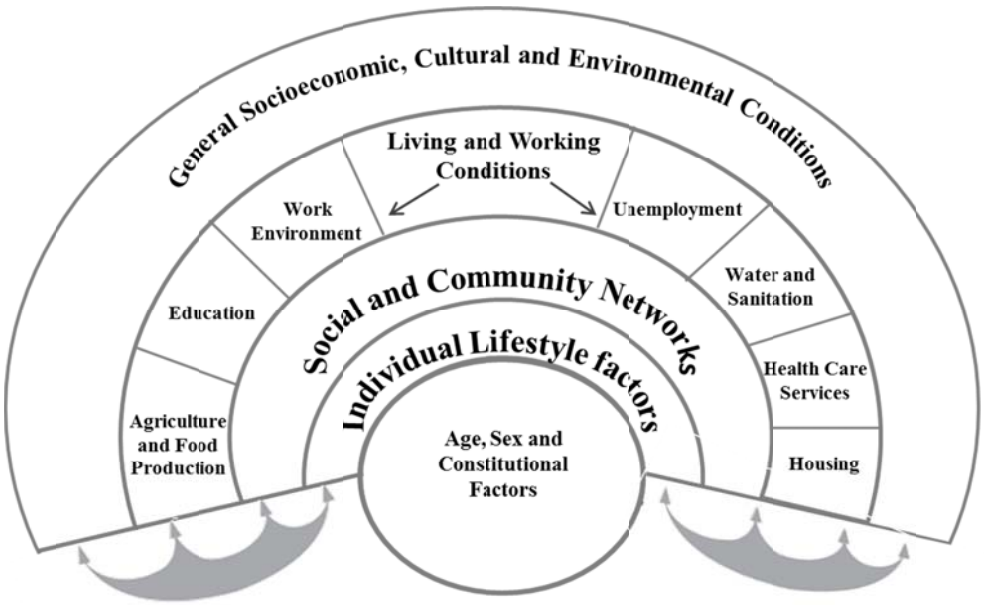

Figure 2: Determinants of health

Source: Dahlgren and Whitehead (1993)

2.a.ii Health inequality

The term of health inequality is used to describe 'differences, variations, and disparities in the health achievements of individuals and groups.' Reasons for such health inequalities are multifaceted[2]. The probably most well-known phenomenon is health inequalities across social groups that are also known as health inequity (Kawachi et al. 2002).

Health inequalities with regard to different groups of SES are one of the most important challenges for public health (Marmot 2005). Main dimensions to describe social inequality are education, occupation and income (Adler and Ostrove 1999; Deaton 1999; Mackenbach et al. 2008; Oakes and Rossi 2003; Richter and Hurrelmann 2009). Apart from SES, many researchers observe a health-income gradient that consistently shows that individuals with greater levels of economic resources have a better health status (Adda et al. 2009). This relationship has been described to be observable over large ranges of income (Deaton 1999; van Ourti et al. 2009; Wagstaff and van Doorslaar 2000). Simply stated, the higher the income, the better the health status. The described relationship is covered by the 'absolute income hypothesis' (Wagstaff and van Doorslaar 2000).

[2] Next to health inequalities across social groups causes may be life stage differences, random genetic mutatations or personal choices (cf. Kawachi et al. 2002).

Based on data from the US, Wagstaff and van Doorslaer (2000) find strong evidence for the 'absolute income hypothesis'.[3] There are further studies in the area of health economics and public health investigating the relationship between income or SES and individual health status in industrialized countries: individuals with a socio-economic disadvantage have higher rates of morbidity and mortality (Adler and Ostrove 1999; Benzeval and Judge 2001; Epstein et al. 2009; Lampert 2005; Mackenbach et al. 2008; Robert and House 2000). E.g., rates of premature mortality are higher for individuals with a low level of income, education or occupational status. These differences can be confirmed for a wide range of industrialized countries in Europe and North America across all age groups, but more often for men than for women (Mackenbach 2006a; Mackenbach et al. 2008; McGinnis and Foege 1993; Mokdad 2004; Smith et al. 1994; Wong et al. 2002). Similarly, morbidity rates are usually higher if the socio-economic position is low. It can be asserted that these inequalities in morbidity have been stable over the past decades as has been concluded in overview works by Mackenbach (2006a) and Richter (2009). It has to be underlined that not only individuals who are affected by a low income, poverty, or a low SES show lower levels of health in comparison to relatively high income groups / SES groups. Such a gradient is also observable in comparison with individuals with a medium income or SES, so that there are already socio-economic inequalities in health on a medium socio-economic position (Müller and Trautwein 2005; Robert and House 2000). However, at higher levels of income (e.g. above the median) a health 'ceiling effect' is observable regarding mortality (McDonough et al. 1997; Klein and Unger 2001) and morbidity (House et al. 1994), because the upper income strata individuals maintain overall good health until late in life so that this relationship is non-linear (Klein and Unger 2001; Robert and House 2000). Finally, it must be considered that classifications of medium income or SES are normative and may be classified in very different ways. This issue will be discussed in detailed in section 4.a.iv. Thus while there is a health-income-gradient across all socio-economic strata, the main differences are most obvious between the high and the low socio-economic position (Robert and House 2000).

[3] Nevertheless, income inequality as a relative measurement may reflect social cohesion or social capital.

Health inequalities are not only a current concern (Mackenbach 2006a; Robert and House 2000): Health inequalities that are caused by socio-economic inequalities were already described in the 19th century. Important researchers were Villermé in France, Chadwick in England, and Virchow in Germany. In absolute terms, health inequalities have decreased since the 19th century. Although the average mortality rate declined due to improvements in public health and the standard of living, the relative risk of dying seems to remain higher for individuals with a low SES than for those with a high status to this day. This can be observed even in countries with highly developed social security, public health and health care systems (Benzeval and Judge 2001; Mackenbach 2006a; Mackenbach et al. 2008).

After the Second World War, the topic of health inequalities was no longer of great interest until the publication of the Black Report in England in 1980, which revitalized research in many Western societies (van Lenthe 2006; Smith et al. 1994). Although absolute mortality and morbidity have been falling in Western societies, health inequalities regarding both dimensions have increased (Marmot and Wilkinson 2001; Richter and Hurrelmann 2009).

In Germany, the question of the health-income-gradient has not received much attention in research. Empirical findings suggest that material and socio-cultural differences can be disadvantageous to health (Lampert and Kroll 2005). In addition, low income can be seen as a predictor for premature mortality (Voges and Schmidt 1996).

In conclusion, many studies from industrialized countries have described existing health inequalities. Currently, academic research has gradually shifted from the description of health inequality to its explanation (Mackenbach 2006b; Macintyre 1997; Richter and Hurrelmann 2009). However, until today, it is still not well understood why socioeconomic inequalities in health exist and persist (Smith et al. 1994; Robert and House 2000). In contrast to research from Great Britain, the Netherlands, Scandinavia, and the US, Richter and Hurrelmann (2009) underline that German research still focuses mainly on a cross-sectional description of health inequality (cf. also Cohen et al. 2003; Mokdad 2004; McGinnis and Foege 1993).

2.b Health behavior

2.b.i Definitions of health behavior

The term ‘health behavior’ encompasses several types of behavior including health-enhancing behaviors like participation in physical activity or healthy eating. Additionally, health-damaging behavior like smoking or excessive alcohol consumption is considered by this definition. Health-protecting behaviors such as health screening, clinic attendance, vaccinations, or compliance with medical regimes fall under this term (Conner and Norman 2005b). In the past, health behavior was defined as ‘any activity undertaken by a person believing himself to be healthy for the purpose of preventing disease or detecting it at an asymptomatic stage’ (Kasl and Cobb 1966). However, this definition is too narrow, because individuals do not always act considering whether their behavior is health-promoting or health-damaging. Thus, it cannot be assumed that individuals always have health behavior as targeted action (Ferber 1979). Additionally, Kasl and Cobb’s (1966) definition does not include activities in case of recognized illnesses (Conner and Norman 2005b). Therefore Gochman (1997) defines health behavior as ‘overt behavioral patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement’ (Gochman 1997a). This definition includes medical service usage, compliance with medical regimes, as well as self-directed health behaviors (Conner and Norman 2005b).

Another approach is the health lifestyle which is based on the work of the sociologist Max Weber. Lifestyle, originally in German ‘Stilisierung des Lebens’ consists of two subsequent aspects namely life conduct (‘Lebensführung’) and life chances (‘Lebenschancen’). On the one hand, life conduct implies managing the course of one’s life, i.e. it means direction or control of an individual’s behavior. On the other hand, structural conditions are represented in the term of life chances (Abel 1991; Weber 1972). These two terms have to be understood as interdependent aspects of a healthy lifestyle: life chances, e.g. income or education, are significantly associated with individual health behavior. Simultaneously, health-damaging behavior has consequences mediated by a poor health status to a decline of the individual’s life chances (Abel 1991).

By mistake, when translating the concept of Weber's health lifestyle into English research literature, the term of 'Lebensführung', i.e. life conduct, was also translated into lifestyle so that life conduct and life chances have been hardly recognized in English literature (cf. Weber et al. 1978). To operationalize the term of lifestyle for empirical research, Abel suggests the following definition: 'Health lifestyles comprise patterns of health-related behavior, […] adapted by groups of individuals in response to their social, cultural and economic environment.' However, due to the mentioned translation error, the term of lifestyle is often used as synonym for health behavior in English literature (c.f. Balia and Jones 2008; Contoyannis and Jones 2004; Lynch et al. 1997a).

Additionally, health behavior can be defined as a bundle of behaviors that individuals freely choose to a certain extent (Balia and Jones 2008; Contoyannis and Jones 2004): Health-related behaviors might reflect not only individual preferences but also constraints of economic, environmental and personal circumstances (Balia and Jones 2008; Fleurbaey 2006). In spite of the translation error mentioned above, the latter statement reflects the original idea of Weber that lifestyle consists of aspects of life conduct and life chances.

In the field of health economics, health behavior can also be understood as an expression of risk preference. While some researchers assume that the main aim of health behavior is the primary prevention of disease, defect, injury, and disability (cf. Alonzo 1993), other authors also consider the propensity to behave in a risky or health-damaging way (Abel 1991; Anderson and Mellor 2008; Wagstaff 1986).

2.b.ii Relationship between health behavior and health

This section deals with the relationship between health and health behavior. As already shown in section 2.a.i, health behavior is one important determinant to explain health (Elkeles and Mielck 1997; Conner and Norman 2005b; Mackenbach 2006a; Schneider and Schneider 2009a; Starfield 2007).

Several studies in the Western society attempt to explain differences in health by the observation that poor health behavior, such as unhealthy dietary behavior, smoking, or physical inactivity, cluster in groups of poverty or low SES (Contoyannis and Jones 2004; Lynch et al. 1997a; Martikainen et al. 2003; McGinnis and Foege 1993; Robert Koch-Institute 2010)[4].

Conner and Norman (2005b) underline the importance of health behavior for both morbidity and mortality. As **table 1** shows for Europe, health behavior like smoking, abuse of alcohol, unhealthy dietary behavior, e.g. low fruit and vegetable intake, but also a too high cholesterol level and overweight as well as physical inactivity belong to the ten key behavioral risk factors of the total burden of disease in Europe that has been identified by the WHO in 2002.

Table 1: Ten key behavioral risk factors for Europe, identified by WHO

1. **Tobacco***
2. *High blood pressure*
3. **Alcohol abuse**
4. *too high cholesterol*
5. *Overweight*
6. **Low fruit and vegetable intake**
7. **Physical inactivity**
8. Drug abuse
9. Unsafe sex
10. *Iron deficiency*

*This thesis will focus on terms highlighted in bold. Italics: determined mainly by health behavior.

Source: modified according to WHO (2002) and Dahlgren and Whitehead (2006)

With regard to data from the US, McGinnis and Foege (1993) and Mokdad (2004) confirm these findings (**table 2**).

In 1990 as well as in 2000 the four leading causes of death in the US were tobacco consumption, poor diet and physical inactivity as well as alcohol consumption. Against this background preventing health-damaging behavior is important to counteract premature death in industrialized countries (Mokdad 2004; Thefeld 2000).

[4] Of course, there are numerous further aspects influencing health that are confirmed by several authors (Jungbauer-Gans and Gross 2009; Mackenbach 2006a, 2006b, 2010; Mielck and Janßen 2008; Robert and House 2000; Schulz and Northridge 2004; Smith et al. 1994; Starfield 2007).

Table 2: Actual causes of death in the United States in 1990 and 2000

Actual cause	No. (%) in 1990[a]	No. (%) in 2000
Tobacco	**400,000 (19)**	**435,000 (18.1)**
Poor diet and physical inactivity	**300,000 (14)**	**400,000 (16.6)**
Alcohol consumption	**100,000 (5)**	**85,000 (3.5)**
Microbial agents	90,000 (4)	75,000 (3.1)
Toxic agents	60,000 (3)	55,000 (2.3)
Motor vehicle	25,000 (1)	43,000 (1.8)
Firearms	35,000 (2)	29,000 (1.2)
Sexual behavior	30,000 (1)	20,000 (0.8)
Illicit drug use	20,000 (<1)	17,000 (0.7)
Total	**1,060,000 (50)**	**1,159,000 (48.2)**

Source: McGinnis and Foege (1993) and Mokdad (2004)

Additionally, these risk factors are also associated with high morbidity rates. Thus health-promoting behavior may have a positive impact on quality of life, productivity and health care costs (Mokdad 2004; Schneider and Schneider 2009a). It effectuates not only a delayed onset of chronic disease but also the extension of an active lifespan (Conner and Norman 2005b).

It has been shown that the previous discussed health-income (SES)-gradient is mediated by an increased prevalence of health-damaging behaviors (Lampert and Kroll 2005; McGinnis and Foege 1993; Lantz et al. 2001; Schneider and Schneider 2009a). Those play an important role in premature death in high-income countries (Mackenbach et al. 2008; Ezzati et al. 2003)

Results of studies regarding the extent of the described relationship however are inconsistent. While some studies confirm the relevance of health behavior for the health-income-gradient (Borg and Kristensen 2000; McGinnis and Foege 1993; Lantz et al. 2010) other authors do not observe (or only in parts) this relationship (Arendt and Lauridsen 2008; Lantz et al. 1998). As an example, Smith et al. (1994) argue that a significant share of the relationship between smoking and mortality is caused by the association between smoking and socio-economic position. These differing results can be explained by the fact that many analyses do not account for unobserved heterogeneity[5] when estimating the relevance of health behavior in the relationship between SES and health (Contoyannis and Jones 2004).

[5] Unobserved heterogeneity defines the case if a correlation between both observable and unobservable variables may be expected. This difficulty may be overcome using panel analyses (Arellano 2003). For instance, Contoyannis and Jones (2004) assume that '[…]

However, health and health behavior differ regarding timing. Health behavior may change immediately whereas health outcomes with regard to non-communicable diseases develop over a longer period.

Subsequently health and diseases can be influenced via long-term behavioral effects (Kroll 2010; Knoops et al. 2004; Olshansky and Ault 1986; Osler 2006). They result from an individual biography (Mackenbach et al. 2002; Osler 2006).

It is also important to consider not only single types of behavior but also a bundle of them (Berrigan et al. 2003; Grünheid 2004; Kvaavik 2010; Khaw et al. 2008; Rhee et al. 2012; Robert and House 2000; Thefeld 2000). For instance, combined health behavior may have synergistic effects on disease risks (Berrigan et al. 2003). This issue will be discussed in detail in section 2.b.iii that deals with empirical findings on health behavior in general and describes in detail dietary behavior, physical activity, smoking, alcohol consumption as well as combined health behavior.

Interestingly, not only health behavior affects health outcomes but also vice versa (Schulz and Northridge 2004). For instance, Schulz and Northridge describe in the model of 'Social Determinants of Health and Environmental Health Promotion' that health outcome as well as well-being influence health behavior. Therefore section 2.b.iv will detail this issue.

2.b.iii Empirical research on health behavior

National surveys focusing on health and health behavior became popular in the 1980s in Europe. Examples are 'Health Behavior among Finnish Adult Population' (Piha et al., 1986a, b, Niemenivu et al, 1988a, b, Berg et al., 1990a) or DAN-MONICA II (Roos and Prättälä, 1999) within the MONICA-WHO project[6] (cf. WHO 1988).

Other potentially unobserved variables such as childhood circumstances may lead to indirect selection (due to unobserved heterogeneity) such that individuals with deprived', backgrounds may be both more likely to behave poorly and be in lower social classes.'

[6] MONICA-WHO (Multinational MONItoring of trends and determinants in CArdiovascular disease) is a major international collaborative study. MONICA collaborating centers have been in Australia, Canada, several countries in Europe, Israel, Japan, former Soviet Union, and the US (cf. WHO 1988).

Table 3: Overview: National surveys focusing on health behavior (selection)

Study	Dietary Behavior	Smoking	Physical Activity	Alcohol consumption	Period	Country	Study design	N[7]	Source
German Health Interview and Examination Survey for Adults (DEGS)	✓	✓	✓	✓	Started 2008	Germany	Combined cross-sectional and longitudinal survey	8152 (2008)	Kurth (2012)
German Health Update (GEDA)	✓	✓	✓	✓	Ongoing telephone survey, started in 2009	Germany	Combined cross-sectional and longitudinal survey	22;050 (2011)	Robert Koch-Institute (2012a)
German Socio-Economic Panel (GSOEP)	✓	✓	✓	✓	Annually panel survey started in 1984	Germany	Panel data	22870 (2010)	GSOEP
Health Behavior among Finnish Adult Population (AVTK)	✓	✓	✓	✓	Ongoing survey, since 1978	Finland	Cross-sectional	5000 (2011)	Helakorpi et al. (2012)
Health Report for Germany[8] (BGS)	✓	✓	✓	✓	1998	Germany	Cross-sectional	7124 (1998)	Gesundheitsberichterstattung des Bundes (2012)
Health Survey for England (HSE)	✓	✓	✓	✓	Started in 1991	Great Britain	Cross-sectional	8000 (adults)	The NHS Information Centre for health and social care (2011)
Helsinki Health Study (HHS)	✓	✓	✓	✓	2000-2002	Finland	Cross-sectional	8960 (2000 – 2002)	Lahelma et al. (2012)

[7] Sample size of last survey period
[8] Previous examinations in Germany: German Cardiovascular Prevention Study: 1984-86, 1987-1989, 1990-91.

Table 3 continued: Overview: National surveys focusing on health behavior (selection)

Study	Dietary Behavior	Smoking	Physical Activity	Alcohol consumption	Period	Country	Study design	N[9]	Source
Monitoring Trends and Determinants in Cardiovascular disease (MONICA-WHO)	✓	✓	✓	✓	mid-1980s to the mid 1990s	international	Cohort study	~ 7 m adults in 37 countries	WHO (1988); Kuulasmaa et al. (2000)
The Japanese Civil Servants Study (JACS)	✓	✓	✓	✓	1998/99	Japan	Cross-sectional	3684 (2003)	Sekine et al. (2006)
National Health and Nutrition Examination Survey (NHANES)	✓	✓	✓	✓	Ongoing survey, started in 1960-62	United States	Cross-sectional	10253 (2009-10)	Centers for Disease Control and Prevention (2011a)
National Health Interview Survey (NHIS)	✓	✓	✓	✓	Started 1957	United States	Cross-sectional[10]	33014 (2011, adults)	Centers for Disease Control and Prevention (2012)
Whitehall Study II[11]	✓	✓	✓	✓	Started in 1985	Great Britain	Cohort study	6761 (2007-2009)	UCL Research Department of Epidemiology and Public Health (2012a)

[9] Sample size of last survey period.
[10] Household survey.
[11] Whitehall study I: started in 1968 and included 18.000 men.

Even earlier, the National Health Interview Survey (NHIS) and the National Health and Nutrition Examination Survey (NHANES) started in the United States in the late 1950s and early 1960s (Centers of Disease Control and Prevention 2013; National Center for Health Statistics 2007). **Table 3** shows an overview on important contemporary studies on health and health behavior.

Furthermore, the Whitehall Study II was established in 1985 in Great Britain. The main focus of this survey is identifying social class differences in health and the investigation of the causes of social inequalities in disease during the working life. The study considers not only unhealthy behaviors and traditional risk factors in heart disease and diabetes but also the importance of psychosocial factors such as work stress, unfairness, and work-family conflict to socio-economic inequalities (UCL Research Department of Epidemiology and Public Health 2012b).

As an example for Germany, the 'German Health Interview and Examination Survey for Adults' (DEGS) provides data on health status, health-related behavior, healthcare and living conditions since 2008. This study aims to collect repeatedly nationally representative data of the adult general population who are aged 18 (Robert Koch-Institute 2012b; Kurth 2012). Additionally, the German Socio-Economic Panel GSOEP collects information on health and health behavior, although it does not mainly focus on health (GSOEP).

This thesis will concentrate on four main types of health behavior: diet, smoking physical activity, and alcohol. They are selected due to the fact that the three leading causes of mortality are directly associated with these types of health behavior (c.f. Mackenbach 2006a; McGinnis and Foege 1993; Mokdad 2004 and section 2.b.ii). E.g., in the US smoking is the leading cause of death followed by poor diet and physical inactivity as well as alcohol consumption.

The following sections (2.b.iii.1 – 5) detail these types of health behavior.

2.b.iii.1 Dietary behavior

World-wide, there is an increasing burden of chronic diseases like cardiovascular diseases, diabetes, obesity[12] and many types of cancer. In this regard, dietary behavior plays an important role (WHO 2003b).

Dietary behavior is one of the main types of health behavior. It influences health over the whole life course starting during the fetal development continuing in infancy, childhood and adolescence to adulthood and ageing.

Through the diet's quality, people influence their own health status to a large extent (WHO 2003b) and behave in either a more health-promoting or a more health-damaging way.

For example, studies have shown that a high consumption of fruit and vegetables lowers the risk for cardiovascular diseases as well as the risk of mortality (Bazzano et al. 2002; He et al. 2006; Hu et al. 2000). Furthermore a dietary pattern containing not only a high intake of fruits and vegetables but also of whole grains and fiber, poultry, and fish lowers the risk of coronary heart disease and improves health status overall (Fung et al. 2001; Hlebowicz et al. 2011; Hu et al. 2000; Hu and Willett 2002; Martikainen et al. 2003). Such diets are characterized by low energy density and high content of vitamins and minerals (Ledikwe et al. 2006; Andrieu et al. 2006).

Conversely, consuming sugar-sweetened beverages, potatoes, and highly refined grains is related to higher risks of heart disease and type 2 diabetes (Ludwig 2002; Malik et al. 2010; Psaltopoulou et al. 2010). So-called 'Western' dietary patterns, which are dominated by highly processed meat, fried food, and sweets, increase the risk of diseases (Fung et al. 2001; Ludwig 2002). This dietary pattern is related to overweight and obesity, which is a central risk factor for health (Schneider and Schneider 2009a). In addition, overweight and obesity are linked to a high consumption of high energy-dense snacks, fast food and soft drinks (Malik et al. 2010; Prentice and Jebb 2003). These types of foods tend to be energy-dense but nutrient-poor (Andrieu et al. 2006). Individuals on such diets tend to show higher energy intakes and lower intakes of various micronutrients (Ledikwe et al. 2006; Andrieu et al. 2006).

[12] Cf. Robert Koch-Institute 2003 and WHO 2003a.

In some studies, dietary energy density was not only an independent predictor of obesity but also for the metabolic syndrome[13] (Mendoza et al. 2007). One assumption is that energy-dense foods, especially mixtures of sugars and fat, are more palatable than foods of low energy density and high water content (Drewnowski 2003). As illustrated, there is evidence for an existing relationship between dietary behavior and health status.

To achieve a healthy diet, recommendations have been formulated based on current nutritional knowledge. These recommendations can focus either on nutrient and energy intake (1), food (2), or complex dietary patterns (3) (Drescher 2007).[14]

The 'Dietary Reference Intakes' (DRI) are an example of recommendations based on nutrient and energy intake in North-America (cf. National Research Council 1989; Otten et al. 2006; Yates et al. 1998.

The German dietary references for nutrition intake are the German counterpart of DRI. Their aim is to maintain and promote health and quality of life. In detail, following the dietary recommendation should guarantee all metabolic, physiological and psychological functions. However, dietary references do not cover recommendations for sick or convalescent patients (DGE 2008).

The presented recommendations based on nutrient and energy intake are addressed to researchers and professionals working in the area of nutrition science but they are not useful in helping consumers adopt a healthy diet. Therefore, dietary recommendations on food or complex dietary patterns have been formulated (cf. for instance USDA and DHHS 1990 and DGE 2008 in the **appendix 1**).

[13] Metabolic syndrome is present if three or more of the following signs are present: blood pressure equal to or higher than 130/85 mmHg, fasting blood sugar (glucose) equal to or higher than 100 mg/dL, large waist circumference, low HDL cholesterol and triglycerides equal to or higher than 150 mg/dL (cf. A.D.A.M. Medical Encyclopedia 2012).

[14] Organizations and institutions like the World Health Organization (WHO) and Food and Agriculture Organization (FAO) as well as the European Food Safety Authority (EFSA) have published dietary recommendations, dietary reference values, and dietary guidelines. (EFSA 2011; WHO 2011a). E.g. the aim of WHO and FAO is to establish human nutrient requirements for all countries and to develop food-based dietary guidelines for their populations. Some countries adopt them as part of their national dietary allowances whereas others use them as a base for their standards.

Scientific institutions have developed several instruments like food pyramids or other visualizations of recommendations to help consumers to attain a healthy diet (cf. (Basiotis et al. 1995; Welsh et al. 1992; Stehle et al. 2005; USDA).

2.b.iii.2 Exercise and physical activity

In addition to dietary behavior, physical activity can be understood as health-promoting behavior. 'Physical activity' and also the term 'exercise' are widely used to describe human movement. Both terms are often used interchangeably, but their definitions differ.

Physical activity can be understood as any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basic level. It includes activities in the areas of occupation including commuting, leisure-time or recreation, but also with regard to household, self-care, and further transportation. Exercise is a subcategory of physical activity (Physical Activity Guidelines Advisory Committee 2008). It is 'planned, structured, and repetitive and purposive in the sense that the improvement or maintenance of one or more components of physical fitness is the objective' (Ginis and Hicks 2007; Physical Activity Guidelines Advisory Committee 2008)[15]. Based on several studies, scientific institutions, namely Department of Health and Human Services (DHHS) and the German Robert Koch Institute (RKI), infer that risks of morbidity and premature death can be significantly reduced by physical activity (Physical Activity Guidelines Advisory Committee 2008; Rütten et al. 2005). According to Lichtenstein et al. (2006) regular physical activity is indispensable not only for physical and cardiovascular fitness but also for a healthy weight status. Individuals who exercise regularly are observed to have lower risks of developing chronic diseases like type 2 diabetes, obesity, cancer of the breast and colon, and osteoporosis, and improved psychological well-being (e.g., through reduced stress, anxiety, and depression) (Hu et al. 2005; Physical Activity Guidelines Advisory Committee 2008; Warburton et al. 2006).

[15] Since the majority of publications use the terms 'physical activity' and 'exercise' synonymously and concentrate mostly on sporting activities, this thesis also considers these studies and does not distinguish between these two terms. Subsequently, the term physical activity is used.

Furthermore, several studies have observed an inverse relationship between physical activity and the incidence of coronary heart disease (Powell et al. 1987; Sofi et al. 2008). Interestingly, not only high levels but also moderate levels of physical activity are significant in protecting against coronary heart disease (Sofi et al. 2008). It has also been shown that physical activity is associated with a lower risk of cardiovascular disease[16] and strokes (Physical Activity Guidelines Advisory Committee 2008).

Against this background, current recommendations have been published by international public health organizations (Rütten et al. 2005).

As an example the American College of Sports Medicine (ACSM) formulated recommendations on the types and amounts of physical activity needed by healthy adults to improve and maintain health: 'To promote and maintain health, all healthy adults aged 18 to 65 years need moderate-intensity aerobic (endurance) physical activity for a minimum of 30 min on five days each week or vigorous-intensity aerobic physical activity for a minimum of 20 min on three days each week'[17] (Haskell W. et al. 2007). These recommendations show that physical activity includes not only exercise but also leisure-time physical activity, and also considers activities with increased respiration like brisk walking, climbing stairs or cycling (Rütten et al. 2005). The recommendations are also consistent with other expert consensus guidelines and scientific reviews (Physical Activity Guidelines Advisory Committee 2008). They can also be found e.g. in the guidelines of DHHS or Robert Koch-Institute (RKI)[18] (Physical Activity Guidelines Advisory Committee 2008; Rütten et al. 2005).

It has to be considered that there is also a higher risk for physically active individuals to experience a higher incidence of leisure-time and sport-related injuries in comparison with less active individuals (Conn et al. 2003). Nevertheless, the injury rate of healthy adults who fulfill the recommendations by performing moderate-intensity activities is not significantly different from their inactive counterparts (Carlson et al. 2006).

[16] Cardiovascular disease is a class of diseases that includes coronary heart disease.
[17] Guidelines are developed by an expert panel of scientists, including physicians, epidemiologists, exercise scientists, and public health specialists.
[18] The Robert Koch-Institute (RKI) is the central federal institution responsible for disease control and prevention in Germany.

2.b.iii.3 Smoking

Following the WHO Statistical Information System (WHOSIS), tobacco smoking includes cigarettes, cigars, pipes or any other smoked tobacco products. The term 'current smoking' includes not only daily but also non-daily or occasional smoking (WHO Statistical Information System 2011).

Particularly in industrial countries, smoking is one of the central health risks that influences morbidity and mortality (Berrigan et al. 2003; Lampert 2011; McGinnis and Foege 1993).

Table 4: Diseases and health problems occurring more often in smoking individuals

Cancer	Lung cancer Laryngeal cancer Oral cavity and pharyngeal cancers Esophageal cancer Pancreatic cancer Bladder and kidney cancers Cervical cancers Stomach cancer Acute leukemia
Cardiovascular diseases	Subclinical atherosclerosis Coronary heart disease Cerebrovascular disease Abdominal aortic aneurysm
Respiratory diseases	Acute respiratory illnesses Chronic respiratory diseases
Reproductive effects	Reduced fertility in women Premature rupture of the membranes, placenta previa and placental abruption Preterm delivery and shortened gestation Fetal growth restriction and low birth weight
Congenital malformations, Infant mortality, and child physical and cognitive development	Sudden infant death syndrome
Other effects	Diminished health status Low bone density in postmenopausal women Higher risk for hip fractures Dental diseases (periodontitis) Eye diseases (nuclear cataract) Peptic ulcer disease (if Helicobacter pylori positive)

Source: modified according to DHHS (2004) and Pötschke-Langer et al. (2009)

Therefore it is often classified as health-risk behavior or health-damaging behavior (Wagstaff 1986; Stronegger et al. 1997; Sturm 2002). Smoking can lead to tobacco dependence, which is recognized in the WHO's International classification of diseases (ICD-10) as well as in the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-IV) (Raw et al. 2002). The use of tobacco is associated with an increased risk of lung cancer, cardiovascular disease, and chronic obstructive lung disease (Raw et al. 2002). There is also evidence to infer a causal relationship between smoking and further diseases and health problems (**table 4**).

Smoking increases the risk of mortality mediated by the increased risk of cardiovascular diseases, lung and oral cancer (Anderson and Mellor 2008; Moore and Hughes J. 2001; Schneider and Schneider 2009a). Thus, it is a major cause for preventable death world-wide (WHO 2011c). E.g., in Europe 14% of all deaths are caused by tobacco use (Raw et al. 2002).

2.b.iii.4 Alcohol consumption

Alcohol, which is synonymously used for ethanol (C_2H_5OH, ethyl alcohol), is the main psychoactive ingredient in alcoholic beverages.[19] The alcohol concentration of alcoholic beverages varies depending on the production method[20]. Alcoholic beverages have sedative/hypnotic effects similar to those of barbiturates. Alcohol intoxication may result in poisoning or even death; long-term heavy use may result in dependence or in a wide variety of physical and organic mental disorders. Since alcohol-related mental and behavioral disorders are classified as psychoactive substance use disorders, they can be also found in ICD-10 (WHO 2011b).

In contrast to the previous sections (2.b.iii.1 – 4) on health behavior, the effects of alcohol consumption on morbidity and mortality are not always clear (cf. Schneider and Schneider 2009a).

Corrao et al. (2004) analyzed alcohol consumption and the risk of fifteen diseases in a meta-analysis. There are direct trends in risk of cancer of the oral cavity and pharynx, esophagus, and larynx.

[19] By extension the term 'alcohol' is also used to refer to alcoholic beverages.
[20] Under normal conditions, beverages produced by fermentation have an alcohol concentration of no more than 14%. In the production of spirits by distillation, ethanol is boiled out of the fermented mixture and re-collected as an almost pure condensate.

Additionally, alcohol consumption is directly associated with an increasing risk of cancer of the colon, rectum, liver and breast. There are also strong trends for hypertension, liver cirrhosis, chronic pancreatitis as well as injuries and violence. For all these diseases/conditions, significant increased risks are observable starting from the lowest dose of alcohol: 25g alcohol/day, corresponding to about two drinks per day. In contrast, for coronary heart disease and ischemic stroke, a significant increased risk was only found at a level of 100g/day. For hemorrhagic stroke the threshold was a 50g alcohol/day.

Interestingly, a significant protective action was observed at 25–50g alcohol/day for coronary heart disease. Hence, Corrao et al. confirm previous results by Rimm et al. (1999) that show also an association between moderate alcohol intake (30g alcohol/day) and lower risk of coronary heart disease. It suggests that the benefit is moderated in parts through several known biological markers of coronary heart disease like high density lipoprotein cholesterol, apolipoprotein A I, Lp(a) lipoprotein, triglycerides, tissue type plasminogen activator activity, tissue type plasminogen activator antigen, insulin, and glucose.

A meta-analysis of prospective studies by Di Castelnuovo et al. (2006) has shown that a J-shape relationship between alcohol and total mortality can be observed in adjusted studies: thus, the lowest mortality rate is observable for moderate drinkers and not for abstainers. In contrast, higher doses of alcohol lead to increased mortality (cf.: Thun et al. 1997).

Against this background, excess drinking is associated with hazards. Nevertheless, there may be a window of low alcohol intake (1–2 drinks per day for women; 2–4 drinks per day for men) that is associated with a net beneficial effect (Di Castelnuovo et al. 2006). Thus, the acceptable amount of alcohol should not exceed one drink per day for women and two drinks per day for men (DGE 2008; USDA and DHHS 2010). Since there are also individual risks to be considered, it is not possible to define a certain threshold where positive effects exceed the health risks of alcohol (DGE 2008).

2.b.iii.5 Combined health behavior

As previously mentioned health behavior can vary widely and consists of many types of behaviors. Behaviors that are presented in section 2.b.iii.1 – 2.c.iii.4 are a selection and should not be regarded to be complete.

The majority of studies investigate single types of health behavior. As shown before, each type of health-damaging behavior is a health risk on its own.

However, the majority of individuals affected by chronic diseases behave in a health-damaging way in various dimensions. This applies especially to smoking, poor diet, physical inactivity, and obesity (Brownson et al. 1998).

The health impact increases in magnitude if two or more advertent behavioral patterns are present in combination (Thefeld 2000) (cf. also Hu et al. 2001; Krebs-Smith 1998; Stamler et al. 1999). There are only a few studies that investigate combinations of several types of health behavior, especially multidimensional health behavior patterns (Berrigan et al. 2003; Miller et al. 2005; Pronk et al. 2004).

The majority of these studies use a sum score indicator to describe multiple health behavior. **Table 5** gives an overview of selected studies on these indicators. The majority of studies consider four types of health behavior. Most often used are the categories dietary behavior, tobacco consumption, alcohol consumption, and physical activity.

Studies find that incidence for of multiple unhealthy behavior is likely (cf. Fine et al. 2004; Grünheid 2004; Kwaśniewska et al. 2007; Martikainen et al. 2003; Miller et al. 2005; Patterson et al. 1994).

In the early 1990s, Patterson et al. (1994) analyzed health behavior patterns. It could be identified that only a minority of individuals show a one-dimensional approach to health, i.e. having either overall health-promoting or health-damaging behavior. The majority showed differentiating – even contradictory – patterns; for instance, having a healthy diet and simultaneously sedentary behavior and vice versa.

Table 5: Measuring multiple combined health behavior using sum scores

Number of considered health behaviors	Dietary behavior	Tobacco consumption	Alcohol consumption	Physical activity	Source
3		✓	✓	✓	Grünheid (2004)
3	✓	✓		✓	Miller et al. (2005)
4	✓**	✓	✓	✓	Fine et al. (2004)
4	✓**	✓		✓	Kwaśniewska et al. (2007)
4	✓	✓	✓	✓	Patterson et al. (1994)
4	✓**	✓		✓	Reeves and Rafferty (2005)
5	✓	✓	✓	✓	Berrigan et al. (2003)
5	✓**	✓		✓	Pronk et al. (2004)

*Multiple types of health behavior per category are possible. **Dietary is (also) considered indirectly using the weight status.

Source: own illustration

Berrigan et al. (2003) confirm these results: Considering whether participants adhere to five selected health behavior recommendations, only 5.9% (4.9%) show a complete (non)adherence. The remaining majority showed a variety of health behavior patterns.

Additionally, almost 80% of the study population does not behave in a health-promoting way in two or more of the five categories.

The most common pattern observed in this study considers individuals who fulfill the recommendations for tobacco and alcohol consumption, but not on dietary behavior and on sports. Furthermore, 56% of the population behaves in a health-promoting way regarding smoking and alcohol consumption, independent of other types of health behavior.

Additionally, data of the British Whitehall II study suggests that current smokers are more likely to be less active and to eat unhealthy food (Martikainen et al. 2003).

Fine et al. (2004) identify several clustering patterns of health behavior using data of the National Health Interview Survey (NHIS). If individuals behave in a health-damaging way regarding three dimensions, the pattern of smoking, being overweight, and a lack of physical activity is most prevalent.

Where two risk factors are present, the combination of smoking and drinking (9%) as well as smoking and inactivity is observable (16%).

Finally, studies observe that only a minority of individuals are likely to have consistent health-promoting behavior (Berrigan et al. 2003; Fine et al. 2004; Grünheid 2004; Kwaśniewska et al. 2007; Miller et al. 2005; Pronk et al. 2004; Reeves and Rafferty 2005). However, there is also evidence from the third National Health and Nutrition Examination Survey (NHANES) that about half of the study population is able to follow at least three out of five health behavior recommendations (Berrigan et al. 2003). This can be also confirmed for further studies from Germany, Poland and the US (Grünheid 2004; Kwaśniewska et al. 2007; Pronk et al. 2004).

Nevertheless, it has to be noted that the evidence of studies examining multidimensional health behavior patterns is mixed due to differences regarding the study populations, analytical methods, and differences regarding the categorization of combined health behavior (Berrigan et al. 2003).

2.b.iv Impact factors on health behavior

The following section presents important factors impacting health behavior. It discusses determinants of dietary behavior, smoking, alcohol consumption, and physical activity. These include socio-demographics, information on health and stress as well as the parental background.[21]

[21] Situations of poverty as well as a low SES are important impact factors for health-damaging behavior (cf. Contoyannis and Jones 2004; Lynch et al. 1997a; Martikainen et al. 2003; McGinnis and Foege 1993). These determinants are discussed in detail in chapter 5.

2.b.iv.1 Educational status

Risky health behavior is more prevalent in subjects with little education (Fine et al. 2004; Nocon et al. 2007; Stronegger et al. 1997). Attempts to explain the influence of education are based on knowledge, especially specific health knowledge, measures of cognitive ability, and social networks.

Blaxter (1990) assumes that the educational status may be the most important determinant to explain **dietary behavior**. This issue is also confirmed by Johansson et al. (1999). The higher the educational attainment, the healthier is the dietary behavior (Cutler and Lleras-Muney 2006; Darmon and Drewnowski 2008; Lallukka et al. 2007).

As an example of dietary behavior, Stronegger et al. (1997) shows risk behavior like high sugar intake or daily meat consumption is lower in highly educated subjects. Furthermore, education positively influences the probability to eat breakfast as well as the intake of fruit and vegetable (Contoyannis and Jones 2004; Cutler and Lleras-Muney 2006). In Germany, Schneider and Schneider (2009b) confirm that education is a central determinant to explain dietary behavior. The dietary quality increases with increasing educational attainment.

The German Health Update (GEDA) reports that educational attainment positively influences fruit consumption (Robert Koch-Institute 2012a).

Smoking is also influenced by educational status. Individuals with a higher educational level are more likely to be non-smokers than the less educated (Contoyannis and Jones 2004; Cutler and Lleras-Muney 2010; Jürges et al. 2011; Laaksonen et al. 2005; Lampert and Mielck 2008; Lynch et al. 1997a; Schneider and Schneider 2009b; Stronegger et al. 1997). Individuals with a medium education are less likely to be non-smokers (Lynch et al. 1997a; Nocon et al. 2007; Robert Koch-Institute 2012a).

With regard to **alcohol consumption**, better educated subjects are less likely to be heavy drinkers (Cutler and Lleras-Muney 2010; Lynch et al. 1997a; van Oers et al. 1999; Schnohr et al. 2004)[22].

[22] Studies have been conducted in Denmark, Finland, the Netherlands, UK and US.

In contrast, data from Germany shows that the probability of frequent drinking is higher for highly educated than for less educated individuals (Robert Koch-Institute 2012a; Schneider and Schneider 2009b). In addition, the likelihood of abstinence decreases significantly with an increasing educational level (van Oers et al. 1999). This issue cannot be supported by German data (Robert Koch-Institute 2012a) and for Finland (1997a).

Additionally, high- and medium-educated subjects are more **physically active** (Nocon et al. 2007; Robert Koch-Institute 2012a; Schnohr et al. 2004). Individuals with little education are more likely to be physically inactive (Lynch et al. 1997a; Robert Koch-Institute 2005). A prospective study shows that individuals with low educational attainment are more likely to decrease physical activity over time (Droomers 2001).

2.b.iv.2 Occupational and employment status

The impact of the occupational status on health and health behavior has been less examined than the educational status (Volkers et al. 2007). The occupational status is related to societal recognition, especially regarding status and power (cf. Bourdieu 1979). Furthermore, there are occupation-related resources and risks. Examples of important resources are income, prestige, and participation in decision processes (Robert Koch-Institute 2010).

In contrast, occupational health risks includes exposure to chemicals, accident risks, physically strenuous work as well as psycho-social strains (Borg and Kristensen 2000; Hemström 2005; Mackenbach 2006a; Rahkonen 2006; Robert Koch-Institute 2010). In addition, there is a significant inverse relationship between occupational status and health behavior (Robert Koch-Institute 2010). Unemployment has been shown to affect health behavior negatively (Miller et al. 2005; Robert Koch-Institute 2010; Stronegger et al. 1997).

With regard to **dietary behavior**, Johansson et al. (1999) report that white-collar workers had higher intakes of fruits and vegetables and fiber than blue-collar workers.[23]

[23] Blue-collar workers: unskilled and skilled workers, and lower level salaried employees (equates to a low occupational status) and white-collar workers: mean and higher level

This observation on fruit and vegetable intake is also confirmed by Alves et al. (2012) for women but not for men. Furthermore, this group shows poor eating behaviors, especially regarding the consumption of fiber (Kachan et al. 2012). In addition, females with a medium and high occupational status report a lower fat intake (1999).

Findings on unemployment and dietary behavior differ. On the one hand, the likelihood of following a healthy diet is lower for unemployed individuals (Schneider and Schneider 2009b). On the other hand, consumption patterns do not differ significantly. There is evidence that German unemployed individuals consume more carbohydrates, which are associated to a low cost diet. Rates of overweight and obesity are higher in this group (Robert Koch-Institute 2010). Balia and Jones (2008) show with data of the British Health and Lifestyle Survey that unemployment lowers the probability of eating breakfast, which is an indicator for a healthy diet. These findings cannot be supported by Contoyannis and Jones (2004).

The association of **smoking** with occupation is controversially discussed. For instance, blue-collar workers are more often smokers and show the highest mean exposure[24] (Lynch et al. 1997a). In addition, individuals with a low occupational status are more likely to be smokers than subjects with a high status (Bang and Kim 2001; Borg and Kristensen 2000; Lee et al. 2007). However, Nocon et al. (2007) could not find significant differences between a high and a low occupational status in Germany. Additionally, Alves et al. (2012) reported for Southern Europe that women with a low occupational status are less often smokers than those with a high occupational status. For men there is no occupational association observable.
With regard to employment status, unemployed individuals show higher smoking rates than their employer counterparts (Balia and Jones 2008; Contoyannis and Jones 2004; Hammarstrom et al. 2011; Miller et al. 2005; Robert Koch-Institute 2010; Schneider and Schneider 2009a). Likelihood for smoking is highest for long-term unemployed men (cf. also Freyer-Adam et al. 2011).

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salaried employees (equates to a medium and high occupational status) (cf. Johansson et al. 1999).

[24] Measured in pack-years (Lynch et al. 1997a).

In contrast, after adjustment for age there are no significant differences between employed and unemployed women (Robert Koch-Institute 2010). Interestingly, using panel analyses of German data, Schunck and Rogge (2012) report that unemployment is not causally related to smoking. Relationships that are observed in cross-sectional data seem to be caused by stable, unobserved differences between employed and unemployed individuals.

Although blue-collar workers are more often abstainers than white collar workers, they report higher rates of frequent drunkenness (Lynch et al. 1997a). Alves et al. (2012) describe that there are no significant differences regarding **alcohol consumption** for men. In contrast, the authors observe higher rates of excessive alcohol consumption for women with a low occupational status.

The relationship between unemployment and alcohol consumption is controversial. The German Health Survey (1998) does not observe significant differences between employed and unemployed subjects. However, there is evidence that already existing risky alcohol consumption is reinforced in the case of unemployment (Robert Koch-Institute 2010). Other authors observe an increase of alcohol consumption if an individual is affected by unemployment (Schneider and Schneider 2009a). Hammarstrom et al. (2011) show for the Swedish population that unemployed women are more likely to consume alcohol than their employed counterparts. There are no significant differences in the male population.

With regard to **physical activity**, blue-collar worker are less often physically active (Lynch et al. 1997a). These findings are also supported by other authors (Becker and Schneider 2005; Lindström et al. 2001; Nocon et al. 2007; Salmon et al. 2000). Becker and Schneider argue that a low occupational status is associated with physical strain at work. This fact is negatively associated with lower levels in physical activity during leisure time.

Additionally, unemployment affects rates of physical activity (Miller et al. 2005; Grobe and Schwartz 2003). In Germany, unemployed men and women show lower rates of physical activity than their employed counterparts (Grobe and Schwartz 2003).

2.b.iv.3 Health status

Health outcomes as well as well-being influence health behavior (Schulz and Northridge 2004; Zanjani et al. 2006). Thus adverse health conditions can cause changes with regard to health behavior (Prochaska and Clark 1997). In this case the individual's sense of vulnerability for morbidity and mortality is influenced (Gochman 1997b and Leventhal et al. 2001 as cited in Zanjani et al. 2006).

With regard to diet, a **healthy diet** is inversely correlated to the current health status. I.e. individuals, who indicate a poor health status, show a higher fruit and vegetable consumption than individuals with good and fair health status (Miller et al. 2005). However, Reeves and Rafferty (2005) report that a high consumption of fruit and vegetables is reported in case of an excellent, very good, or poor health status.

Furthermore, individuals with good or fair health have lowest rates of **smoking** abstinence whereas indicating a poor health status is associated with higher rates of non-smoking (Miller et al. 2005). In contrast, data from the US: shows lower rates of prevalence of non-smoking if the respondent indicates a fair or poor health status (Chin et al. 2012; Reeves and Rafferty 2005).

Data on health status and **alcohol consumption** are less clear so that conclusions are not possible.

Physical activity and health status are positively correlated. The higher the health status, the higher the rate of physically active individuals (Miller et al. 2005; Reeves and Rafferty 2005).

2.b.iv.4 Gender

Men show a lower life expectancy than women. Causes to explain this issue are a higher male mortality in infancy, higher rates of accidents in young men, and a higher risk of the major causes of death in middle-aged men (Wardle 2004). The latter aspect is related to health behavior (cf. also McGinnis and Foege 1993; Mokdad 2004).

Men and women show different health behaviors. Generally, men behave more riskily than women (Dawson et al. 2007; Fine et al. 2004; Grünheid 2004; Miller et al. 2005; Nathanson 1977; Robert Koch-Institute 2012a; Schoenborn and Adams 2010). Women are more likely to take preventive action (Nathanson 1977).

Data of the German Health Update (GEDA) show that the female population is more likely to follow a **healthy diet**. As an example women consume more fruits and vegetables than men (Robert Koch-Institute 2012a). These findings are also confirmed by other authors (Johansson et al. 1999; Miller et al. 2005; Schneider and Schneider 2009b; Wardle 2004).

Smoking rates are significantly higher for men than for women (Chahine et al. 2011; Robert Koch-Institute 2012a; Schneider and Schneider 2009b; Schoenborn and Adams 2010; Thefeld 2000). As an example 34% of the male population and 26% of the female population in Germany are current smokers (Robert Koch-Institute 2012a).

In the US, men are also more likely to be smokers or former smokers than women. The quantity of cigarettes is higher for men (Schoenborn and Adams 2010).

Concerning **alcohol consumption**, results are less distinct (cf. Robert Koch-Institute 2012a; Schoenborn and Adams 2010). In Germany, risky alcohol consumption is reported by one third of the men and one fifth of the women. Twice as many women are abstainers.

However, there are no differences regarding moderate alcohol consumption (Robert Koch-Institute 2012a; Schoenborn and Adams 2010). In contrast, data from NHANES show that males are about three times as likely as women to be moderate drinkers (Schoenborn and Adams 2010). Furthermore, several studies confirmed that women are more likely to be abstainers than men (Pärna et al. 2010; Schoenborn and Adams 2010). Additionally, women are less likely to report regular alcohol consumption than men (Bloomfield et al. 2008; Schneider and Schneider 2009b).

Men show higher rates of **physical activity** than woman (Becker and Schneider 2005; Caspersen et al. 2000; Miller et al. 2005; Robert Koch-Institute 2012a).

GEDA data indicates that 46% of males and 40% of females do more than 2 h per week sports (Robert Koch-Institute 2012a). NHANES data finds comparable results for the US. Although there are no differences between men and women with regard to regular light-moderate leisure-time physical activity, men are more likely than women to do regular vigorous leisure-time physical activity (Schoenborn 2004).

2.b.iv.5 Age

Health behavior also differs by age groups (Zanjani et al. 2006). Generally, health risk behavior is more prevalent in younger age groups (Fine et al. 2004; Stronegger et al. 1997).

For instance, older adults report daily fruit consumption more often than younger individuals (Miller et al. 2005; Robert Koch-Institute 2012a). In Germany, 58% of the female population and 35% of the male population aged 18–29 years indicate daily fruit consumption whereas individuals aged 65 and older show a higher consumption rate (85% and 70%).

In contrast, there are no significant variations regarding vegetable consumption for all age groups until 64 years. Only older individuals consume slightly more vegetables (Robert Koch-Institute 2012a). Altogether older individuals more often follow a **healthy diet** (Martikainen et al. 2003; Schneider and Schneider 2009b). Martikainen et al. (2003) report an ambiguous age-related gradient for women. In this case, the age group of 45–49 and the age group of 55–63 show the highest rates of healthy diet.

Smoking behavior is correlated with age. Highest rates of smoking are observable for individuals aged 18–29 years. Tobacco consumption of middle-aged individuals is only slightly lower. An obvious decline of smoking behavior is observable for subjects that are 65 years and older (Robert Koch-Institute 2012b) (cf. also Thefeld 2000). These findings are also confirmed by other authors (Miller et al. 2005; Schneider and Schneider 2009b).

In Germany, the highest **alcohol consumption** is among young adults aged 18–29 years. They report risky drinking most often. This type of behavior declines significantly for individuals aged 30 years and older (Robert Koch-Institute 2012a).

An age-related decrease in alcohol consumption is also confirmed for other European countries and the US (Schoenborn and Adams 2010; Uitenbroek et al. 1996). Inverse findings are found in Southern Europe. Excessive alcohol intake increases with age (Alves et al. 2012). In Denmark, regular drinking is most prevalent in the age groups of 50 years and older (Bloomfield et al. 2008).

With increasing age a decline of **physical activity** is observable (Caspersen et al. 2000; Miller et al. 2005; Robert Koch-Institute 2012a; Sallis 2000). In Germany, highest rates of physical activity are found for the group aged 18–29 years. Interestingly, women of this age group are less likely to be physically active than their male counterparts. In contrast, for subjects aged 40 and older, women are more likely to be physically active than men (Robert Koch-Institute 2012a). For the US, Caspersen et al. (2000) report that there is a strong decline of physical activity from ages of 12 through 21. This decrease continues also in young adulthood. Despite this decline, middle-aged adults show relatively stable patterns of physical activity. Interestingly, individuals aged 65 and older may improve their activity patterns.
Altogether, it must be noted that the presented studies are mainly cross-sectional studies. Studies analyzing cohort effects are very seldom in this field of research.

2.b.iv.6 Marital status

Health behavior also differs according to marital status. These differences are not identical across all types of health behavior (Fine et al. 2004; Schoenborn 2004).

For instance, married men are more likely to follow a **healthy diet** (Martikainen et al. 2003; Roos et al. 1998). In contrast, moderately healthy diets are reported for unmarried women (Martikainen et al. 2003). Divorced individuals are least likely to be in line with dietary recommendations (Roos et al. 1998).

In addition, by entering into marriage the likelihood for risky health behaviors that include problem **drinking and smoking** is decreasing (Umberson et al. 2010). This observation is supported by Schoenborn (2004).

The highest prevalence of smoking is reported for individuals who are divorced or separated as well as for individuals who are living with a partner (not married).

With regard to alcohol consumption, heavy drinking is most likely among individuals living with a partner as well as for the categories 'widowed' and 'divorced/separated' (Schoenborn 2004).

Data of the National Health Interview Survey (NHIS) reports that married individuals are most likely to be **physically active**, whereas widowed individuals are least likely to be so (Schoenborn 2004). In contrast, other authors observe that married individuals are less often physically active than the unmarried (Grzywacz and Marks 1999; Jeffery and Rick 2002).

Additionally, studies show that married individuals have lower mortality rates. These are partly explained by health-promoting behavior (Rogers 1995; Waite and Gallagher 2000). It is argued that a marriage is related to responsibility so that an individual protects his/her health in order to care for others. This does not apply to cohabitations (Nock 1998; Waite and Gallagher 2000). In contrast, divorced, separated, and widowed individuals are affected by psycho-social stress that favors health-damaging behavior (cf. Mackenbach 2006a).

As an example, Schoenborn (2004) shows that independent of age, sex, educational status, and income group, married individuals are healthier than those in other marital status categories.

2.b.iv.7 Migration background

Migration is observable world-wide.[25] As an example, 19.5% of the population living in Germany has a migration background. These individuals have immigrated themselves or are children and grandchildren of immigrants (Destatis 2012a). Immigration is an event that influences the biography of the person concerned as well as the following generations. Furthermore, it is associated with opportunities and risks regarding social and economic situation as well as the health status.

[25] Studies from the US more often consider race than the migration background. Since race is not relevant for health investigations in Germany, this issue will not be considered in this thesis.

Important roles play the language of the home country and the cultural background. Altogether, the life event of immigration is associated with psychosocial stress. Next, subjects with a migration background are likely to be affected by various disadvantages, e.g. low SES, language barriers and different understanding of health and illness, and situations of discrimination (Razum 2008).

In Germany, only a few studies examine **dietary behavior** of migrants. Findings suggest that their nutritional behavior differs in a positive way from that of the German population (Winkler 2003). These results can be also confirmed for France (Darmon and Khlat 2001). They show that migrants from southern Europe and North Africa report a Mediterranean diet, which is associated with positive effects on health. Interestingly, the second generation of migrants seems to adopt dietary patterns comparable to those of first generation migrants (Landman and Cruickshank 2001).

Men with a migration background show higher rates of **smoking** than males without. For women this relationship is reversed but the difference is smaller (Lampert 2010; Robert Koch-Institute 2010). In the US, women with a migration background less often report to be smokers than native-born Americans. These effects are also valid for men, even if differences are not as big as for women (Lopez-Gonzalez et al. 2005).

However, there are variations of smoking rates depending of the country of origin (Brussaard et al. 2001).

Regarding **alcohol**, individuals with a migration background are more likely to be abstainers.

Additionally, those that consume less alcohol (Brussaard et al. 2001; Lopez-Gonzalez et al. 2005; Robert Koch-Institute 2010). One explanation is religious taboos (Brussaard et al. 2001). The duration of stay in the receiving is positively associated with drinking alcohol (Robert Koch-Institute 2010). This goes along with the so-called acculturation hypothesis whereby risk-taking behavior increases with increasing length of residence (Singh et al. 2002).

In the UK, individuals report lower levels of **physical activity** (Landman and Cruickshank 2001).

A report on physical activity in Europe shows that there is no significant relationship with regard to the migration background except for Poland as receiving country (Hovemann and Wicker 2009). These findings are supported by Sieberer et al. (2009). Interestingly, language skills of the language of the receiving country are positively associated with physical activity.

2.b.iv.8 Region of residence: East and West Germany

Between 1949 and 1990, Germany was divided into the Federal Republic of Germany (FRG, 'West Germany') and the German Democratic Republic (GDR, 'East Germany')(Kinder et al. 2008). Due to differences regarding the political constitutions and growing cultural disparities, differences existed regarding health behavior, e.g. food consumption. Even eight years after reunification, differences between East and West Germany were observable. Attempts to explain these differences are based upon varying job opportunities, income, education history as well as cultural habits (Mensink and Beitz 2004).

With regard to **dietary behavior**, Mensink and Beitz (2004) analyze data of the German Nutrition Survey (1998). Differences regarding dietary behavior have decreased since one year after reunification. Nonetheless, food intake still varied between East and West Germany in 1998. For instance, East Germans consumed more bread, fruit, fish, sausage, and offal than West Germans. In contrast, West Germans consumed more cereals, pasta, sweets, leafy vegetables, tea and drinking water.

The German Robert Koch Institute (2009) published a report[26] on developments on health and health behavior 20 years after reunification. In 2010, dietary patterns have as far as possible aligned. Although differences regarding dietary patterns between both regions still exist, e.g. for fruit consumption, the authors conclude that neither the East German nor the West German pattern is more health-promoting (cf. also Robert Koch-Institute 2012a).

[26] Analyses of this report are based on several epidemiological studies that have been conducted in Germany. Regarding health behaviour analyses are mainly based on data of the Health Report for Germany (BGS) and the first National Nutrition Survey (NVS) (cf. Robert Koch-Institute 2009).

In addition, the second German Nutrition Survey does not consider differences between East and West Germany but between federal states (cf. Max Rubner-Institute 2008b).

After reunification, significant differences in **smoking** have only been observable for women. Women in West Germany consume tobacco more often than their Eastern counterparts. In the meantime, these differences are no longer observable (Robert Koch-Institute 2009).

In East Germany, risky **alcohol consumption** has been observed more often than in the West. Today this difference applies only for 40–69-year olds. In contrast, 18–29-year-old West Germans more often show risky alcohol consumption (Robert Koch-Institute 2009).

Participation in **sports** is more prevalent in West Germany than in the East because club sports are more common in the West. These differences have decreased since reunification. Looking at physical activity beyond club sports, no significant variation between the two regions is observable (Robert Koch-Institute 2009).

2.b.iv.9 Parental status – children in a household

There is a controversial discussion about whether having children is associated with less or more health-damaging behavior (cf. Bellows-Riecken and Rhodes 2008; Umberson 1992). As an example, Nock (1998) as well as Waite and Gallagher (2000) argue that '[…] parenthood promotes a sense of purpose, commitment, and responsibility that leads individuals to protect their health in order to care for others' (as cited in Umberson et al. 2010). Hence it may be assumed that health-promoting behavior is more likely for mothers and fathers than for childless individuals.

Studies in this area on **dietary behavior** are limited and come to conflicting results (Berge et al. 2011; Laroche et al. 2012). As an example, Roos et al. (1998) reported that women in Finland with preschool-aged children are more likely to follow dietary recommendations than other women. There are no significant results for men. Additionally, Berge et al. (2011) shows that women consume more sugar-sweetened beverages, more total energy and saturated fat compared to childless women. In contrast, Laroche et al. (2012) conclude that parenthood has neither positive nor negative impacts on dietary behavior.

Results on **smoking** are mixed. Comparing households without and with children, Schuster et al. (2002) show for the US that regular smoking is more common in households with children. In Germany, Lampert (2010) show that individuals with children are more often non-smokers than childless individuals. However, using data of the GSOEP Schneider and Schneider (2009b) report no significant relationship for smoking and parental status.

Findings on parenthood and **alcohol consumption** are rather rare. As an example, individuals with children consume less alcohol than individuals without children (Umberson 1992). These findings are supported by Schneider and Schneider (Schneider and Schneider 2009b).

With regard to **physical activity**, a meta-analysis examining studies of the years 1989 to 2007 found that parenthood is negative related to physical activity (Bellows-Riecken and Rhodes 2008). This applies especially to mothers. Furthermore, both mothers and fathers are less often physically active (Berge et al. 2011; Hovemann and Wicker 2009). In contrast, Candelaria et al (2012) show that there are only negligible differences in parents' objectively measured moderate-to-vigorous physical activity compared with nonparents. Self-reported household activity was even higher for parents. As an explanation for these differences, Hovemann and Wicker (2009) assume that the existence of children has a negative influence on the time needed for sport participation.

However, Bellows-Riecken and Rhodes (2008) criticize that the majority of studies use a cross-sectional design so that future research should focus on longitudinal data.

2.b.iv.10 Economic worries

Financial difficulties caused by low income, unemployment, and negative live events are an explanation for having economic worries. These can be understood as one characteristic of psychosocial stress which can lead to health-damaging behavior (cf. Mackenbach 2006a; Taylor 2009). Individuals who are affected by high stress are more likely to behave in a health-damaging way in at least 2 out of 4 categories (Fine et al. 2004).

Individuals who are worried about their economic situation are more likely not to follow a **healthy diet** (Schneider and Schneider 2009b). In addition, subjects affected by stress are more likely to eat fast-food (Steptoe et al. 1998).

Economic worries are positively associated with **smoking** (La Rosa et al. 2004; Schneider and Schneider 2009a). Based on data of the Helsinki Health Study, Laaksonen (2005) shows that men and women who report financial difficulties are more likely to be smokers. The lowest prevalence of smoking is among individuals with no economic worries.

In contrast, the relationship of economic worries and **alcohol consumption** is inverse (Schneider and Schneider 2009a). This can be also confirmed for stress in general (Steptoe et al. 1998).

Economic distress is also a cause for low leisure-time **physical activity** for both men and women (Wemme and Rosvall 2005).

2.b.iv.11 Risk preference

Finally, the risk preference is likely to affect health behavior (Anderson and Mellor 2008).

With regard to **dietary behavior** Traill et al. (2012) show that risk-averse individuals are more likely to follow a healthy diet. These subjects try to minimize their risk of adverse health outcomes.

There is evidence that risk preference is associated with **tobacco** consumption. Anderson and Mellor (2008) show that smoking is negatively associated with risk aversion. Thus risk taking increases the likelihood of smoking. This is also approved in findings from Germany (Dohmen et al. 2005).

Alcohol consumption, especially heavy drinking, is positively associated with a low risk-aversion. Subsequently, risk-averse individuals are less likely to show risky alcohol consumption (Anderson and Mellor 2008). Also Dave and Saffer (2008) show with data from the Panel Study of Income Dynamics (PSID) and the Health and Retirement Study (HRS), that risk-tolerant individuals participate more in drinking and have a higher level of consumption.

Particularly, risk is an important dimension of **sport**. Dohmen et al. (2005) demonstrate that being physically active is strongly, positively correlated with the willingness to take risks. This issue is supported by a previous analysis that shows that male athletes have a higher prevalence of risk behaviors than non-athletes. Female athletes show less often risk behaviors than their counterparts (Kokotailo et al. 1996).

In conclusion, the individual's risk preference is simultaneously associated with health-promoting and health-damaging behavior.

3. Theoretical background

The following chapter gives an overview of existing theories on health behavior, health, and health inequality that may be applicable to research questions in this thesis. Based on the theories presented, a theoretical framework is developed that is empirically analyzed in chapter 7.

Several academic fields, among others health sociology (3.a), health economics (3.b) and health psychology (3.c) have developed approaches to explain health behavior, health, and health inequality (cf. **Table 6).**

Table 6: Theories on health behavior, health, and health inequality

Theory	Academic field	Author(s)	Explaining:			Section
			Health behavior	Health	Health inequalities	
Social determinants of health and environmental health promotion (society level)	Social theory	Schulz and Northridge (2004)	✓	✓	✓	3.a
Influences on health equity (society level)	Social theory	Starfield (2007)	✓	✓	✓	3.a
Explanation of health inequality (individual level)	Social theory	Mackenbach et al. (1994); Mackenbach 2006a)	✓	✓	✓	3.a
Model of explaining health inequality (individual level)	Social theory	Elkeles and Mielck (1997)	✓	✓	✓	3.a
Human capital model of the demand for health	Health economics	E.g.: Grossman (1972b); Schneider and Schneider (2009b)	✓	✓		3.b
Social cognition models	Health Psychology	[27]	✓	✓		3.c

Source: own illustration

[27] Social cognition models are summarized in section 3.c.

After presenting most relevant theories for the presented study, this section will conclude with deriving hypotheses (section 3.d) for the empirical analyses.

3.a Social Theories

Social theories that focus on health, health behavior and health inequality may be constructed at a societal or individual level (Kroll 2010). Both are presented in the subsequent section.

3.a.i Theories at societal level

Models at societal level emphasize that health is not only determined by the health system but also by society itself. Society includes all levels from neighborhood to the supranational organizations (Kroll 2010)[28] (cf. also Wagstaff 2002). The aim of these approaches is to explain health inequalities by analyzing societal structures (Siddiqi and Hertzman 2007). They are mainly based on empirical findings (Kroll 2010). In 1990, the approach 'Producing health, consuming health care' by Evans and Stoddart (1990) established the connection between macro and micro levels. The authors consider not only health care as determinant for health, but also aspects of the social and physical environment as well as prosperity and individual factors like behavior (Evans and Stoddart 1990, 2003). Although this model is most widely cited there are limitations because it considers only very few societal influences. Furthermore, the model accounts only for a few interactions among these influences (Starfield 2007).

Two more detailed approaches are 'Social determinants of health and environmental health promotion' by Schulz and Northridge (2004) and 'Influences on the health of individuals' by Starfield (2007).

As shown in **figure 3** by Schulz and Northridge (2004), health is integrated in a construct of social determinants at a macro, meso, micro and individual level. The model developed includes fundamental factors at the macro level, namely the natural environment, macrosocial factors and inequalities that affect health.

[28] Cf. also Wagstaff (2002).

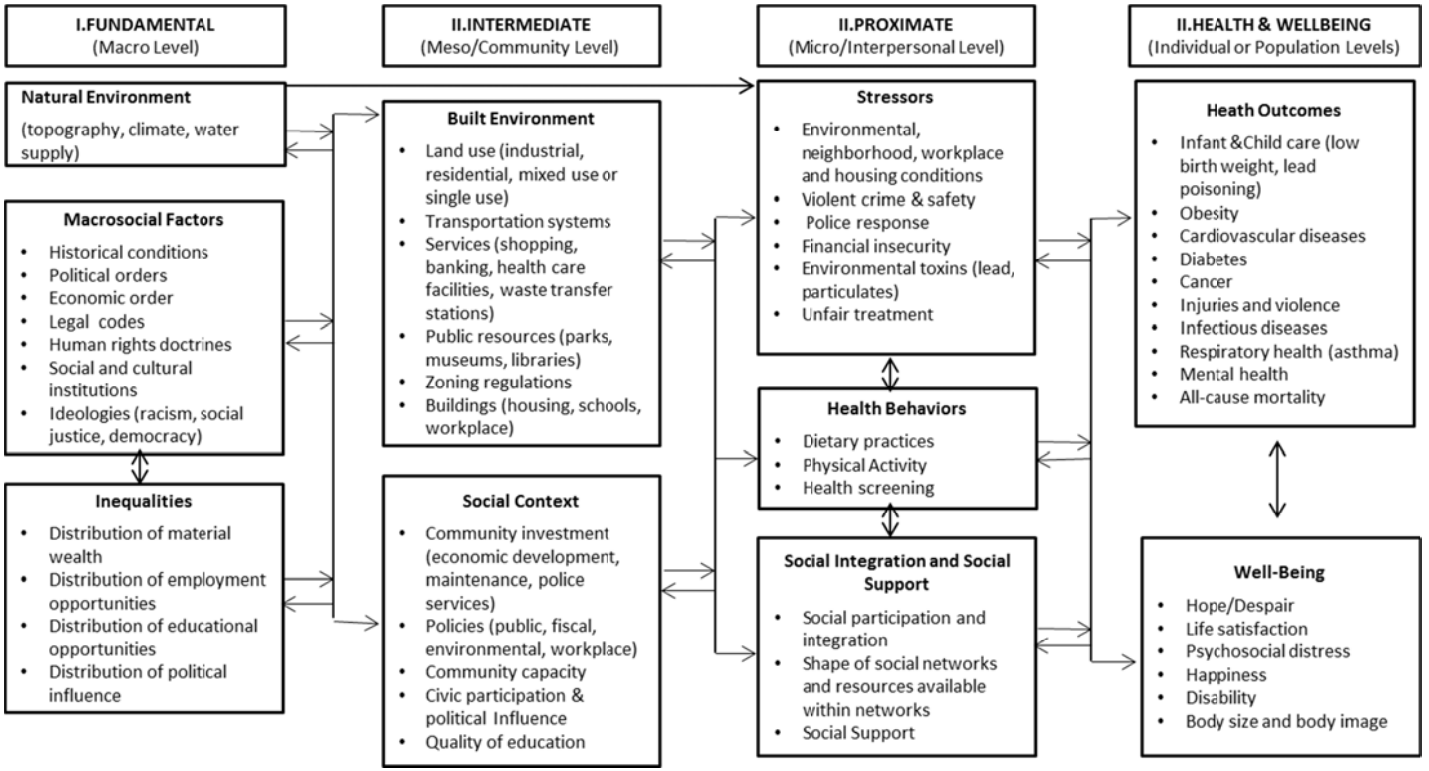

Figure 3: Social determinants of health and environmental health promotion

Source: Schulz and Northridge (2004)

There are interactions between the political, economic, and legal processes and inequalities in the area of material wealth, employment, educational opportunities as well as political influences (cf. Cassel 1976; House et al. 1994; Link and Phelan 1995). At the intermediate level with its built environment and social context, the community level influences again the proximate level including stressors, social integration/ social support, and health behaviors. Eventually, these factors affect health outcomes and well-being. Finally, health and well-being is also influenced by the proximate factors at the micro level (cf. Heaney and Israel 2008; Israel et al. 2002; Lantz et al. 1998; Yen and Syme 1999). These determinants lead to both individual and population health and well-being and are noticeable at the personal and interpersonal level. There are several stressors that influence health behavior. Examples are a lack of public spaces such as parks which facilitate physical activities or reduced access to fresh and healthy food (Schulz & Northridge M. 2004).

This conceptual model shows that fundamental factors like social and economic inequality affect the environmental and social context, which in turn influences health behavior, various stressors, and social relationships. Finally, these factors result in health and well-being (Schulz and Northridge 2004).

In addition to this approach, Starfield (2007) introduced the model of 'Influences on the health of individuals'.

This model highlights pathways that are consistent with the majority of social determinants literature that focus on the individual basis. Research on social determinants often studies the influence on health of individual and community-level aspects. These are e.g. income, education, social networks, behaviors, stress or medical care. Apart from individual aspects, it also considers community-level factors such as political and policy context, level and distribution of wealth or health system characteristics so that individual aspects are embedded in the societal context. **Figure 4** shows that the pathway leads from influences at the community level like occupational and environmental exposures, behavioral and cultural characteristics as well as health system characteristics, via individual determinants like social resources and behaviors, to individual health.

Within this concept, individual determinants have a moderating effect with regard to health. Since health equity refers to the distribution of health in a population, Starfield (2007) has also developed this model at the population level too (cf. **appendix 2**). Finally, she criticizes that the majority of models on health, health inequality, and health behavior consider pathways and interactions of societal influences insufficiently.

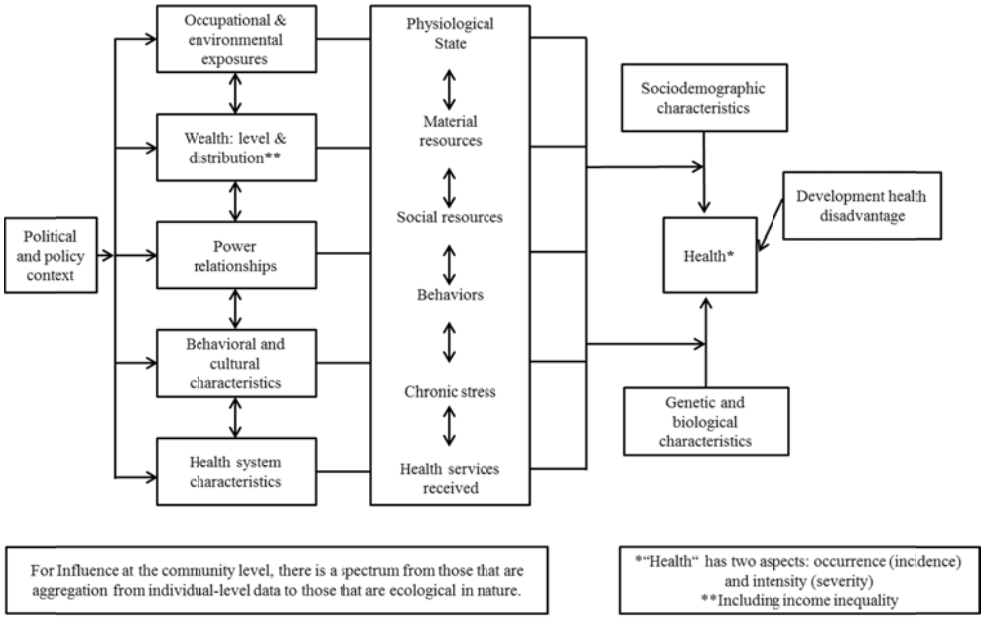

Figure 4: Influences on the health of individuals

Source: Starfield (2007)

In conclusion, these models can be understood as models for orientation. It is obvious that health and health behavior are directly linked and embedded in a societal context. However, these frameworks are too complex, so that it is not possible to analyze all these interactions empirically. The models only permit a description of empirical relation, but not an analysis of mechanisms and conditions to produce health (cf. Kroll 2010). Nevertheless, they are eligible as a basis of discussion for formulating implications for health policy and public health and give an understanding of how individual health behavior and health is embedded in a societal context.

3.a.ii Social theories at an individual level

Social theories at the individual level describe and analyze mediating mechanisms between social status and health to explain health inequalities.

They are based on empirical findings of social epidemiological research (Kroll 2010).

In the area of social epidemiology, four main approaches are discussed (**table 7**). They were first described in the Black Report (Elkeles and Mielck 1997; Kroll 2010; Macintyre 1997).

Table 7: Approaches to explain health inequalities

Approach	Explanation
Artifact	Magnitude of observed class gradients will depend on the measurement of both class and health
Natural/social selection	Health can contribute to achieved class position and help to explain observed gradients
Materialist/structural	Material, physical conditions of life associated with the class structure are the complete explanation for class gradients in health
	Physical and psychosocial features associated with the class structure influence health and contribute to observed gradients
Cultural/behavioral	Health damaging behaviors are differentially distributed across social classes and contribute to observed gradients

Source: modified, according to Macintyre (1997)

The 'artifact explanation'[29] suggests that observed health inequalities are the result of an error of measurement (Macintyre 1997). Actually, biased results that are conditioned by measuring errors have been observed '[…] because census data and death certificates are not linked at an individual level in Britain and occupations reported on death certificates may differ from those given in the census, which are used as the denominator from which rates are calculated.' Since different social class classifications were used, valid comparisons are not possible (Macintyre 1997). Finally, it has been shown that the artifact explanation can be an issue but that is empirically not relevant (Elkeles and Mielck 1997).

The explanation of natural or social selection assumes that the health status determines the SES (Macintyre 1997). Although some evidence regarding this to the explanation has been found, it is questionable whether it contributes significantly socio-economic differences by health status (Elkeles and Mielck 1997; Muennig 2008).

[29] The original source uses the British spelling 'artefact'.

The explanation of material and structural aspects considers 'the role of economic and associated socio-structural factors in the distribution of health and well-being' (Townsend et al. 1992).

Thus material inequality regarding e.g. income, savings, property and housing conditions as well as occupational conditions, causes differences in health.

Finally, cultural and behavioral explanations assume that health-damaging behavior follows a social gradient so that social inequalities contribute to differences in health via health behavior importance (Macintyre 1997).

Against this background, the majority of individual-based approaches follow the causation hypothesis that includes the materialist/-structural explanations as well as cultural and behavioral explanations. Since behaviors are associated with materialist aspects, the two approaches cannot be separated because behaviors are not autonomous (Blaxter 1983 as cited in Smith et al. 1994). Although social selection processes are also observable, it is assumed that this approach explains only a minor proportion of social inequalities with regard to health. Therefore causal processes are empirically of prime importance (Benzeval and Judge 2001; Richter and Hurrelmann 2009; Smith et al. 1994; Elkeles and Mielck 1997; Macintyre 1997; Mackenbach 2006a). For this reason this thesis follows the causation hypothesis and explains in the following two models based on the materialist/structural and cultural/behavioral approaches.

As a matter of illustration, the relationship between health and health behavior at an individual level can be found in the 'Explanatory model of health inequality' by Mackenbach (2006a) (**figure 5**). A first version of this model was presented in (Mackenbach et al. 1994). The previous model shows not only the causation mechanism but also the selection mechanism. Due to its minor significance, the latter mechanism had been dropped in the updated model. This approach considers health behavior as one out of three mediators between SES and health. It shows that health behavior is influenced by socio-economic parameters directly as well as indirectly via material and psychosocial factors. Mackenbach (Mackenbach 2006a) assumes that the causal effect on health is likely to be largely indirect.

Furthermore, these determinants, namely health behavior, material factors and psychosocial factors, are differentially distributed across socio-economic groups so that they are seen as the main explanation of health inequality. Material factors influence the health status directly as well as via psychosocial factors and health-related behavior.

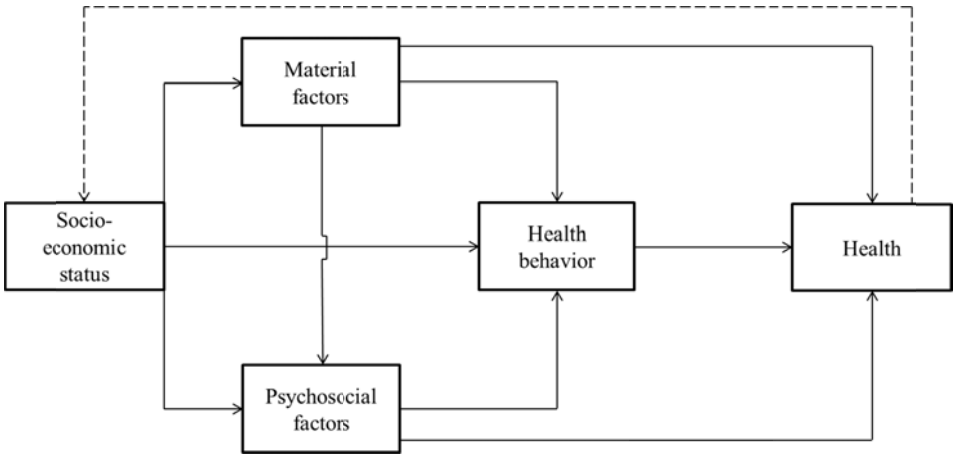

Figure 5: Explanation of health inequality[30]

Source: modified according to Mackenbach et al. (1994) and Mackenbach (2006a)

Material factors include financial aspects, especially the income situation which influences psychosocial aspects like stress, subsequent risk-taking health behavior as well as the access to health-promoting facilities and products. Further material factors are health risks related to occupation and housing. Next, psycho-social factors are considered that cover negative life-events, daily hassles, effort-reward imbalance, and a combination of high demands and low control. These types of psychosocial stress may lead to ill-health either through biological pathways, for instance by affecting the immune systems, or via behavioral pathways.

The group of contributory health-related behaviors consists of dietary behavior, smoking, alcohol consumption and physical activity. Interestingly, health-promoting behavior is less likely in lower socio-economic groups. Finally, many studies suggest that health-related behavior contributes to inequalities in mortality (Mackenbach 2006a) (see also chapter 2).

[30] Continuous lines describe the causation hypothesis. The dashed line represents the explanation of natural or social selection that was included in Mackenbach et al's (1994) first model. This aspect is not included in the updated model from 2006.

It is important to note that Mackenbach's model does not consider the use of health care in terms of therapeutic and rehabilitative services, because these aspects of health care deal with variation in incidence, not prognosis, of health problems. In contrast, preventive services are considered as life-styles (Mackenbach et al. 1994). Furthermore social selection processes (dashed line in the model) that were considered in the first model by Mackenbach et al. (1994) like the influence of incidence of health problems at adult ages or childhood environment are left out due to minor empirical evidence (Mackenbach 2006a).

In Germany, Elkeles and Mielck (1997) developed a 'Model of explaining health inequality' that also follows the materialist/structural as well as behavioral explanations (**figure 6**).

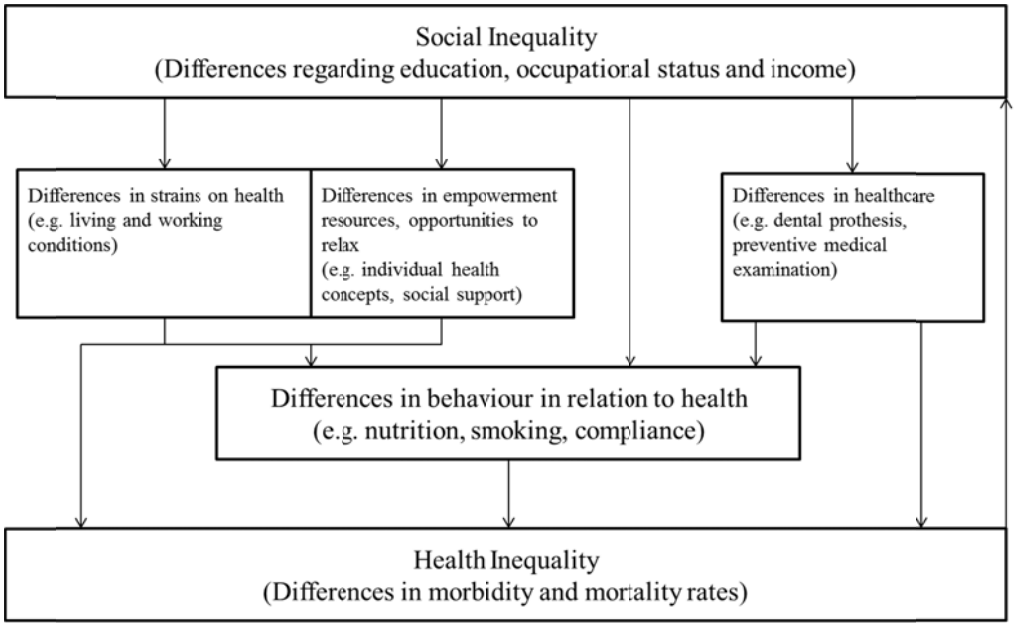

Figure 6: Model explaining health inequality

Source: Elkeles and Mielck (1997) and Mielck (2000)

The initial point of the model is social inequality, which reflects differences regarding education, occupational status and income.[31]

[31] The first version of the "Model of explaining health inequality" that follows both the materialist/structural as well as behavioral explanations included knowledge, power, money and prestige instead of education, occupational status and income (cf. Elkeles and Mielck 1997 and Mielck 2000).

Relating to these aspects individuals may have advantages or disadvantages that affect the morbidity and mortality of an individual via certain mediators. First differences in strains on health are relevant.

Examples are stress at work or environmental pollution in the living environment. Secondly, there are differences in empowerment resources and opportunities to relax. This aspect includes social support as well as leisure-time options.

In the field of differences in empowerment resources Elkeles and Mielck (1997) consider the approach of 'locus of control' which may be internal or external. In the case of 'internal locus of control', an individual is convinced that s/he decides with their actions whether an aim is reached or not. In contrast, the 'external locus of control' describes situations when an individual assumes that s/he is not able to influence destiny (cf. Wallston and Strudler Wallston 1982). Thirdly, differences in healthcare are relevant regarding differences in health behavior and health. Although it can be assumed that the German healthcare system is equally distributed. However, the quality of prevention, treatment and rehabilitation may (Elkeles and Mielck 1997).

Comparing the two approaches, the category 'differences in strains on health' can also be found in Mackenbach's category 'material factors'. Furthermore, 'differences in empowerment, resources and opportunities to relax' can be understood as psychosocial factor. In contrast to Mackenbach, Elkeles and Mielck also consider the influences of healthcare. The authors argue that there are empirical differences regarding the quality of healthcare, so that differences concerning maintenance and recovery of health are observable. The three mediators mentioned affect not only the level of health inequality but also health-related behavior which are variable and selectable. Additionally, empirical studies have shown that a socioeconomic gradient is observable. Finally, health behavior influences health status.

The authors emphasize that the described mediators have not only an independent impact, but are also explained by SES. Thus health inequalities are not exclusively a result of social inequality.

Furthermore, increased morbidity may have repercussions on an individual's social situation. Thus the aspect of social selection is considered.

Altogether models by Mackenbach (2006a) as well as Elkeles and Mielck (1997) are alike regarding several aspects.

Both models assume that SES influences health behavior but also health via direct and indirect pathways. Material factors can be also found in Elkeles' model with regard to living and working conditions (see differences in strains on health). In parts, differences in empowerment can be understood as psychosocial factors.

However, aspects of healthcare are not congruent with Mackenbach. As already explained, Mackbach considers only preventive healthcare in his approach whereas Elkeles and Mielck also include curative aspects.[32]

Finally, the presented approaches to explain health inequalities may be applied not only at a cross-sectional but also at a longitudinal level to analyze the relationship of health and health behavior and dynamic SES and poverty patterns.

Using the example of income poverty Brennecke (1998) shows the application of the material and structural approach (here 'prevention') as well as the natural and social selection approach (here 'deprivation') in a longitudinal perspective (**figure 7**).

I.e. income and health of time period *t* is influenced by previous period (*t-1*). Furthermore health (*t*) is influenced by income[33] in the previous period (*t-1*) and income by health[34]. This fact is of vital importance.

For instance, (Benzeval and Judge 2001) shows that persistent poverty is more harmful for health than occasional episodes. In addition, further confounding socio-demographic variables have to be considered. Brennecke includes also age, sex, marital status, children, qualification and occupation in his model. The two latter aspects and income constitute SES.

[32] In addition to the Mackenbach (2006a) and Elkeles and Mielck (1997) models, another important approach in the area of social theories is the health lifestyle theory by Cockerham (2005). According to this approach, health lifestyles are dependent not only on current class circumstances but also on socialization. Since aspects of socialization, especially regarding childhood SES and poverty as well as health behavior, cannot be covered by this thesis, this approach is not presented in detail.
[33] Structural approach.
[34] Social selection approach.

Thus, SES seems to be applicable for this model too. Finally, Brennecke states that the income situation affects also health behavior.

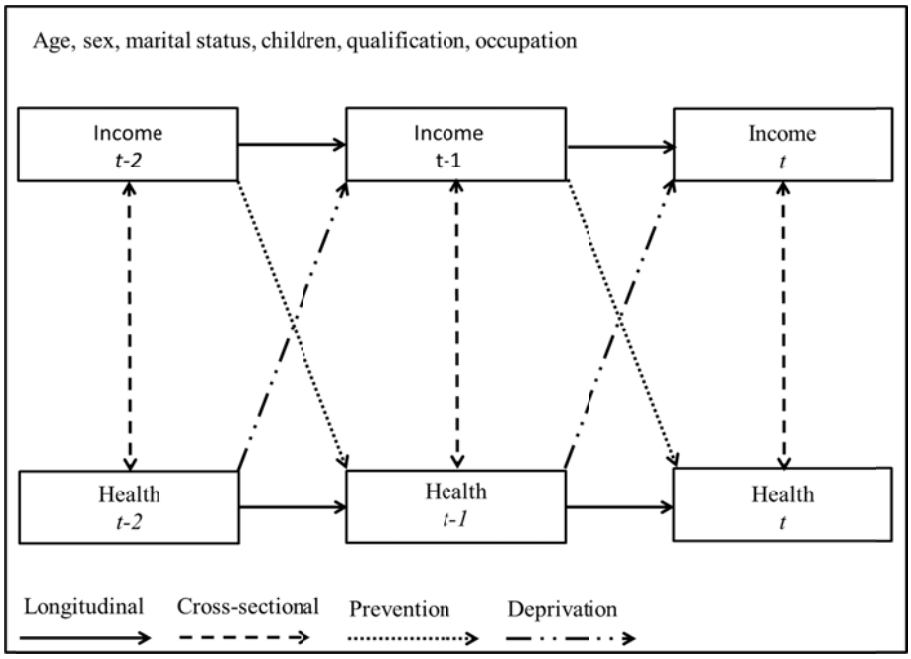

Figure 7: Discussed relationships between income and health
Source: Brennecke (1998)

In conclusion, social theories at an individual level presented by Mackenbach (2006a) as well as Elkeles and Mielck (1997) cover the main topic of this thesis which is health behavior and poverty and/ or SES. Although poverty is not explicitly integrated in the models, differences in income, occupational status, and education are considered. Therefore, these models can be applied to extreme income situations such as poverty. Furthermore, Mackenbach's approach includes material factors, amongst others financial aspects that may be caused by poverty (cf. Groh-Samberg 2009). Both approaches show that SES influences health as well as health behavior via direct and indirect pathways. Indirect pathways are mediated via material and psychosocial factors. Healthcare as a determinant for health behavior is not considered within this thesis by following Mackenbach's argumentation.

As already explained, the individual poverty/SES situation of an individual may change and vary over time (cf. Brennecke 1998).

Therefore, this study aims at analyzing effects of poverty and SES on health behavior, because health behavior may change immediately, whereas health outcomes with regard to non-communicable diseases develop over a longer period and can be influenced via long-term behavioral effects (Kroll 2010; Knoops et al. 2004; Olshansky and Ault 1986; Richter and Hurrelmann 2009).

Although analyses presented in chapter 7 cannot consider all aspects indicated in the models by Mackenbach (2006a) as well as Elkeles and Mielck (1997), both approaches offer an eligible framework for this thesis. Thus the following hypotheses can be formulated:

H1: Health behavior is influenced by poverty and SES directly and indirectly via material and psychosocial factors.

H2: Suitable poverty and SES dimensions are represented by income, occupational status and education. Furthermore, material aspects such as unemployment and financial savings, also contribute to the poverty situation that impacts health behavior.

H3: Health behavior is influenced by changes over time and length of poverty/ low SES.

3.b Human capital model of the demand for health and enhancements

After presenting social theories in section 3.a, this part describes a theoretical framework of the research field of health economics to explain health, health inequality, and health behavior. First, the 'Human capital model of the demand for health' that Michael Grossman developed in 1972 is introduced. Second, enhancements regarding health behavior by Grossman and other authors are described.

Although several authors have already suggested viewing health as a form of human capital, Grossman (1972a) was the first author to construct a demand model for health.[35]

[35] Grossman (1972a) refers to Becker (1964), Fuchs (1967) and Mushkin (1962).

He emphasized the importance of noting that there are differences between health capital and other forms of human capital because '[…] a person's stock of knowledge affects his market and nonmarket productivity, while his stock of health determines the total amount of time he can spend producing money earnings and commodities.'

Grossman (1999) provides two reasons for the demand for health. First, health can be understood as a source of utility. Second, health is a productive input and determines wealth in the life-cycle context.

It is assumed that an individual obtains an initial stock of health. On the one hand this health stock depreciates over time. If the health stock decreases below a certain threshold an individual dies. On the other hand investments can increase the health stock. Hence, according to Gary Becker's household production theory an individual or a consumer is the producer of his/her health. Health investments includes '[…] the own time of the consumer and market goods such as medical care, diet exercise, recreation, and housing.' (Grossman 1972a). In 1999, Grossman states more precisely that 'diet, exercise, cigarette smoking, and alcohol consumption' can be understood as health inputs. These health inputs are derived from the basic demand for health (Grossman 1999).

Consumers demand and produce health that includes not only longevity but also illness-free days in a given year (Grossman 1999).

Furthermore, health production depends on education and other environmental variables[36] that 'influence the efficiency of the production process'. The higher the education status, the higher the efficiency of producing gross investments in health (Grossman 1972a).

In addition, Grossman (1972a) predicts that the depreciation rate of health increases with age. Finally, the demand for health and medical care is predicted to be positively correlated with the wage rate.

Against this background the natural/-social selection approach as well as the materialist/structural approach presented in section 3.a can be applied in the area of health economics too.

[36] Also defined as personal characteristics (Grossman 1999).

On the one hand, demand for health by itself determines the extent of wealth that is comparable to the natural/-social selection approach. In this case, health is a contributor to the achieved social position. On the other hand, health is dependent on the educational status.

The following section details the importance of health behavior in this model. As already mentioned, the health status may be enhanced through investments into health (Grossman 1972a, 1972b). In the 1980s, Muurinen (1982) and Wagstaff (1986) recommended understanding health investments as embracing all types of health-promoting behavior, and valuing health-damaging behavior as affecting the rate at which health capital depreciates. Thus next to the use of medical services determinants like diet, tobacco, alcohol consumption, and physical activity have to be considered. By determining his/ her health behavior an individual influences the stock of health and ultimately the length of life (Wagstaff 1986).

Initially, Grossman's household production function for gross investments in health I_i during the i^{th} period considers education E_i as stock of human capital, time TH_i spent for preventive efforts, and medical services M_i that are bought by an individual (Grossman 1972a).

Although Grossman (1972a) admits that types of health behavior are also market goods in the gross investment function, he considers only medical care '[…] as the most important market good […]'. Thus the function is written as follows:

$$I_i = I_i\,(E_i; TH_i; M_i) \qquad (1)$$

Based on empirical findings (e.g. cf. Muurinen 1982 and Wagstaff 1986), Schneider and Schneider (2009b) propose an enhancement of this model that is different from Grossman's approach. The authors assume that most health behaviors have an impact on the health capital stock in general. Hence, there are determinants that unrelated to medical care but essential for the health stock. Consequently health-promoting as well as health-damaging behavior may influence the depreciation rate of health positively or negatively. Against this background Schneider and Schneider (2009b) developed the following theoretical framework.

It focuses on health behavior HB_i that is determined by education E_i, labor force participation W_i and other personal characteristics V_i:

$$HB_i = HB_i\,(E_i; W_i; V_i) \tag{2}$$

Since the authors assume that education leads to better health knowledge, E_i is integrated in this function. The better the education, the better the understanding of one's own behavior with its implication for consequences on one's own health. This is valid especially for long-term health risks (Schneider and Schneider 2009b). As an example, research shows that health knowledge is positively correlated to health-promoting behavior (Cutler and Lleras-Muney 2006; Kenkel 1991).

Labor force participation influences health behavior too. Schneider and Schneider (2009b) argue that long working hours reduce time for health investment activities like sports. Secondly, high workload is also associated with a stressful job that leads to health-damaging behavior like smoking (cf. Schofield 1996). Moreover, education and labor time determines income, which also influences health behavior as well (Andrén and Palmer 2001). Individuals with a low income are more likely to behave in an unhealthy way. Additionally, it is assumed that unemployment as indirect effect of labor force leads to lower health investment. E.g. unemployed individuals are more likely to behave in a health-damaging manner (Mathers and Schofield 1998).

Finally, health outcome HO_i, which is assumed to be an objective measurement of health status, is influenced by health behavior HB_i. Additionally, health outcomes are influenced by education E_i[37] and other individual characteristics X_i:

$$HO_i = HO_i\,(HB_i; E_i; X_i) \tag{3}$$

[37] Education is not only part of the health behavior function but also of the health function. Education influences health knowledge regarding health-damaging behavior. With regard to health education increases the efficiency of producing gross investments in health (cf. Grossman 1972a and Kenkel 1991).

Finally, health-damaging behavior may lead to illness and chronic diseases that cause loss of productivity and income. Simultaneous, private health care expenditures increase. Grossman's model has been the topic of several empirical studies on health production (Folland et al. 2007).

As an example Gerdtham and Johannesson (1999) observe that empirical results are consistent with the theoretical predictions and show that the demand for health increases with income and education.

However, many authors criticize that the empirical application of Grossman's model is limited (Breyer et al. 2003; Muurinen 1982; Wagstaff 1986; Zweifel 2012). The main criticism refers to the assumption of certainty. This implies among others that an individual knows his/her own depreciation rate of health capital (McGuire et al. 1988).

The theoretical enhancement on health behavior by Schneider and Schneider (2009b) was empirically applied too. The authors use GSOEP-data for the year 2006. They can confirm their hypotheses in parts. For instance, low education is associated with health-damaging behavior like smoking and unhealthy dietary behavior. A negative income effect is reported for smoking while alcohol consumption is positively correlated. However, there are no significant income effects on dietary behavior. Finally, unemployment supports health-damaging behavior.

To sum up, according to the 'Human capital model of the demand for health' and enhancements, health behavior is influenced by a number of determinants and is integrated in the gross investment function to produce health. Although this theoretical framework does not deal explicitly with the topic of SES and poverty with regard to health behavior, Grossman and other authors highlight merely the importance of education, aspects of labor force, e.g. occupational status and income. Moreover, this approach implies that health behavior can be understood as a mediator to health outcome so that health behavior is of central importance. Applying this assumption to Grossman's gross investment function, health behavior can be seen as an important investment for the individual health stock. This assumption is afterwards formulated in social theories by Elkeles and Mielck (1997) and Mackenbach (2006b) (see also 3.a). Health behavior itself is influenced by education, aspects of labor force, and further individual characteristics.

The following hypotheses can be formulated:

H4: Educational status is a central determinant of health behavior.

H5: Occupation and income as well as unemployment are related to health behavior.

Comparable to social theories, the theoretical framework offered by the realm of health economics assumes direct and indirect relationships. In addition, the relevance of dynamics regarding income and other aspects that are associated with poverty is considered explicitly by Grossman (1972a).

3.c Health psychology theories

In the research area of health psychology numerous theories exist to explain individual health behavior and response to treatment (Conner and Norman 2005a; Lengerke 2001). These theories concentrate on cognitions (Lengerke 2001). Therefore, these models are also termed as social cognitive (Conner and Norman 2005b; Lengerke 2001). They have been developed to explain health behavior and to analyze how individuals respond to a certain treatment (Conner and Norman 2005b).

Since these approaches are not eligible to answer the main research questions of this thesis, this section gives only a short overview and does not detail each theory. Nevertheless, these approaches may be helpful in formulating public health strategies.

Table 8 gives an overview on individual-level theories of health behavior and behavior that have been developed since 1974. Approaches listed in **table 8** like the Health Belief Model (Becker 1974), Theory of Reasoned Action (Ajzen and Fishbein 1980) and Social Cognitive Theory (Bandura 1986) are of major importance in the area of health-promotion research and practice (Elder et al. 1999). These models aim to predict health behavior. So-called stage-models like the Transtheoretical Model (Prochaska and DiClemente 1983), the Precaution Adoption Process Model (Weinstein and Sandman 2002), and the Health Action Process Approach (Schwarzer 1992) assume that behavior changes via a set of stages that differ qualitatively (Conner and Norman 2005b).

Table 8: Overview social cognition models on health behavior

Theory	Attitude	Social influence/ Social network	Knowledge	Self-efficacy	Intention/ stage of change	Source
Health Belief Model (HBM)	Perceived susceptibility to illness	Demographic variables	Demographic variables	-	Cues to action	Becker (1974)
Protection Motivation Theory (PMT)	Severity, vulnerability	-	-	Self-efficacy	Behavioral intentions	Rogers (1975)
Theory of Reasoned Action (TRA)	Attitude toward a behavior	Subjective Norm (perceived social pressure)	-	-	Intention	Ajzen and Fishbein (1980)
Transtheoretical Model (TTM)	Consciousness raising	Social liberation	self-reevaluation	Self-efficacy	Stage 1: Precontemplation Stage 2: Contemplation Stage 3: Preparation Stage 4: Action Stage 5: Maintenance	Prochaska and DiClemente (1983)
Social Cognitive Theory (SCT)	Outcome expectancy	Socio-structural factors	-	Self-efficacy	Intention	Bandura (1986)
Theory of Planned Behavior (TPB)	Attitude toward the behavior	Subjective norm: perceived social pressure to perform or not to perform the behavior.	-	Perceived behavioral control	Intention	Ajzen (1985), (1991)

Table 8 continued: Overview social cognition models on health behavior

Theory	Attitude	Social influence/ Social network	Knowledge	Self-efficacy	Intention/ stage of change	Source
Health Action Process Approach (HAPA)	Outcome expectancy and risk perception	Barriers and resources, e.g. social support	-	Task self-efficacy, maintenance self-efficacy and recovery self-efficacy	Intention	Schwarzer (1992)
Information-Motivation-Behavioral Skills Model (IMB)	Adherence motivation	Moderating factors affecting adherence, e.g. living situation	Adherence information, adherence behavioral skills	Adherence behavioral skills	Adherence behavior: adherence levels over time	Fisher and Fisher (1992), (2002)
Precaution Adoption Process Model (PAPM)					Stage 1: Unaware of Issue Stage 2: Unengaged by Issue Stage 3: Undecided about acting Stage 4: Decided not to act Stage 5: Decided to act Stage 6: Acting Stage 7: Maintenance	Weinstein and Sandman (1992)

Source: own illustration based on (Conner and Norman 2005b; Noar et al. 2008)

Unlike previously presented models in 3.a and 3.b that consider socio-demographic variables such as gender, SES, or culture social cognition models focus on psychological variables because these variables are more likely to change than socio-demographic variables models.

Furthermore, it is assumed that individual differences in health behavior are explained by social cognition variables and less by socio-demographic influences (Armitage and Conner 2000). The majority of these theories suggest that health behavior is directly influenced by attitudes, social influence, self-efficacy and intention/stage of change variables (Fishbein and et al. 2001; Noar et al. 2008).

These constructs play a major role within social cognition models although their names might vary (Noar et al. 2008).

Additionally, knowledge of things such as diseases is of central importance to explain behavior. **Table 8** gives an overview on the use of these important terms and how they are conceptualized[38].

The determinants presented here influence health behavior and are acquired by socialization. Since health behavior is regarded as changeable, pathways via cognitive factors are a central option to influence health behavior and to develop interventions to change health behavior (Conner and Norman 2005b).

However, social cognition models are criticized due to deficient consideration of environmental factors (Lengerke 2001).

In conclusion the theoretical framework presented in this section reflects the relationship between health behavior and poverty/SES only indirectly via social cognitive aspects. Although these models do not permit answering the main research questions, these models have to be taken into consideration as background information.

[38] If nothing is indicated the respective social cognition model does not consider the term.

3.d Summary of the theoretical framework

The theoretical framework for this thesis can be formulated on the basis of the theoretical approaches presented in this chapter. **Table 9** shows how the presented models may be applied for this thesis.

Table 9: Application of the presented theoretical frameworks for this thesis

Social Theories (3.a)		**Human capital model of the demand for health and enhancements (3.b)**	**Social cognition models (3.c)**
Societal level	**Individual level**		
↓	↓	↓	↓
Understanding the integration of individual health behavior and poverty/ SES in the societal context	Theoretical framework to answer research questions (cf. section 1.b)	Theoretical framework to answer research questions (cf. section 1.b)	Background information to understand the theoretical framework for public health strategies.

Source: own illustration

Social theories at a societal level allow an understanding of how individual health behavior and health is embedded in a macro context. Against this background empirical findings can be discussed and integrated to derive implications for public health.

Social theories at an individual level as well as the human capital model of the demand for health and enhancements allow the formulation of five hypotheses[39] that will be empirically tested in chapter 7. Due to the long-term genesis of non-communicable diseases, health behavior is chosen as a dependent variable to analyze immediate effects of poverty/SES.

H1: Health behavior is influenced by poverty and SES directly and indirectly via material and psychosocial factors

H2: Suitable poverty and SES dimensions are represented by income, occupational status and education. Furthermore, material aspects such as unemployment and financial savings, also contribute to the poverty situation that impacts health behavior.

[39] **H1** – **H3** are based on social theories (3.a) while **H4** and **H5** derived from human capital model of the demand for health and enhancements. For this reason **H2**, **H4**, and **H5** overlap.

H3: Health behavior is influenced by changes over time and length of poverty / low SES.

H4: Educational status is a central determinant of health behavior.

H5: Occupation and income as well as unemployment are related to health behavior.

Finally, social cognition models are not applicable to the main research questions because aspects like beliefs, attitudes and knowledge on health behavior are not surveyed in GSOEP.

4. Poverty and low socio-economic status (SES)

The main aim of this thesis is to examine health behavior with regard to poverty and low SES. Before this main topic is discussed (chapter 5), the following chapter gives an overview of poverty and SES.

Several approaches to the definition of poverty in developed countries exist and there is no universally valid definition. For this reason, this chapter first gives an overview of concepts of poverty (4.a.i and 4.a.ii) as well as socio-economic inequality and SES (4.a.iv). Section 4.b presents measurements to describe both concepts. Since this thesis deals with poverty and SES dynamics, section 4.c details dynamic concepts.

4.a Concepts of poverty and SES

Scientists have developed various objective attempts to define poverty. Definitions are based on absolute and relative concepts. In addition, subjective approaches exist that are based on self-assessment. Subjective poverty standards are often criticized due to a lack of comparability over time and across societies (Wagle 2002). These approaches are not used in this thesis.

4.a.i Absolute poverty

The International Labor Organization (1977) defines the absolute poverty line 'in terms of the minimum requirements for food, shelter, clothing, and other essential services such as transportation, sanitation, health, and education' (cf. also Volkert et al. 2003). Hence, absolute poverty is oriented on a physical subsistence minimum. Income or consumption-based absolute poverty lines are usually used in developing countries (Laderchi et al. 2003; Wagle 2002). As an example the World Bank has proposed a new international poverty line of $1.25[40] a day at 2005 purchasing power parity (PPP) for household consumption (Ravallion et al. 2009).

However, the concept of absolute poverty is widely criticized because it does not allow an objective definition of a physical subsistence minimum (Moll

[40] This poverty line is calculated using a reference group including countries with personal consumption expenditure per capita of less than $60 a month. These are Malawi, Mali, Ethiopia, Sierra Leone, Niger, Uganda, Gambia, Rwanda, Guinea-Bissau, Tanzania, Tajikistan, Mozambique, Chad, Nepal and Ghana (Ravallion et al. 2009).

2006). Altogether the concept of absolute poverty is unsuitable for answering the research questions of this thesis.

4.a.ii Relative poverty

The concept of relative poverty includes the dimensions income, consumption, and welfare of an individual in a societal context (Wagle 2002). According to the European Commission people are defined as relatively poor 'if their income and resources are so inadequate as to preclude them from having a standard of living considered acceptable in the society in which they live. They are often excluded and marginalized from participating in activities (economic, social and cultural) that are the norm for other people and their access to fundamental rights may be restricted' (European Union 2010). The German government takes this approach of the EU as a basis in its Poverty and Wealth reports to the German parliament (cf. Bundesregierung 2008).

The definition of the European Commission illustrates the multidimensional and dynamic character of the construct poverty. It is based on ideas of the British sociologist Peter Townsend. He was first researcher in providing a definition based on concepts of deprivation and social exclusion. He described deprivation as follows: 'Deprivation takes many different forms in society. People can be said to be deprived if they lack the types of diet, clothing, housing, household facilities and fuel and environmental, educational, working and social conditions, activities and facilities which are customary, or at least widely encouraged and approved in the societies to which they belong' (Townsend 1979).

He creates the deprivation approach by surveying whether essential items, namely goods or practices of everyday life, are missing due to financial restrictions. A deprivation in the area of standards of living exists if a defined amount of items is missing. This amount is oriented on the common standard of living in society. In the meantime, there have been several attempts to describe multidimensional poverty since Peter Townsend developed the deprivation index in 1979 (Pérez-Mayo 2004). Several researchers have refined Townsend's approach within the last years (Halleröd 1994, 1995; Mack and Lansley 1985; Muffels 1993; Berthoud et al. 2004; Whelan and Maître 2005). As an example, Mack and Lansley (1985) modified Townsend's approach because a lack of a given item is not necessarily explained by a lack of finan-

cial resources. They defined the 'enforced lack of socially perceived necessities'. These minimum requirements are empirically surveyed.

They include all items that are identified as a necessity by at least 50% of the respondents. Another enhancement refers to checking for preferences. Individuals are not only asked whether an item is missing but also for the reason. A missing item can be explained by financial or other reasons. The latter aspect reflects differences regarding preferences in comparison to the societal framework (Groh-Samberg 2009; Mack and Lansley 1985). Interestingly, the majority of studies using this approach does not identify differences regarding minimum requirements by social status (cf. Andreß et al. 2004; Mack and Lansley 1985; Nolan and Whelan 1996). However, Halleröd (2006) observes that individuals gradually adapt their preferences to what is economically achievable. In this case individuals are more likely to indicate that an item is missing for other reasons and not for economic reasons. Thus, the extent of economic hardship/ deprivation may be underestimated.

The standard of living approach is also used in Germany (Andreß and Lipsmeier 1995). GSOEP has been surveying this information since 2001 (GSOEP).

Supplementary to the standard of living, further poverty approaches have been created. As an example, the concept of life domains was created in Germany. This concept considers not only material but also immaterial aspects that are not necessarily income-related. Examples are health status, education, and isolation at work. These aspects may also cause income poverty. Life domains that are very often used due to availability in data are income and financial reserves, housing, education, occupation, diet, networks, and health status (Groh-Samberg 2009; Voges et al. 2003). In addition, the concept of life domains resembles Sen's capability approach (cf. section 4.a.iii).

While the deprivation approach focuses explicitly on the causal nexus of deficient economic resources and deprivations in everyday life, the concept of life domains regards life domains of income and other life domains, that are not income-related, as equivalent. In addition, a normative explanation for the choice of life domains is not available.

Groh-Samberg (2009) also criticizes that life domains may show a dual character. It is possible to interpret them as causation and as result of poverty (Groh-Samberg 2009).

Finally, however, it needs to be recognized that the definition of relative poverty is difficult and normative (Moll 2006; O'Boyle 1999). Although the definition presented in this section allows a broad idea of relative poverty, the measurement of relative income poverty is most widely used for research and policy in Europe (Dennis and Guio 2003). Section 4.b details poverty measurements that are based on direct and indirect approaches, namely income-based measurements (4.b.i) and multidimensional concepts (4.b.ii).

4.a.iii Excursion: Other poverty concepts

In addition to concepts in the realm of economic well-being, other approaches exist. These are firstly capability poverty and secondly the construct of social exclusion.

Capability as a poverty concept was decisively developed by Sen (cf. Sen 1987, 1992, 1999). This approach concentrates on capabilities that include numerous material and immaterial dimensions such as education and health. According to Sen (1987; 1992), capabilities are necessary to achieve functionings. ‘'Functionings' are, however, personal features; they tell us what a person is doing or achieving. 'Capability' to function reflects what a person can do or can achieve’ (Sen 1984). The concept of capability is also integrated in an approach of the standard of living. Next to the utility view and the standard of living of opulence which focuses on real income indicators and commodity bundles, Sen prefers the positive concept of freedom.[41] Both, the individuals’ capabilities and freedoms are relevant indicators to describe the standard of living (Sen 1984). Already in 1983, he argued that the information on commodity ownership of availability is not sufficient to know what an individual can do. The commodity ‘[…] may provide the basis for a contribution to the standard of living, but it is not in itself a constituent part of that standard.’ Looking at the aspect of utility, Sen criticized that ‘[…] it does not concentrate on the use itself, but on the mental reaction to that use.’

Finally he concludes that the aspect of ability is of central importance to the standard of living (Sen 1983).

[41] The focus on capability as freedom with regard to an evaluation of the standard of living has its origin in the classical political economy (Sen 1984).

Altogether the capability approach provides a framework to analyze not only poverty[42] but also other social issues, e.g. development, gender bias and inequalities, or justice and social ethics (Sen 1993). The United Nations Development Programme (UNDP) developed the Human Development Index (HDI) for quantitative applications. It considers several dimensions of capabilities, such as 'long and healthy life', 'knowledge' and 'a decent standard of living' (UNDP 2011).

However, Sen's approach is criticized. Capability itself does not solely determine the individual well-being. In addition, institutional factors can promote or block the transformation of capabilities into functioning that is summarized as human well-being (Wagle 2002). Despite these criticisms, that are partly based on mistaken interpretations, the capability approach should be understood 'primarily and mainly as framework of thought, a mode of thinking.' Next to poverty and deprivation analysis, this approach is also eligible to be applied in rich communities, e.g. as framework for policy evaluations or inequality measurement (Robeyns 2000).

Finally, social exclusion is an important dimension of poverty. Individuals may be socially excluded, even if they have an adequate income or capabilities. This approach has its origins in Europe, especially in France (Wagle 2002). Analyses of data from welfare recipients in France showed that the poor population is not a homogenous social entity. Furthermore, the multidimensional character of poverty is recognized. Paugam (1995) identified the employment status, including income and job stability, social life and housing conditions as important dimensions of social exclusion.

Altogether, social exclusion is determined by the terms of interdependence and participation. Interdependence considers the integration of an individual in the labor market and within social networks. Participation includes three dimensions, namely at a political and institutional level, at a cultural level, and at an economic level (Kronauer 2002).

However, Wagle (2002) criticizes that this approach highlights the importance of social orders and institutions while minimizing individual capacities.

[42] In this context '[…] poverty is an absolute notion in the space of capabilities […].' Nevertheless, in Sen's opinion there is no conflict with regard to Peter Townsend relative view on poverty (Sen 1983).

Finally, the term of social exclusion is preferentially used in a political context, but a specific definition is missing (Oyen 1997).

4.a.iv Socio-economic status (SES) to describe socio-economic inequalities

The SES is a construct that is often applied to describe the position of an individual within a society that is characterized by social inequality (Duncan 1961; Geissler 1994). Social inequality exists if a social position is linked to social advantages or disadvantages that are caused by income, assets, power, social prestige as well as education and knowledge (Bolte and Hradil 1988; Borgers and Steinkamp 1994). Advantages and disadvantages that are caused by social position are shown not only by material goods and the resultant living conditions but also by an individual's attitudes, value systems and behavior (Hradil and Schiener 2001). There is neither consensus on a definition of SES nor a widely accepted SES measurement tool (Barkley 2008; Oakes and Rossi 2003).

The main dimensions used to describe social inequality are education, occupation, and income (Adler and Ostrove 1999; Deaton 1999; Mackenbach et al. 2008; Oakes and Rossi 2003; Richter and Hurrelmann 2009). These three dimensions are widely used to define the SES, which is very common in social sciences and social epidemiology (Adler and Ostrove 1999; Braveman et al. 2005). Altogether, SES is a multidimensional construct that comprises diverse socio-economic factors (cf. Abramson et al. 1982; Braveman et al. 2005; Winkler and Stolzenberg 1999). Scheuch (1970), who develops an indicator to describe social prestige and social stratification, divides prestige into three categories, namely economic situation, occupational status, and the cultural level. Based on this categorization social stratification is measured using three central indicators. The economic situation is represented by income, the occupational status by the social prestige of a profession, and education as the cultural level. Altogether the term 'SES' considers actual resources as well as dimensions that are related to prestige. Thus SES describes simultaneously the absolute situation of an individual and the relative position within the society (Krieger et al. 1997).

Although the three dimensions of SES (income, education, and occupation) are only moderately correlated with one another, they are often used interchangeably (Ostrove and Adler 1998; Winkleby et al. 1992). Interestingly, the occupational status category is used very often as an SES category in Europe. In contrast, studies from the US more often use the dimensions of income and educational status to describe SES (cf. Braveman et al. 2005).

4.b Measuring poverty and socio-economic status (SES)

This section details how poverty and SES are measured. There are direct and indirect approaches. This chapter starts with the indirect approach of income-based measurements of poverty which is one option to describe the individual's endowments with financial resources[43] (Moll 2006) (4.b.i). Section 4.b.ii gives an overview of multidimensional measurements of poverty that include both direct and indirect approaches. Section 4.b.iii presents other poverty concepts. Finally, section 4.b.iv concludes with the measurement of SES.

4.b.i Income-based measurement

Although poverty can be measured directly using the standard of living, the concept of income-based measurement is more widely used (cf. Moll 2006; Muffels 1993). For example, in the European Union, the at-risk-of-poverty rate is one of the so-called Laeken indicators and defined to be at 60% of median net-equivalence income[44] (Atkinson et al. 2002; Dennis and Guio 2003). A person living in a household with a net equivalent income below the poverty line is regarded as at risk of deprivation and social exclusion (Groh-Samberg 2008). Also the German report on Poverty and Wealth is based on this concept (Volkert et al. 2003). Alternative references use a threshold[45] of 40%, 50% and 70% of median income (Dennis and Guio 2003). Although the term 'income poverty' is often used in this context, the at-risk-of-poverty rate does not explicitly measure wealth or poverty but the risk of being poor (Eurostat 2011).

[43] In addition to financial resources, there are human resources and social resources. Generally, analyses on poverty consider resources in form of income (Moll 2006).
[44] Fuchs (1967) as cited in Förster (1994) was the first author who suggested this definition.
[45] The EU uses the term threshold instead of poverty line (cf. Dennis and Guio 2003).

Nevertheless, the Laeken European Council[46] defines the at-risk-of-poverty rate as one out of 18 indicators[47] to describe social inclusion within the EU.

In contrast, the central statistics offices of both the US as well as of Canada use poverty lines that are based on absolute income thresholds (CCSD 2005; OMB 2012). These thresholds vary by family size and are updated for inflation using the Consumer Price Index. Families with an income[48] below this threshold are defined as poor (OMB 2012). The US poverty line is close to the 40% of median net equivalent income threshold (Förster 1994).

In addition, further income-based measurements exist. Examples are the inequality of income distribution (S80/S20 quintile share ratio)[49] and the relative at-risk-of-poverty gap[50] (Dennis and Guio 2003).

Next to income-based measurements, the concept of social assistance benefits was used in Germany to analyze poverty. However, underreporting or refusal to answer this question must be considered (Klocke 2000).

In conclusion, income-based measurements are widely used to describe income poverty or the at-risk-of-poverty rate (Nolan and Whelan 2007). Nevertheless, information on income may be insufficient to determine the degree to which a person is at risk of deprivation. Some households are able to maintain an acceptable standard of living although they are on a low level of income, either because income poverty is only temporary or because of other resources like savings or gifts. Thus researchers propose to supplement the measurement of income poverty with direct measurements of standard of living and of life domains (Benzeval and Judge 2001; Groh-Samberg 2009; Moll 2006; Nolan and Whelan 2007; Ringen 1988).

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[46] The European Council met to debate the European Union's future before introducing the Euro in Laeken, Belgium 14th and 15th December 2001. Being part of the Lisbon Strategy, the topics of poverty and social exclusion were discussed and the Laeken indicators defined (European Council 2001).

[47] These indicators are also known as Laeken indicators; these cover four dimensions of social exclusion, namely financial poverty, employment, health, and education (Dennis and Guio 2003).

[48] In the US 'the official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps) (OMB 2012).

[49] This is the ratio of total equalized income received by the 20% of persons with the highest income (top quintile) to that received by the 20% of persons with the lowest income (lowest quintile) (Dennis and Guio 2003).

[50] This is the difference between the median net equivalent income of persons below the at-risk-of-poverty threshold and the at-risk-of-poverty threshold, expressed as a percentage of the at-risk-of-poverty threshold (Dennis and Guio 2003).

4.b.ii Multidimensional poverty measurements

In 1979, Townsend presented the approach of relative deprivations (cf. section 4.a.ii) that considers poverty as a multidimensional concept. In the meantime, research focuses more and more on that issue (cf. e.g. Barnes 2002; Cohen et al. 2003; Groh-Samberg 2009; Halleröd 1995; Mack and Lansley 1985; Nolan and Whelan 2007; Pérez-Mayo 2004; Whelan et al. 2001). As an example, the Laeken indicators include not only income measurements but also aspects of education, health, and unemployment (Atkinson et al. 2002; Dennis and Guio 2003). Nolan and Whelan (2007) argue that measuring poverty on the basis of income or another single dimension would be sufficient to describe poverty in societies without social mobility, i.e. in the event that birth determines outcome as in a pure caste society. This does not apply to the highly complex societies of the industrialized countries where social mobility is observable. This is not only relevant for poverty measurements but also for policy implications.

Against this background, several studies criticize that income poverty or the at-risk-of-poverty rate as a unidimensional approach is not a reliable indicator to describe poverty. Studies using additionally non-monetary concepts of deprivation show that individuals may be deprived but not at risk of poverty (cf. Bradshaw and Finch 2003; Halleröd 1995; Mack and Lansley 1985; Nolan and Whelan 1996). Muffels et al. (1992) state ‘income and consumption deprivation are rather different concepts. It seems to be justified to consider consumption-based and income-based standards as being complements instead of being mere substitutes.’ For instance, Halleröd (1995) shows for the Swedish population that individuals may be non-poor, affected either by only one dimension of poverty, or by both income poverty and deprivation. The latter group is named ‘truly poor’.

There are three approaches to explain the described mismatch between income poverty and deprivations. Firstly, information on disposable income may be deficient. Secondly, an individual may have further disposable non-monetary and monetary resources like assets or personal contribution. Finally, deprivations become apparent only over time (cf. section 4.c) (Groh-Samberg 2009).

This thesis concentrates not only on income poverty, but also on a multidimensional measurement that considers income and aspects of deprivation.

The multidimensional poverty indicator by Groh-Samberg[51]

Also Groh-Samberg (2009) assumes that describing poverty by income is insufficient. In addition to the reasons described for mismatch between income poverty and deprivations, Groh-Samberg argues that extreme forms of deprivation are not considered by income poverty (cf. also Ringen 1988).

Groh-Samberg connects the approach of relative deprivation with the concept of life domains. Using the deprivation approach it has to be considered that the control of preferences[52] regarding missing items may be too strict in the case of permanent poverty (cf. Halleröd 2006 presented in section 4.a.ii). For this reason Groh-Samberg (2009) aims at including advantages and to exclude disadvantages of both approaches. Consequently, his poverty approach considers the nexus between resources and deprivation. This relationship is not one-sided but reciprocal. On the one hand life domains depend directly upon the level of income. On the other hand life domains determine directly income opportunities.

Therefore the index combines income poverty with four life domain dimensions to represent the concept of cumulative deprivation. By linking income poverty and deprivation in the area of four life domains, Groh-Samberg (2009) surveys the extent of cumulative deprivations. He counts not only poverty dimensions, but also shows the process of successive exclusion of the society.

Groh-Samberg chooses exclusively life domains in the area of the standard of living and housing that are directly related to economic resources in order to overcome disadvantages of this approach (see section 4.a.ii). Furthermore, the life domain of unemployment is integrated, because it is a main reason for income poverty and dependence on social assistance (cf. Kronauer et al. 1993).

[51] The detailed construction of Groh-Samberg's combined poverty indicator is described in section 6.b.iii and in the **appendix 4**.

[52] Interviewees are asked to differentiate between choice and economic constraint, i.e. 'individuals can distinguish between what that they cannot afford and what they do not want (Halleröd 2006).'

Groh-Samberg selects only resources and/or life domains if there is evidence of a socio-political responsibility. Social welfare offices aim to ensure a sufficient income, standard of living, and housing.

Additionally, access to the labor market should be guaranteed by social welfare offices. These aspects do not apply to life domains like health, education and social networks so that they are not considered in the indicator.[53]

Minimum standards are defined for income as well as for the four additional life domains. Individuals and households are regarded as poor if they fall below these standards (Groh-Samberg 2008).

As presented in **figure 8**, the combined poverty indicator considers multidimensionality of poverty at two levels. Firstly, at the level of life domains (multidimensionality I) and secondly, regarding income poverty and the defined life domains (multidimensionality II). Consequently, nine different nuances of poverty, precarity[54], and prosperity exist (cf. **table 10** and detailed description in section 6.b.iii).

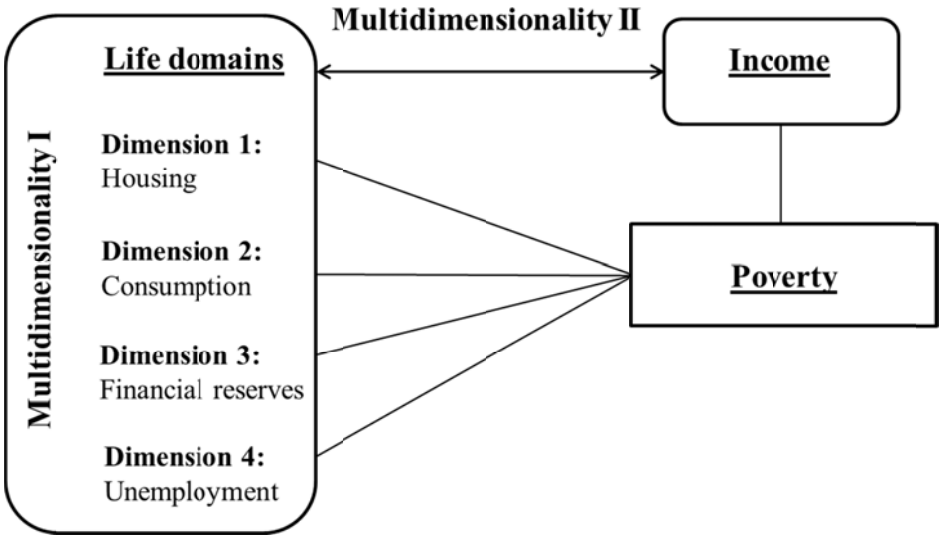


Figure 8: Surveying multidimensionality

Source: modified according to Groh-Samberg (2009)

Thus Groh-Samberg (2009) distances himself from the dichotomous character of poverty (non-poor vs. poor) that is most common in several poverty approaches.

[53] For these categories only an indirect relationship exists. Health status, educational status or social networks are not buyable (cf. Destatis and WZB 2011).

[54] Precarity is described by 'vulnerability' and 'fragile prosperity'.

Table 10: Characteristics of the combined poverty index by Groh-Samberg

Income	Deprivation		
	Multiple deprivation (≥ 2)	**Single deprivation**	**No deprivation**
Income poverty (<50% of mean)	Extreme poverty	Moderate poverty	One-sided poverty
Low income (50-75% of mean)	Moderate poverty	Vulnerability	Fragile prosperity
Adequate income (> 75% of mean)	One-sided poverty	Fragile prosperity	Secure prosperity

Source: Groh-Samberg (2008)

4.b.iii Measuring the socio-economic status (SES)

As mentioned in section 4.a, traditional components of SES are income, education and occupation that are often used interchangeably. However, the three dimensions are only moderately correlated with one another (Ostrove and Adler 1998; Winkleby et al. 1992). For example, Braveman (2005) criticizes that education is often used as a proxy for income because information on income is more sensitive than information on education. Furthermore, the authors refute the argument that both education and income are correlated, so that an inclusion of both parameters is not possible. Generally, such a correlation is not strong enough (cf. e.g. Braveman et al. 2005; Geyer 2008).

Altogether, many studies use only one out of the three SES variables as a single indicator to describe social inequality (for an overview in Europe cf. (Mackenbach 2006a). In the meantime, studies increasingly use two or all dimensions of SES (cf. Laaksonen et al. 2005).

Hence, while continuing to use the expression ‘SES’ as a comprehensive proxy, it always has to be considered that results are dependent on the precise choice of SES determinants (i.e. income, education, occupation, or others) (cf. Wagstaff and Watanabe 2003).

It is possible to operationalize the three dimensions within an index. As an example, Winkler and Stolzenberg (1999) developed a SES by totaling the values of the three dimensions.

This also implies a compensating effect, so that a low income may be compensated by a high education (cf. Geyer 2008).

Other approaches weight the importance of the three dimensions on the basis of theoretical and empirical findings (cf. Hollingshead and Redlich F. 1958 as cited in Geyer 2008[55]). However, Geyer (2008) emphasizes that the use of the three single dimensions shows comparable or even stronger effects than an index. He recommends using such an index only in combination with single indicators.

SES by (Winkler and Stolzenberg 1999)[56]

The social status scale by Winkler and Stolzenberg (1999) includes, in addition to household income, the level of education and occupational qualification as well as the highest occupational status within the household (Winkler and Stolzenberg 1999). SES by Winkler and Stolzenberg is based on Scheuch's index (Scheuch 1970) (cf. section 4.a.iv). Studies in the area of social epidemiology in Germany apply this indicator (Lampert and Kroll 2009).

Individual education and occupational qualification describe the 'cultural level' and indicate the preference for behavior in general. The occupational status of the main earner of a household reflects the impact of the social environment. Additionally, the household income describes the economic situation and indicates the financial capacity that an individual has and the restrictions he or she is subjected to (Winkler and Stolzenberg 1999). All three components of this index are defined as life domains (Lampert and Kroll 2009).

4.c Dynamic concepts of poverty

Next to multidimensional aspects, poverty is characterized by dynamic aspects (Ashworth et al. 1994; Duncan et al. 1993; Pérez-Mayo 2004). Poverty dynamics were already described in the early twentieth century by Rowntree (2000).

Lillard and Willis (1978) were among the first researchers in the area of poverty dynamics after the Second World War.

[55] This measurement was modified into a two-factor Index of Social Prestige (ISP) that is based on occupation and education. Within this concept, occupation represents the skill and power an individual possesses and education the cultural tastes (cf. Hollingshead 1971 and Hollingshead 1975 as cited in Oakes and Rossi 2003).

[56] The detailed construction of SES according to Winkler and Stolzenberg (1999) is described in section 6.b.iv and in the **appendix 3**.

They analyzed earnings of a male population in the US regarding aspects of permanent and transitory poverty spells over seven years, 1967 to 1973. They show that individuals affected by poverty in a given year have permanently lower incomes than non-poor individuals. They are also more likely to be poor six years later. Nevertheless, the authors do not assume that poverty is generally a permanent phenomenon, because the majority of poor respondents (55% of whites and 35% of blacks) quit the poverty status one year after entering it. Furthermore, Lillard and Willis (1978) observe a tendency to retain the income position over time.

In the 1980s, research on this topic gained in importance in the US (cf. for example Bane and Ellwood 1986; George and Howards 1991; Hill 1985). In the 1990s the research on poverty dynamics gained importance in Europe following the research ideas in the US (Leisering 2008).

Using panel data allows observing poverty spells with beginnings and ends. I.e. poverty is not a static state, but has a dynamic character (Ashworth et al. 1994). Duncan et al. (1993) stated in an analysis of poverty dynamics in eight countries that 'the static dichotomy of 'poor' versus 'not poor' is very misleading and needs to be replaced by at least four dynamic categories of economic position – persistent poverty, transition poverty, the economically vulnerable and the financially secure'.

As an example, Ashworth et al. (1994) developed a temporal patterning of poverty considering the length and number of occurrence of poverty spells for children. They determined six patterns of poverty (**figure 9**).

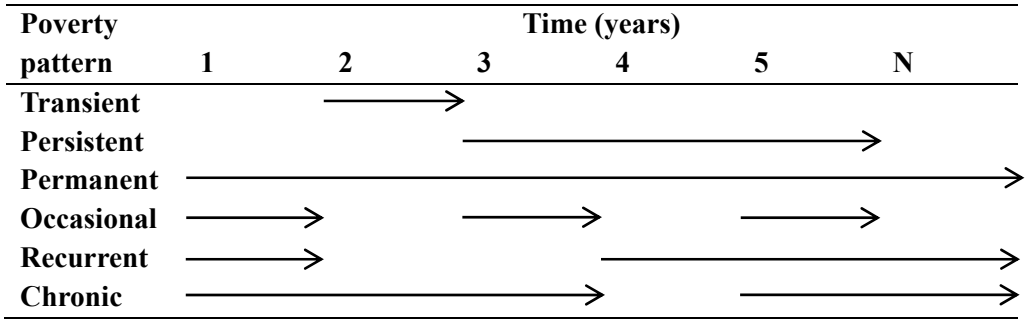


Figure 9: Types of poverty

Source: Ashworth et al. (1994)

On the one hand, there are single spell patterns that differ regarding length, namely transient poverty (one year), persistent poverty (one nonshort poverty spell and at least one out-of-poverty spell) and permanent poverty (one unceasing poverty spell).

On the other hand, Ashworth et al. observe multiple-spell patterns. These are occasional poverty (repeated short poverty spells), recurrent poverty (multiple poverty spells) and chronic poverty spells (multiple poverty spells interrupted by short out-of-poverty spells).[57]

Stevens (1999) examines poverty persistence and shows that individuals who experience poverty once returns to poverty within the following years. Furthermore, individual and family characteristics determine whether individuals experience transitory or permanent poverty. Important impact factors are education, ethnicity, or head of household.

Duncan et al. (1993) compare poverty dynamics based on income between eight countries from North America and Europe. They observe that in Europe permanent poverty over three years[58] is between 0.4% (Luxembourg and The Netherlands) and 1.6% (France-Lorraine), while these rates are clearly higher for Canada (11.9%) and the US (14.4%). The findings for Europe are comparable to Jenkin's findings (2000) for Great Britain using data of the British Household Panel Survey (BHPS), where less than 2% of the population is poor at all 6 interviews (equal to six years). In contrast about two-thirds are classified as non-poor over this period. Additionally, Duncan et al. (1993) shows that individuals that are black or have a migration background are at highest risk of permanent poverty (Germany 4%, US black population 41.5%). There are also differences regarding quitting the poverty status. Lowest transition rates from poverty to non-poverty[59] are observable for Canada and the US (12.0% and 13.8%), while rates for Europe, particularly for Sweden (36.8%) and The Netherlands (44.4%) are considerably higher. The authors conclude that the typical duration of a poverty spell lasts one or two years and emphasize the necessity to consider dynamic categories of poverty.

[57] Although this approach considers dynamic patterns of poverty, it neglects the approach of multidimensionality presented in section 4.b.ii.

[58] 3-year poverty rate (percent of population with income <50% of median in all 3 years of a 3-year period (%).

[59] Transitions: percent of poor becoming non-poor (of those with income <50% 9f median in *t*, percent with income ≥60% of median in *t+1* [%].

In addition, the authors criticize that multiple spells of poverty are often ignored. For this reason the dichotomy character of poverty is obsolete and has to be replaced. Therefore they suggest four dynamic categories, namely persistent poverty, transition poverty, the economically vulnerable and the financially secure.

Smith and Middleton (Smith and Middleton 2007) show in a review of poverty dynamics in the UK that most poor people become non-poor in one of the following years. The share of individuals that are affected by poverty decreases over time (cf. also Jenkins 2000).

Interestingly, Fabig (1999) analyzes income mobility with regard to social welfare. He shows that the extent of social welfare seems to be mobility-reducing, especially for Germany. In contrast, in other countries such as Great Britain or the US income mobility is much higher.

In Germany, one of the first research studies/works on dynamic poverty was a long-term study on social welfare in the city of Bremen. Berger (1996) shows that income poverty or receipt of social welfare is an event or a stage in the lifecycle that is temporarily finite. Also Moll (2006) analyzes poverty dynamics in Germany. He identified five groups that differ regarding poverty and non-poverty periods. Highest risk to remain or to re-enter a period of poverty is identified for individuals who are unemployed, little educated, single / single parent, or families with many children. In contrast, individuals that are fully employed and highly educated are only poor at a short-term level.

As explained in section 4.b, multidimensional characteristics are important to describe poverty. However, this section demonstrates that the majority of research in the area of poverty dynamics focuses only on income poverty. In contrast, studies that describe multidimensional poverty are usually at a cross-sectional level (Groh-Samberg 2009).

There are only a few studies that aim to combine the concept of multidimensional poverty and aspects of dynamics (cf. Groh-Samberg 2009; Pérez-Mayo 2004; Whelan et al. 2002). Combining both aspects is important because deprivations occur in case of a permanent deficit of economic resources. As **figure 10** shows, poverty may be cumulative or inconsistent (cf. section 4.b). At the same time, these types of poverty may be transient or permanent.

One of the few studies is conducted by Pérez-Mayo who uses data of the European Community Household Panel (ECHP) for Spain between 1994 and 2000. In addition to income poverty, he included information on living conditions. 8.66% of the respondents are consistently poor while 68.14% are non-poor.

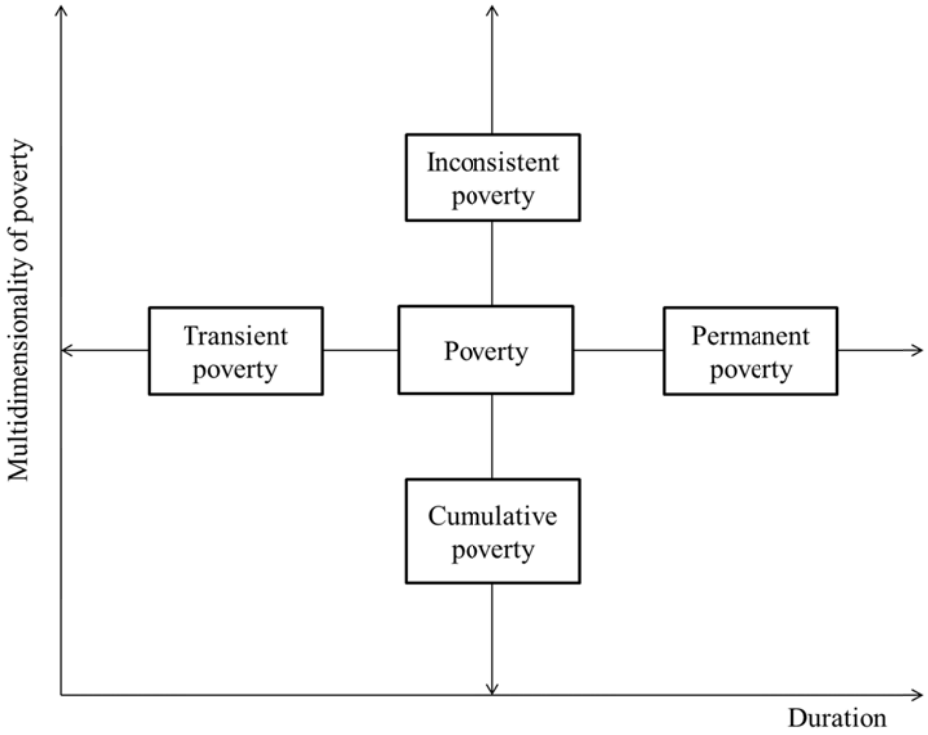


Figure 10: Specifications of dynamic and multidimensional poverty
Source: modified, according to Groh-Samberg (2009)

Furthermore, Pérez-Mayo demonstrates that including information of living conditions improves the poverty measurement. On the one hand, 9.3% of the respondents are poor by income. On the other hand 13.9% show solely low living conditions and are non-poor by income (Pérez-Mayo 2004).
In a second step transition[60] probabilities have been determined. There is a low transition of individuals that are not affected by both dimensions of poverty as well as for cases of extreme poverty. In contrast, the author argues that inconsistent categories can be understood as temporary situation that are assigned to the situation of inclusion. Finally, variations of income have less impact on the poverty situation because living conditions change more slowly than income.

[60] Transition from given certain states (from poverty to non-poverty and vice versa).

Whelan et al. (2001) also examine multiple deprivation and persistent poverty regarding the extent to which persistent poverty is associated with multiple deprivation. They conclude that individuals that are affected by persistent income poverty are more likely to be affected by multiple deprivation. However, the authors are not able to identify significant interactions between the two dimensions.

In Germany, Groh-Samberg (2009)[61] analyses poverty regarding multidimensionality and dynamics using the combined poverty indicator that is presented in section 4.b.

He stated that poverty becomes more persistent over time in Germany. According to his analyses, 8.4% of the German population is persistently poor over 5 years (2000 – 2004). These individuals are mainly affected by extreme and moderate poverty. These findings contradict previous findings on poverty dynamics in Germany that observe lower rates of persistent poverty. Additionally, 10.1% show a precarious living standard that is dominated by moderate poverty and vulnerability. The author observes inconsistent poverty (5.7%) and temporary poverty (3.8%). Finally, Groh-Samberg observes secure and unstable prosperity for the majority of the population (45.9% and 26.1%). Thus, around 28% of individuals living in Germany are affected either by poverty or by precarity.

In conclusion, the majority of studies focus on single dimensions of poverty, particularly on income poverty. Only the minority of studies include aspects of cumulative poverty. Furthermore, classifications of dynamic poverty patterns do not follow a theoretical approach but are based on empirical findings (cf. Pérez-Mayo 2004; Weikard 2000).

Finally, it has to be noted that SES is rarely discussed at the dynamic level. Information on income poverty can doubtlessly be applied to the SES dimension. In contrast, dynamics on education and occupation are less often studied. Due to the aggregation in an index, transitions, e.g. from a low income to a higher status, wash out. Additionally, the occupational status is often measured as last occupation or at the household level. These difficulties complicate the SES measurement at the dynamic level.

[61] Cf. also Groh-Samberg (2008).

5. Health behavior and poverty/SES

Following the presentation of the empirical background for each type of health behavior (chapter 2) and poverty/SES (chapter 4), as well as the theoretical background on existing theories on health behavior, health, and health inequality (chapter 3), this chapter concludes the state of research section and moves on to the empirical analyses of this thesis. Section 5.a summarizes empirical findings on health behavior and poverty as well as SES at a cross-sectional level. Section 5.b deals with dynamic aspects of these issues.

5.a Health behavior and poverty/SES – cross-sectional view

First, this section gives a general overview on this topic. In the following, findings for each type of health behavior are presented.

Health-damaging behavior, such as unhealthy dietary behavior, smoking, or physical inactivity, cluster in poverty groups (Contoyannis and Jones 2004; Lynch et al. 1997a; Martikainen et al. 2003; McGinnis and Foege 1993). In contrast, this relationship is less clear for alcohol consumption (Lynch et al. 1997a). This supports findings by Evans (1994 as cited in Contoyannis and Jones 2004), that health behavior is not only based on individual preferences but it is also conditioned by the social environment.

Interestingly, social epidemiology deals less often with the term ‘poverty’ than with SES. For this reason the majority of the presented findings are based on SES.

Generally, individuals with a low SES or income consume less fruits and vegetables (Grünheid 2004; Mackenbach 2006a). The greatest differences have been found for males in Germany, Denmark, Great Britain, and the Netherlands, as well as for women in Denmark, Great Britain, Spain, and Germany (Cavelaars et al. 1997). Furthermore, Johansson et al. (1999) show that the SES is correlated to a healthy diet. In comparison to occupational status and income, education is the best determinant to explain dietary behavior. Nevertheless, all three indicators are criticized to be weak.

The variable ‘degree of attention paid to keeping a healthy diet’ has a higher explanatory power and underlines the importance of personal preferences.

Martikainen et al. (2003) also examine socioeconomic differences in dietary patterns using data of the Whitehall II study. They find that individuals with low occupational status are more likely to show an unhealthy diet than individuals of a higher occupational group.

In Germany, the 2nd National Nutrition Survey (NVS II) observes different dietary behavior for individuals with a low SES. These individuals consume fewer products with a high nutrient density, for instance vegetables, fruits, fish, mushrooms, or legumes. In contrast, consumption of fats, sweets, soft drinks as well as meat and sausages is higher (Max Rubner-Institute 2008b). Schneider and Schneider (2009b) are not able to confirm these findings for income but for occupational status.

One approach to explain differences in dietary behavior is based on the cost of food. Drewnowski (2010) studies this issue for the US and concludes that prices for grains and sugar food groups are lower than for food with high nutrient-density like fruits and vegetables, which may be an explanation for differing dietary patterns in dimensions of SES like education and income (cf. also (Darmon and Drewnowski 2008; Drewnowski and Specter S. 2004). Although Bernstein et al. (2010) confirm that higher expenses for food are associated with a healthy diet, significant improvement of dietary quality is achievable without increasing spending. According to Martikainen et al. (2003), economic hardship plays only a minor role in explaining the socioeconomic differences in dietary behavior. With regard to the nutrient intake level, only the micronutrient intake but not the macronutrient and energy intake is affected by SES (Darmon and Drewnowski 2008).

Most data with regard to social inequality is available for the category **smoking**. In Europe, individuals with low SES show higher prevalence of smoking. This applies especially to men (Mackenbach 2006a). In the US, Lantz et al (1998) use data from the American Changing Lives longitudinal survey (ACL). They can confirm that the highest rates of current smokers can be found for individuals with low educational attainment, while those who have never been smokers are more often highly educated. Additionally, Lantz observes a negative income effect.

Further studies support these findings (Harper and Lynch 2007; Nocon et al. 2007; Schneider and Schneider 2009b).

Nocon et al. (2007) and Schneider and Schneider (2009b) observe additionally, that a low occupational status is related to current smoking.

There are also few findings regarding poverty and smoking. As an example from the National Health Interview Survey (NHIS), individuals living below the income-based poverty level are more often smokers than those at or above the poverty level (Centers for Disease Control and Prevention 2011b; Schiller et al. 2010). Flint and Novotny (1997) show with cross-sectional analyses in the US between 1983 and 1993 that individuals who are below the poverty threshold are more likely to be smoker. Furthermore, they have fewer chances to quit smoking. The authors conclude that these individuals do not feel concerned by changing social norms on smoking.

In Germany, individuals aged 18–64 who are at risk of poverty are also more often smokers than other income groups. Smoking rates are considerably higher for men than for women (Lampert and Kroll 2005; Robert Koch-Institute 2010). Altogether, Laaksonen et al. (2003) state that the relationship between smoking and income is gradual. They conclude that 'not only poverty or adverse material circumstances lie behind this association.'

The relationship of **alcohol consumption** and SES is quite complex and less clear than for other types of health behavior (cf. Lynch et al. 1997a). In Germany, NVS II reports that women with a high SES drink twice as much alcohol than women with a low SES. However, men with a low SES drink more alcohol than their counterparts with a high SES. Men with a medium SES have the lowest alcohol consumption (Max Rubner-Institute 2008b). Interestingly, Schneider and Schneider (2009b) observe that alcohol consumption is associated positively with income but negatively with the educational status (cf. also Grünheid 2004). Lantz et al. (1998) observe the opposite. The higher the educational status, the lower the rate of abstainers and the higher the number of drinks in the past month. This also applies to income.

Data from Eurobarometer shows that excessive alcohol consumption is more common among less educated individuals.

This applies particularly to men while differences for women are generally small (Mackenbach 2006a; Stronegger et al. 1997).

Additionally, binge drinking behavior is also more prevalent in lower socio-economic groups in Europe (Mackenbach 2006a). In the US, individuals with the lowest educational attainment show lowest rates of binge drinking (Harper and Lynch 2007).

Looking at poverty status and alcohol consumption, the results of NHIS 2010 are similar to the figures shown for education and income. The percentage of abstainers is higher among poor and near poor individuals than for subjects who are not poor (32.9% and 27.0% vs. 16.3%). The majority of non-poor individuals are frequent drinkers (57.8%), while only 33.7% of the poor are frequent drinkers (Schiller et al. 2010).

Individuals with a low income are less often **physically active** than individuals with a higher income (Grünheid 2004; Nocon et al. 2007). Furthermore, subjects with a low educational and occupational status are less likely to be physically active (Nocon et al. 2007). Lantz et al. (1998) confirm these findings for the US. Individuals with lowest education and lowest income are less likely to be physically active. Harper and Lynch (2007) observe an inverse gradient between physical activity and educational attainment.

Data on physical activity and poverty show that individuals who are at risk of poverty are more often physical inactive. The biggest differences are observable for middle-aged men and women of the highest income group (Lampert and Kroll 2005; Robert Koch-Institute 2010). NHIS data from the US show that 53.4% who are not poor are sufficiently active. In contrast, only 31.9% of the poor and 35.9% of the nearly poor subjects meet the guidelines of physical activity. Furthermore, 50.4% of the poor and 25.7% of the non-poor are physically inactive (Schiller et al. 2010).

Looking at **combined health behavior**, Reeves (2005) shows that individuals of the lowest income groups show the lowest prevalence regarding their engagement in all four groups of health-promoting behavior. Nevertheless, the author criticizes that the overall prevalence for healthy behavior in four dimensions is low as well, so that differences across the income subgroups are very small.

In contrast, Miller et al. (2005), who consider non-smoking, physical activity, and fruit and vegetable consumption in a combined index, do not confirm these results. Findings show an inverse relationship between income and health-promoting behavior. Only 6% of the lowest income group can fulfill this condition, while 50% of the highest income group does so. Nevertheless, combined health behavior is not explicitly analyzed for a particular poverty status.

Furthermore, these studies consider only single dimensions of SES, for instance educational status or income, but not all three dimensions simultaneously (cf. e.g. Miller et al. 2005; Reeves and Rafferty 2005; Stronegger et al. 1997).

In conclusion, the studies and results presented demonstrate that the topic of health behavior and poverty has only been rarely studied up to now. Concerning the SES, an index that includes all three dimensions of SES is seldom used, too. However, numerous studies using single dimensions of SES show that most health-damaging behavior is associated with low SES. These findings illustrate that there is a high need for research, especially with regard to multidimensional poverty and SES measurements.

5.b Health behavior and dynamic poverty patterns/SES

Concerning poverty dynamics and health, there are only a small number of longitudinal studies available in the international literature. Studies examining poverty dynamics and health behavior are even rarer. Although numerous poverty measurements exist (cf. section 4.b), the majority of studies on poverty dynamics and health outcomes use the unidimensional measurement of income poverty. Consequently the application of multidimensional poverty measurements is not only widespread in the realm of poverty research but also in the area of health economics and epidemiology. Thus, to the best of the author's knowledge there is a lack of research on dynamics of multidimensional poverty with regard to health behavior.

This criticism is also applicable on dynamic SES including income, education and occupation to explain health behavior. As already explained in section 4.c, SES is seldom used at a dynamic level.

It can be assumed that particularly the dimensions of education as well as of occupational status do not significantly change over time so that this aspect may be neglected. Solely, the SES dimension of income is considered in dynamic analyses on health and health behavior.

As mentioned at the beginning of this section, the majority of research on poverty or SES and health is based on cross-sectional data, while only few studies use longitudinal data (Benzeval and Judge 2001; McDonough and Berglund 2003). This is also valid for health behavior.

However, Benzeval and Judge (2001) underline the importance of considering the duration of poverty spells. For example, Walker and Ashworth (Walker and Ashworth 1994 as cited in Benzeval and Judge 2001) state: 'a brief spell of poverty is not the same as a lifetime spent with resources outstripped by need and […] neither is [it] the same as repeated bouts of poverty separated by time that may allow for some financial and emotional repair. […] During spells of poverty psychological well-being may well reflect a complex interplay between factors that change with time: frustrated expectations and stress caused by the need to budget on an exceptionally low income for long periods, contrasting with growing expertise in what may be relatively stable financial circumstances.' Against this background, Benzeval and Judge (2001) argue that consideration of the time factor is important for analyzing the direction of causation, but also for including information on an individual's life-course experience and for examining poverty-induced consequences for health. The authors show in a review that there are only a few studies that investigate the dynamic relationship of income and health for 1982–1997. The review shows that income is significantly related to health outcomes. Furthermore, permanent income is more relevant for health than short-term income. With regard to income changes, an individual's health is more likely to be negatively affected if income decreases over time in comparison with stable or increasing income. Additionally, Benzeval and Judge conduct dynamic analyses using data of the British Household Panel Survey (BHPS) from 1991 to 1996/97 which supports the general findings their review.

McDonough and Berglund (2003) observe that increasing incomes are better for self-rated health than falling incomes.

Meanwhile, current prosperous economic circumstances do not compensate the negative health effects of earlier poverty experiences.

Additionally, longer and more numerous poverty spells leads to poor health and increasing mortality (Lynch et al. 1997b).

Generally, the income level is more important than the income changes for health outcomes. Finally, persistent poverty is more harmful for health than occasional episodes. Nevertheless, the studies presented by Benzeval and Judge (2001) as well their own analyses concentrate mainly on health but not on health behavior. Only a few studies use single dimensions of health behavior as a confounding variables (cf. also Smith and Zick 1994; Lynch et al. 1997b). Furthermore, McDonough and Berglund (2003) underline the importance to examine poverty dynamic and health not only on two or three observation points because results are less meaningful. Although income-based poverty measurements are generally used to describe poverty dynamics, McDonough et al. (2005) emphasize the importance to take further social characteristics like education into consideration.

As initially mentioned, research on health behavior and poverty dynamics is seldom studied. As an example, Lynch et al. (1997b) investigate health behavior, namely alcohol consumption, smoking, and physical activity with regard to income poverty spells in 1965, 1974 and 1983. Additionally, the risk factor of BMI was included. The authors report that the highest rates of smoking are observable for individuals who are never or only once affected by poverty. However, individuals who are poor in all three survey periods show much lower rates of physical activity. In contrast, the highest alcohol consumption is observable for those who are never affected by poverty. Nevertheless, it has to be critically noted that these dimensions of health behavior are not the focus of Lynch et al.'s study. They are used rather as covariate[62] in the multivariate model examining the impact of economic hardship on physical, psychological, and cognitive functioning.

In Germany, Schunck and Rogge (2012) analyze tobacco consumption and the duration of unemployment.

[62] The authors explain that 'low income may affect health directly through inadequate housing and sanitation or indirectly through threatening, socially disrupted neighborhoods and the promotion of behaviour […].'

As explained in section 4.b.ii, unemployment can be understood as a life domain and is used as a dimension of deprivation by Groh-Samberg (2009).
The authors observe an increasing likelihood of smoking among the unemployed. However, the number of cigarettes per day is not affected. Furthermore, fixed effects models show that unemployment is not an eligible predictor for tobacco consumption including taking up, relapsing, and quitting. The authors conclude that a direct causal effect of unemployment on smoking does not exist. Previously observed relationships may be explained by stable, unobserved differences between employed and unemployed respondents.
Finally, this section underlines that further research on dynamic aspects is needed. As already claimed by Smith et al. (1994) there is a need for panel data to obtain information from an individual over the course of his or her life. This also applies to Germany (Babitsch et al. 2009).
Although there is almost no empirical research that focuses on health behavior and dynamics of poverty and SES, the theoretical framework that is presented in chapter 3 supports the assumption that the dynamics of poverty and SES affect health behavior[63]. For this reason, this thesis aims to close this gap not only by examining the dynamics of health behavior with regard to income-based measurements but also by using multidimensional poverty and SES constructs. The combined poverty indicator used by Groh-Samberg (2009) has been already used for dynamic analyses on poverty. Applying this indicator to research questions on changing health behavior may show whether this indicator is helpful in specifying further risk groups for health-damaging behavior that contributes to morbidity and mortality.

Additionally, SES defined by Winkler and Stolzenberg (1999) is applied. Analyses should show whether this index, which is already established in cross-sectional analyses, is also useful in describing changes in health behavior.

[63] Cf. hypothesis **H4**: Health behavior is influenced by changes over time and length of poverty / low SES.

6. Data and methods

6.a The German Socio-Economic Panel

This study uses data of the German Socio-Economic Panel (GSOEP), which is planned and designed by the German Institute for Economic Research, DIW Berlin. Annual interviews have been conducted by TNS Infratest Sozialforschung from the outset of the survey (Heady and Holst 2008).

GSOEP is an ongoing household panel survey of households and individuals conducted annually since 1984 and representative of the resident population of Germany. GSOEP covers topics such as demography, labor market and employment, income, social security, health, education/qualification, individual preferences and merits as well as information on worries and satisfaction with life. Representativeness of the panel is assured by using a weighting-procedure and a multi-step random-sampling process of subsamples for West Germans, East Germans, foreigners, and immigrants and a high income sample (Wagner et al. 2007). A detailed overview on the sample structure is given in **table 11.**

Table 11: Sample structure of the GSOEP

Sample	Explanation
Sample A	**'West German'**: residents: started in 1984, n=4,528 households Head is either German or other nationality than those in Sample B.
Sample B	**'Foreigners'**: started in 1984, n=1,393 households (oversampling) Head is Turkish, Italian, Spanish, Greek, or Yugoslavian.
Sample C	**'East Germans'**: started in 1990, n=2,179 households Head was a citizen of the GDR. (expansion of survey territory)
Sample D	**'Immigrants'**: started in 1994/95, n=522 households At least one HH member has moved to Germany after 1984. (expansion of survey population)
Sample E	**'Refreshment sample'**: started in 1998, n=1,067 households Random sample covering all existing subsamples (total population)
Sample F	**'Innovation sample'**: started in 2000, n=6,052 households Random sample covering all existing subsamples (total population)
Sample G	**'High Income sample'**: started in 2002, n=1,224 households Monthly net Household income > 7,500 DM (4 500 EUR in wave 2)
Sample H	**'Refreshment sample'**: started in 2006, n=1,506 households Random sample covering all existing subsamples (total population)

Source: Wagner et al. (2007)

In GSOEP all household members aged 17 and older are asked to give an interview annually. Information on younger household members is also recorded. If an individual leaves a household, e.g. due to marriage, going to university, or other reasons, the new household including the new additional household members is considered in the sample in order to maintain national representativeness (Heady and Holst 2008). Since the start of GOEPS in 1984, around 2,500 individuals have taken part annually in the interviews. Additionally, approx. 1,500 East Germans have participated annually since 1989 (Goebel et al. 2008).

The GSOEP uses three modes of interviews to collect data. Starting in 1984, the interviews were conducted face-to-face and responses were recorded by the traditional paper and pencil interviewing (PAPI). In 1994–1995, computer assisted personal interviewing (CAPI) was introduced. Apart from CAPI, participants can also choose to self-administer questionnaires and to send them back by mail. Research has validated that no bias arises due to using these different modes of data collection (Heady and Holst 2008). Particularly for this study, social selectivity must be assumed: Like many empirical surveys, GSOEP is not able to cover homeless persons, illegal immigrants, addicts, or persons who are highly deprived, because these persons can hardly be reached. In contrast, households that actively manage their living conditions take part more often in surveys like GSOEP. This issue has to be taken into account when interpreting the results of this thesis (Groh-Samberg 2009). Almost 60% of the study population is interviewed between January and April[64]. However, the month of interviewing may vary.

For the following analyses, GSOEP data of the survey years 2000 to 2010 is used and considers individuals between 17 and 65. [65,66] (cf. Groh-Samberg 2009).

[64] Cf. personal datasets: $PMONIN = Month of interview.
[65] For details, see section 6.e.
[66] Individuals who are older than 65 are excluded from the analyses due to different consumption patterns Elderly people indicate less often to own items that belong to the group of new information technologies like having internet. However, they indicate more seldom financial reasons if they don't own that good.

GSOEP is currently the only representative panel dataset in Germany that permits widespread analyses in the area of social and behavioral sciences as well as economics, and covers such a long period[67].

Furthermore, this data is internationally comparable with data such as Panel Study of Income Dynamic (PSID) in the US, British Household Panel Survey (BHPS) in Great Britain, or Survey of Health, Ageing and Retirement in Europe (SHARE) in the European Union (Wagner et al. 2008).

Unlike German epidemiological data, GSOEP provides much differentiated information on socioeconomic issues, especially on the topics of poverty and SES. Information not only on income, occupational status, and education is given, but also on household commodity items, employment status, living conditions etc. that are detailed in the following section 6.b. Thus, GSOEP allows poverty and SES analyses at multidimensional and dynamic levels.

6.b Indicators to describe poverty and social status

The following section describes the construction of the main variables for the analyses. The section begins with a short introduction on household income (6.b.i). Afterwards, the construction of variables measuring poverty as well as SES that are used for the multivariate analyses in section 7.b is presented in the following sections 6.b.ii – iv.

6.b.i Household income

In this thesis, poverty is measured at the household level. A household[68] can be understood as an arrangement that is made by persons to jointly manage living conditions, e.g. to provide themselves with food and other essentials for living. A distinction is made between a one-person household and a multi-person household, where related or unrelated individuals may live together (United Nations 1998).

[67] Approximately comparable studies in Germany are the German General Social Survey (ALLBUS) and the German Family Panel (pairfarm). ALLBUS started in 1980 and surveys every two years a representative cross-section of the population (GESIS 2008). Pairfarm was launched in 2008. This longitudinal survey studies partnership and family dynamics (University of Bremen et al. 2012).

[68] For detailed definitions on household cf. Destatis (2012c) and United Nations (1998).

The (economic) behavior of members of a household is interrelated, assuming that earnings of one or several household members form the household's income that is at least partly used for common consumption (Destatis 2012c; Kooreman and Wunderink 1997). Therefore, income can only be assessed at the household level and there is no meaning in giving individual levels of income. This does not, however, account for any intra-household inequality that may nevertheless exist (Vos and Zaidi 1997).

In order to adjust household income by household size, this thesis uses the concept of equivalent income. Equivalent income adjusts household income for multiple consumption units (people) living in a household in order to give a meaningful measurement of available resources. The above also means that when presenting results on poverty statistics in terms of persons, this information is based on the poverty status of the household.

Using the measurement of the at-risk-of-poverty rate (6.b.ii) as well as the combined poverty indicator (6.b.iii) requires the use of equivalence scales, which are based on the (old) OECD equivalence scale (combined poverty indicator) as well as the OECD-modified equivalence scale (at-risk-of-poverty rate) (c.f. OECD 1982; Hagenaars et al. 1994; Groh-Samberg 2009). Using these scales, each household type in the sample is assigned a value in proportion to its size and to the age of its members (**table 12**) to consider economic scales and composition in consumption. Consequently, equivalence scales allow accounting for the household size so that resources to reach a certain welfare level are commensurable (Vos and Zaidi 1997).

For the (old) OECD equivalence scale, the first adult in the household receives an equivalent weight (w_1) of 1.0, the additional *l* adult member (14 years and older) a weight (w_2) of 0.7 and the *m* children younger than 14 a weight (w_3) of 0.5. These weighting factors imply that, for instance, the additional adult needs only 0.7 of the resources of the head of household to reach the same welfare level.

Table 12: Equivalence scales

Scale	Weight	OECD equivalence scale	OECD-modified scale
Head of household	w_1	1	1
Additional adult	w_2	0.7	0.5
Children (0 -14)	w_3	0.5	0.3

Source: modified according to OECD (1982) and Hagenaars et al. (1994)

Using the modified OECD scale, the coefficients (i. e. w_2 and w_3) for this scale are 0.5 and 0.3 for additional adults and persons younger than 14 respectively. For interpreting results it has to be noted that the (old) OECD equivalence scale overestimates the needs of larger households in comparison to smaller households (Vos and Zaidi 1997).

The equivalent net household income (ENI) is computed as follows:

$$ENI_{EU} = \frac{HHI}{w_1 + w_2 * l + w_3 * m} \tag{4}$$

where *HHI* defines household income, l is the number of additional adult household members and m is the number of children in a household who are younger than 14.

6.b.ii At-risk-of-poverty rate

Income poverty is measured as the at-risk-of-poverty rate of the Laeken indicators. It results as a dichotomous variable based on the disposable income[69], which represents the combined income after taxes and government transfers in the previous year of all individuals in the household (Grabka 2011). According to the European Union, the at-risk-of-poverty rate is defined as 60% of median net-equivalent household income using the modified OECD scale according to Hagenaars (1994): Anyone with an equivalent income of less than 60% of the median is considered to be at risk of poverty at a 60% level (Dennis and Guio 2003). The annual net equivalent household income following Laeken (NEI_{EU}) is computed using equation (1). Thus a household is affected by income poverty ($Poverty_{EU} = 1$) if:

$$Poverty_{EU} = \begin{cases} 1 \; if NEI_{EU} < 60\,\% \; of \; Median \; ENI_{EU} \\ 0 \; if NEI_{EU} \geq 60\,\% \; of \; Median \; ENI_{EU} \end{cases} \tag{5}$$

The permanent income situation is considered in a second analytical step (cf. 6.b.ii).

[69] GSOEP defines this term as household post-government income (cf. Grabka 2011).

Since permanent income can be represented by the average of income over time, the mean of ENI_{EU} is computed over five years (Goebel et al. 2008), where

$$NEI_{EU=} \sum_{t=1}^{5} \frac{NEI_{\mathrm{EU}}}{5} \quad , t=1, 2,\ldots 5. \qquad (6)$$

The period over five years is chosen in accordance with previous panel analyses in this research area.

It allows considering on the one hand as many survey years as possible and on the other hand to avoid a high rate of panel attrition that may be expected, especially for individuals affected by poverty (Moll 2006). The period of five years permits the observation not only of permanent poverty situations but also of temporary periods of poverty (Groh-Samberg 2009). As with defining at-risk-of-poverty rate for one year, the threshold for the permanent at-risk-of-poverty rate is 60% of the median of $NEI_{EU-permanent}$.

In addition to the presented measurement, the at-risk-of-poverty gap measures the difference between the median net equivalent income of individuals below the at-risk-of-poverty threshold and the at-risk-of-poverty threshold (Dennis and Guio 2003; Destatis and WZB 2011). This measurement is not applied to the following analyses since it is assumed that the majority of individuals have access to public welfare benefit so that the informational value is limited. Furthermore, analyses have shown that there are only a few changes over time (cf. Destatis and WZB 2011).

6.b.iii Combined poverty indicator by Groh-Samberg

The combined poverty indicator by Groh-Samberg uses information on income poverty and deprivation dimensions. Unlike the European definition of income poverty, Groh-Samberg uses the ‘old’ OECD equivalence scale to compute the equivalent net household income (NEI_{GS}) (OECD 1982). He argues that using the ‘old’ scale allows comparisons with previous German poverty research. However, this indicator is also based on the household post-government income (Groh-Samberg 2009). In order to make results of this thesis comparable to Groh-Samberg, this approach is used for the calculation of the combined poverty indicator.

Groh-Samberg defines three income situations with regard to the mean of the ENI: 'income poor' (< 50% of mean), 'low income' (50-75% of mean) and 'adequate income' (> 75% of mean) assuming that a mean is more suitable to consider changes for higher incomes than the median (Groh-Samberg 2009).

The four deprivation dimensions are (a) housing, (b) consumption, (c) financial reserves, and (d) unemployment. Housing deprivation includes insufficient room and lack of basic equipment.

Consumption is aggregated at the scale of commodities. This scale includes a large number of items such as owning a car or TV. The deprivation threshold is defined at one standard deviation below the index mean. It has to be considered that consumption is adjusted for consumption preferences only in even-numbered (e.g. 2008)[70]. To determine deprivation in the area of financial reserves, a household is regarded as deprived if it has no assets and no significant savings at all[71]. Finally unemployment is a state of deprivation because it can be seen as one of the most important non-monetary dimensions of social exclusion and lowers life satisfaction substantially (Groh-Samberg 2008). For detailed information on construction of the combined poverty indicator, refer to the **appendix 4**.

Combining income poverty with deprivation measures, nine combinations of the combined poverty index can be observed. Altogether six groups – namely extreme, moderate and one-sided poverty as well as vulnerability, fragile prosperity and secure prosperity – can be specified (**table 13**). As an example, an individual is classified as extremely poor if s/he is affected simultaneously by income poverty and deprivation in at least two of the four dimensions, i.e. multiple deprivation.

In contrast, secure prosperity prevails if an individual has an adequate income and is not deprived in any of the four dimensions.

Depending on the combination of available income and number of deprivations, an individual can be assigned to the four remaining groups.

[70] Participants are only asked whether they own an item or not. In years with odd numbers they are also asked why they don't own these items: financial or other reasons.
[71] C.f. indicator construction in **appendix 4.**

Table 13: Characteristics of the combined poverty index by Groh-Samberg

Income	Deprivation		
	Multiple deprivation (≥ 2)	**Single deprivation**	**No deprivation**
Income poverty (<50% of mean)	Extreme poverty	Moderate poverty	One-sided poverty
Low income (50-75% of mean)	Moderate poverty	Vulnerability	Fragile prosperity
Adequate income (> 75% of mean)	One-sided poverty	Fragile prosperity	Secure prosperity

Source: Groh-Samberg (2008)

As already described in section 6.b.ii, the permanent poverty status is computed for analyses presented in 7.b.ii and 7.b.iv. Groh-Samberg follows Goebel et al. (2008) to define the permanent income status:

$$\overline{ENI}_{GS=} \sum_{t=1}^{5} \frac{ENI_{\mathrm{GS}}}{5} \quad , \text{t=1, 2,…5.} \tag{7}$$

Afterwards income groups are defined as presented in **table 13**. Groh-Samberg (2009) follows that idea not only for income but also for deprivations. Multiple deprivations over 5 years can be observed if the sum of deprivations is greater than 8 (≈ 2 deprivations/ year), a single deprivation exists if the sum of deprivations is less than 8 and greater than 2 (≈ 1 deprivation/ year), and no deprivation if the sum of deprivations does not exceed 2 deprivations over five years (Groh-Samberg 2009). After combining income poverty with deprivation measurements, the nine combinations can be observed again (**cf. table 13**).

6.b.iv Socio-economic status according to Winkler and Stolzenberg

Winkler and Stolzenberg consider the following variables on a scale of 1 to 7 to describe the SES: education and occupational qualification (1), occupational status (2) and income (3) (Winkler and Stolzenberg 1999).

In contrast to the measurements presented in section 6.b.ii and 6.b.iii, not all information is measured at household level. This indicator includes the net household income based on the variable of household post-government income, but does not consider equivalence scales (cf. Lampert and Kroll 2009). Depending on the income level, individuals achieve point values, whereby a point value of 1 is assigned to the lowest income group and a point value of 7 is assigned to the highest income group (cf. **appendix 3**). Since income groups for SES have been created for 2003 (cf. Lampert and Kroll 2009) and the survey years have to be comparable, it is necessary to adjust values of the respective income groups of other survey years using the respective consumer price index (CPI), whereby the year 2003 is the base year (CPI=100) (cf. Destatis 2012d and appendix 3).

Furthermore, SES considers the highest occupational status in a household (Winkler and Stolzenberg 1999). In contrast, the education and occupational qualification categories are measured at the individual level. The two latter categories are also evaluated using point values from 1 to 7 (cf. Lampert and Kroll 2009).

Finally, all three dimensions are totaled. Respondents can gain a total score of point values between 3 and 21. Following Winkler and Stolzenberg (1999) three groups are identified: low SES (score max 8), medium (score 9–14) and high SES (score 15–21) (**table 14**).

Table 14: Dimensions of the SES according to Winkler and Stolzenberg

SES	Point values
Low SES	≤ 8
Medium SES	9–14
High SES	≥ 15

Source: modified, following Lampert and Kroll (2009)

It has to be noted that using the classification into three SES levels is not theory-based but normative (Lampert and Kroll 2009). In the event of missing data, the study proceeds as follows: If only one out of the three categories is missing, the value is imputed by the mean of the two other variables. The same procedure is used if the occupational status is ‘not employed’ or ‘unemployed’ (cf. Lampert and Kroll 2009).

This issue shows that there is only a minor impact of poverty due to unemployment on SES in addition to eventual income changes. In case of 'pensioner', the last occupational position is considered.

The construction of the permanent SES considering five study years follows the idea of computing the permanent income poverty (Goebel et al. 2008). Therefore the average of point values respondents reach is computed for five years.

$$\overline{SES}_{=} \sum_{t=1}^{5} \frac{SES}{5} \quad , t=1, 2,\ldots 5. \tag{8}$$

6.c Dependent variables

GSOEP offers information on health behavior regarding dietary behavior, smoking, alcohol consumption and physical activity. As **table 15** shows, information on these dimensions of health behavior is not always surveyed simultaneously.

Table 15: GSOEP data availability of information on health behavior 2004-2010

Health behavior	2004	2005	2006	2007	2008	2009	2010
Dietary behavior	✓		✓		✓		✓
Smoking	✓		✓		✓		✓
Alcohol consumption			✓		✓		✓
Physical activity		✓		✓	✓	✓	

Source: modified based on GSOEP (2013)

Information on all four categories is available only for 2008. This is a relevant issue for the forthcoming multivariate analytical steps presented in section 6.e.

Due to the cross-sectional results on alcohol consumption (section 7.b.i) this dimension of health behavior is excluded from the panel analyses (7.b.iii - iv).

In contrast to poverty information presented above, all dimensions of health behavior are measured at the individual level.

Dietary behavior is measured by the question: 'To what extent do you follow a health-conscious diet?' Answers are measured on a four-point scale in the form: 'very strong' (=1), strong' (=2), 'a little' (=3) and 'not at all' (=4).

Since it can be suggested that there is a direct association between self-reported healthfulness of diet and dietary quality this question is intended to identify the dietary behavior within the German population (Basiotis et al. 1995). For the following analyses, answers are aggregated to produce a binary variable: healthy diet (=1, includes answers 1 and 2) and no healthy diet (=0; includes answers 3 and 4).

Smoking is associated with higher risk for cardiovascular diseases and several forms of cancer (Krueger and Chang 2008; Moore and Hughes J. 2001). GSOEP considers three types of smoking, namely cigarettes, cigars and pipes, by asking: 'How many cigarettes, pipes or cigars do you smoke per day? Please give the daily average of the previous week.'

Following Mueller and Heinzel-Gutenbrunner (2001), pipes and cigars are counted as two cigarettes. Based on the findings on health-damaging effects of smoking, it is summarized as a dichotomous variable indicating whether the respondent is non-smoker (Y=1) or smoker (Y=0).

Furthermore, **alcohol consumption** is surveyed. Therefore, information for four types of alcoholic beverages, namely beer, wine, champagne, spirits (schnapps, brandy etc.) and mixed drinks (alcopops, cocktails etc.) are collected. For each category, individuals are asked whether they drink the beverage regularly, occasionally, seldomly or never. Due to the anticipated J-shape of alcohol consumption on health, the thesis focuses on the highest category of drinking: the variable 'alcohol' takes the value 0 (Y=0) if at least one alcoholic beverage is regularly consumed (c.f. Schneider and Schneider 2009a). In all other cases (never, seldom, and occasionally) it takes the value 1 (Y=1). It has to be considered that this procedure is rather vague. However, GSOEP data do not provide information on the exact quantity of alcohol consumption (Ziebarth and Grabka 2008).

To survey information on **physical activity** GSOEP asks the respondents to indicate how often s/he takes part in active sport: daily, at least once a week, at least once a month, more seldom, or never.

For the following analyses, physical activity is defined as sufficient if the respondent practices sport at least once per week or more often (Y=1), which is near to the recommendations of Robert Koch Institute (the central federal institution responsible for disease control and prevention in Germany) and the Physical Activity Guidelines for Americans (Centers for Disease Control and Prevention 2008; Rütten et al. 2005). In case for less physical activity the variable takes the value 0 (Y=0).

In addition to the measures relating to dietary behavior, smoking, alcohol consumption, and physical activity, a **combined health behavior index** according to Grünheid (2004) is constructed. As already explained, results regarding alcohol consumption differ strongly from the other three dimensions of health behavior. Furthermore, the information on alcohol consumption provided by GSOEP is rather vague. For this reason this dimension is excluded from this indicator.

The remaining dimensions, namely dietary behavior, smoking, and physical activity are considered in the combined health behavior index. For each category of health behavior, one point is assigned if an individual shows a healthy behavior (**table 16**). Thus a maximum of 3 can be attained if an individual shows health-promoting behavior in all 3 categories.

Table 16: Index of combined health behavior according to Grünheid (2004)

Dependent variable	Point values	Description
Y= 1,	3	Very healthy
Health-promoting behavior	2	Still healthy
Y= 0,	1	Unhealthy
No health-promoting behavior	0	Very unhealthy

Source: modified, based on Grünheid (2004)

An individual behaves in a health-promoting way if s/he shows a point value of 2 or 3. If an individual achieves a point value of 0 or 1, the person's behavior is classified as not health-promoting. Finally, a binary variable (0/1) indicating a health-promoting behavior (Y=1) is constructed. Due to the GSOEP data structure, this index can only be constructed for the survey year 2008 (**cf. table 15)**. In other survey years, either dietary behavior and smoking in even years or physical activity in uneven years is measured. Therefore this indicator is exclusively used in cross-sectional analyses (7.b.i and 7.b.ii) but not for panel analyses (7.b.iii - iv).

6.d Confounding variables

In addition to the poverty measurements presented in section 6.b, other important confounding variables are considered in the following analyses. As presented in **table 17**, confounding variables are socio-demographics, educational and occupational status, employment status, risk preference and economic worries. The majority of variables used are dummy variables. Additionally, variables are labeled with 'xx' in reference to the respective survey years. Variables with an ending 'xx_yy' are used to describe the permanent status over five years (cf. 6.b). Furthermore, **table 17** indicates whether variables are time-variant or time-invariant. This information is important for panel analyses presented in 6.b.iii-iv (cf. Allison 2009). Finally, the column 'model' indicates in which model a variable is used.

Educational status is divided into three groups: low, medium and high. As a prerequisite to describe the educational status adequately, the classification is based on information on educational status as well as on occupational qualification (Lampert and Kroll 2009). Therefore, the scale of Winkler and Stolzenberg is adopted (cf. **appendix 3**). Individuals who reach a score of 1 or 2 are assigned to the group of low educational status, a score between 3 and 5 reflects the medium status, and a score of 6 or 7 a high educational status. The highest status reflects the reference group.

Since the **occupational status** of the main earner of a household reflects the impact of the social environment (Winkler and Stolzenberg 1999), this thesis uses information of the highest occupational position in a household to describe the occupational status.

The classification is also adopted by the categorization used for SES (cf. Lampert and Kroll 2009; Winkler and Stolzenberg 1999 and **appendix 3**). Thus individuals who reach a score of 1 or 2 are assigned to the group of low occupational status, a score between 3 and 5 reflects the medium status, and a score of 6 or 7 a high occupational status, which is the reference group.

Table 17: Variables used in the multivariate analyses

Variable	Explanation	Time-variant	Time-invariant	Model		
				At-risk-of-poverty rate	Combined poverty indicator	SES
Dependent variables						
diet_xx	Healthy diet	✓		✓	✓	✓
Reference group	*No healthy diet*	✓		✓	✓	✓
NS_xx	Non-smoker	✓		✓	✓	✓
Reference group	*Smoker*	✓		✓	✓	✓
Alc_opt_2008	Moderate alcohol consumption			✓	✓	✓
Reference group	*Risky alcohol consumption*			✓	✓	✓
PA_opt_xx	Sufficient physical activity	✓		✓	✓	✓
Reference group	*Insufficient physical activity*	✓		✓	✓	✓
HB_opt_2008	Health-promoting behavior		✓	✓	✓	✓
Reference group	*No health-promoting behavior*		✓	✓	✓	✓
Independent variables						
y_pov_xx	At-risk-of-poverty	✓		✓		
Reference group	*Prosperity*	✓		✓		
y_pov_perm_xx_yy	Permanent at-risk-of-poverty		✓		✓	
Reference group	*Not permanent at-risk-of-poverty*		✓		✓	
pov_extreme_xx	Extreme poverty	✓			✓	▪
mod_pov_xx	Moderate poverty	✓			✓	▪
one_sided_xx	One-sided poverty	✓			✓	▪
pov_vul_xx	Vulnerability	✓			✓	▪
fragile_xx	Fragile Prosperity	✓			✓	▪
Reference group	*Prosperity*	✓			✓	
pov_extreme_xx_yy	Permanent extreme poverty		✓		✓	
mod_pov_xx_yy	Permanent moderate poverty		✓		✓	
one_sided_xx_yy	Permanent one-sided poverty		✓		✓	
pov_vul_xx_yy	Permanent vulnerability		✓		✓	
fragile_xx_yy	Permanent fragile prosperity		✓		✓	
Reference group	*Permanent prosperity*		✓		✓	
SES_low_xx	Low SES	✓				✓
SES_med_xx	Medium SES	✓				✓
Reference group	*High SES*	✓				✓
SES_low_xx_yy	Permanent low SES		✓			✓
SES_med_xx_yy	Permanent medium SES		✓			✓
Reference group	*Permanent high SES*		✓			✓
Confounding variables						
edu_low_xx	Low education	✓		✓	✓	
edu_med_xx	Medium education	✓		✓	✓	
Reference group	*High education*	✓		✓	✓	
Occ_low_xx	Low occupational status	✓		✓	✓	
Occ_med_xx	Medium occupational status	✓		✓	✓	
Reference group	*High occupational status*	✓		✓		

Table 17 continued: Variables used in the multivariate analyses

Variable	Explanation	Time-variant	Time-invariant	Model	Variable	Explanation
Unempl_HH_xx	Household affected by unemployment	✓		✓		✓
Reference group	*Household is not affected by unemployment*	✓		✓		✓
Unempl_xx	Currently unemployed	✓		✓	✓	✓
Reference group	*Currently employed*	✓		✓	✓	✓
Health_c_xx	Health status	✓		✓	✓	✓
Female	Female		✓	✓	✓	✓
Reference group	*Male*		✓	✓	✓	✓
Age_group_17_24_xx	Age group: 17 - 14	✓		✓	✓	✓
Age_group_25_34_xx	Age group: 25 - 34	✓		✓	✓	✓
Reference group	*Age group: 35 - 44*	✓		✓	✓	✓
Age_group_45_54_xx	Age group: 45 - 54	✓		✓	✓	✓
Age_group_55_65_xx	Age group: 55 - 65	✓		✓	✓	✓
Single_xx	Single (not married)	✓		✓	✓	✓
Reference group	*Married*	✓		✓	✓	✓
Divorced_xx	Divorced	✓		✓	✓	✓
Widowed_xx	Widowed	✓		✓	✓	✓
No_migback	No migration background		✓	✓	✓	✓
Reference group	*Migration background*		✓	✓	✓	✓
East_xx	East Germany	✓		✓	✓	✓
Reference group	*West Germany*	✓		✓	✓	✓
Kid_HH_c_xx	Number of children (0-14)/ HH	✓		✓	✓	✓
Risk_taker_xx	Risk-taker		✓	✓	✓	✓
Risk_neutral_xx	Risk-neutral		✓	✓	✓	✓
Reference group	*Risk-averse*		✓	✓	✓	✓
Worry_high_xx	High economic worries	✓		✓	✓	✓
Worry_med_xx	Medium economic worries	✓		✓	✓	✓
Reference group	*Low economic worries*	✓		✓	✓	✓

The **employment status** is not only part of the combined poverty indicator but also considered as two single variables used in the models. Firstly, a dummy variable describes whether a household was affected by unemployment during the previous survey year (Unempl_HH_xx)[72].

[72] Only used in models regarding at-risk-of-poverty rate and SES.

The variable is set to 1 if the sum of months in unemployment in a household exceeds 3 months per year. A second dummy variable indicates whether an individual is currently affected by unemployment (=1) or not (=0) (Unempl_xx).

Not only health behavior affects **health** outcomes but also vice versa. Schulz and Northridge (2004) describe in the model of 'Social Determinants of Health and Environmental Health Promotion' that health outcome as well as well-being influence health behavior (Schulz and Northridge 2004). Therefore **subjective health** of the recent year of the survey is considered. Self-rated health is measured by the international widely accepted scale: How would you evaluate your present health? Is it 'Very Good' (=1), 'Good' (=2), 'Fair' (=3), 'Poor' (=4) or 'Bad' (=5)?.

Furthermore socio-demographics including sex, age group, marital status, migration background, region of residence, and number of children living in a household are considered.

Since health-related behavior varies by **sex**, the dummy variable female (=1; male = reference group) is considered in the analyses (Wardle 2004). Additionally, analyses are conducted not only for the total population but also separated by sex.

Although **age** is surveyed as a metric variable in GSOEP, this thesis considers age groups so that reverse developments are observable.

Age is classified in five groups and considers around 10 years per group according to Mensink and Burger (2002). The age group 35–44 years is used as reference group.

The category **marital status** is divided into 4 specifications, namely single (not married), married (reference group), divorced, and widowed.

The variable No_migback indicates that an individual has no **migration background**.

The reference group **migration background** considers all respondents who have a direct migration background (person immigrated by him/herself), an indirect migration background (s/he is of migrant origin but born in Germany), or an undifferentiated migration background[73] (cf. Krause 2009).

The variable **region of residence** differs between former Eastern and Western Germany. The dummy variable East_xx is set to 1 if the respondent lives in one of the following German federal states: Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt, or Thuringia in the respective survey year.

To describe the family structure of a household, the metric variable **children living in a household** indicates the number of children aged 0–14 living in the household.

The category **risk preference** is based on information concerning the personal willingness to take risks. Respondents have to answer the question 'Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?' where a score of 0 indicates 'risk-averse' and the value 10 means: **'**fully prepared to take risks'. Subsequently, three groups of risk preference can be defined where risk averse (score 0–3) reflects the reference group. An individual is classified as risk-neutral if s/he has a score between 4 and 6. Respondents with a value greater than or equal to 7 are assigned to the risk-taker group.

According to Mackenbach (2006a), **economic worries** are also considered as a measurement of psychosocial stress relating to financial aspects.

GSOEP surveys respondents' attitudes towards their own economic situation. An individual is affected by high economic worries if s/he indicates 'very concerned' (=1). Medium economic worries are existent if the answer is 'somewhat concerned' (=2), and low economic worries are observable if the answer is 'not concerned at all' (=3). The latter group is the reference group.

[73] Country of origin is not indicated by the interviewee.

6.e Multivariate analyses

This section details the methods of the following empirical analyses of this thesis and describes the four analytical steps that are used in chapter 7.

This study applies logistic regression models. The equation for the logistic regression models the probability of the binary outcome variable for individual *i* as ($Y_i \in \{0, 1\}$) as a function of the *k=1,...K* explanatory variables X_{ki} (cf. Menard 1995):

$$P_i = Prob\ (Y_i = 1) = f(X_{1i}, X_{2i}, \ldots, X_{Ki}) \qquad (9)$$

The outcome of the dependent binary variable is assumed to be mutually exclusive and exhaustive (Aldrich and Nelson 1984).

The models are estimated using the method of maximum likelihood estimation (MLE) (Pampel 2000).[74] The aim of this procedure is to identify values for the unknown distribution parameters which maximize the probability of obtaining the observed set of data (Hosmer and Lemeshow 1989; Menard 1995; Pampel 2000). In the case of logistic regression models, the likelihood function is expressed as the joint probability of observing the pattern of occurrences ($Y_i = 1$) and nonoccurrences ($Y_i = 0$). This expression depends on unknown parameters of the logistic distribution function. Finally, the MLE identifies model parameters that are most likely to give rise to the patterns of observations in the sample data.

Thus in logistic regression models the maximum likelihood function is

$$L = \prod \{P_i^{Y_i} (1 - P_i)^{1-Y_i}\} \qquad (10)$$

where *L* refers to the likelihood, Y_i denotes the observed value of the binary dependent variable for individual, *i* and P_i is the predicted probability for case *i* (Pampel 2000).

[74] In contrast to linear regression models, an estimation using ordinary least squares (OLS) is inappropriate. OLS is inappropriate because the error term has neither normal distribution nor equal variances for values of the independent variables. Thus minimizing the sum of the squared deviations between the observed and the predicted values of the dependent variable gives no efficient estimates (Pampel 2000).

In the logistic regression model, P_i is modeled by the logistic distribution function. Hence P_i is the logistic function of Z_i

$$P_i = F(Z_i) = \frac{1}{1 + e^{-Z_i}} \tag{11}$$

where Z_i is a linear transform of the explanatory variables:

$$Z_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_K X_{Ki} \tag{12}$$

The likelihood is maximized by choosing the vector of parameter $\widehat{\beta_0}$,…, $\widehat{\beta_k}$ that maximizes L as given in equations 10 – 12.

The interpretation of the results of logistic regression models makes use of the odds ratios (OR). According to the explanatory variables, individuals are sorted into groups. Given that the independent variable is coded as either 0 or 1, two values of $P(Y=1|X_k=1)$ and two values of $1\text{-}P(Y=1|X_k=1)$ can be identified. OR are calculated by dividing the odds of being in group 1, (i.e., X_k=1) by the odds of being in group 2 (i.e., X_k=0) (Hosmer and Lemeshow 1989).

$$OR = \frac{Odds_{\text{group1}}}{Odds_{\text{group2}}} = \frac{P(Y = 1\ given\ X_k = 1)/[1 - P(Y = 1\ given\ X_k = 1)]}{P(Y = 1\ given\ X_k = 0)/[1 - P(Y = 1\ given\ X_k = 0)]} \tag{13}$$

where P denotes the probabilities calculated within the logit model for the separate groups. All result tables indicate the respective ORs, which can be calculated from the logit model as $e^{\hat{a}_k}$. Hence, ORs greater than 1 indicate that the odds of realizing health-promoting behavior is more likely in group 1 than in group 2 (cf. Menard 1995).

At the outset, the appropriate type of panel analyses has to be identified. It is possible to conduct fixed effects (FE) logistic regression models or random effects (RE) models.

Using the log odds representation of the logistic regression (equations (10) – (12), FE logistic regression models are estimated as follows (c.f. Allison 2009):

$$\log\left(\frac{\mathrm{P_{it}}}{1-\mathrm{P_{it}}}\right) = \mu_t + \beta x_{it} + \gamma z_i + \alpha_i, \qquad t = 1, 2, \ldots, T \qquad (14)$$

where p_{it} is the probability that the response variable is equal to 1 for individual i at time t.

μ_t is an intercept that may be different for each period, x_{it} is a (Kx1)-vector of time-varying predictors, and z_i is a vector of time-invariant variables that are constant over time. Finally, α_i represents the combined effects of all unobserved variables that are constant over time. α_i is treated as a set of fixed constants. It must be considered that fixed effects logistic regression analyses use only within-person variation, so that individuals without variations on the dependent variable over time are excluded from the sample. This method checks for the potential confounding effects of all time-invariant variables. Applying equation 14 for more than one period leads to an elimination of both, α_i and γz_i, so that fixed effects models do not produce any estimates of the effects of explanatory variables that do not change over time. I.e. variables on sex and migration background are not included in the model. The model is estimated with conditional maximum likelihood where the likelihood function is conditioned on the total number of events observed for each individual (Allison 2009).

Random effects models are based on the same equation that is used for FE models. In contrast to FE models, α_i is assumed to be a realization of randomly distributed variables with a specified probability distribution. Generally, there is the assumption that each α_i is normally distributed with a mean of 0 and a constant variance and it is independent of all other independent variables. The main difference between the FE and RE method is that the latter method can include time-invariant predictors (Allison 2009; Brüderl 2010). Furthermore, not only within-person variation but also between-person variation is considered (Brüderl 2010).

The simpler RE model produces more efficient estimates but they may be biased if the assumption that α is correlated with all other variables of the model is violated. In contrast, FE models are more complex but they are less prone to bias (Allison 2009). Choosing FE or RE models depends on whether there is a correlation between α_i and x_{it}. FE models are consistent when α_i and x_{it} are correlated whereas RE models would be inconsistent (Allison 2009; Wooldridge 2002).

FE and RE models are compared using the Hausman specification test (cf. Hausman 1978):

$$H = \left(\hat{\beta}_{FE} - \hat{\beta}_{RE}\right)' \left[\widehat{V}\left(\hat{\beta}_{FE}\right) - \widehat{V}\left(\hat{\beta}_{RE}\right)\right] - 1\left(\hat{\beta}_{FE} - \hat{\beta}_{RE}\right) \qquad (15)$$

where $\hat{V}$ is the estimated covariance matrix of the coefficient vectors of the fixed effect, $\hat{\beta}_{FE,}$ and the random-effect model, $\hat{\beta}_{RE}$. The Hausman specification test allows to determine whether the biases are inherent so that an RE model is reasonable or not. The null hypothesis (H_0) is that the estimator $\hat{\beta}_{RE}$ is indeed an efficient (and consistent) estimator of the true parameters. If this is the case, there should be no systematic difference between the two estimators $\hat{\beta}_{RE}$ and $\hat{\beta}_{FE}$. In case of rejection of H_0, panel analyses are conducted using FE models (cf. Stata press 2011; Wooldridge 2002).

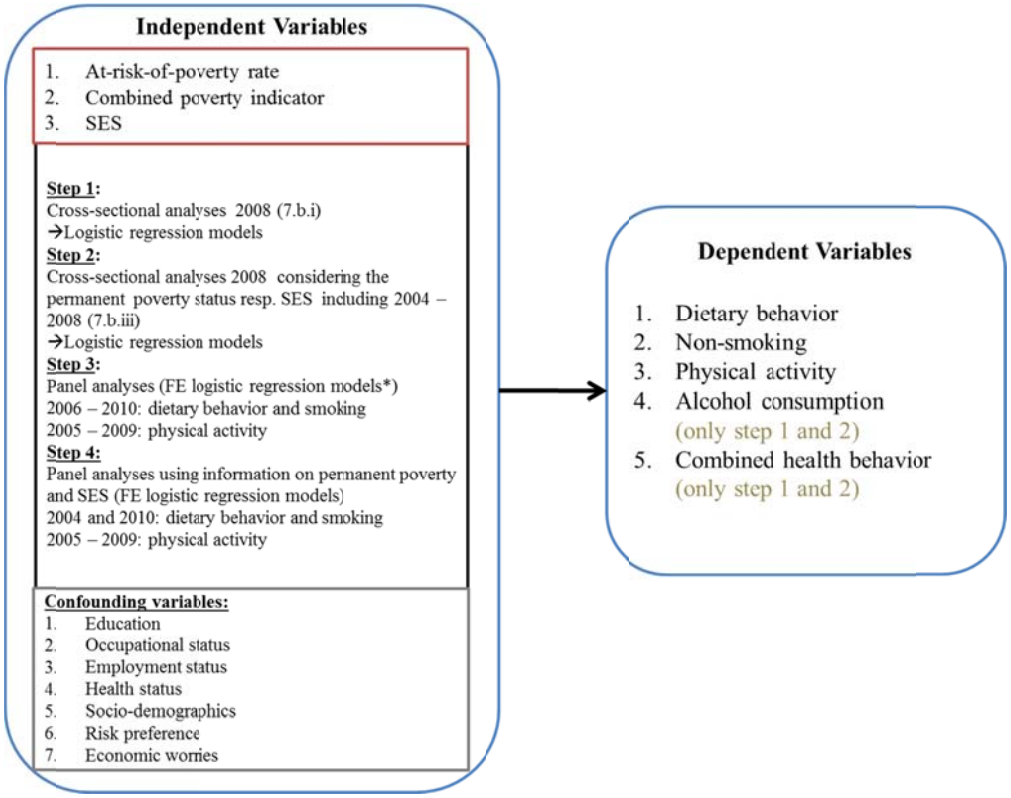
Variables presented in sections 6.b to 6.d are part of the subsequent multivariate analyses that are conducted in four steps (**figure 11**).

As mentioned in section 6.c, health behavior dimensions are only simultaneously available for 2008.[75]

Therefore, steps 1 and 2 are conducted for the survey year 2008 so that considering combined health behavior is possible. As explained in section 6.d, each analysis is conducted not only for the total sample but also separated by sex.

Secondly, the five dependent variables for health behavior are analyzed as dependent binary variables using information on permanent poverty or SES between 2004 and 2008 as explanatory variables in logistic regression models (cf. 6.b).

[75] Since panel analyses also include the years 2009 and 2010, the cross-sectional analyses are repeated for 2010 regarding dietary behavior, alcohol consumption, and smoking, as well as for 2009 regarding physical activity (cf. appendix 7).



*Based on results of the Hausman specification test, FE logistic regression models are applied.

Figure 11: Multivariate analyses – Analytical steps

Source: own illustration

Confounding variables are not modified. Only information for 2008 is considered. Furthermore, analyses are adjusted for confounding variables that are listed in **table 17** (cf. section 6.d).

Thirdly, panel data analyses are conducted for the three types of health behavior. According to the data availability in GSOEP, panel analyses regarding dietary behavior and smoking are conducted for the period 2004 to 2010, whereas analyses on physical activity are conducted for 2005 to 2009[76].

Finally, panel analyses are repeated using information on permanent poverty and SES between 2000 and 2010 and between 2001 and 2009 respectively as explanatory variables in logistic regression panel analyses (cf. 6.b). Confounding variables are not modified.

[76] In this period the respective health behavior is surveyed four times.

7. Empirical results

The following chapter is divided into two sections. First, descriptive results on the study population, the used measurements to describe poverty and SES as well as the dependent variables are presented (7.a). Second, results of the multivariate analyses are described and discussed (7.b).

7.a Descriptive results

7.a.i Study population

The dataset of this thesis covers the survey periods 2004 to 2010 and 2005 to 2009[77] for the dependent variables on health behavior. It considers individuals aged between 17 and 65 years living in private households in Germany. Since the permanent poverty/SES situation is considered, the sample period is extended to use data from 2000 to 2010[78] and 2001 to 2009[79]. The panel data design is unbalanced to consider as many individuals as possible. **Table 18** shows the population varies over the study period between 19,498 in 2000 and 15,119 respondents in 2010. The number of participating households fluctuates around 10,000.

Table 18: Study population in 2000–2010*

Study year	Sample size	Number of households
2000	19,498	10,012
2001	17,984	9,169
2002	19,530	10,119
2003	18,495	9,781
2004	18,081	9,703
2005	17,384	10,228
2006	18,393	10,476
2007	17,228	9,996
2008	16,092	9,559
2009	16,878	10,434
2010	15,119	9,512

*Only respondents aged between 17 and 65 years are considered.

Altogether, 10,776 respondents have continuously participated during the study period 2004–2010 and 12,301 participants between 2005 and 2009.

[77] Applies to panel analyses regarding physical activity.
[78] Information on dietary behavior and smoking is available for 2004, 2006, 2008 and 2010 (cf. 5.c).
[79] Information on physical activity is available for 2005, 2007, 2008 and 2009 (cf. 5.c).

Regarding permanent poverty/SES, 8,759 individuals have always taken part in the survey between 2000 and 2010 and 10,007 participants between 2001 and 2009.

Table 19: Study population in 2008: Descriptive statistics of variables used as confounder in the multivariate analyses*

Topic	Explanation**	N[80]	Percentage (%)[81]	Mean (SD) if available
Gender	Male	7,785	48.85	
	Female	8,307	51.15	
Age groups	17–24	2,395	13.90	41.47 (13.33)
	25–34	2,618	18.02	
	35–44	3,729	24.25	
	45–54	3,920	23.90	
	55–65	3,430	19.93	
Marital status	Single (not married)	4,521	33.09	
	Married	9,081	52.99	
	Divorced	1,273	10.09	
	Widowed	297	2.15	
Migration back-ground	No migration background	13,456	80.17	
	migration background	2,636	19.83	
Region of residence	West Germany	11,929	79.35	
	East Germany	4,163	20.65	
Children living in the House-hold[82] N=16,017				0.44 (0.80)
Educational status	Low educational status	5,667	40.99	
	Medium educational status	7,446	45.08	
N=15,948	*High educational status*	2,693	13,39	
Occupational status	Low occupational status	3,554	27.63	
	Medium occupational status	6,305	41.88	
N=15,948	*High occupational status*	6,089	30.48	
Months in un-employment/ HH N=15172				1.84 (4.84)
Current em-ployment status	Currently employed	1,158	90.89	
	Currently unemployed	13,433	9.11	
N=14,591				
Health status 2008	Very good (5)	1,627	10.94	3.47 (0.94)
	Good (4)	6,867	43.31	
N= 15,153	Satisfactory (3)	4,550	30.73	
	Poor (2)	1,741	12.22	
	Bad (1)	368	2.80	

[80] Absolute values are always unweighted.

[81] Information in per cent is always weighted. The weighting procedure is applied due to different design probabilities for subsamples A-H in wave 1, unit-non-response (not willing to participate in the first wave) or attrition in the subsequent waves (unsuccessful follow-up or refusal). Aim of the weighting of the sample cases is deriving the case numbers of the target population. There are cross-sectional and longitudinal weighting procedures (cf. Pannenberg et al. 2005 and Frick et al. 2005).

[82] Continuous variables are indicated without reference group.

Table 19 continued: Study population in 2008: Descriptive statistics of variables used as confounder in the multivariate analyses

Topic	Explanation**	N	Percentage (%)	Mean (SD) if available
Risk preference	Risk-taker	3,512	22.49	
N=15,172	Risk-neutral	6,465	42.94	
	Risk-averse	5,195	34.57	
Economic worries	High economic worries	3,246	24.35	
N=15.172	Medium economic worries	7,944	52.43	
	Low economic worries	3,933	22.75	

* N= 16,092 in 9,559 households, however, respondents didn't always answered all questions (separate N is indicated)

**Reference groups used in multivariate models are shown in italics.

Due to data availability on health behavior (cf. 5.c), steps 1 and 2 of the multivariate analyses are conducted for the study year 2008 (cf. 5.e) so that subsequent descriptive statistics are presented only for this year.

Turning to the characteristics of the subsample used, **table 19** shows that more women (51.15%) than men (48.85%) are included.

The mean age is 41.47. Furthermore, the majority of respondents is married (52.99%) or single (33.97%), has no migration background (80.17%) and lives in West Germany (79.35%).

On average, 0.44 children aged 0–14 live in a household. Respondents have achieved a medium educational (45.08%) and a medium occupational status (41.88%). However, the proportion of a low educational status is 40.99% whereas 27.63% have a low occupational status. Regarding the health status, a good to satisfactory status is reported ($mean_{2008}$=3.47).

Finally, risk preference and economic worries are considered in the multivariate models. On the one hand 22.49% are risk-takers whereas 34.57% of the population are risk-averse. High economic worries are reported by 24.35% and low economic worries by 22.75% of the respondents.

7.a.ii Indicators to describe poverty and social-economic status

7.a.ii.1 At-risk-of-poverty rate

The share of individuals whose net-equivalent household income after social transfers is below the at-risk-of-poverty threshold of 60% of median net equivalence income increases gradually from 11.85% in 2000 to 16.17% in 2010. Similarly, the threshold increases over the years from 10,222 Euros to 12,185 Euros.

As **table 20** shows, the income of 15.88% of the GSOEP population aged 17–65 is below the at-risk-poverty rate in 2008, which is equal to a net-equivalent household income lower than 11,594.29 Euros/year.

Table 20: At-risk-of-poverty threshold based on ENI_{EU} (%)

Study period	Sample size (N)	Threshold (Euro)	At-risk-of-poverty rate (%)
2000	19,498	10,222.33	11.85
2001	17,984	10,522.00	12.26
2002	19,530	10,566.60	12.76
2003	18,495	10,878.57	13.43
2004	18,081	10,971.00	14.50
2005	17,384	10,965.71	15.27
2006	18,393	11,045.43	16.15
2007	17,228	11,101.20	14.95
2008	16,092	11,594.29	15.88
2009	16,878	11,827.30	15.70
2010	15,119	12,185.10	16.17

Regarding the permanent income situation, not only the threshold but also the share of individuals that are affected by poverty risk is lower although the development over time is comparable (**table 21**). As an example, 10.17% of the GSOEP population was affected by permanent poverty at during the study period 2000–2004 whereas the permanent income of 13.59% of the individuals was below the threshold between 2006 and 2010. Altogether, these findings support the assumption that poverty is no static phenomenon.

Table 21: Permanent at-risk-of-poverty rate based on ENI_{EU} (%)

Study period	Sample size (N)	Threshold (Euro)	At-risk-of-poverty rate (%)
00- 04	14,298	10,326.24	10.17
01- 05	13,806	10,555.87	11.12
02- 06	13,165	10,907.66	11.49
03- 07	13,864	10,986.06	12.64
04- 08	13,128	11,056.52	12.79
05- 09	12,246	11,238.41	13.06
06- 10	12,284	11,579.46	13.59

Finally, **table 22** details how often individuals are affected by income poverty over the whole study period. For this reason, only individuals who have always answered the GSOEP questionnaire are considered. The majority of the population (61.62%) was never at risk of poverty. Approximately 23% of individuals is temporarily (between 1 and 4 years) at risk of poverty, whereas 15.3% of the population is at risk of poverty for 5 years or more. Comparable to the findings presented in **table 21** above, the assumption that poverty is not a static phenomenon is supported.

Table 22: Frequency distribution of at-risk-of-poverty rate between 2000 and 2010*

Frequency (in years)	At-risk-of-poverty rate (%)
0	61.62
1	9.56
2	5.68
3	4.14
4	3.70
5	2.92
6	2.09
7	2.05
8	1.52
9	2.81
10	2.14
11	1.77

*N=8,703

7.a.ii.2 Combined poverty indicator

Turning to the combined poverty indicator, the distribution is given in **table 23**.

Table 23: Distribution of the combined poverty indicator (%)

		Poverty			Precarity		Prosperity
Study year	**N**	**Extreme poverty**	**Moderate poverty**	**One-sided poverty**	**Vulnerability**	**Fragile prosperity**	**Secure prosperity**
2000	19,498	4.23	8.24	8.67	5.94	24.06	48.87
2001	17,984	4.84	8.71	7.94	6.03	21.25	51.24
2002	19,530	5.28	9.63	7.87	7.45	23.40	46.36
2003	18,495	6.65	9.16	8.39	6.98	20.53	48.29
2004	18,081	6.56	9.21	7.77	8.21	22.97	45.28
2005	17,384	7.71	11.02	8.05	6.75	20.80	45.67
2006	18,393	7.97	10.78	8.99	6.36	22.00	43.90
2007	17,228	8.55	10.56	8.38	6.61	20.47	45.44
2008	16,092	7.68	10.56	8.57	6.10	22.67	44.42
2009	16,878	7.76	10.03	10.76	6.05	21.86	43.55
2010	15,119	5.70	10.27	8.09	6.19	22.63	47.12

The majority of the study population (43.55% to 51.24%) is living in secure prosperity, i.e. these individuals are not affected by deprivations and have an adequate income. The second largest group is fragile prosperity (20.53% to 24.06). These respondents have either only a low income or are only affected by a single deprivation. Individuals who are vulnerable not only have a low income but are also affected by a single deprivation. In this subsample the share of individuals affected by vulnerability varies between 5.94% and 7.45%.

Turning to the three poverty groups, most individuals (8.24% to 11.02%) are affected by moderate poverty, i.e. they are either affected by income poverty and a single deprivation or by multiple deprivation and have a low income. Between 7.77% and 10.76% of the subsample are affected by one-sided poverty so that either income poverty or multiple deprivation is present.

Finally, between 4.23% and 8.55% of the subsample is categorized as extremely poor. These individuals are affected by income poverty and multiple deprivations.

Turning to the distribution of the permanent combined poverty indicator it becomes obvious that it differs from single survey years (**table 24**). There are remarkable differences for moderate poverty, one-sided poverty and vulnerability as well as secure prosperity. If we compare the status of a single year with the permanent status, the shares of individuals that are permanently one-sided or moderately poor decreases, whereas more individuals are assigned to the vulnerability and secure prosperity groups. These results may suggest that individuals do not always remain in the same poverty group. Furthermore, on a long-term view, individuals are more likely to be affected by precarity including vulnerability and fragile prosperity as well as secure prosperity.

Table 24: Distribution of the permanent combined poverty indicator (%)

		Poverty			Precarity		Prosperity
Study year	**N**	**Extreme poverty**	**Moderate poverty**	**One-sided poverty**	**Vulnerability**	**Fragile prosperity**	**Secure prosperity**
00-04	12,832	2.58	5.23	2.15	9.16	23.98	56.89
01-05	12,464	3.05	5.82	2.43	9.35	22.09	57.26
02-06	13,332	4.62	5.90	2.14	9.93	23.70	53.70
03-07	12,722	4.89	7.10	2.08	9.38	22.55	54.01
04-08	11,175	4.63	6.21	2.17	9.89	23.98	53.11
05-09	11,337	5.28	6.82	2.08	9.42	24.03	52.37
06-10	11,466	4.70	7.30	2.02	8.34	23.61	54.02

Table 25 describes how long individuals remain in the respective group of the combined poverty indicator. Interestingly, 78.36% are never extremely poor and around two-thirds are never moderately and one-sidedly poor or affected by vulnerability. In contrast, 29.56% are never assigned to fragile prosperity and 27.17% to secure prosperity.

Table 25: Frequency distribution of the combined poverty indicator between 2000 and 2010 (%)*

Frequency (in years)	Poverty			Precarity		Prosperity
	Extreme poverty	Moderate poverty	One-sided poverty	Vulner-ability	Fragile prosperity	Secure prosperity
0	78.36	61.99	63.99	65.64	29.56	27.17
1	6.28	11.56	16.64	15.96	13.69	7.6
2	3.01	7.44	7.69	8.24	12.46	5.63
3	3.17	5.67	3.8	4.42	11.63	4.88
4	1.74	4.92	2.53	3.01	9.84	6.51
5	1.65	3.13	0.95	1.43	7.94	5.21
6	1.29	2.12	0.54	0.76	6.24	5.2
7	1.0	1.4	0.8	0.35	4.84	5.52
8	0.82	0.84	0.7	0.13	2.25	6.22
9	1.07	0.36	0.55	0.06	0.8	6.89
10	0.93	0.45	0.55	0.00	0.49	7.27
11	0.67	0.13	1.26	0.00	0.26	11.91

*N=8,795

Furthermore **table 25** illustrates that the status is seldom stable over time. Especially regarding the poverty and vulnerability groups, only a minor share (around 5%) remains in these groups longer than 5 years.

7.a.ii.3 SES

Finally, **table 26** shows descriptive statistics for the **SES** according to Winkler and Stolzenberg.

Table 26: Distribution of SES by survey year (%)

Study year	Sample size (N)	Low SES	Medium SES	High SES
2000	19,498	29.45	50.51	20.04
2001	17,984	29.27	50.37	20.37
2002	19,530	30.63	49.83	19.53
2003	18,495	29.80	50.13	20.06
2004	18,081	31.03	49.17	19.80
2005	17,384	31.61	48.90	19.49
2006	18,393	32.22	47.50	20.28
2007	17,228	32.44	46.66	20.90
2008	16,092	32.16	47.24	20.60
2009	16,878	30.92	47.03	22.04
2010	15,119	30.88	46.59	22.54

Around one third is assigned to the low SES (29.27%–32.44%) and one fifth to the high SES (19.49%–22.54%). The majority (46.59%–50.51%) of the GSOEP population has a medium SES; i.e., these respondents have reached a score of 9–14 considering education and occupational qualification, occupational status and the household net income.

In contrast to the at-risk-poverty rate and the combined poverty indicator, the distribution of the permanent SES remains quite stable (**table 27**).

However, in comparison to the permanent distribution of SES, the share of high SES decreases in favor of the medium SES. Thus the assumption that the status may vary over time is supported.

Table 27: Permanent distribution of SES (%)

Study year	Sample size (N)	Low SES	Medium SES	High SES
00- 04	14,015	29.64	55.39	14.97
01- 05	13.541	29.97	54.89	15.14
02- 06	14,269	29.88	51.79	18.33
03- 07	13,625	30.26	51.10	18.64
04- 08	12,920	30.76	50.85	18.39
05- 09	12,031	29.83	51.62	18.55
06- 10	12,051	28.63	51.10	20.27

Furthermore, **table 28** confirms this observation: only 19.34% of the population always remains in the group of medium SES, 11.17% permanently have a low SES, and only 6.73% have a high, stable SES.

Table 28: Frequency distribution of the SES between 2000 and 2010 (%)

Frequency (in years)	Low SES	Medium SES	High SES
0	45.75	19.8	63.64
1	7.04	6.93	7.06
2	5.52	5.55	4.35
3	4.20	5.51	3.18
4	3.83	5.02	2.55
5	3.61	5.75	2.82
6	3.68	5.50	2.24
7	3.13	5.80	1.73
8	3.61	6.25	2.01
9	3.49	6.27	1.87
10	4.97	8.28	1.82
11	11.17	19.34	6.73

* N=8,759

Interestingly, a remarkable share (45.75% and 63.64%) never reachs a score for low SES or such a high score that they are assigned to a high SES.

Next to individuals who are always or never part of a status group, quite a few respondents seem to change their status over years.

In conclusion, depending on the used measurement, individuals are affected by poverty or social inequality in different ways. In 2008, 15.88% of the respondents were at risk of poverty, based on income.

In contrast, using the combined poverty indicator, 26.81% are assigned to be extremely poor, moderately poor, or one-sidedly poor and 28.77% to be precarious (vulnerability and fragile prosperity). Finally, 32.16% of the population has a low SES. These findings support the assumption that including of more than one dimension to describe poverty or SES is reasonable.

With regard to permanent measurements, results for the at-risk-of-poverty rate and the combined poverty indicator are comparable (2004 - 2008: 12.79 and 13.01). These rates are considerably lower than for a single survey year (2008: at-risk-of-poverty: 15.88% and poverty based on the combined poverty indicator 26.81. Results of permanent SES are only slightly lower than for one year (2004–2008: 30.76% and 2008: 32.16).

Finally, the frequency distribution over eleven years (2000–2010) suggests that persistent poverty or a low SES is relevant in Germany. 10.29% of the population is at risk of poverty for at least 7 years. Comparable results are observable for the three poverty groups of the combined poverty indicator (11.53%). Even 26.37% of the respondents is assigned to a low SES for at least 7 years. However, these results also show that the majority of individuals do not remain in one group over years. For that reason it can be assumed that persistent and transient poverty situations exist. In particular, moving into and out of poverty is of interest for this thesis when analyzing changes in health behavior that are caused by poverty or SES dynamics.

7.a.iii Dependent variables

As described in section 6.c, four types of health behavior, namely dietary behavior, smoking, alcohol consumption, and physical activity, are considered in the multivariate analyses. Additionally, a combined health behavior indicator is used.

Since gender-specific health behavior is expected, descriptive statistics are conducted not only for the total sample but also separately for men and women.

Table 29 shows the distribution of health behavior during the period 2004 to 2010. Around 44% of the population has a **healthy diet**. However, gender differences are obvious: More than 54% of the female and only a third of the male population has a healthy diet. Remarkable changes over time are not observable.

Table 29: Distribution of health behavior in the GSOEP population (%)*/**

Health Behavior	Sample		2004	2005	2006	2007	2008	2009	2010
Healthy diet	Total	Yes	45.44	#	44.95	#	44.98	#	43.68
		No	54.56	#	55.05	#	55.02	#	56.32
	Male	Yes	36.07	#	35.12	#	35.01	#	32.54
		No	63.93	#	64.88	#	64.99	#	67.46
	Female	Yes	54.58	#	54.35	#	54.51	#	54.23
		No	45.42	#	45.65	#	45.49	#	45.77
Non-smoking	Total	Yes	64.60	#	64.30	#	66.42	#	66.83
		No	35.40	#	35.70	#	33.58	#	33.17
	Male	Yes	60.45	#	61.17	#	62.65	#	62.87
		No	39.55	#	38.83	#	37.35	#	37.13
	Female	Yes	68.64	#	67.29	#	70.02	#	70.56
		No	31.64	#	32.71	#	29.98	#	29.44
Sufficient physical activity	Total	Yes	#	33.72	#	35.49	40.67	37.64	#
		No	#	66.28	#	64.51	59.33	62.36	#
	Male	Yes	#	33.36	#	34.25	39.67	38.77	#
		No	#	66.64	#	65.75	60.33	61.23	#
	Female	Yes	#	34.07	#	36.67	41.63	36.45	#
		No	#	65.93	#	63.33	58.37	63.55	#
No regular alcohol consumption	Total	Yes	#	#	85.56	#	83.78	#	85.18
		No	#	#	14.44	#	16.22	#	14.82
	Male	Yes	#	#	77.40	#	74.93	#	76.97
		No	#	#	22.60	#	25.07	#	23.03
	Female	Yes	#	#	93.37	#	92.23	#	92.96
		No	#	#	6.630	#	7.77	#	7.04
Health-promoting behavior	Total	Yes	#	#	#	#	51.37	#	#
		No	#	#	#	#	48.63	#	#
	Male	Yes	#	#	#	#	44.71	#	#
		No	#	#	#	#	55.29	#	#
	Female	Yes	#	#	#	#	57.75	#	#
		No	#	#	#	#	42.25	#	#

* Weighted results, ** Sample size for each type of health behavior and year is presented in **appendix 5**. # Data not available

Regarding **smoking**, about two-thirds of the respondents are non-smokers. Differences between men and women exist, but they are considerably smaller than for dietary behavior. Over time, the share of individuals that are non-smokers increases by two percentage points.

In contrast, only one third of the population is sufficiently **physically active**. This applies for the whole study population. In the course of time more individuals practice sports sufficiently. The increase amounts to approximately 4 percentage points.

Concerning **alcohol consumption**, about 85% drink less than regularly at least one out of four types of alcoholic beverages. Women indicate this even more often than men (~93% vs. ~75%).

Turning to the **combined health behavior index**, 51.37% of the total sample indicates to practice health-promoting behavior. However, there are big gender differences: whereas 57.75% of the female sample behaves in a health-promoting way, only 44.71% of the male sample follows a health-oriented lifestyle.

Table 30 describes changes in health behavior over time. One third of the population never follows a **healthy diet**. Additionally, differences between men and women are obvious (43.12% vs. 24.4%). In contrast, one fifth always adhere to a healthy diet over the whole observation period. The remaining 47.03% change their dietary behavior over time. In contrast to the year-by-year view, the share of permanent **non-smokers** amounts to 56.30% and is subsequently lower. These differences are also observable for the subsamples separated by sex. Differences between women and men are comparable to the yearly view. Concerning **alcohol consumption**, results differ from the view of single years. Looking at individuals who always indicate moderate alcohol consumption, a decrease of 10 percentage points is evident.

Finally, 44.29% of the GSOEP population is never sufficiently **physically active**, whereas around 16% fulfill the recommendations for physical activity. Other respondents change their behavior over time.

In conclusion, results show that analyzing health behavior separated by sex is necessary. Generally, more women behave in a health-promoting way than men. This is valid for all types of health behavior as well as for the combined health behavior indicator. Furthermore, sequences of health behavior vary over time. Nevertheless, a relevant share of individuals does not change their health behavior, neither from health-damaging to health-promoting nor vice versa. Thus 81.64% do not change their patterns of tobacco consumption. A comparable distribution is observable for alcohol consumption. Interestingly, 52.92% do not change their dietary behavior and 60.59% show a stable physical activity behavior. However, at least about 18% report changes in their health behavior. This issue is analyzed in detail in section 7.b.iii and iv. .

Table 30: Sequences of healthy behavior (summarized)*

Number of years	Healthy diet (%) N=11,180			Non-smoking (%) N=9,416			No regular alcohol consumption (%) N=12,677			Sufficient physical activity N=11,213		
	total	**male**	**female**	**total**	**male**	**female**	**total**	**male**	**female**	**total**	**male**	**female**
0	33.51	43.12	24.48	25.34	28.59	22.43	6.75	11.19	2.60	44.29	46.61	42.05
1	13.36	14.73	12.07	5.21	6.25	4.29	6.39	9.60	3.39	11.19	10.62	11.74
2	20.13	20.25	20.01	7.65	8.10	7.24	10.10	14.21	6.25	16.95	15.87	18.00
3	13.59	10.27	16.71	5.50	5.46	5.53	76.77	65.00	87.76	11.27	10.64	11.87
4	19.41	11.63	26.72	56.30	51.60	60.51	#	#	#	16.30	16.26	16.34

*Only respondents who always answered the questions on health behavior are considered.

7.b Multivariate analyses

The following section deals with the multivariate analyses of health behavior. The chapter is divided into four parts. First, section 7.b.i presents cross-sectional analyses of the study year 2008. Second, section 7.b.ii show results of cross-sectional analyses using the permanent at-risk-of-poverty rate, the combined poverty indicator, and SES information. Third, fixed effects logistic regression models for the study periods 2004–2010 and 2005–2009[83] (7.b.iii) are described. Fourth, section 7.b.iv deals with fixed effects logistic regression analyses using information on a permanent at-risk-of-poverty rate, the combined poverty indicator, and SES (2000–2010 and 2001–2009[84]). Each section presents the results of the three measurements to describe risk of poverty, multidimensional poverty, and SES that are subsequently discussed and compared against one another. All results are based on models with confounding variables. To focus the discussion only those for the variables of interest are presented here. The full estimation results can be found in the **appendix 6**.

Next, section 7.b.v compares the applied types of models (7.b.i - iv). In section 7.b.vi results of confounding variables are presented and discussed. Finally, section 7.c summarizes and discusses the main findings of this thesis on the basis of the theoretical framework (cf. chapter 3).

7.b.i Cross-sectional analyses 2008

The following section presents results of cross-sectional logistic regression models on five dimensions of health behavior and the at-risk-of-poverty rate, the combined poverty indicator, and the SES.

Table 31 summarizes values of pseudo R-squareds (R^2) of the cross-sectional analyses (step 1) that are based on McFadden (cf. McFadden 1973 and Kohler and Kreuter 2008). By way of comparison, pseudo R^2 as goodness-of-fit measure is rather small (<0.1) which can often be observed in analyses regarding health behavior.

[83] 2004–2010 applies to dietary behavior and tobacco consumption, 2005 -2009 applies to physical activity.
[84] 2000–2010 applies to dietary behavior and tobacco consumption, 2001 -2009 applies to physical activity.

Table 31: Pseudo-R² of the cross-sectional analyses

Dependent Variables	Independent Variables	Total sample	Male sample	Female sample
		Pseudo-R²	Pseudo-R²	Pseudo-R²
Diet (healthy diet=1)	At-risk-of-poverty	0.063	0.034	0.042
Smoking (non-smoking=1)	At-risk-of-poverty	0.071	0.074	0.068
Alcohol consumption (no regular consumption=1)	At-risk-of-poverty	0.090	0.024	0.067
Physical activity (sufficient physical activity=1)	At-risk-of-poverty	0.081	0.090	0.086
Combined health behavior (health-oriented=1)	At-risk-of-poverty	0.082	0.071	0.075
Diet (healthy diet=1)	Combined poverty indicator	0.064	0.034	0.046
Smoking (non-smoking=1)	Combined poverty indicator	0.074	0.076	0.072
Alcohol consumption (no regular consumption=1)	Combined poverty indicator	0.095	0.027	0.068
Physical activity (sufficient physical activity=1)	Combined poverty indicator	0.087	0.094	0.094
Combined health behavior (health-oriented=1)	Combined poverty indicator	0.085	0.073	0.080
Diet (healthy diet=1)	SES	0.060	0.030	0.037
Smoking (non-smoking=1)	SES	0.070	0.073	0.064
Alcohol consumption (no regular consumption=1)	SES	0.094	0.022	0.065
Physical activity (sufficient physical activity=1)	SES	0.074	0.081	0.079
Combined health behavior (health-oriented=1)	SES	0.074	0.060	0.068

Highest values are present for all three models regarding alcohol consumption (0.090–0.095). Pseudo R^2 for physical activity and the combined health behavior indicator are > 0.08 except for SES. Lowest values are observed for healthy diet (0.060–0.064). Interestingly, pseudo R^2 for separated samples by sex deviate from the total sample. On the one hand, values are clearly lower (healthy diet); on the other hand, males show lower values than women (alcohol consumption).

For physical activity, pseudo R^2 is even higher for men and women than for the total sample. This issue illustrates the importance of sex as explanatory variable.

7.b.i.1 Results of the logistic regression models using the at-risk-of-poverty rate of 2008

Table 32 presents the results of the logistic regression models using the at-risk-of-poverty rate of 2008.

Table 32: Results of the logistic regression models using the at-risk-of-poverty rate of 2008[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio[85]	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1) N = 14,913	At-risk-of-poverty	0.993	0.088	1.119	0.153	0.918	0.105
Smoking (non-smoking=1) N = 14,913	At-risk-of-poverty	0.992	0.086	1.011	0.133	0.988	0.116
Alcohol consump-tion (no regular consump-tion=1) N = 14,913	At-risk-of-poverty	**1.350****	0.181	**1.512****	0.251	0.900	0.198
Physical activity (sufficient physical activity=1) N = 14,913	At-risk-of-poverty	**0.795****	0.073	0.905	0.126	**0.756****	0.092
Combined health behavior (health-oriented=1) N = 13,953	At-risk-of-poverty	**0.777*****	0.074	0.912	0.129	**0.716*****	0.089

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

There are no significant differences regarding following a **healthy diet** or **tobacco consumption** between individuals who are affected by income poverty and the reference group (prosperity). In contrast, income-poor individuals are less likely to drink regular **alcoholic beverages** (OR=1.35) but they are also less likely to practice sufficient **physical activity** (OR=0.795).

[85] Odds Ratio = OR.

Concerning the **combined health behavior** that considers dietary behavior, smoking, and physical activity, a similar relationship is observable (OR=0.77).

Looking at the samples that are separated by sex, results differ. In the male sample, only significant results regarding alcohol consumption exist (OR=1.512), whereas income-poor women are less likely to do sufficient sport (OR=0.756) or to behave in a health-oriented manner overall (OR=0.716).

In conclusion, individuals who are at risk of poverty are less likely to behave in a health-promoting way in terms of physical activity and the combined health behavior indicator. In contrast, they are more likely to behave in a health-promoting way with regard to alcohol consumption.

7.b.i.2 Results of the logistic regression models using the combined poverty indicator of 2008

Turning to the **combined poverty indicator**, results differ for each poverty group (**table 33**).

There are only a few differences between the reference group 'secure prosperity' and the poverty as well as the precarity groups concerning having a **healthy diet**. Significant differences are only observable for individuals who are affected by moderate poverty. These respondents are less likely to have a healthy diet (OR=0.784). However, if the sample is separated by sex, the distribution of significant odds ratios varies. For men, dietary behavior differs from the reference group only if they are affected by vulnerability, whereas moderately and one-sidedly poor women are less likely to have a healthy diet.

In contrast, significant differences are observable for the category **non-smoking**. The lowest odds of being non-smokers are in all three groups of poverty (OR: 0.647–0.693), followed by the group of vulnerability (OR= 0.734). Nevertheless, moderately poor men as well as women in a precarious situation do not show significant differences in comparison to their prosperous counterpart.

Interestingly, results on **alcohol consumption** show an inverse relationship. Individuals who belong to the groups 'extreme poverty' (OR=1.838), 'moderate poverty' (OR=1.656) and 'fragile prosperity' (OR=1.233) are more likely not to drink alcohol regularly than the reference group.

Thus these individuals behave in a more health-promoting manner than prosperous individuals. The observed significant results are only observable for the male sample but not for women.

Table 33: Results of the logistic regression models using the combined poverty indicator of 2008[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	Extreme poverty	0.924	0.130	1.193	0.245	0.772	0.140
	Moderate poverty	**0.784****	0.086	0.963	0.164	**0.672*****	0.094
	One-sided poverty	0.891	0.098	1.136	0.178	**0.717****	0.105
	Vulnerability	0.864	0.094	**0.730***	0.123	0.951	0.141
	Fragile prosperity	1.058	0.071	0.992	0.098	1.122	0.107
N = 14,913							
Smoking (non-smoking=1)	Extreme poverty	**0.647*****	0.086	**0.626****	0.117	**0.673****	0.129
	Moderate poverty	**0.693*****	0.077	0.770	0.124	**0.674****	0.104
	One-sided poverty	**0.669*****	0.074	**0.767***	0.116	**0.625*****	0.099
	Vulnerability	**0.734*****	0.086	**0.643*****	0.105	0.856	0.145
	Fragile prosperity	0.963	0.070	**0.825***	0.082	1.164	0.126
N = 14,913							
Alcohol consump-tion (no regular consump-tion=1)	Extreme poverty	**1.838*****	0.375	**2.096*****	0.505	1.147	0.463
	Moderate poverty	**1.656*****	0.285	**2.216*****	0.466	0.804	0.221
	One-sided poverty	1.226	0.177	**1.350***	0.233	1.022	0.258
	Vulnerability	1.134	0.173	1.236	0.228	0.857	0.235
	Fragile prosperity	**1.233****	0.111	**1.278****	0.138	1.124	0.179
N = 14,913							
Physical activity (sufficient physical activity=1)	Extreme poverty	**0.446*****	0.068	**0.446*****	0.068	**0.353*****	0.074
	Moderate poverty	**0.449*****	0.053	**0.449*****	0.053	**0.364*****	0.059
	One-sided poverty	**0.577*****	0.064	**0.577*****	0.064	**0.502*****	0.076
	Vulnerability	**0.559*****	0.067	**0.559*****	0.067	**0.512*****	0.085
	Fragile prosperity	**0.794*****	0.054	**0.794*****	0.054	**0.701*****	0.065
N = 14,913							
Combined health be-havior (health-oriented=1)	Extreme poverty	**0.485*****	0.084	**0.606***	0.155	**0.413*****	0.094
	Moderate poverty	**0.615*****	0.077	0.800	0.150	**0.519*****	0.085
	One-sided poverty	**0.578*****	0.077	0.848	0.158	**0.446*****	0.079
	Vulnerability	**0.676*****	0.076	**0.646*****	0.105	**0.685****	0.107
	Fragile prosperity	0.966	0.065	0.950	0.092	0.980	0.095
N = 13,935							

[a]Reference group = prosperity

[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.

[c]Significance level: ***,**,* = 1%, 5%, 10%

For **physical activity**, all odds ratios are highly significant and lower than 1.0. The lowest odds ratio is found for extreme poverty (OR=0.446), followed by moderate poverty (OR=0.449), one-sided poverty (OR=0.577), and vulnerability (OR=0.559) as well as fragile prosperity (OR=0.794).
Hence, prosperous individuals are more likely to be sufficiently physically active than their counterparts. Comparing the male and the female sample, OR are lower for women than for men (OR_{min}=0.353 and OR_{min}=0.446).
Finally, the logistic regression model on **combined health behavior** shows significant results with the exception of fragile prosperity.
Especially extremely poor individuals are least likely to behave in a health-promoting way if three types of health behavior are considered simultaneously (OR=0.485). Moderately and one-sidedly poor as well as vulnerable respondents are also less likely to behave healthily (OR=0.578–0.676). However, results for men are not significant regarding moderate and one-sided poverty as well as fragile prosperity. Thus results for men and women vary in parts.
In conclusion, the highest differences between the reference group and the poor as well as precarious individuals are observable for smoking, physical activity, and the combined health behavior indicator. In contrast, dietary behavior differs only in one case whereas alcohol consumption shows a positive relationship.

7.b.i.3 Results of the logistic regression models using the SES of 2008

Table 34 presents the results of the logistic regression models using the SES of 2008. First, it has to be emphasized that almost all results are highly significant.
Individuals with a low SES are least likely to have a **healthy diet** (OR=0.585). Additionally, respondents with a medium SES are also less likely to eat healthily in comparison to the group of high SES (OR=0.75). This gradient is observable for men but not significant for women. Nevertheless, the odds ratio of women with a low SES is comparable with results for the total sample.

Furthermore, this inverse relationship is obvious for **smoking**, **physical activity** and the **combined health behavior** indicator and varies only minimally between men and women. As already shown for the two poverty measurements, individuals who are affected by a low SES or medium SES are more likely to behave health-promoting in the area of **alcohol consumption** than respondents who belong to the group of high SES.

The greatest odds of behaving in a health-promoting way in this category are among women with a low SES.

The widest differences between a low and a high SES are observable for combined health behavior (OR=0.345), non-smoking (OR=0.378), and physical activity (OR=0.397) as well as alcohol consumption (OR=2.255).

Table 34: Results of the logistic regression models using the SES of 2008[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1) N = 14,913	Low SES	**0.585*****	0.046	**0.598*****	0.067	**0.596*****	0.064
	Medium SES	**0.750*****	0.048	**0.641*****	0.058	0.881	0.080
Smoking (non-smoking=1) N = 14,913	Low SES	**0.378*****	0.033	**0.383*****	0.045	**0.381*****	0.049
	Medium SES	**0.567*****	0.042	**0.568*****	0.058	**0.572*****	0.063
Alcohol consumption (no regular consumption=1) N = 14,913	Low SES	**2.255*****	0.235	**1.865*****	0.233	**3.738*****	0.732
	Medium SES	**1.666*****	0.135	**1.479*****	0.147	**2.184*****	0.291
Physical activity (sufficient physical activity=1) N = 14,913	Low SES	**0.397*****	0.031	**0.367*****	0.042	**0.418*****	0.046
	Medium SES	**0.689*****	0.044	**0.663*****	0.062	**0.704*****	0.063
Combined health behavior (health-oriented=1) N = 13,953	Low SES	**0.345*****	0.029	**0.341*****	0.040	**0.357*****	0.042
	Medium SES	**0.599*****	0.041	**0.555*****	0.052	**0.648*****	0.065

[a]Reference group = prosperity

[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.

[c]Significance level: ***,**,* = 1%, 5%, 10%

7.b.i.4 Discussion of the cross-sectional analyses 2008

Generally, the three measurements to describe poverty and the SES show that non-prosperous individuals are less likely to behave in a health-promoting way. This applies particularly to physical activity and combined health behavior. In contrast, this relationship cannot be confirmed for alcohol consumption.

In this case, individuals who are living in prosperity or have a high SES are more likely to drink regularly alcohol than their non-prosperous counterparts. However, the measurement of the at-risk-of-poverty rate leads to the weakest results: There are no significant differences regarding dietary behavior and smoking but for alcohol consumption, physical activity, and combined health behavior.

Using multidimensional measurements, namely the combined poverty indicator and the SES, non-prosperous individuals, including poverty, precarity and low SES are more likely to behave in a health-damaging way, except for alcohol consumption. In comparison to the unidimensional at-risk-of-poverty rate, differences between the reference group and the other groups are clearly stronger. Thus, income as a single indicator is not able to cover the construct of poverty as well as of SES in the same way. In fact, life domains and SES dimensions of educational status and occupational status have high relevance to determine individual health behavior. Although the greatest differences are observable for the SES, it has to be underlined that the combined poverty indicator allows a more differentiated view on poverty. Interestingly, odds ratios increase from extreme poverty to fragile prosperity and show a gradient to the results of the reference group.

The present cross-sectional analyses confirm the majority of associations with health behavior among adults from the literature for the applied measurements.

However, previous findings on income and **dietary behavior** cannot be confirmed. National and international cross-sectional studies observe that individuals with a low income less often have a healthy diet (cf. Grünheid 2004; Mackenbach 2006a). Schneider and Schneider (2009b), who used GSOEP data of 2006, approve the present results for income, but not explicit for poverty.

Studies that used SES indicators including at least one out of the three SES dimensions show that a low SES is associated with a lower likelihood of following a healthy diet (cf. eg. Johansson et al. 1999; Martikainen et al. 2003; Max Rubner-Institute 2008b). Since there are no comparable findings on cumulative poverty, it is not possible to compare the combined poverty indicator with previous findings.

Results for **tobacco consumption** are in line with previous findings on SES and poverty. I.e., individuals with a low SES are more often smokers than those with a higher status. This applies for all three categories of SES (cf. e.g. Harper and Lynch 2007; Lantz et al. 1998; Mackenbach 2006a; Nocon et al. 2007). Likewise results on poverty and smoking behavior can be confirmed with findings for Germany and the US (Schiller et al. 2010; Robert Koch-Institute 2010).

Next, **alcohol consumption** is examined. In this case, previous research shows less clear findings. However, for these analyses health-promoting behavior can be reported for the non-prosperous individuals independently of the used measurement. This observation is in line with previous findings (cf. e.g. Lantz et al. 1998; Schiller et al. 2010).

Looking at the female subsample, this association is only observable for the SES but neither for the at-risk-of-poverty rate nor for the combined poverty indicator. Observations by Schneider and Schneider (2009b) and Grünheid (2004) that income influences women's alcohol consumption cannot be confirmed by the present analyses.

Interestingly, results on SES contradict the findings of the German NVS II. This study finds that men with a low SES consume more alcohol than men with a medium or high SES. This difference may result from the specific construction from the variables.

Results on **physical activity** consistently confirm findings of previous research. This applies to income poverty / the at-risk-of-poverty rate (cf. Lampert and Kroll 2005; Schiller et al. 2010) as well as to indicators to describe SES (cf. e.g. Harper and Lynch 2007; Lantz et al. 1998; Nocon et al. 2007).

With regard to **combined health behavior**, only a few studies exist. Looking at the total sample, it becomes clear that poverty or a low SES influences the combined health behavior negatively.

These findings are supported by Miller et al. (2005) and by Reeves and Rafferty (2005)). However, if the sample is separated by sex, results for the male sample are less clear. There are no significant differences between the at-risk-of-poverty group and the reference group. Using the combined poverty indicator, significant odds ratios are present for only two out of five groups. These findings underline the importance of analyzing health behavior separated by sex.

Looking at the theoretical framework, it is stated in hypothesis **H1** that 'health behavior is influenced by poverty and SES directly and indirectly via material and psychosocial factors'. With regard to the presented results, the first part of this hypothesis can be mainly confirmed. The same applies to hypothesis **H2**: Suitable poverty and SES dimensions are represented by income, occupational status, and education. Furthermore, material aspects such as unemployment and financial savings also contribute to the poverty situation that impacts health behavior.

7.b.ii Cross-sectional analyses using permanent poverty and SES

Section 7.b.ii presents results of cross-sectional logistic regression models using the permanent at-risk-of-poverty rate, the combined poverty indicator, and the SES. Therefore, information of 2004–2008 is used for analyzing the five types of health behavior.

Table 35 presents pseudo R^2 of the cross-sectional analyses using the permanent at-risk-of-poverty rate, the combined poverty indicator, and SES of 2004–2008 (step 2).

As already explained in section 7.b.i, values of pseudo R^2 are small. For these models the highest values are achieved for alcohol consumption (0.089–0.094). Lowest goodness-of-fit is found for dietary behavior (0.053–0.063). Looking at the pseudo R^2 for males and females, values are considerably smaller with regard to dietary behavior whereas pseudo R^2 is higher for separated samples for models on physical activity. Finally, men show lower values than women (alcohol consumption).

Table 35: Pseudo-R^2

Dependent Variables	Independent Variables	Total sample	Male sample	Female sample
		Pseudo-R^2	Pseudo-R^2	Pseudo-R^2
Diet (healthy diet=1)	At-risk-of-poverty	0.057	0.030	0.041
Smoking (non-smoking=1)	At-risk-of-poverty	0.073	0.068	0.075
Alcohol consumption (no regular consumption=1)	At-risk-of-poverty	0.094	0.026	0.058
Physical activity (sufficient physical activity=1)	At-risk-of-poverty	0.082	0.090	0.089
Combined health behavior (health-oriented=1)	At-risk-of-poverty	0.078	0.064	0.077
Diet (healthy diet=1)	Combined poverty indicator	0.063	0.035	0.046
Smoking (non-smoking=1)	Combined poverty indicator	0.078	0.071	0.081
Alcohol consumption (no regular consumption=1)	Combined poverty indicator	0.089	0.020	0.046
Physical activity (sufficient physical activity=1)	Combined poverty indicator	0.079	0.082	0.089
Combined health behavior (health-oriented=1)	Combined poverty indicator	0.085	0.068	0.087
Diet (healthy diet=1)	SES	0.053	0.027	0.036
Smoking (non-smoking=1)	SES	0.069	0.065	0.068
Alcohol consumption (no regular consumption=1)	SES	0.093	0.023	0.054
Physical activity (sufficient physical activity=1)	SES	0.080	0.087	0.085
Combined health behavior (health-oriented=1)	SES	0.070	0.057	0.066

7.b.ii.1 Results of the logistic regression models using the permanent at-risk-of-poverty rate of 2004–2008

Results presented in **table 36** show the logistic regression models using the permanent at-risk-of-poverty rate of 2004 to 2008.

Table 36: Results of the logistic regression models using the permanent at-risk-of-poverty rate of 2004–2008[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1) N = 12,221	At-risk-of-poverty	0.964	0.108	0.977	0.169	0.947	0.136
Smoking (non-smoking=1) N = 12,221	At-risk-of-poverty	**0.748*** **	0.081	**0.701** **	0.114	0.799	0.119
Alcohol consump-tion (no regular consump-tion=1) N = 12,221	At-risk-of-poverty	1.255	0.197	**1.413***	0.274	0.882	0.224
Physical activity (sufficient physical activity=1) N = 12,221	At-risk-of-poverty	**0.791** **	0.092	0.91	0.163	**0.717** **	0.109
Combined health be-havior (health-oriented=1) N = 11,393	At-risk-of-poverty	**0.690*** **	0.085	**0.688** **	0.131	**0.690** **	0.112

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

For the category **diet**, there are no significant differences between individuals who are permanently at risk of poverty and the reference group of prosperity.

In contrast, respondents who are at risk of poverty are less likely to be **non-smokers** (OR=0.748). However, if the sample is separated by sex, only men are less likely to be non-smokers (OR=0.701).

Concerning **alcohol consumption**, there are no significant differences between respondents who are permanently at risk of poverty and the reference group. Only men of the risk group are more likely not to drink regularly alcohol (OR=1.413).

On the other hand, permanent risk of poverty leads to a lower likelihood of being sufficiently **physically active** (OR=0.791). Nevertheless, these results are not significant for male respondents but for females (OR=0.717).

Finally, the lowest odds ratios are observable regarding the **combined health behavior** indicator. Independent of sex, individuals who are affected by permanent risk of poverty are less likely to behave in a health-promoting way (OR=0.690).

In conclusion, results underline that permanent risk-of-poverty affects the five types of health behavior in different ways. The biggest disadvantages are reported for smoking, physical activity and combined health behavior. Furthermore, men and women cope with being at risk of poverty in different ways.

7.b.ii.2 Results of the logistic regression models using the permanent combined poverty indicator of 2004–2008

Table 37 presents results of the logistic regression models using the permanent combined poverty indicator of 2004 to 2008.

First, **dietary behavior** differs only in two cases from the reference group. Extremely poor individuals (OR=0.682) are least likely to have a healthy diet, followed by moderately poor respondents (OR=0.758). Looking at the male and female sample, significant odds ratios are only existent for moderately poor women (OR=0.634).

In contrast, there are significant differences regarding **non-smoking** for all groups of poverty and precarity. The lowest likelihood is among permanently extremely and moderately poor individuals (OR=0.444 and OR=0.418). In comparison to the latter results, differences are smaller for permanently one-sidedly poor (OR=0.609), vulnerable (OR=0.729) as well as fragile prosperous individuals (OR=0.822), who are also less likely to be non-smokers. Significant results on smoking differ if analyses of males and females are separated.

Furthermore, if individuals are affected by permanent one-sided poverty, they are more likely to behave healthily in the area of **alcohol consumption** (OR=2.642). Additionally, permanently moderately poor as well as fragilely prosperous individuals are more likely not to indicate regular alcohol consumption.

Turning to the results for the male and female sample, there are only significant results for men. ORs are even slightly higher than in the total sample. In contrast, there are no significant results between poor and precarious women and the reference group.

Table 37: Results of the logistic regression models using the permanent combined poverty indicator of 2004–2008[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	Extreme poverty	**0.682***	0.138	0.649	0.202	0.698	0.184
	Moderate poverty	**0.758***	0.121	0.894	0.213	**0.634****	0.130
	One-sided poverty	1.083	0.244	1.417	0.455	0.846	0.239
	Vulnerability	0.826	0.099	0.824	0.149	0.811	0.132
	Fragile prosperity	0.978	0.079	1.023	0.122	0.930	0.102
N = 10,464							
Smoking (non-smoking=1)	Extreme poverty	**0.444*****	0.084	**0.395*****	0.108	**0.474*****	0.127
	Moderate poverty	**0.418*****	0.062	**0.464*****	0.100	**0.393*****	0.080
	One-sided poverty	**0.609****	0.133	0.642	0.200	0.602	0.187
	Vulnerability	**0.729****	0.091	**0.673****	0.116	0.797	0.145
	Fragile prosperity	**0.822****	0.072	0.832	0.100	0.826	0.104
N = 10,464							
Alcohol consumption (no regular consumption=1)	Extreme poverty	1.257	0.318	1.466	0.444	0.734	0.334
	Moderate poverty	**1.476***	0.329	**1.558***	0.419	1.272	0.490
	One-sided poverty	**2.642*****	0.826	**2.922*****	1.067	2.145	1.295
	Vulnerability	1.253	0.194	1.225	0.228	1.398	0.415
	Fragile prosperity	**1.222***	0.128	**1.286****	0.163	1.066	0.193
N = 10,464							
Physical activity (sufficient physical activity=1)	Extreme poverty	**0.353*****	0.082	**0.521****	0.173	**0.274*****	0.081
	Moderate poverty	**0.405*****	0.070	**0.618***	0.154	**0.28*****	0.068
	One-sided poverty	**0.401*****	0.089	**0.532****	0.166	**0.305*****	0.097
	Vulnerability	**0.523*****	0.068	**0.611*****	0.114	**0.458*****	0.083
	Fragile prosperity	**0.65*****	0.054	**0.684*****	0.083	**0.629*****	0.071
N = 10,464							
Combined health behavior (health-oriented=1)	Extreme poverty	**0.328*****	0.072	**0.251*****	0.083	**0.38*****	0.107
	Moderate poverty	**0.381*****	0.061	**0.515*****	0.123	**0.305*****	0.063
	One-sided poverty	**0.584****	0.133	0.773	0.240	**0.463****	0.147
	Vulnerability	**0.631*****	0.077	**0.691****	0.121	**0.581*****	0.099
	Fragile prosperity	**0.761*****	0.061	**0.794****	0.092	**0.737*****	0.083
N = 10,464							

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

However, prosperous individuals are more likely to be sufficiently **physically active** than their poor and precarious counterparts. The lowest odds ratios are observable for the permanently extremely poor (OR=0.353). Furthermore, odds ratios for permanently moderately and one-sidedly poor individuals are also low (OR=0.405 and 0.401). In addition, individuals who belong either to the vulnerability group (OR=0.523) or to the fragile prosperity group (OR=0.65) are less likely to practice sufficient sports.

The described effects are stronger for female than for male individuals. Permanently extremely poor women are least likely to be sufficiently physically active (OR=0.274). Altogether, odds ratios for women are lower than 0.5. Only fragilely prosperous women reach an OR of 0.629. In contrast, the lowest OR for men amounts to 0.521 for the group of extreme poverty.

Finally, **table 37** shows results of the logistic regression model of **combined health behavior** and the permanent combined poverty indicator. Looking at the total sample, a decreasing gradient is observable. The least likely people to behave in a health-promoting way are permanently extremely poor individuals (OR=0.328). Comparable significant differences also exist for permanently moderately poor respondents (OR=0.381). However, the one-sidedly poor, vulnerable, and fragilely prosperous are also less likely to behave in a health-promoting way than their prosperous counterparts. Comparable results offer analyses separated by sex. The lowest odds ratios exist for extremely poor men (OR=0.251). Altogether, a similar gradient like for the total sample exists both for men and women. There are no significant differences between permanently one-sidedly poor men and the reference group.

In conclusion, the most noticeable results as well as a gradient from extreme poverty to fragile prosperity are observable for the categories combined health behavior, physical activity, and smoking. In these cases, prosperous individuals are more likely to behave in a health-promoting way than poor or precarious individuals. As already shown for previous analyses, results for alcohol consumption are inverse. In contrast, the poverty status has the lowest impact on dietary behavior. Furthermore, the impact of the combined poverty indicator varies by sex. For instance, women's physical activity is more reduced, especially in the poverty groups.

7.b.ii.3 Results of the logistic regression models using the permanent SES of 2004–2008

Table 38 presents results of the logistic regression models using the permanent SES of 2004–2008. Generally, all results are significant at the 5% and 1% level.

First, individuals with a low SES are least likely to have a **healthy diet** (OR=0.621).

Additionally, respondents with a medium SES perform worse than the reference group (OR=0.743). These results are reflected in the analyses that are separated by sex, too.

Table 38: Results of the logistic regression models using the permanent SES of 2004–2008[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1) N = 12,907	Low SES	**0.621*****	0.056	**0.641*****	0.083	**0.602*****	0.075
	Medium SES	**0.743*****	0.054	**0.705*****	0.073	**0.776****	0.080
Smoking (non-smoking=1) N = 12,907	Low SES	**0.424*****	0.042	**0.439*****	0.060	**0.411*****	0.060
	Medium SES	**0.596*****	0.051	**0.612*****	0.070	**0.581*****	0.073
Alcohol consumption (no regular consumption=1) N = 12,907	Low SES	**2.129*****	0.256	**1.839*****	0.268	**3.224*****	0.710
	Medium SES	**1.429*****	0.128	**1.320****	0.146	**1.693*****	0.243
Physical activity (sufficient physical activity=1) N = 12,907	Low SES	**0.332*****	0.031	**0.316*****	0.043	**0.346*****	0.045
	Medium SES	**0.576*****	0.042	**0.568*****	0.060	**0.571*****	0.059
Combined health behavior (health-oriented=1) N = 11,292	Low SES	**0.354*****	0.034	**0.329*****	0.046	**0.367*****	0.051
	Medium SES	**0.569*****	0.044	**0.590*****	0.062	**0.534*****	0.061

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

Being in the group of low SES or medium SES implies a lower chance of being a **non-smoker** (OR=0.424 and OR=0.596). These results can also be found for females and males.

In contrast, the reference group is less likely not to **drink alcohol** regularly (OR=2.129 and OR=1.429). These effects are stronger for women than for men (OR=3.224 vs. OR=1.829).

The lowest odds ratios are found for the category of **physical activity**. For a low SES, the odds ratio is 0.332. Individuals with a medium SES are also less likely to do sufficient sports. This is valid not only for the total but also for the male and female sample.

This issue can also be stated in terms of the **combined health behavior** indicator. Individuals with a low SES are least likely to behave in a health-promoting manner, followed by a medium SES.

In conclusion, the widest differences regarding the listed types of health behavior exist for the combined health behavior indicator and physical activity, followed by non-smoking and a healthy diet. Odds ratios > 1 are only observable concerning regular alcohol consumption. Interestingly, results of models using the permanent SES do not clearly vary by sex.

7.b.ii.4 Discussion of the cross-sectional analyses using permanent poverty and SES

Analyses of individuals who are either at risk of poverty, poor, precarious, or have a low SES at a permanent level show that they are less likely to behave in a health-promoting way than their prosperous counterparts.

The smallest differences are reported for the at-risk-of-poverty rate. In contrast, the combined poverty indicator and the SES affect the health behavior in a stronger and comparable way.

Furthermore, for these indicators significant odds ratios can be found for all five categories of health behavior, while using the at-risk-of-poverty rate produces only significant results for tobacco consumption, physical activity, and combined health behavior. Thus these findings emphasize and confirm the relevance of considering multidimensional aspects of poverty and social inequality that is demanded by various poverty researchers (cf. hypothesis **H2**[86] and Bradshaw and Finch 2003; Groh-Samberg 2009; Halleröd 1995; Mack and Lansley 1985; Nolan and Whelan 1996; Winkler and Stolzenberg 1999).

However, with regard to the at-risk-of-poverty rate and the combined poverty indicator, variations between men and women occur and may differ from the general sample. This does not hold true for the SES.

Previous empirical findings to compare the presented findings are rare. Benzeval and Judge (2001) state that ‘average income appears more significant for health than current income.’ This assumption can be applied.

[86] **H2**: Suitable poverty and SES dimensions are represented by income, occupational status, and education. Furthermore, material aspects such as unemployment and financial savings also contribute to the poverty situation that impacts health behavior.

Compared to results of the cross-sectional analyses using the current poverty status, differences between the permanent poverty and SES groups and the reference groups are slightly higher. The importance of persistent poverty on health behavior can be confirmed.

In addition, Lynch et al. (1997b) observe that persistently poor individuals are less often physically active, which is in line with the presented analyses for all three measurements used.

Furthermore, the authors observe for persistent poverty based on an absolute poverty level that individuals drink less alcohol than their prosperous counterparts. However, using the at-risk-of-poverty rate, Lynch et al.'s findings cannot be supported, while the combined poverty indicator and the SES confirm this outcome.

Finally, findings of this section contribute to answer hypothesis **H3** of this thesis: 'Health behavior is influenced by changes over time and length of poverty / low SES.' All three applied measurements to describe at-risk-of-poverty, poverty and SES show that they affect several dimensions of health behavior. The greatest differences are observable for the dimensions of tobacco consumption, physical activity and combined health behavior. Both multidimensional measurements show that not only the most permanent non-prosperous groups, namely poverty and low SES, but also medium SES and precarity report a higher likelihood for health-damaging behavior than their prosperous counterparts.

7.b.iii Fixed effects logistic regression analyses

This section deals with the results of panel analyses. Therefore, only three types of health behavior, namely dietary behavior, tobacco consumption, and physical activity are included. Since alcohol consumption is more prevalent among individuals who are not poor or are assigned to a high SES, it is excluded from the analyses. Additionally, due to data availability combined health behavior cannot be included in the panel analyses[87]. The presented analyses include the periods of 2004–2010 regarding dietary behavior and 2005–2009 regarding physical activity. Based on results of the Hausman specification test fixed effects analyses are conducted.

[87] This also applies to analyses that are described in section 7.b.iv.

Looking at the presented results, it must always be considered that only individuals who change their health behavior are considered in these analyses because fixed effects models use only the within-person variation (cf. Allison 2009).

7.b.iii.1 Results of the fixed effects logistic regression models using the at-risk-of-poverty rate

Results of the fixed effects logistic regression models using the at-risk-of-poverty rate are presented in **table 39**.

Table 39: Results of the fixed effects logistic regression models using the at-risk-of-poverty rate[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	At-risk-of-poverty	**1.131****	0.060	1.098	0.094	**1.145****	0.077
Number of observations: 18,207, number of individuals: 4,705							
Smoking (non-smoking=1)	At-risk-of-poverty	**1.192****	0.102	**1.395****	0.182	1.056	0.123
Number of observations: 6,596, number of individuals: 1,698							
Physical activity (sufficient physical activity=1)	At-risk-of-poverty	1.024	0.069	**1.408*****	0.151	**0.763*****	0.067
Number of observations: 15,673, number of individuals: 4,095							

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

In the total sample, significant odds ratios are observable for **dietary behavior** and **smoking**.

Individuals that are affected by at risk of poverty are more likely to realize a healthy diet than the reference group which is prosperity (OR=1.131). This effect is present for women (OR=1.145) but not for men (n.s.).

Furthermore, the analysis shows odds ratios greater than 1.0 for **non-smoking** if an individual belongs to the at-risk-of-poverty group (OR=1.192). This effect is even stronger for men (OR=1.395).

Interestingly, results regarding **physical activity** for the total sample are not significant.

However, income-poor men increase their odds of being sufficiently physically active with a 40.8% increase, whereas for women belonging to the poverty group is associated with a lower chance of being physically active (OR=0.763).

In conclusion, being at-risk-of-poverty is associated with a greater chance of behaving in a health-promoting way. Nevertheless, differences between the male and the female sample must be always considered.

7.b.iii.2 Results of the fixed effects logistic regression models using the combined poverty indicator

Table 40 shows results of panel analyses using the combined poverty indicator. The reference group is secure prosperity.

For dietary behavior, causal effects are only observable for men. Compared to secure prosperity being affected by vulnerability implies a lower likelihood of **eating in a healthy way** (OR=0.803) whereas belonging to fragile prosperity increases the likelihood for this type of health behavior.

With regard to the total sample, significant odds ratios are only observable for **smoking**. Extreme poor respondents are more likely to be non-smokers than the reference group (OR=1.472). In contrast, vulnerability reduce the chances of being non-smokers (OR=0.821). Samples that are separated by sex results vary.

Extreme poor individuals are more likely to be a non-smoker (OR=1.721) in the male sample. In contrast, the status of vulnerability is associated with lower chances of being a non-smoker. (OR=0.661). No significant odds ratios are observable for women.

Finally, men who are affected by one-sided poverty or fragile prosperity are more likely to pursue sufficient **sports** (OR=1.567 and OR=1.179).

Interestingly, women who are extreme, moderate and one-sided poor, as well as fragile prosperous, are less likely to be physically active. Lowest odds ratios are present for extreme (OR=0.646) and moderate poverty (OR=0.673) followed by one-sided poverty (OR=0.808) and fragile prosperity (OR=0.893).

In conclusion, results for the total, male and female samples vary distinctly. It is important to examine these types of health behavior separated by sex because of different responses to poverty and precarity.

Women are less likely to practice sports when being affected by precarity or poverty, whereas men's behavior differs also with regard to smoking and dietary behavior. Interestingly the majority of odds ratios for men are greater than 1.

Table 40: Results of the fixed effects logistic regression models using the combined poverty indicator[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	Extreme poverty	1.099	0.100	0.964	0.146	1.176	0.137
	Moderate poverty	1.067	0.077	1.075	0.128	1.067	0.099
	One-sided poverty	0.986	0.070	1.136	0.136	0.896	0.081
	Vulnerability	0.928	0.062	**0.803****	0.09	0.999	0.085
	Fragile prosperity	1.055	0.042	**1.131****	0.066	0.99	0.053
Number of observations: 18,207, number of individuals: 4,705							
Smoking (non-smoking=1)	Extreme poverty	**1.472****	0.223	**1.721****	0.396	1.334	0.273
	Moderate poverty	1.125	0.128	1.274	0.218	1.069	0.168
	One-sided poverty	0.919	0.106	0.822	0.141	1.049	0.166
	Vulnerability	**0.821***	0.089	**0.661****	0.112	0.986	0.145
	Fragile prosperity	0.924	0.059	0.947	0.086	0.919	0.085
Number of observations: 6,596, number of individuals: 1,698							
Physical activity (sufficient physical activity=1)	Extreme poverty	0.884	0.106	1.27	0.223	**0.646*****	0.108
	Moderate poverty	0.871	0.078	1.195	0.166	**0.673*****	0.079
	One-sided poverty	1.116	0.088	**1.567*****	0.189	**0.808****	0.086
	Vulnerability	0.956	0.075	1.073	0.133	0.86	0.089
	Fragile prosperity	0.994	0.046	**1.179****	0.087	**0.893***	0.053
Number of observations: 15,673, number of individuals: 4,095							

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

7.b.iii.3 Results of the fixed effects logistic regression models using the SES

Table 41 summarizes results of the fixed effects logistic regression models using the SES. Looking at the total sample, significant results are present for **dietary behavior** and **physical activity**.

Given a high SES as reference group, being in the medium SES group is associated with a lower likelihood of having a healthy diet (OR=0.890), but with a higher likelihood of pursuing sufficient sports (OR=1.188).

With regard to the male sample, results are comparable to the total sample. Additionally, men of the low SES group are more likely to be physically active (OR=1.632). Women with a low SES have only fewer chances of pursuing sufficient sports.

Table 41: Results of the fixed effects logistic regression models using the SES[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	Low SES	1.055	0.075	0.958	0.109	1.131	0.105
	Medium SES	**0.890****	0.049	**0.735*****	0.063	1.019	0.073
Number of observations: 18,261, number of individuals: 4,715							
Smoking (non-smoking=1)	Low SES	1.156	0.132	1.224	0.206	1.054	0.167
	Medium SES	1.056	0.095	1.059	0.141	1.030	0.128
Number of observations: 6,625, number of individuals: 1,703							
Physical activity (sufficient physical activity=1)	Low SES	1.118	0.095	**1.632*****	0.217	**0.784****	0.088
	Medium SES	**1.188*****	0.076	**1.373*****	0.137	1.017	0.086
Number of observations: 15,735, number of individuals: 4,106							

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

Generally, a low SES does not affect the three types of health behavior. However, this observation does not apply to physical activity. Men with a low SES are more likely to practice sufficient sports. In contrast, women are less likely to do so.

7.b.iii.4 Discussion of the fixed effects logistic regression analyses

Previous findings of this thesis show that non-prosperous individuals are generally more likely to behave in a health-damaging way. Results presented in this section differ considerably. This is due to the fact that fixed effects logistic regression analyses consider only individuals who change their health behavior.

First, individuals of a non-prosperous group, i.e. at-risk-of-poverty, poverty, or low SES, are often more likely to change their behavior towards a health-promoting way. In contrast to previous analyses, the three applied measurements produce different findings for the total sample. As an example, women with an income below the at-risk-of-poverty threshold have an increased likelihood to change into a healthy diet, while belonging to a low SES or a poverty group is not associated with a lower likelihood to do so.

Compared to the reference groups, individuals who belong to the groups of vulnerability or medium SES have fewer chances to eat healthily or to be non-smoker (only combined poverty indicator).

Differences by sex are also valid for these analyses. For women, dietary behavior is only positively affected using the at-risk-of-poverty. Additionally, females who belong to the three poverty groups and fragile prosperity as well as to a low SES show have a lower probability to pursue sufficient sports. On the contrary, men who belong to one of these non-prosperous groups are generally more likely to behave in a health-promoting way than their prosperous counterparts. Exceptions are only reported for dietary behavior and vulnerability as well as a medium SES and for non-smoking and vulnerability.

Currently, there are not sufficient empirical findings to allow for a comparison. Nevertheless it may be considered that Benzeval and Judge (2001) show that an income decrease affects health negatively. Further findings on health behavior are not available (cf. chapter 5). As already explained, Benzeval and Judge's findings are only conferrable to single cases of the presented analyses.

Against this background the first part of hypothesis **H1** 'Health behavior is influenced by poverty and SES directly' is approved in parts. This is discussed in detail in the final discussion.

Finally, the **third hypothesis** of the theoretical framework – that health behavior is influenced by changes over time and length of poverty / low SES – can be confirmed. Nevertheless, the direction of causal effects differs from expectations in most cases. Changing from the prosperous reference group to a non-prosperous group is mostly associated with a greater chance of health-promoting behavior. However, precarious individuals or those with a medium SES are most likely to behave in a health-damaging way. Approaches to explain these findings will be discussed in detail in the final discussion (7.c).

7.b.iv Fixed effects logistic regression analyses using permanent poverty and SES

The last section deals with the fixed effects logistic regression analyses using permanent measurements of the at-risk-of-poverty rate, the combined poverty indicator and the SES. These analyses consider the periods 2004–2010[88] and 2005–2009[89]. As already explained in section 7.b.iii, alcohol consumption and combined health behavior is excluded from the analyses. Furthermore, individuals are not included if they do not change their behavior.

7.b.iv.1 Results of the fixed effects logistic regression models using the permanent at-risk-of-poverty rate

Results of the fixed effects logistic regression models using the permanent at-risk-of-poverty rate are presented in **table 42**.

Table 42: Results of the fixed effects logistic regression models using the permanent at-risk-of-poverty rate of 2000–2010[57] and 2001–2009[58] [a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	At-risk-of-poverty	0.975	0.084	**0.659*****	0.098	**1.226***	0.133
Number of observations: 16,781, number of individuals: 4,486							
Smoking (non-smoking=1)	At-risk-of-poverty	0.839	0.113	1.267	0.292	**0.685****	0.116
Number of observations 5,975, number of individuals: 1,591							
Physical activity (sufficient physical activity=1)	At-risk-of-poverty	0.856	0.089	0.924	0.156	0.810	0.110
Number of observations 14,243, number of individuals: 3,853							

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

[88] Regarding dietary behavior and smoking.
[89] Regarding physical activity.

Basis for these analyses are five-year periods that an individual stays in a certain poverty group.

With regard to the total sample there are no causal effects for the association of being permanently at risk of poverty and the three categories of health behavior.

Compared to the reference group that is not permanent at-risk-of-poverty, men who are permanently at risk of poverty are less likely to follow a **healthy diet** (OR=0.659) whereas women are more likely to do so (OR=1.226). Additionally, women who are permanently at risk of poverty are less likely to be a **non-smoker**.

In conclusion, this description underlines the importance of separated samples for men and women. Causal effects for being permanently at risk of poverty are only present for men regarding diet and for women concerning diet and smoking.

7.b.iv.2 Results of the fixed effects logistic regression models using the permanent combined poverty indicator

Panel analyses on health behavior and the combined poverty indicator produce a number of significant differences with regard to the reference group of secure prosperity (**table 43**).

Individuals who belong to one of the five groups of permanent poverty or precarity decrease their probability to have a **healthy diet**. The highest risk of eating unhealthily is indicated for the groups of permanent extreme poverty (OR=0.485) and moderate poverty (OR=0.623). Altogether an inverse gradient is observable so that odds ratios for fragile prosperous individual is only 0.839.

If the sample is separated by sex, males and females vary regarding dietary behavior. The lowest likelihood of having a healthy diet is among males (OR=0.547) and females (OR=0.469) who are part of the extreme permanent poverty group. Furthermore, permanent moderate poor or vulnerable men as well as women who are affected by permanent moderate poverty, vulnerability and fragile prosperity groups are less likely to have a healthy diet. Odds ratios range between 0.501 and 0.803.

With regard to **tobacco consumption**, results are less clear. Only individuals who are permanent fragile prosperous are more likely to be non-smokers (OR=1.253). Interestingly, there are no significant odds ratios for men but only for women.

Looking at the female sample shows positive causal effects for the groups of permanent extreme poverty, vulnerability and fragile prosperity (OR =1.400–1.788). Permanent extreme poverty is associated with the greatest chances of behaving in a health-promoting way in this category.

Table 43: Results of the fixed effects logistic regression models using the permanent combined poverty indicator of 2000–2010 and 2001–2009[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	Extreme poverty	**0.485*****	0.076	**0.547****	0.146	**0.469*****	0.092
	Moderate poverty	**0.623*****	0.069	**0.501*****	0.094	**0.708****	0.098
	One-sided poverty	**0.768***	0.112	0.727	0.188	0.793	0.140
	Vulnerability	**0.724*****	0.060	**0.683*****	0.094	**0.750*****	0.079
	Fragile prosperity	**0.839*****	0.043	0.916	0.076	**0.803*****	0.054
Number of observations 15,065, number of individuals: 4,057							
Smoking (non-smoking=1)	Extreme poverty	1.411	0.367	1.177	0.495	**1.788***	0.613
	Moderate poverty	1.011	0.182	1.325	0.379	0.930	0.223
	One-sided poverty	0.993	0.227	1.378	0.506	0.908	0.274
	Vulnerability	1.038	0.141	**0.696***	0.142	**1.459****	0.278
	Fragile prosperity	**1.253*****	0.109	1.185	0.145	**1.400*****	0.177
Number of observations 5,319, number of individuals: 1,429							
Physical activity (sufficient physical activity=1)	Extreme poverty	1.018	0.244	**2.311****	0.820	0.734	0.248
	Moderate poverty	1.103	0.171	**2.545*****	0.655	0.790	0.159
	One-sided poverty	0.837	0.149	**3.192*****	0.965	**0.403*****	0.093
	Vulnerability	0.974	0.105	**1.885*****	0.348	**0.761****	0.104
	Fragile prosperity	0.994	0.068	**1.582*****	0.180	**0.797*****	0.070
Number of observations 13,221, number of individuals: 3,583							

[a]Reference group = prosperity
[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.
[c]Significance level: ***,**,* = 1%, 5%, 10%

Analyses of **physical activity** and the permanent combined poverty indicator show that there are no significant differences for the total sample. Nevertheless, significant odds ratios are present for men and for women. Men who belong to one of the permanent poverty or precarity groups are more likely to pursue sufficient sports than their prosperous counterparts. The highest odds ratios are observable for one-sided poverty (OR=3.192), moderate poverty (OR=2.545) and extreme poverty (OR=2.311).

Women behave contrarily. Women who are part of the permanent one-sided poverty group are least likely to be physically active (OR=0.403).

Additionally, being affected by permanent vulnerability or fragile prosperity is associated with lower odds ratios (OR=0.761–0.797). No causal effects are observable for permanent extreme or moderate poverty and pursuing sufficient sports.

In conclusion, significant results are mainly observable for dietary behavior. Particularly regarding non-smoking and physical activity, it is important to consider the results of the separated samples for men and women.

Being affected by permanent precarity and poverty is associated with a higher likelihood of being a non-smoker, whereas men are more likely to be physical active.

7.b.iv.3 Results of the fixed effects logistic regression models using the permanent SES

Finally, **table 44** describes results of the fixed effects logistic regression models using the permanent SES whereas a high SES is the reference group.

Table 44: Results of the fixed effects logistic regression models using the permanent SES of 2000–2010 and 2001–2009[a, b, c]

Dependent Variables	Independent Variables	Total sample		Male sample		Female sample	
		Odds Ratio	Std. Err.	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
Diet (healthy diet=1)	Low SES	0.863	0.086	**0.627*** **	0.100	1.092	0.142
	Medium SES	**0.879***	0.064	**0.731*** **	0.083	1.003	0.095
Number of observations 16,404, number of individuals: 4,404							
Smoking (non-smoking=1)	Low SES	**0.447*** **	0.071	**0.639***	0.147	**0.302*** **	0.069
	Medium SES	**0.488*** **	0.059	**0.566*** **	0.096	**0.404*** **	0.069
Number of observations 5,857, number of individuals: 1,564							
Physical activity (sufficient physical activity=1)	Low SES	**0.657*** **	0.084	0.773	0.156	**0.549*** **	0.092
	Medium SES	**0.756*** **	0.069	**0.726*** *	0.103	**0.708*** **	0.086
Number of observations 14,140, number of individuals: 3,825							

[a]Reference group = prosperity

[b]Results based on estimation including confounders. Full estimation results are presented in the **appendix 6**.

[c]Significance level: ***,**,* = 1%, 5%, 10%

With regard to **dietary behavior**, a permanent medium SES is associated with fewer chances of having a healthy diet (OR=0.879). Furthermore, there are significant results for men but not for women. Men belonging to the permanent low and medium SES groups are less likely to eat healthily (OR=0.627–0.731).

For **non-smoking**, odds ratios are always significant. A low SES is associated with fewer chances of being a non-smoker (OR=0.447). A change to a medium SES implies low odds ratios too (OR=0.488).

Interestingly, this effect is less strong for men than for women (low SES: OR_{man}=0.639 vs. OR_{woman}=0.302 and medium SES: OR_{man}=0.566 vs. OR_{woman}=0.404).

A permanent low or medium SES also implies less likelihood of pursuing sufficient **sport** (OR=0.657 and 0.756).

For men, there are only causal effects with regard to a permanent medium SES (OR=0.726). Females who belong to the permanent low SES are less likely to do sports (OR=0.549). This also applies to the permanent medium SES (OR=0.708).

In conclusion, a permanent low or medium SES is mostly associated with a reduced likelihood of behaving in a health-promoting manner. However, it is reasonable to take into account results separated by sex.

7.b.iv.4 Discussion of the fixed effects logistic regression analyses using permanent poverty and SES

The results presented in this section show noticeable differences between the three applied measurements. As shown in previous analytical steps (especially in 7.b.i and 7.b.ii), the (slightly) weakest impact on health behavior is reported for the at-risk-of-poverty rate for the total sample. Comparing the permanent combined poverty indicator with the permanent SES, both measurements affect health behavior in different ways. On the one hand, permanent poverty or precarity is associated with unhealthy dietary behavior. On the other hand, permanent fragile prosperity leads to increased chances of being a non-smoker.

In contrast, a permanent low or medium SES affects especially the tobacco consumption and physical activity negatively.

It can be concluded that the three determinants cover different mechanisms of explaining health behavior. For this reason they are not interchangeable.

Furthermore, these results vary for men and women. Although results for the permanent at-risk-of-poverty rate are not significant for the total sample, significant differences are reported for both subsamples. Varying results for both subsamples are also reported for the two other measurements. Interestingly, men and women may behave in opposite ways. As an example, men who are permanent at risk of poverty are less likely to follow a healthy diet than women.

This relationship is also observable for the non-smoking category and the permanent combined poverty indicator. Using this measurement also shows that permanent poverty or precarity is associated with a greater chance of pursuing sports for men than for women.

Altogether, it has to be stated that the majority of significant odds ratios are lower than 1.0, so that being to non-prosperous group is mostly associated with health-damaging behavior.

The presented findings underline the relevance of persistent poverty (cf. section 4.c, e.g. Duncan et al. 1993; Groh-Samberg 2008). Furthermore, results support Benzeval and Judge's (2001) observation that persistent poverty implies greater health risks than occasional episodes which can be transferred to health behavior. Additionally, Lynch et al.'s (1997b) observation that permanently poor individuals smoke less than prosperous females can be supported for the permanent combined poverty indicator but not for the permanent SES. The authors also observe lower rates of physical activity for poor individuals. The present analyses of this thesis show, however, that this is only valid for permanent SES and for women using the combined poverty indicator but not for men.

Finally, the third hypothesis of this study **H3:** 'Health behavior is influenced by changes over time and length of poverty / low SES' can be confirmed for the permanent combined poverty indicator and the permanent SES but not for the at-risk-of-poverty rate. Analyzing men and women separated shows that the latter measurement influences health behavior in parts.

7.b.v Comparison of the applied models

Following the presentation of results for all analyses for the at-risk-of-poverty rate, the combined poverty indicator and the SES, this section aims to summarize the main outcomes. Therefore, the four types of models that are applied for each of the three determinants on poverty and SES are compared with each other.

Table 45 gives an overview of positive and negative associations between the applied poverty / SES indicators and health behavior. Since presented results confirm that men and women show different behavioral patterns, findings are separated by sex.

There are only few clear findings for the determinant of **at-risk-of-poverty rate** that are observable for the four types of models (7.b.i–7.b.iv).

As an example, dietary behavior is not significantly associated with being at risk of poverty at the cross-sectional level, irrespective of whether a 1-year or a 5-year period (so-called permanent at-risk-of-poverty) is used. Applying fixed effects models leads to significant odds ratios. Men who are affected permanently by at-risk-of-poverty are less likely to eat healthily. In contrast, women are more likely to have a healthy diet, regardless of the duration of the poverty situation.

Inconsistencies between the four analytical steps are also reported for smoking and physical activity for men. Interestingly, for the female subsample, negative associations with being physically active are always reported except for panel analyses using the permanent at-risk-of-poverty rate. Additionally, men at risk of poverty do not drink alcohol regularly (7.b.i and ii). Females who are affected by risk of poverty (7.b.i and ii) are more likely to show health-damaging behavior. Since panel analyses have not been conducted for these types of health behavior, causal effects cannot be identified. On the basis of findings of the fixed effects models, it can be concluded that only dietary behavior is negatively affected if a male individual is permanently at risk of poverty. In contrast, women who are in the same situation are less likely to be smokers. Additionally, women who are at risk of poverty are less likely to be physically active.

This does not apply to being permanently at risk of poverty. Consequently, men and women respond in different ways to being at risk of poverty that is based on income.

Turning to the results of the **combined poverty indicator**, differences between the four analytical steps can be identified especially for dietary behavior and tobacco consumption.

In the male sample the vulnerability group attracts attention when interpreting results of the combined poverty indicator with regard to dietary behavior. Thus, men assigned to being vulnerable are less likely to follow a healthy diet than the reference group. The panel analyses (7.b.iii and iv) confirm this effect for vulnerability in general and for being permanently affected by this status. In contrast, being fragilely prosperous is associated with a higher likelihood of behaving healthily in this category.

Table 45: Summary of results (male and female sample)

			Diet (healthy diet=1)		Smoking (non↓smoking=1)		Alcohol consumption (no regular consumption=1)		Physical activity (sufficient physical activity=1)		Combined health behavior (health↓oriented=1)	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
At↓risk↓of↓poverty rate	7.b.i	At risk↓of↓poverty	-	-	-		↑		-	↓	-	↓
	7.b.ii	At risk↓of↓poverty	-	-	↓		↑		-	↓	↓	↓
	7.b.iii	At risk↓of↓poverty	-	↑	↑				↑	↓		
	7.b.iv	At risk↓of↓poverty	↓	↑		↓			-	-		
Combined poverty indicator	7.b.i	Extreme poverty	-	-	↓	↓	↑	-	↓	↓	↓	↓
		Moderate poverty	-	↓	-	↓	↑	-	↓	↓	-	↓
		One↓sided poverty	-	↓	↓	↓	↑	-	↓	↓	-	↓
		Vulnerability	↓	-	↓	-	-	-	↓	↓	↓	↓
		Fragile prosperity	-	-	↓	-	↑	-	↓	↓	-	-
	7.b.ii	Extreme poverty	-	-	↓	↓	-	-	↓	↓	↓	↓
		Moderate poverty	-	↓	↓	↓	↑	-	↓	↓	↓	↓
		One↓sided poverty	-	-	-	-	↑	-	↓	↓		↓
		Vulnerability	-	-	↓	-	-	-	↓	↓	↓	↓
		Fragile prosperity	-	-	-	-	↑	-	↓	↓	↓	↓
	7.b.iii	Extreme poverty	-	-	↑	-			-	↓		
		Moderate poverty	-	-	-	-			-	↓		
		One↓sided poverty	-	-	-	-			↑	↓		
		Vulnerability	↓	-	↓	-			-	-		
		Fragile Prosperity	↑	-	-	-			↑	↓		
	7.b.iv	Extreme poverty	↓	↓	-	↑			↑	-		
		Moderate poverty	↓	↓	-	-			↑	-		
		One↓sided poverty	-	-	-	-			↑	↓		
		Vulnerability	↓	↓	↓	↑			↑	↓		
		Fragile prosperity	-	↓	-	↑			↑	↓		
SES	7.b.i	Low SES	↓	↓	↓	↓	↑	↑	↓	↓	↓	↓
		Medium SES	↓		↓	↓	↑	↑	↓	↓	↓	↓
	7.b.ii	Low SES	↓	↓	↓	↓	↑	↑	↓	↓	↓	↓
		Medium SES	↓	↓	↓	↓	↑	↑	↓	↓	↓	↓
	7.b.iii	Low SES	-	-	-	-			↑	↓		
		Medium SES	↓	-	-	-			↑	-		
	7.b.iv	Low SES	↓	-	↓	↓			-	↓		
		Medium SES	↓	-	↓	↓			↓	↓		

Grey: Panel analyses are not conducted for alcohol consumption and combined health behavior. ↑=indicates significant odds ratios >1; ↓=indicates significant odds ratios <1, - = not significant.

Although there are no significant differences between the reference group and the three poverty groups in the cross-sectional models, panel analyses using the permanent poverty status show that extremely and moderately poor men are less likely to eat in a healthy way.

Findings for women differ. Results for moderate poverty are significant for the two cross-sectional models and applying the permanent combined poverty indicator. These women are always less likely to eat healthily. One-sidedly poor individuals also seem to be less likely to do so. Panel analyses do not confirm these findings. Additionally, analyses for women show that being affected by poverty or precarity does not affect the dietary behavior. However, considering the permanent status over five years shows that permanently extremely poor, moderately poor, vulnerable, and fragilely prosperous women are less likely to have a healthy diet than the reference group.

With regard to smoking, results for men that are affected by vulnerability are most consistent. All four models confirm that being affected by vulnerability increases the likelihood of smoking. Although cross-sectional analyses for the 1-year and the 5-year period indicate that the other poverty and precarity groups are less likely to be non-smokers, it is not possible to replicate these findings in the panel analyses. Interestingly, fixed effects models for the one-year period (7.b.iii) show that changing to extreme poverty is associated with an increased likelihood of being a non-smoker.

Cross-sectional results for women (7.b.i-ii) suggest that poor individuals are less likely to be non-smokers. These findings cannot be supported by either type of panel analysis (7.b.iii-iv).

Surprisingly, there are no significant findings on smoking for women for fixed effect models that include the period 2004–2010. Applying the permanent combined poverty indicator shows that permanently extremely poor and precarious women are more likely to be non-smokers than their more prosperous counterparts.

Next, alcohol consumption is less prevalent among poor and fragilely prosperous men than for the reference group. In contrast, there are no significant differences for women. Since alcohol is only examined at the cross-sectional level, causal effects cannot be identified.

Turning to results on physical activity, cross-sectional analyses give the impression that poor and precarious men and women are less likely to be physically active than their more prosperous counterparts. Surprisingly, panel analyses for men show opposite effects. One-sidedly poor and fragilely prosperous men are more likely to pursue sports. Applying the permanent combined poverty indicator reveals that all groups are more likely to pursue sport. However, cross-sectional results for women are mainly in accordance with the panel analyses. There are no significant differences for women who enter the vulnerability group as well as for women who are permanently extremely or moderately poor. Finally, men who are affected by (permanent) extreme poverty and vulnerability are less likely to show health-promoting behavior with regard to the combined health behavior indicator. Additionally, odds ratios smaller than one are reported for permanently moderately poor and fragilely prosperous men. Results for women are mainly consistent. Living in poverty or precarity is associated with a lower likelihood of behaving in a health-promoting way. Since information on diet, smoking and physical activity is only simultaneously available in 2008, panel analyses are not possible. Thus causal effects cannot be proved.

Finally, the four steps to analyze health behavior and **SES** are compared. With regard to cross-sectional models, associations between the five types of health behavior and SES are identical for both men and women.[90]

Panel analyses cannot confirm the observed relationships for all cases. For instance, men with a low SES do not differ significantly regarding their dietary behavior.

However, applying the permanent SES confirms the cross-sectional findings of 2008. In contrast, the observed differences between a high SES and the two lower SES groups at the cross-sectional level are not replicable in the presented panel analyses.

Neither men nor women differ regarding their smoking behavior if they change to the medium or low SES. Nevertheless, panel analyses on the permanent SES confirm the inverse relationship between tobacco consumption and SES. Men who change their SES group are more likely to be physically active than the high SES group (7.b.iii).

[90] Exception: Result for diet and a medium SES is not significant (cf. section 7.b.i).

However, results for a permanently low SES are not significant, while men with a permanently medium SES are less likely to pursue sport (7.b.iv). This is also valid for the two panel analyses (7.b.iii-iv) for women, except for the medium SES.

In conclusion, this comparison underscores the importance of applying panel analyses. Results of the cross-sectional models comply only in single cases with fixed effects models that allow identifying causal effects. The latter method allows considering all possible confounders at the individual level. Since unobserved stable differences are included in the fixed effects model there may be different results compared to the cross-sectional approach. For instance, men who are affected by poverty are more likely to be physically active using panel analyses although cross-sectional analyses suggest negative associations.

7.b.vi Confounding variables

The following section deals with confounding variables of the presented analyses. Only findings of the total sample are briefly described and discussed to give a short overview about the relevance of the presented confounders.[91,] As already observed for the variables risk of poverty, combined poverty indicator and SES, results of confounders separated by sex may vary. Odds ratios for women and men are described in **appendix 6**.

Table 46 summarizes the results of confounding variables used in the cross-sectional analyses (step 1 (#[92])) as well as of cross-sectional analyses considering the permanent poverty status and SES (step 2 (##[93])). **Table 47**[9495] summarizes the results of confounding variables used in the panel analyses (#[96])) as well as analyses considering the permanent poverty status and SES (##[97]). For both types of panel analyses, only time-variant confounders are integrated in the FE models.

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[91] For details on odds ratios of confounding variables, see **appendix 6**.
[92] # refers to cross-sectional models (step 1).
[93] ## refers to cross-sectional models considering the permanent poverty and SES situation (step 2).
[94] For details on odds ratios of confounding variables, see **appendix 6**.
[95] This section describes only results of the total sample. For results separated by sex, see **appendix 6**.
[96] # refers to fixed effects logistic regression models 2004 -2010 and 2005 - 2009
[97] ## refers to fixed effects logistic regression models using permanent poverty and SES of 2000-2010 or 2001-2009

The lowest odds ratios regarding **education**[98] are observable for the low education group. Less well educated individuals are less likely to have a healthy diet than the reference group of highly educated respondents. Additionally, this group is less likely to consist of non-smokers, be sufficiently physically active, or behave in a health-promoting way in general. In contrast, odds ratios regarding alcohol consumption are greater one so that they are less likely to drink alcoholic beverages regularly than the reference group. Odds ratios for the 'medium education' group are comparable to 'low education' even though odds ratios are higher than for the variable low education. As an exception, the result for medium education and alcohol consumption is not significant. Generally, these findings are replicable for models that include permanent poverty and SES measurements. As an exception, results for alcohol consumption and medium education are not significant. Within the panel analyses (7.b.iii and iv), individuals with a low educational attainment are less likely to have a healthy diet. In contrast, these respondents are more likely to be non-smokers and to be physically active. Results for the medium educational status category are only significant in models on permanent poverty and SES. Those with a medium SES are less likely to have a healthy diet.

The presented findings at a cross-sectional level conform to previous research on this topic[99]. Interestingly, individuals with both a low and a medium educational status are less likely to have a healthy diet than those with a high status (cf. Cutler and Lleras-Muney 2006; Darmon and Drewnowski 2008; Lallukka et al. 2007). This is also valid for smoking and physical activity (Contoyannis and Jones 2004; Cutler and Lleras-Muney 2010; Jürges et al. 2011; Laaksonen et al. 2005; Lampert and Mielck 2008; Lynch et al. 1997a; Schneider and Schneider 2009b; Stronegger et al. 1997and Nocon et al. 2007; Robert Koch-Institute 2012a; Schnohr et al. 2004; Lynch et al. 1997a; Robert Koch-Institute 2005).

[98] Education and occupational status are part of the models of the at-risk-of-poverty rate and the combined poverty indicator.
[99] For details, see section 2.b.iv.

However, presented panel analyses confirm the inverse relationship only for dietary behavior but not for smoking and physical activity so that a confirmation of the **fourth hypotheses**[100] is restricted. These results may be explained by the fact that fixed effects models analyze only within-person changes and that information on education can possibly change but there may be too little variation within respondents (cf. Schunck and Rogge 2012).

Results for alcohol consumption show a positive relationship with the educational attainment. These findings are also supported by previous research (Robert Koch-Institute 2012a; Schneider and Schneider 2009b). However, the alcohol consumption variable does not allow conclusions on the intensity so that it is not possible to compare the results with previous findings on heavy drinking and educational status.

Similar results are found for the **occupational status**. People with a low occupational status are least likely to behave in a health-promoting way, followed by people with a medium occupational status. Odds ratios greater than one are only existent regarding alcohol consumption.

Results for smoking are only significant for the first step of analyses. Findings for dietary behavior are supported by other authors (2012; 1999; Kachan et al. 2012). In contrast, observations by for instance Borg and Kristensen (2000) and Lee et al. (2007) that smoking is more likely among the low occupational status group can be only confirmed for the cross-sectional model described in section 7.b.i. In contrast, Nocon et al. (2007) demonstrate with data from Germany that the occupational status does not affect smoking behavior, but applying panel analyses shows that a low status is associated with greater odds of being a non-smoker. This is in line with Alves et al. (2012). A medium occupational status is associated with less likelihood to eat healthily regarding permanent models and a greater likelihood of pursuing sufficient sports. Results for alcohol consumption differ from previous results. However, Lynch et al. (Lynch et al. 1997a) report that a low occupational status is associated with higher rates of abstainers. Findings on excessive alcohol consumption for individuals with a low occupational status cannot be confirmed (Alves et al. 2012).

[100] **H4**: Education is a central determinant of health behavior.

Table 46: Overview confounding variables for cross-sectional analyses (steps 1 and 2)

	Diet		Smoking		Alcohol consumption		Physical activity		Health behavior	
	#	# #	#	##	#	##	#	##	#	##
Low education	↓	↓	↓	↓	↑	↑	↓	↓	↓	↓
Medium education	↓	↓	↓	↓	↑	-	↓	↓	↓	↓
High education										
Low occupational status	↓	↓	↓	-	↑	↑	↓	↓	↓	↓
Medium occupational status	↓	↓$^{+}_{+}$	↓	-	↑	↑	↓	↓	↓	↓
High occupational status										
Household affected by unemployment	↓	-	↓	↓	-	↑	↓	↓	↓	↓
Household not affected by unemployment										
Currently unemployed	-	-	↓	↓	↓$^{+}$	-	↓$^{+}$	↓$^{+}$	↓	↓
Currently employed										
Health status	↑	↑	↑	↑	↓	↓	↑	↑	↑	↑
Female	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Male										
Age group: 17 -24	↓	↓	↑	↑	↑	-	↑$^{+}$	↑	-	-
Age group: 25–34	↓	↓$^{+}_{+}$	-	-	↑	-	-	-	-	-
Age group: 35–44										
Age group 45–54	↑	-	-	-	↓	↓	-	-	-	-
Age group 55–65	↑	↑	↑	↑	-	↓$^{+/++}$	-	-	↑	↑
Single (not married)	-	-	↓	↓	-	-	↑	↑	-	-
Married										
Divorced	-	-	↓	↓	-	-	-	↓$^{+/++}$	↓	↓$^{+}$
Widowed	-	-	-	-	-	-	-	-	-	-
No migration background	-	-	-	-	↓	↓$^{++}$	↑	↑	-	-
Migration background										
East Germany	↑	-	-	-	-	-	↓	↓	-	-
West Germany										
Children (0–14)/ HH	↑	↑	↑	↑$^{++}$	↑$^{++}$	↑$^{++}$	↓	-	-	-
Risk-taker	↑	↑	↓	↓	-	-	↑	↑	↑	↑
Risk-neutral	↑	↑	↓	↓	-	-	↑	↑	-	↑
Risk-averse										
High economic worries	-	-	↓	↓	-	↑$^{++}$	↓	↓	↓	↓
Medium economic worries	-	-	↓	↓$^{++}$	-	-	-	-	↓	-
Low Economic worries										

Italics = Reference group; #= Results of cross-sectional analyses 2008; ##= Results of cross-sectional analyses considering the permanent poverty status and SES; ↑=indicates significant odds ratios >1; ↓=indicates significant odds ratios <1, - = not significant, + = not significant in models on the combined poverty indicator, ++ = not significant in models on SES.

Altogether, the **fifth hypothesis** regarding the relevance of the occupational status for heath behavior is confirmed in parts.

The variable **'Household affected by unemployment'** is considered for models on income poverty and on SES. A household is affected by unemployment if the sum of months in unemployment in a household exceeds three months per year.

Table 47: Overview confounding variables for panel analyses (step 3)

	Diet		Smoking		Physical activity	
	#	##	#	##	#	##
Low education	↓	↓	↑	↑	↑	-
Medium education	-	↓	-	-	-	-
High education						
Low occupational status	-	-	↑	↑	-	-
Medium occupational status	-	↓	-	-	↑	-
High occupational status						
Household affected by unemployment	-	-	-	-	-	-
Household not affected by unemployment						
Currently unemployed	-	-	-	-	-	-
Currently employed						
Health status	-	-	↓	-	↑	↑
Age group: 17–24	↓	-	↓	↓	↓	↓
Age group: 25–34	-	-	↓	↓	↓	↓
Age group: 35–44						
Age group 45–54	-	-	↑	↑	-	-
Age group 55–65	-	-	↑	↑	↑	↑
Single (not married)	-	-	↓	↓	↑	↑+
Married						
Divorced	-	-	↓	↓+	-	-
Widowed	-	-	-	↑	↑	↑
East Germany	↓	↓	↓	↓	-	-
West Germany						
Children (0–14)/ HH	↑	↑	-	↓	↓	↓
Risk-taker	-	↑+/++	↓	↓	-	-
Risk-neutral	-	-	-	↓++	↓	↓
Risk-averse						
High economic worries	↑	↑	↑	↑	↑	-
Medium economic worries	↑	↑	-	-	-	-
Low economic worries						

Italics = Reference group; #=Results of panel analyses (7.b.iii); ##= Results of panel analyses considering the permanent poverty status and SES; ↑=indicates significant odds ratios >1; ↓=indicates significant odds ratios <1, - = not significant, + = not significant in models on the combined poverty indicator, ++ = not significant in models on SES.

In comparison to the reference group, an individual living in a household that is affected by unemployment is less likely to have a healthy diet, to be a non-smoker, to pursue sufficient sports and to behave in a health-promoting way overall.

For models considering the SES, individuals are less likely not to drink alcohol regularly. In reference to analyses of step 2, results differ only regarding diet and alcohol consumption. This is not valid for 'dietary behavior and SES' and also not for 'SES and alcohol consumption'. With regard to panel analyses no significant causal effects are observable for this variable.

If an individual is **currently affected by unemployment**, s/he behaves in a health-damaging manner except regarding diet.

At the longitudinal level, for both variables on unemployment significant odds ratios are only observable in single cases. In models on the permanent combined poverty indicator, unemployment is associated with less likelihood of having a healthy diet. Additionally, in models on the combined poverty indicator, (#) shows that individuals who become unemployed are less likely to be non-smokers.

The presented results at a cross-sectional level show that the relationship between unemployment and dietary behavior is ambiguous, which was already illustrated in chapter 2 (e.g. Balia and Jones 2008; Contoyannis and Jones 2004). Looking at the panel analyses, results conform to Contoyannis and Jones (2004). Interestingly, numerous studies show at a cross-sectional level that unemployment is associated with a higher prevalence of smoking (Balia and Jones 2008; Contoyannis and Jones 2004; Hammarstrom et al. 2011; Miller et al. 2005; Robert Koch-Institute 2010; Schneider and Schneider 2009a). However, these associations are not reported in panel analyses (cf. Schunck and Rogge 2012). Furthermore, alcohol consumption is associated with positive (at the household level) and negative associations (at the individual level), which underscores the controversial discussion. Additionally, GSOEP surveys the topic of alcohol consumption in a very ambiguous way. This issue is also taken up in the final discussion. The fact that physical activity is negatively associated with the unemployed can be confirmed at the cross-sectional level (cf. also Miller et al. 2005; Robert Koch-Institute 2010). If panel analyses are used, significant odds ratios disappear.

In conclusion, hypothesis **H5** on the relevance of unemployment for health behavior cannot be confirmed for the total sample.

Next, the individual **health status** influences health behavior.

Individuals are more likely to behave in a health-promoting way the better the current health status is. This does not apply to alcohol consumption. In these cases OR are smaller than one. Using panel analyses, a better health status lowers the odds of being a non-smoker (only for non-permanent models) but increases the likelihood of pursuing sports.

With regard to dietary behavior, findings of Miller et al. (2005) that a healthy diet is associated with a poor health status have to be refuted, while results by Reeves and Rafferty (2005) are in accordance with findings of this thesis. However, this is only valid for cross-sectional analyses.

Looking at tobacco consumption, health is positively associated with the likelihood of non-smoking, while panel analyses show an inverse relationship. The latter aspect is in line with findings by Chin et al. (2012) and Reeves and Rafferty (2005).

The clearest results are available regarding **sex**. Females are always more likely to behave in a health-promoting way than their male counterparts. The highest odds ratios are observable for diet and alcohol consumption. The presented findings underscore the importance of examining health behavior separated by sex. Thus previous findings that men are more likely to behave in a health-damaging way are supported (Dawson et al. 2007; Fine et al. 2004; Grünheid 2004; Miller et al. 2005; Nathanson 1977; Robert Koch-Institute 2012a; Schoenborn and Adams 2010).

Results for **age-groups** are less explicit. In comparison to the reference group (age 35–44), the youngest respondents (age 17–24) are more likely to behave in a health-promoting manner regarding non-smoking, alcohol consumption (step 1 only) and physical activity. However, they are less likely to have a healthy diet. On the other hand, older respondents are more likely to adopt a healthy diet, to be non-smokers, and to behave in a generally health-promoting way. Additionally, they drink alcohol more regularly than the reference group (step 2 only). The two other age groups differ only in single cases from the reference group.

Looking at the age groups in panel analyses, the majority of significant odds ratios are observable for non-smoking and physical activity. Only people aged 17–24 are less likely to have a healthy diet. Further age groups do not influence the dietary behavior

In contrast, being in the age groups 17–24 as well as to 25–34 is related to being less likely to be a non-smoker or physically active. This applies both types of models. Being in the age between 45–54 years is associated with a greater probability of being a non-smoker. Compared to the reference group (age group 35–44) the highest age group implies higher odds of being a non-smoker and physically active.

At the cross-sectional level, present findings that dietary behavior is positively associated increasing age can be confirmed (cf. Martikainen et al. 2003; Miller et al. 2005; Schneider and Schneider 2009b). Using panel analyses, significant differences are only observed among the middle-aged and the youngest respondents. As Fine et al. (2004) and Stronegger et al. (1997) stated, health risk behavior is more prevalent among the younger individuals. Although cross-sectional analyses show that smoking rates for the age-group 17-24 are lower than for middle-aged individuals, panel analyses indicate that younger individuals (aged 17–34) are less likely to be non-smokers, which conforms to previous findings (Miller et al. 2005; Thefeld 2000; Robert Koch-Institute 2012a). Regular alcohol consumption is most prevalent among individuals who are older than 45 (cf. also Bloomfield et al. 2008), while the youngest age group is more likely to pursue sports. However, an opposite effect is on hand at the longitudinal level where individuals aged 55–65 are more likely to be physically active than middle-aged individuals. Thus this study is not able to support the often reported inverse age effect on physical activity (cf. Caspersen et al. 2000; Miller et al. 2005; Robert Koch-Institute 2012a; Sallis 2000.

Significant differences concerning the **marital status** occur only for singles and divorced individuals. In comparison to married individuals, they are less likely to be non-smokers. Singles are more likely to pursue sports regularly than the reference group. Divorced respondents are less likely to pursue sufficient sports (only step 2) and to behave in a health-promoting manner.

Equally to the cross-sectional analyses, there are no significant odds ratios reported for marital status and dietary behavior using panel analyses.

Furthermore, singles are less likely to be non-smokers and are more likely to pursue sports. Divorced individuals are less likely to be non-smokers.

Models using the permanent SES indicate higher odds of having a healthy diet. In the event that a respondent becomes a widow/widower, s/he is more likely to be a non-smoker and to pursue sufficient sports.

Interestingly, panel analyses confirm the health-damaging behavior of singles and the increased likelihood of smoking for divorced respondents.

Against this background, presented results support the assumption that married subjects behave in a more health-promoting way (Nock 1998; Waite and Gallagher 2000). Since there are no significant findings on a healthy diet and alcohol consumption, previous findings by Martikainen et al. (2003), Roos et al. (1998), and Schoenborn (2004) cannot be supported. However, singles and divorced individuals are less likely to be non-smokers, which is in line with other studies (Umberson et al. 2010; 2004). In contrast, the presented analyses confirm results by Grzywacz and Marks (1999) and Jeffery and Rick (2002), which indicate that unmarried people pursue more sports. In addition, widowed individuals are more likely to be physically active than their married counterparts, so that Schoenborn's (2004) findings have to be confuted.

Next, individuals without a **migration background** are more likely to pursue sufficient sport. However, odds ratios have been smaller than one for non-smoking and the combined poverty indicator.[101] Additionally, if odds ratios of step 1 and step 2 are compared, results for alcohol consumption are not consistent.

Differences regarding dietary behavior and smoking described by other authors cannot be confirmed by the presented analyses. However, as already described by Brussaard et al. (Brussaard et al. 2001), Lopez-Gonzalez et al. (Lopez-Gonzalez et al. 2005), and the RKI (Robert Koch-Institute 2010), individuals with a migration background are less likely to drink alcohol regularly. In contrast, the likelihood to be physically active is lower for individuals with a migration background (cf. also Landman and Cruickshank 2001; Hovemann and Wicker 2009; Sieberer et al. 2009).

[101] Results for the variable 'migration background' are not significant if the at-risk-of-poverty rate or SES are applied (see table 44).

The **region of residence** (East vs. West Germany) reveals significant differences regarding dietary behavior. Concerning models on SES, individuals from East Germany are more likely to be non-smokers. In contrast, the likelihood of pursuing sufficient sports is lower than for West Germans. Additionally, panel analyses show that living in East Germany is associated with fewer chances of having a healthy diet and being a non-smoker than moving to West Germany.

Although data of the RKI (2012a) suggests that dietary behavior has largely evened up, panel analyses underscore that residents of East Germany are less likely to indicate a healthy diet. Furthermore, the RKI (2009) reported that West Germans pursue more club sports but there are no differences beyond sports clubs. Interestingly, cross-sectional analyses suggest that East Germans are less physically active, but panel analyses refute this observation. The opposite effect is observed for smoking. No significant differences between East and West are reported (cf. also Robert Koch-Institute 2009. Using panel analyses, East Germans are less likely to be non-smokers. Finally, alcohol consumption does not differ between the two regions. In contrast, the RKI (2009) observes that risky alcohol consumption is more prevalent in East Germany. These differences may be explained by varying survey methods on alcohol consumption.

The **number of children aged 0 to 14 years who are living in a household** also influences individuals' health behavior. The more children there are in a household, the more likely it is that an individual will behave in a health-promoting way regarding diet, smoking, and alcohol consumption. However, s/he is less likely to pursue sufficient sports (only step 1). In models on the permanent combined poverty indicator, an odds ratio greater one is observable for the combined health behavior indicator. Results of the panel analyses show that if the number of children living in a household increases, individuals are more likely to adopt a healthy diet. With regard to panel analyses on permanent poverty status and SES, an increase in the number of children in a household is associated with lower odds of being a non-smoker. With regard to this variable, all panel analyses show that the chances of being physically active decrease too.

With regard to the existing literature, parental status is controversially discussed. Living with children in a household is positively associated with a healthy diet, which conforms to findings of Roos et al. (1998). Furthermore, it must be emphasized that the literature on this topic is very limited. Results for parenthood and tobacco consumption are inconsistent. Additionally, the cross-sectional analyses show that living with children in a household is associated with a lower likelihood to smoke (cf. 2010). In contrast, using panel analyses for permanent poverty/SES, the opposite effect is observable, which is in line with findings of Schuster et al. (2002).

Findings that parenthood is associated with greater odds of not drinking alcohol regularly are supported by other authors (Umberson 1992; Schneider and Schneider 2009b). Finally, physical activity is negatively associated with children living in a household. Thus the presented results confirm previous findings (Bellows-Riecken and Rhodes 2008; Berge et al. 2011; Hovemann and Wicker 2009).

Risk preference influences health behavior as well. Risk-takers and risk-neutral respondents are more likely to have a healthy diet, to pursue sports regularly, and to behave in a health-promoting way than their risk-averse counterparts. In contrast, they are less likely to be non-smokers.

With regard to results of the panel analyses, being in the risk-taker group is associated with fewer chances of being a non-smoker. Concerning models that consider the permanent poverty and SES situation, risk-takers are more likely to eat healthily. Individuals that are risk-neutral are less likely to be non-smokers (applies to permanent models) and to pursue sports. Looking at previous findings, Traill et al. (2012) confirm findings on dietary behavior. There is consensus that risk-taking individuals are more likely to be smokers (cf. Anderson and Mellor 2008). In contrast, neither cross-sectional nor panel analyses find significant differences regarding alcohol consumption, so that findings that risk-averse subjects are less likely to show a risky alcohol consumption cannot be confirmed (Anderson and Mellor 2008). Furthermore, Pedersen (1997) and Dohmen et al. (2005) shows that risk-takers are more likely to be physically active.

This conforms to cross-sectional analyses but not to panel analyses. Interestingly, risk-neutral individuals are even less likely to pursue sports if panel analyses are applied.

These results can also be found for individuals with high and medium **economic worries**. In case of high economic worries, respondents are less likely to be sufficiently physically active and to behave in a health-promoting way in general.

Applying panel analyses shows that high economic worries lead to higher chances of behaving in a health-promoting way in all categories. This is not valid for analyses on permanent poverty and SES except for the combined poverty indicator.

Individuals with medium economic worries are more likely to eat healthily. For the majority of results, it can be stated that economic worries promote health-damaging behavior (cf. Mackenbach 2006a; Taylor 2009). This also applies to combined health behavior. Results on a healthy diet are not in line with findings reported by Schneider and Schneider (2009b) and Steptoe et al. (1998). Interestingly, panel analyses show that high and medium economic worries are related to greater chances of eating healthily. Furthermore, cross-sectional analyses show that economic worries are associated with a higher tobacco consumption (cf. also La Rosa et al. 2004; Schneider and Schneider 2009a; Laaksonen et al. 2005). However, applying panel analyses leads to opposed results. In contrast, findings on alcohol consumption can be confirmed by other authors (cf. Schneider and Schneider 2009a; Steptoe et al. 1998). Finally, economic worries are associated with a reduced likelihood of being physically active (cf. (Wemme and Rosvall 2005). Using panel analyses, it can be shown that individuals with high economic worries are more likely to pursue sports, while there are no significant differences between medium economic worries and the reference group. Altogether, results confirm hypothesis **H1** regarding psychosocial factors. However, causal effects on economic worries differ from expectations that are based on literature and cross-sectional findings.

In conclusion, results of the confounding variables contribute important information to explain health behavior. The importance of differences between men and women has to be underlined. Furthermore, panel analyses show that many associations that are reported on the cross-sectional level cannot be confirmed by panel analyses.

7.c Final discussion

The following part discusses the result in light of the seven research questions (cf. section 1.b). In order to guide the reader trough the discussion of the results **table 48** lists these questions together with the associated hypotheses derived from the theoretical framework (chapter 3).
The final discussion concludes with methodical considerations on limitations of this study and enhancements for future research.

With regard to the **first research question**, this thesis shows, that not only being at risk of poverty and being poor but also a low SES is associated with health-damaging behavior. However, fixed effects models allow a confirmation of the **first hypothesis** only in parts. Additionally, differences by sex have to be taken into consideration. Men being at risk of poverty or poor as well as those with a low SES are less likely to eat in a healthy way and to be non-smokers. The latter aspect does not apply to the at-risk-of-poverty rate. In contrast, women show health-damaging behavior for all three categories.

Clearest associations are identified for physical activity. Results for dietary behavior and tobacco consumption vary. Thus the findings underline that the three indicators affect health behavior in a different way and may even produce opposite effects.
For instance, women who are permanently at risk of poverty are more likely to eat in a healthy way, whereas being permanently poor according to Groh-Samberg (2009) is related to a lower likelihood of having a healthy diet. It may be concluded that interactions between income and further aspects of deprivation are determining for unhealthy dietary behavior of women. These opposite relationships are also observable when comparing the permanent combined poverty indicator and SES with regard to physical activity and males.

Table 48: Research questions and hypotheses of this thesis

No.	Research questions	Covered by theoretical framework by the following hypotheses
1	Do poverty situations or a low SES affect risky and health-damaging behavior directly?	**H1:** Health behavior is influenced by poverty and SES **directly** and indirectly via material and psychosocial factors.
2	Poverty and SES are multidimensional phenomena. What dimensions – apart from income – need to be taken into account?	**H2:** Suitable poverty and SES dimensions are represented by income, occupational status, and education. Furthermore, material aspects such as unemployment and financial savings also contribute to the poverty situation that impacts health behavior.
3	Are individuals in precarious situations also more likely to show more health-damaging behavior?	
4	Periods of poverty are time-varying for each individual. Do patterns of health behavior differ depending on the length of a poverty period? Does the SES also vary over time?	**H3:** Health behavior is influenced by changes over time and length of poverty / low SES.
5	What type of health behavior is most responsive in situations of poverty?	
6	With regard to poverty situations / SES: Are there differences between individual dimensions of health behavior and combined health behavior patterns?	
7	What other determinants influence health behavior and thus have to be taken into account?	**H1:** Health behavior is influenced by poverty and SES directly and **indirectly** via material and psychosocial factors. **H4**: Educational status is a central determinant of health behavior. **H5:** Occupation and income as well as unemployment are related to health behavior.

Second, **research question no. 2** states that poverty is a multidimensional phenomenon. For this study the at-risk-of-poverty rate, which is solely based on income, as well as two multidimensional measurements are applied: on the one hand, the combined poverty indicator, which apart from income includes four dimensions of life domains to describe the extent of deprivation; on the other hand, the SES index, which includes income as well as the occupational status and education.

Using the at-risk-of-poverty rate allows identifying differences in health behavior. However, this indicator is dichotomous so that a differentiated view on the extent of poverty is not possible. As already described in the previous sections of this chapter, the observed effects – especially in cross-sectional analyses – are not as strong as reported for the multidimensional measurements. In contrast, the combined poverty indicator shows a more differentiated picture on poverty although the four life domains are related to financial resources.

The application of the SES, which considers interactions between income, education and occupational status, is also justified because it allows one to identify the association of social inequalities with health behavior. It has to be emphasized that the arrangement of three SES groups into a high, medium and low group is normative (cf. Lampert and Kroll 2009). It would also be possible to classify the SES in smaller groups. Against this background **H2** can be confirmed. The most differentiated view on health behavior can be made by using the combined poverty indicator.

The latter aspect leads over to the **third research question** regarding whether precarity affects health-damaging behavior. At the cross-sectional level, men of the vulnerability or fragile prosperity groups are less likely to eat in a healthy way (only valid for vulnerability in models of 7.b.i), to be non-smokers, or to be sufficiently physically active. Additionally, they do not behave in a health-promoting way at all. Applying panel analyses, men who are in the vulnerability group are less likely to have a healthy diet and to be non-smokers. For fragile prosperity only positive associations are reported (**table 45**). Results for women in precarity differ. Analyses for 2008 show only significant odds ratios lower than one for vulnerability and fragile prosperity. Regarding the combined health behavior, only vulnerable women are less likely to behave health-promoting. Applying the permanent combined poverty indicator confirms these results. In addition, permanent fragile prosperous women show odds ratios lower than one regarding the combined health behavior index. Findings for physical activity can be mostly confirmed for the panel analyses. If fixed effects models are conducted for the permanent combined poverty indicator, the two groups of precarity are less likely to eat in a healthy way. In contrast, their likelihood of being non-smokers is greater than one.

Thus situations of precarity, especially permanent precarity, affect health behavior negatively. Individuals with a single deprivation and a low income most often show health-damaging behavior. These findings underline again that the dichotomous understanding of poverty is obsolete.

The **fourth research question** is covered by **H3**: 'Health behavior is influenced by changes over time and length of poverty / low SES.' This hypothesis can be mainly confirmed by cross-sectional analyses using a 5-year period to describe the risk of poverty, the combined poverty indicator and the SES. Looking at the panel analyses , it is important to consider that a general change of the poverty / SES situation (section 7.b.iii) may lead to different results than panel analyses that include information on the permanent situation (section 7.b.iv).

Fifth, it is questioned which type of health behavior is most responsive in situations of poverty or low SES. Analyses at the cross-sectional level create the impression that physical activity and the combined health behavior index are most responsive in situations of poverty. Looking at the panel analyses, only physical activity can be evaluated. The inverse relationship between poverty / low SES and pursuing sport can be confirmed for the female sample, while men seem to be more active if they are affected by poverty. However, this is not valid for analyses on the permanent SES (7.b.iv).

Additionally, men who are permanently non-prosperous due to a poverty situation or a low SES are less likely to be non-smokers or to follow a healthy diet. Interestingly, for women consistent findings on health-damaging behavior can be found only with regard to physical activity.

Due to poor data availability, a comparison of single types of health behavior with the combined health behavior indicator is only possible at the cross-sectional level. Individuals who are at risk of poverty, poor according to the combined poverty indicator or have a low SES have a lower likelihood of behaving in a healthy way with regard to at least two out of three types of health behavior. Odds ratios are generally very low. However, they are comparable with those for physical activity, which is the most responsive type of health behavior with regard to poverty or a low SES. These findings underscore the importance of evaluating combined health behavior. Therefore, future panel data should provide information on different health behavior dimensions simultaneously that allow analyses on causal effects.

Finally, the last research question deals with other determinants that may influence health behavior. Therefore the following hypotheses have to be taken into account:

H1: Health behavior is influenced by poverty and SES directly and indirectly via material and psychosocial factors.

The first part of this hypothesis regarding direct influences of poverty and SES is already answered above in this section. However, applied models also include material and psychosocial aspects. Material aspects apart from income are situations of unemployment. Within this study two types of unemployment are considered. On the one hand there is the individual employment status and on the other hand there is information about whether a whole household is affected by unemployment. Cross-sectional analyses suggest the assumption that material factors like unemployment promote unhealthy behavior of the dietary behavior, tobacco consumption, physical activity, and combined health behavior categories. If the household is affected by poverty, individuals are more likely not to drink alcohol regularly (7.b.ii). Nevertheless, individuals that are currently unemployed are more likely to drink alcohol regularly in comparison to the reference group. The described effects cannot be confirmed if panel analyses are applied.

Men who are living in a household that is affected by unemployment are slightly more likely to do sport. If they are currently unemployed they are more likely to eat in a healthy way than their employed counterparts. Applying the combined poverty indicator also shows a reduced likelihood of being a non-smoker. In contrast, women do not change their health behavior if the household is affected by unemployment. If a woman is unemployed, she is less likely to eat in a healthy way. Thus this part of **H2** can be only confirmed for exceptional cases. With regard to psycho-social factors, the variable of economic worries is included. At the cross-sectional level high or medium economic worries are associated with a lower likelihood of being a non-smoker, being physically active (only high economic worries) and behaving in a health-promoting way in general.

Results of the fixed effects models differ for men and women. Interestingly the suggested inverse relationship between health behavior and psychosocial stress in the form of economic worries cannot be confirmed at the longitudinal level.

Men with high and economic worries are more likely to behave in a health-promoting way in the categories of diet and physical activity. Women with high economic worries show a higher likelihood of eating in a healthy way and being non-smokers. With regard to permanent measurements (7.b.iii and iv), women with medium economic worries are also more likely to behave in a health-promoting way in these categories. However, these females are less likely to pursue sport regularly. In conclusion, economic worries as indicators for psychosocial stress are negatively associated with health-damaging behavior. Examining causal effects shows the opposite effect with only one exception for women. Thus economic worries seem not to be a determinant that influences health behavior negatively.

Next the relevance of education by answering **H4** is discussed. Findings at a cross-sectional level suggest an inverse relationship between educational status and health behavior. A single exception is reported for alcohol consumption (cf. 7.b.vi). If causal effects for a low educational status are examined, these results conform to dietary behavior. Results for men are significant for both types of panel analyses, while women are only less likely to follow a healthy diet if the permanent poverty status is considered. Additionally, medium educated males are less likely to pursue sufficient sports. Interestingly, women who are in the low education group are more likely to be physically active. In conclusion **H4** can be confirmed only in parts.

Finally, **H5** on the relevance of occupation and income as well as unemployment for health behavior is discussed. As initially described, income is related to health behavior, while unemployment is less relevant. Cross-sectional analyses suggest that the occupational status is inversely related to health-promoting behavior. Inverse associations can be reported for dietary behavior, non-smoking, physical activity, and for combined health behavior, while the opposite effect is shown for alcohol consumption. Analyzing the occupational status at the longitudinal level shows that there are only a few significant causal effects on heath behavior. Men of the medium occupational status group have a higher likelihood of pursuing sports. In contrast, women with a low status are less likely to pursue sports. In addition these respondents are more likely to be non-smokers.

Women who have a medium occupational status are less likely to eat healthily (only in 7.b.iv) but are more likely to be non-smokers (only 7.b.iii). In conclusion, the relevance of the occupational status as single variable seems to be overestimated.

The following part of this section deals with some **methodical considerations on limitations** of this thesis and discusses enhancements for future research.

First, it must be underscored that GSOEP focuses mainly on socio-economic aspects in Germany. Data regarding health behavior is part of the survey but not elicited in detail. In comparison to pure health (behavior) surveys, information on health behavior is not very detailed. This applies especially to dietary behavior and alcohol consumption. Although Basiotis et al. (1995) report a direct association of self-reported healthfulness in diet and dietary behavior, it must be assumed that more detailed information allow more differentiated conclusions on dietary behavior. However, it would not be necessary to use a detailed Food Frequency Questionnaire (FFQ) like it was used for the German NVS II, but there are several proxy questions, e.g. on fruit and vegetable consumption, or on breakfast, to analyze a healthy diet (cf. Max Rubner-Institute 2008a; Contoyannis and Jones 2004; Cutler and Lleras-Muney 2006).

Additionally, information on alcohol consumption must be criticized due to its very vague character. Only frequencies without indicating a time unit (e.g. per week) and no quantities are surveyed. However, applying this method may avoid underreporting of alcohol consumption (cf. Stockwell et al. 2004). Altogether, modifying this question by adding a time unit would considerably improve information on alcohol consumption in this survey.

Due to selecting logistic regression models, variables on health behavior are reduced to binary variables so that a differentiated view on each type of health behavior is limited. This thesis does not look at correlations of health behavior by assuming interdependence. Future research should examine health behavior more in detail and focus on potential correlations among the different types of health behavior.

The main point of criticism concerning health behavior refers to the missing simultaneity of the four categories of health behavior. Only in 2008 are all four types of health behavior surveys at the same time.

In the other survey periods, physical activity is not considered in even-numbered years. Thus periods of the panel analyses differ. This problem is not only related to single dimensions of health behavior but also to combined health behavior. Due to the fact of non-simultaneity, it is not possible to conduct fixed effects models for combined health behavior. As already reported, cross-sectional analyses show clear negative associations for this category. However, causal effects of poverty or a low SES cannot be proven. Future research should focus more on combined health behavior patterns. Adapting the survey process of health behavior would solve this problem.

Nevertheless the GSOEP offers an interesting data base, as epidemiological surveys offer fewer details regarding socio-economic aspects which this study considers in the analyses.

Furthermore, one has to take into account that the results are not valid for extreme types of poverty such as the homeless, illegal immigrants, addicts or individuals who are highly deprived, because such individuals are not listed in GSOEP (cf. section 6.a). Nevertheless, the GSOEP presents a valuable data source for the analysis of the health gradient so often observed in economic and public health studies.

The next point within the methodical considerations applies to the panel analyses. Firstly, fixed effects logistic regression models allow analyzing causal effects. However, the equation considers individuals only if within-person variations for both the dependent and the independent variables exist (cf. Brüderl 2010). Thus the analyses do not allow conclusions on individuals who never experience the event of change, for instance if a respondent is always poor or shows a low SES. This individual may also show adverse health behavior that is caused by these determinants but is excluded from the fixed effects models. Secondly, using fixed effects models only within-person variations are examined while between-person variations cannot be considered. This is positive because the model accounts for all potential confounding variables. On the other hand the sample is much smaller than the sample for cross-sectional analyses.

This issue is observable for all three types of health behavior, especially for the category non-smoking. Since the presented panel analyses focuses mainly on changes of the poverty or SES situation fixed effects models are an advantage.

Finally, it must be criticized that data of GSOEP does not allow analyzing aspects of socialization regarding poverty, SES, or health behavior although authors like Bourdieu (1979) or Cockerham (2005) suggest that there is a high relevance of socialization for life-style aspects.

Individual health behavior is not only determined by poverty and SES situations of the last few years. There is evidence that childhood SES influences health of adults independently of adult SES (cf. Braveman et al. 2005). Additionally, Cockerham (2005) includes in his model on health lifestyles paradigm aspects of socialization (cf. **appendix 8**), which supports this suggestion. Although GSOEP provides information on a respondent's biography, it is not yet possible to identify information on childhood poverty or SES[102]. In addition to information on socialization, information on health knowledge should be taken into account as a possible determinant for health behavior.

[102] Parental income is not available (cf. GSOEP).

8. Summary

Over the last decades, the topic of health and health behavior with regard to poverty and social inequality has increased in importance. Research as well as health policy focuses on health inequality that is based on differences regarding health behavior and poverty or social inequality. These determinants are covered by the causation hypothesis, which includes materialist and behavioral explanations to describe health inequalities.

This study aims to analyze the relationship between health behavior with regard to poverty as well as the SES. Since around 16% of the population living in Germany in 2008 is at risk of income poverty, 26.81% are affected by poverty according to the combined poverty indicator[103], and about one third assigned to a low SES, this topic is of great interest not only for poverty and public health research but also for health policy and actors of public health.

The theoretical framework is given by social theories at the individual level as well as the human capital model of the demand for health and enhancements. These approaches underline, that health behavior is influenced directly and indirectly by poverty, SES, or single dimensions of SES.

Based on this framework, this thesis questions whether income-based measurements that are very commonly used to describe poverty are suitable to cover all dimensions of this condition. Many authors criticize that such a dichotomous approach is not eligible to describe a poverty situation. Therefore several poverty researchers suggest using multidimensional poverty indicators to analyze cumulative poverty. Despite these concerns on the usage of dichotomous poverty measurements, studies in the area of health economics and social epidemiology often use income information to describe health behavior. Furthermore, the application of the SES is very typical in the area of health research, but there is no consensus on measuring SES. Poverty and social inequality have also a dynamic character. To the best of the author's knowledge this thesis analyzes health behavior regarding multidimensional poverty and SES as well as regarding dynamics for the first time.

[103] Refers to the combined poverty indicator and includes extreme, moderate and one-sided poverty.

This thesis provides more detailed analyses on the topic of health behavior and poverty / social inequalities and aims to contribute important aspects to the existing literature.

Main findings of this thesis on the relevance of poverty and SES for health behavior show that:

1. The cross-sectional results suggest an inverse relationship between poverty / low SES and health behavior, especially regarding physical activity and combined health behavior.
2. Results of panel analyses can confirm cross-sectional findings only in parts.
3. Using the income-based at-risk-of-poverty rate leads to negative causal effects in the category physical activity for women. Using the permanent at-risk-of-poverty rate show that men are less likely to follow a healthy diet and women have fewer chances to be non-smoker. Positive causal effects are reported for women and dietary behavior as well as for men with regard to physical activity.
4. The combined poverty indicator provides more differentiated results. Negative causal effects for men are reported for dietary behavior and smoking while men affected by (permanent) poverty or precarity are more likely to pursue more sports than the prosperous reference group. In contrast, women who are permanently non-prosperous are less likely to eat healthily or to pursue sufficient sports. Interestingly they are more likely to be non-smokers.
5. With regard to social inequalities, men with a permanently low SES are less likely to realize a healthy diet and to be non-smokers. In contrast, women in the same situation are less likely to be non-smokers and to pursue sufficient sports.
6. Analyses on permanent poverty and low SES strengthen the effect of poverty and SES. Only a few exceptions are observable.

Against this background it can be summarized that all three applied measurements determine health behavior.

It has to be taken into consideration that different mechanisms underlie these determinants. However, the weakest effects are observable for the at-risk-of-poverty rate. This measurement must be also criticized due to its dichotomous character. Using the combined poverty indicator and SES leads to more differentiated results.

Analyses show also that not only poverty, but also situations of precarity may affect health behavior adversely.

For instance, precarious males are more likely to eat unhealthily and to be smokers while women are less likely to pursue sport sufficiently.

Additionally, health behavior as well as causal effects of poverty / low SES are differently distributed among men and women. This has to be taken into consideration if public health strategies to improve health behavior are developed.

The applied models examine also further impact factors on health behavior. At the cross-sectional level, educational attainment, occupational status as well as unemployment are inversely related to health behavior. These associations are confirmed only in a few cases if panel analyses are applied. This is also valid for economic worries, which are used as an indicator for psycho-social stress. This variable proves to be unsuitable for identifying psycho-social stress as described in Mackenbach's model 'Explanation of health inequality'. Other indicators, which include daily hassles or negative life-events, may be more eligible to cover this aspect.

In conclusion, the results show that being at risk of poverty, but also poor and precarious as well as having a low SES, influences health behavior in different ways. Findings underscore the relevance of cumulative poverty as well as dynamic aspects. Most responsive to these situations are physical activity for women and dietary behavior for men. Thus gender-specific approaches are needed to support health-promoting behavior. Furthermore, it must be assumed that childhood SES and socialization contribute to health behavior too. According to Cockerham (2005) these aspects should be also integrated in analyses concerning health behavior. Unfortunately no data are available for Germany in this regard.

9. Zusammenfassung

In den letzten Jahrzehnten hat das Forschungsinteresse am Thema Armut und gesundheitlicher Ungleichheit zugenommen. Sowohl Forschung als auch Politik haben sich bereits ausführlich damit auseinandergesetzt. Dabei haben Untersuchungen gezeigt, dass Personen, die von Armut oder sozialer Ungleichheit betroffen sind, häufiger gesundheitsschädigendes Gesundheitsverhalten vorweisen. Diese Beobachtung spiegelt sich auch in der sog. Kausationshypothese wider, die gesundheitliche Ungleichheit durch Verhalten sowie materielle Bedingungen erklärt.

Viele sozialepidemiologische Forschungsarbeiten, die zu diesem Thema bereits vorliegen, definieren Armut ausschließlich auf der Einkommensebene. Seit den 1990er Jahren betonen jedoch zahlreiche Armutsforscher die hohe Relevanz der sog. kumulativen Armut. Diese schließt sowohl Informationen zum Einkommen als auch Armut in Hinblick von Deprivationen, etwa Güterausstattungen, ein.

Des Weiteren zeigten Untersuchungen, dass Armut und soziale Ungleichheit einen dynamischen Charakter aufweisen. So liegen bereits Panelanalysen zum Thema Gesundheit und Armut vor. Diese legen ihren Schwerpunkt allerdings in der Regel auf Gesundheit in Bezug auf (Einkommens-) Armutsverläufe, nicht jedoch in Hinblick auf das Gesundheitsverhalten. Auch finden mehrdimensionale Armutskonzepte im Rahmen von Analysen des Gesundheitsverhaltens keine Anwendung. Durch bislang fehlende Untersuchungen von kumulativer Armut und sozialer Ungleichheit ist es bisher nicht möglich gewesen, etwaige kausale Effekte auf das Gesundheitsverhalten zu identifizieren.

Der theoretische Hintergrund dieser Arbeit beruht einerseits auf individuellen Erklärungsansätzen der Sozialtheorie zur gesundheitlichen Ungleichheit, andererseits auf Michael Grossmans Modell zur Gesundheitsproduktion sowie dessen Weiterentwicklungen in Hinblick auf Gesundheitsverhalten. Basierend auf diesen theoretischen Ansätzen wird angenommen, dass individuelles Gesundheitsverhalten durch Armut, den SES oder einzelne Bestandteile wie Bildung direkt und indirekt beeinflusst werden.

Vor diesem Hintergrund untersucht die vorliegende Studie mittels Daten des Sozio-ökonomischen Panels (GSOEP) die Bedeutung von Situationen von Armut und einem niedrigen Sozialstatus für das Gesundheitsverhalten in Deutschland. Gesundheitsverhalten wird dabei in Hinblick auf Ernährung, Rauchen, Alkoholkonsum, Sport sowie basierend auf einem kombinierten Indikator analysiert.

Zur Beschreibung von Armut bzw. sozialer Ungleichheit werden drei verschiedene Messinstrumente herangezogen. Dazu zählt die Armutsrisikoquote, die sowohl von der EU als auch von der Deutschen Bundesregierung in der Armuts- und Reichtumsberichterstattung verwendet wird. Des Weiteren werden zwei mehrdimensionale Messkonzepte angewendet. Dabei handelt es sich erstens um den kombinierten Armutsindikator nach Groh-Samberg (2009), der ein differenziertes Bild von Armut und Prekarität zulässt, indem neben Einkommensarmut, weitere Dimensionen von Deprivationen hinzugezogen werden. Zweitens wird der SES nach Winkler und Stolzenberg (1999) verwendet, welcher Informationen zum Bildungs- und Berufsstatus sowie zur Einkommensposition zusammenfasst. Dieses Messinstrument hat bereits häufig in epidemiologischen Untersuchungen in Deutschland Anwendung gefunden.

Die wichtigsten Ergebnisse dieser Untersuchung sind:

1. Ergebnisse der Querschnittsuntersuchungen für das Jahr 2008 zeigen, dass Personen, welche entweder arm sind oder einen niedrigen SES aufweisen, ein ungünstigeres Gesundheitsverhalten als Personen der Wohlstandsgruppe haben. Dies trifft besonders auf körperliche Aktivität und das kombinierte Gesundheitsverhalten zu.
2. Ergebnisse der Panelanalysen können die Ergebnisse der Querschnittsanalysen nur zum Teil bestätigen.
3. Für Personen, die als armutsgefährdet gelten, werden negative kausale Effekte hinsichtlich der Ernährung für Männer und für Rauchen und körperliche Aktivität für Frauen identifiziert. Positive Kausale Effekte sind für Frauen in Hinblick auf Ernährung und für Männer hinsichtlich körperlicher Aktivität beobachtbar.

4. Die Anwendung des kombinierten Armutsindikators zeigt ein differenzierteres Bild als die dichotome Armutsrisikoquote. Männer, die von Armut oder Prekarität (dauerhaft) betroffen sind, weisen eine höhere Wahrscheinlichkeit auf, sich nicht gesund zu ernähren oder zu rauchen. Frauen in diesen Situationen treiben dagegen weniger Sport und ernähren sich ungesünder.

5. Insbesondere Männer mit einem dauerhaft niedrigen SES weisen ein schlechteres Ernährungsverhalten auf und rauchen häufiger. Auch Frauen sind seltener Nichtraucher oder treiben Sport.

6. Insgesamt weisen Analysen, die das dauerhafte Verbleiben in Armut oder im niedrigen Sozialstatus berücksichtigen, stärkere kausale Effekte auf als Untersuchungen, die nur ein Jahr berücksichtigen.

Somit können für die drei angewendeten Messkonzepte kausale Effekte auf das Gesundheitsverhalten nachgewiesen werden, wobei diese für die eindimensionale Armutsrisikoquote am schwächsten sind. Folglich wird die Annahme, dass Armut ein mehrdimensionales Phänomen ist, gestützt. Zudem sind nicht nur Personen, die den Kategorien Armut oder niedriger SES zugeordnet sind, häufiger gesundheitsgefährdendes Verhalten, sondern auch Personen aus dem Prekariat oder des mittleren SES. Zudem zeigen die Analysen, dass Männer und Frauen unterschiedlich auf Armut und soziale Ungleichheit reagieren. Dies sollte auch bei der Formulierung von Gesundheitsförderungskonzepten berücksichtigt werden.

Zukünftige Untersuchungen sollten nicht nur verstärkt auf kumulative und dynamische Armutsverläufe beachten, sondern auch kombiniertes Gesundheitsverhalten betrachten. Des Weiteren gibt es Hinweise, dass der kindliche SES sowie die Sozialisation im Allgemeinen einen hohen Stellenwert für die Ausprägung des Gesundheitsverhaltens haben, die in Anlehnung an Cockerham (2005) auch berücksichtigt werden sollten. In Deutschland liegen dafür bislang keine Daten vor.

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Appendix

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Appendix 1: Examples for dietary key messages for consumers

Table A 1: Dietary Guidelines for Americans (DGA) - Consumer key messages

Key Messages	Detailed Messages
Build a healthy plate	1. Make half your plate fruits and vegetables. 2. Switch to skim or 1% milk. 3. Make at least half your grains whole. 4. Vary your protein food choices.
Cut back on foods high in solid fats, added sugars, and salt	1. Choose foods and drinks with little or no added sugars. 2. Look out for salt (sodium) in foods you buy—it all adds up. 3. Eat fewer foods that are high in solid fats.
Eat the right amount of calories for you	1. Enjoy your food, but eat less. 2. Cook more often at home, where *you* are in control of what's in your food. 3. When eating out, choose lower calorie menu options. 4. Write down what you eat to keep track of how much you eat. 5. If you drink alcoholic beverages, do so sensibly—limit to 1 drink a day for women or to 2 drinks a day for men.
Be physically active your way	Pick activities that you like and start by doing what you can, at least 10 minutes at a time. Every bit adds up, and the health benefits increase as you spend more time being active.

Source: modified, following USDA and DHHS 2011

Table A 2: 10 guidelines of the German Nutrition Society (DGE) for a wholesome diet

1. Versatile eating habits
2. Ample cereal products – and potatoes
3. Vegetables and Fruit – take '5 a day'...
4. Milk and dairy products daily; fish once to twice a week; meat, sausages and eggs in moderation
5. Fat and fatty foods in moderation
6. Sugar and salt in moderation
7. Plenty of fluid
8. Prepare tasty, carefully cooked dishes.
9. Take your time and enjoy eating
10. Watch your weight and stay active

Source: DGE 2011

Appendix 2: Influences on health equity

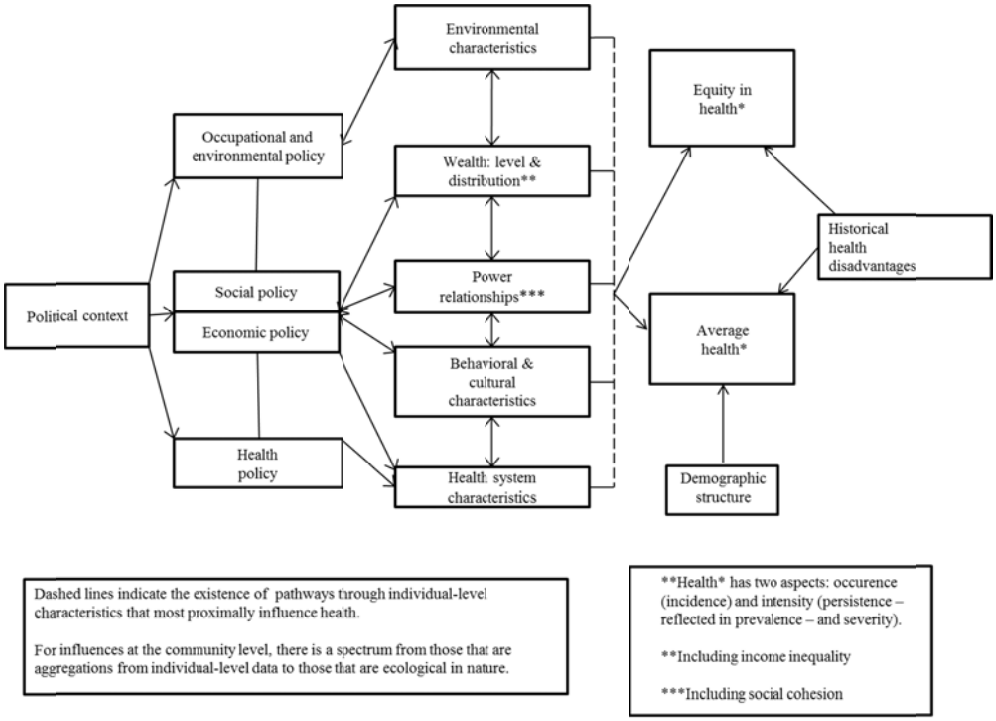

Figure A 1: Influences on health equity

Source: Starfield 2007

Appendix 3: SES according to Winkler and Stolzenberg

Table A 3: Construction of SES following Winkler and Stolzenberg (1999)

Education		Occupational qualification	Household net income	Occupational status	Point Value
no school degree yet dropout, no school degree secondary school degree Intermediate School Degree 10th school degree (East) Technical School Degree	and	no vocational degree other training apprenticeship, not graduated yet	<1,249 Euro	in education apprentice, trainee industry technology apprentice, trainee trainee, intern untrained worker	1
dropout, no school degree secondary school degree other degree	and	apprenticeship vocational school technical school	1,250 – 1,749 Euro	untrained worker semi-trained worker	2
intermediate school degree	and	apprenticeship vocational school technical school university, not graduated yet	1,750 – 2,249 Euro	foreman team leader help in family business employee with simple tasks low-level civil service	3
technical school degree 10th school degree (East)	and	apprenticeship vocational school technical school university, not graduated yet	2,250 – 2,999 Euro	qualified professional middle-level civil service	4
Abitur/ college entrance exam (East) (upper secondary degree)	and	no vocational degree apprenticeship vocational school technical school apprenticeship, not graduated yet, university, not graduated yet	3,000 – 3,999 Euro	self-employed farmer or other self-employed, no co-workers – 9 co-workers	5
Abitur/ college entrance exam (East) (upper secondary degree)	and	technical college	4,000 – 4,999 Euro	free-lance professional high qualified professional high-level civil service	6
Abitur/ college entrance exam (East) (upper secondary degree)		university	≥ 5,000 Euro	self-employed farmer and other self-employed > 9 co-workers managerial executive civil services	7

Source: Lampert and Kroll 2009

Table A 4: SES - Income groups (Euro) adjusted for Consumer Price Index (CPI)

	2000	**2001**	**2002**	**2003***	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
CPI	**96**	**98**	**99**	**100**	**102**	**103**	**105**	**107**	**110**	**110**	**112**
SES-1	>1196	>1219	>1238	>**1250**	>1271	>1290	>1311	>1340	>1375	>1380	>1396
SES-2	1196 - 1674	1219-1705	1238-1732	**1250-1749**	1271-1779	1290-1805	1311-1835	1340-1875	1375-1924	1380-1931	1396-1954
SES-3	1675-2152	1706-2193	1733-2227	**1750-2249**	1780-2287	1806-2321	1836-2359	1876-2411	1925-2474	1932-2483	1955-2512
SES-4	2153-2870	2194-2924	2228-2969	**2250-2999**	2288-3050	2322-3095	2360-3146	2412-3215	2475-3299	2484-3311	2513-3350
SES-5	2871-3827	2925-3899	2970-3959	**3000-3999**	3051 4067	3096-4127	3147-4195	3216-4287	3300-4399	3312-4415	3351-4467
SES-6	3828-4784	3900-4874	3960-4949	**4000-4999**	4068-5084	4128-5159	4196-5244	4288-5359	4400-5499	4416-5519	4468-5584
SES-7	4785	4875	4950	**5000**	5085	5160	5245	5360	5500	5520	5585

*base year, computed following Destatis 2012d

Appendix 4: Construction of the combined poverty indicator according to Groh-Samberg

This section is based on Groh-Samberg (2008 and 2009).

Income: Household Post-Government Income

This variable represents the combined income after taxes and government transfers in the previous year of all individuals in the household. The value of this variable ranges from 0 to 5,000,000. This variable is EURO in the current year (Grabka 2011).

Table A 5: Operationalization of income groups of the combined poverty indicator

Denotation	Defined threshold
Adequate income	>75% of mean
Low income	50–75% of mean
Income poverty	<50% of mean

Domains of deprivation

1. Financial reserves
2. Housing
3. Consumption
4. Unemployment

Table A 6: Financial reserves:

Category	No deprivation	Characteristics of deprivation	
Assets including savings account, securities, building-savings, life assurances and operating assets	Assets available	Only bank book with low interest	No assets
Income from rent	Earnings available	Low earnings < costs	No earnings
Savings behavior	Savings ≥50 Euro	Savings < 50 Euro	No Savings
Transfer benefit	No transfer benefit	Housing allowance subsidy	Social assistance benefits

A household is categorized as deprived regarding financial reserves if either:

a) The household receives social assistance benefits, and/or
b) The household receives housing allowance subsidy AND has low savings, no positive income from rent and only bank book with low interest and/or.
c) The household has no savings, no earnings from income from rent and no assets or interest earnings

Table A 7: Housing

Dimension	Deprived if:
Room	Less than one room per person aged three and above
Central heating	Dwelling without central **or** floor heating
Condition of house	Major renovation, ready for demolition
Sanitation facilities	Dwelling without kitchen, indoor bath/kitchen, indoor toilet **or** hot water / boiler
Garden, balcony, basement/ storage space	No garden **and** no balcony/terrace **and** no basement / storage space

A household is categorized as deprived regarding housing if the dwelling shows at least one out of these five deficits.

Consumption

The dimension on consumption considers a large number of items that are summarized by a commodity and deprivation scale (**tables 55 and 56**). In years with an odd number, participants indicate not only whether they own a certain item but also reasons for not owning an item (financial reasons or others).

Table A 8: Commodity scale for even-numbered years (2000 – 2010)

Item
• Color Television • Car • Stereo, HiFi System • Washing Machine • Telephone • Video Recorder* • PC • Internet-Connection • Microwave • Dishwasher • Fax Machine • ISDN • DVD-Player**

* only until 2006; **only 2008 and 2010

Table A 9: Deprivation scale for odd-numbered years (2001 – 2009)

Item
• Color Television • Telephone • Warm meal/2 days • HH located in good neighborhood • Building in good condition • Car • Able to put money away for emergencies • Vacation of at least one week per year • New furniture • Invite friends for dinner once a month

First, the share of households where an item is missing is calculated. If an item is missing 'for other reasons' it is weighted by one half. Next, the mean of the sum of all items and the standard deviation are calculated.

A deprivation in the area of consumption is present if the value of the individual commodity indicator or the proportional deprivation index of a household is greater than the mean plus one standard deviation.

Unemployment

A deprivation regarding unemployment is present if a household is affected by more than three months of unemployment per year. Therefore all adult members of a household are considered.

Construction of the combined poverty indicator

Based on information on income and the four dimensions of deprivation, the combined poverty indicator is constructed (**table A 10**).

Table A 10: Characteristics of the combined poverty index by Groh-Samberg

Income	**Deprivation**		
	Multiple deprivation (≥ 2)	**Single deprivation**	**No deprivation**
Income poverty (<50% of mean)	Extreme poverty	Moderate poverty	One-sided poverty
Low income (50-75% of mean)	Moderate poverty	Vulnerability	Fragile prosperity
Adequate income (> 75% of mean)	One-sided poverty	Fragile prosperity	Secure prosperity

Source: Groh-Samberg 2008

Appendix 5: Detailed descriptive statistics on health behavior

Table A 11: Distribution of Health Behavior in the GSOEP population (%)* (including N)

Health behavior	Sample		2004	2005	2006	2007	2008	2009	2010
Healthy diet	Total	Yes	45.44	#	44.95	#	44.98	#	43.68
		No	54.56	#	55.05	#	55.02	#	56.32
	Male	Yes	36.07	#	35.12	#	35.01	#	32.54
		No	63.93	#	64.88	#	64.99	#	67.46
	Female	Yes	54.58	#	54.35	#	54.51	#	54.23
		No	45.42	#	45.65	#	45.49	#	45.77
N (Healthy diet)			18,081		18,393		16,092		15,119
Non-smoking	Total	Yes	64.60	#	64.30	#	66.42	#	66.83
		No	35.40	#	35.70	#	33.58	#	33.17
	Male	Yes	60.45	#	61.17	#	62.65	#	62.87
		No	39.55	#	38.83	#	37.35	#	37.13
	Female	Yes	68.64	#	67.29	#	70.02	#	70.56
		No	31.64	#	32.71	#	29.98	#	29.44
N (Non-smoking)			17,482		17,465		15,172		14,275
Sufficient physical activity	Total	Yes	#	33.72	#	35.49	40.67	37.64	#
		No	#	66.28	#	64.51	59.33	62.36	#
	Male	Yes	#	33.36	#	34.25	39.67	38.77	#
		No	#	66.64	#	65.75	60.33	61.23	#
	Female	Yes	#	34.07	#	36.67	41.63	38.77	#
		No	#	65.93	#	63.33	58.37	61.23	#
N (Sufficient physical activity)				17,384		17,228	16,092	15,219	#
Moderate alcohol consumption	Total	Yes	#	#	85.56	#	83.78	#	85.18
		No	#	#	14.44	#	16.22	#	14.82
	Male	Yes	#	#	77.40	#	74.93	#	76.97
		No	#	#	22.60	#	25.07	#	23.03
	Female	Yes	#	#	93.37	#	92.23	#	92.96
		No	#	#	6.63	#	7.77	#	7.04
N (Moderate alcohol consumption)					18,393		16,092		15,119
Health-promoting behavior	Total	Yes	#	#	#	#	51.37	#	#
		No	#	#	#	#	48.63	#	#
	Male	Yes	#	#	#	#	44.71	#	#
		No	#	#	#	#	55.29	#	#
	Female	Yes	#	#	#	#	57.75	#	#
		No	#	#	#	#	42.25	#	#
N (Health-promoting behavior)							15,038		

Table A 12: Sequences of health behavior (detailed): Dietary behavior

Y=1: healthy **Y=0: unhealthy**	**Dietary behavior** **N=11,180**						
Sample	total	male	female		total	male	female
0000	33.51	43.12	24.48	**0110**	1.84	2.09	1.61
1000	5.46	5.55	5.39	**0101**	1.95	1.80	2.09
0100	3.75	4.09	3.43	**0011**	4.08	3.81	4.34
0010	4.15	5.10	3.26	**1110**	3.19	2.80	3.55
0001	6.05	6.27	5.83	**1101**	2.71	2.27	3.11
1100	2.24	2.52	1.98	**1011**	2.81	1.94	3.62
1010	2.14	2.07	2.20	**0111**	4.89	3.25	6.43
1001	1.83	1.70	1.95	**1111**	19.41	11.63	26.72

Table A 13: Sequences of health behavior (detailed): Smoking

Y=1: healthy **Y=0: unhealthy**	**Smoking** **N= 9,416**						
Sample	**total**	**male**	**female**		**total**	**male**	**female**
0000	25.34	28.59	22.43	**0110**	0.51	0.42	0.59
1000	2.21	2.74	1.74	**0101**	0.36	0.37	0.34
0100	1.33	1.55	1.14	**0011**	2.50	2.35	2.64
0010	1.67	1.95	1.41	**1110**	1.17	1.34	1.02
0001	2.39	2.78	2.03	**1101**	0.74	0.84	0.65
1100	1.03	1.39	0.70	**1011**	1.23	0.92	1.51
1010	0.35	0.25	0.45	**0111**	2.36	2.37	2.35
1001	0.51	0.54	0.49	**1111**	56.30	51.60	60.51

Table A 14: Sequences of health behavior (detailed): alcohol consumption

Y=1: healthy **Y=0: unhealthy**	**Alcohol consumption (%)** **N=12,677**		
Sample	**total**	**male**	**female**
000	6.75	11.19	2.60
100	3.21	4.83	1.69
010	1.14	1.74	0.58
001	2.04	3.03	1.12
110	3.70	5.28	2.22
011	3.07	4.29	1.93
101	3.33	4.64	2.10
111	76.77	65.00	87.76

Table A 15: Sequences of health behavior (detailed): Physical activity

Y=1: healthy Y=0: unhealthy	Physical activity N=11,213						
Sample	**total**	**male**	**female**		**total**	**male**	**female**
0000	44.30	46.98	41.74	**0110**	2.30	1.97	2.61
1000	4.19	4.19	4.18	**0101**	1.07	0.92	1.21
0100	2.14	2.23	2.05	**0011**	4.31	4.24	4.39
0010	5.12	4.41	5.80	**1110**	2.76	2.47	3.03
0001	4.73	3.99	5.44	**1101**	1.54	1.60	1.47
1100	1.67	1.53	1.81	**1011**	1.89	1.81	1.96
1010	1.39	1.43	1.35	**0111**	5.17	4.72	5.60
1001	1.17	1.21	1.14	**1111**	16.27	16.31	16.23

Appendix 6: Complete Results of the multivariate analyses (cf. 7b)

Table A 16: Results of the logistic regression model: Diet and the at-risk-of-poverty rate of 2008

Healthy diet	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
At-risk-of-poverty	0.993	[0.834-1.181]	0.088	1.119	[0.857-1.462]	0.153	0.918	[0.734-1.148]	0.105
Low education	**0.662*****	[0.554-0.791]	0.06	**0.671*****	[0.525-0.859]	0.084	**0.650*****	[0.501-0.844]	0.087
Medium education	**0.809*****	[0.689-0.95]	0.066	**0.761****	[0.609-0.952]	0.087	0.843	[0.666-1.069]	0.102
Low occupational status	**0.652*****	[0.553-0.768]	0.055	**0.686*****	[0.542-0.868]	0.082	**0.625*****	[0.499-0.784]	0.072
Medium occupational status	**0.822*****	[0.724-0.933]	0.053	**0.779*****	[0.645-0.939]	0.074	**0.855***	[0.719-1.018]	0.076
Household affected by unemployment	**0.985***	[0.97-1.001]	0.008	0.982	[0.958-1.007]	0.013	0.989	[0.969-1.009]	0.01
Currently unemployed	0.992	[0.794-1.239]	0.113	1.152	[0.825-1.611]	0.197	0.841	[0.632-1.118]	0.122
Health status	**1.141*****	[1.074-1.212]	0.035	**1.099****	[1.004-1.204]	0.051	**1.179*****	[1.088-1.278]	0.048
female	**2.443*****	[2.201-2.711]	0.13						
Age group: 17 -14	**0.621*****	[0.496-0.778]	0.071	**0.69****	[0.499-0.953]	0.114	**0.579*****	[0.424-0.79]	0.092
Age group: 25 - 34	**0.813****	[0.686-0.964]	0.07	**0.737****	[0.567-0.958]	0.099	0.857	[0.68-1.079]	0.101
Age group 45 -54	**1.177****	[1.009-1.373]	0.092	**1.214***	[0.972-1.516]	0.137	1.131	[0.911-1.402]	0.124
Age group 55 - 65	**1.921*****	[1.615-2.286]	0.17	**2.006*****	[1.564-2.573]	0.255	**1.784*****	[1.399-2.274]	0.221
Single (not married)	1.005	[0.855-1.181]	0.083	0.995	[0.791-1.251]	0.116	0.986	[0.785-1.238]	0.115
Divorced	0.957	[0.802-1.143]	0.087	0.847	[0.643-1.117]	0.119	1.059	[0.835-1.343]	0.128
Widowed	1.164	[0.824-1.643]	0.205	1.396	[0.659-2.956]	0.534	1.178	[0.806-1.722]	0.228
No migration background	0.969	[0.841-1.117]	0.07	0.928	[0.752-1.145]	0.099	1.01	[0.836-1.219]	0.097
East Germany2008	**1.142****	[1.006-1.296]	0.074	1.078	[0.898-1.294]	0.101	**1.209****	[1.011-1.446]	0.111
Children (0-14)/ HH	**1.088****	[1.01-1.172]	0.041	1.02	[0.913-1.139]	0.058	**1.136****	[1.022-1.262]	0.061
Risk-taker	**1.215*****	[1.058-1.396]	0.086	1.172	[0.962-1.428]	0.118	**1.320*****	[1.081-1.612]	0.135
Risk-neutral	**1.135****	[1.011-1.275]	0.067	1.153	[0.964-1.379]	0.105	1.118	[0.959-1.303]	0.088
High Economic worries	0.964	[0.821-1.13]	0.078	0.936	[0.741-1.182]	0.111	0.958	[0.768-1.195]	0.108
Medium Economic worries	0.911	[0.805-1.031]	0.058	0.94	[0.789-1.12]	0.084	0.868	[0.728-1.035]	0.078
Constant	0.729**	[0.569-0.934]	0.092	0.767	[0.539-1.09]	0.138	**1.776*****	[1.276-2.472]	0.3

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 17: Results of the logistic regression model: Smoking and the at-risk-of-poverty rate of 2008

Non-smoking 2008	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
At-risk-of-poverty	0.992	[0.837-1.176]	0.086	1.011	[0.781-1.307]	0.133	0.988	[0.785-1.242]	0.116
Low education	**0.409*****	[0.333-0.502]	0.043	**0.401*****	[0.304-0.528]	0.056	**0.418*****	[0.307-0.568]	0.065
Medium education	**0.625*****	[0.516-0.757]	0.061	**0.581*****	[0.446-0.756]	0.078	**0.69*****	[0.521-0.914]	0.099
Low occupational status	**0.784*****	[0.661-0.93]	0.068	**0.799***	[0.635-1.005]	0.093	**0.779***	[0.602-1.008]	0.102
Medium occupational status	**0.803*****	[0.699-0.921]	0.057	0.9	[0.741-1.092]	0.089	**0.709*****	[0.583-0.862]	0.071
Household affected by unemployment	**0.979*****	[0.966-0.992]	0.007	**0.982***	[0.962-1.002]	0.01	**0.974*****	[0.956-0.992]	0.009
Currently unemployed	**0.609*****	[0.499-0.743]	0.062	**0.503*****	[0.376-0.672]	0.074	**0.74****	[0.56-0.977]	0.105
Health status	**1.12*****	[1.052-1.193]	0.036	**1.094****	[1.003-1.195]	0.049	**1.158*****	[1.058-1.268]	0.054
female	**1.42*****	[1.273-1.584]	0.079						
Age group: 17 -14	**1.539*****	[1.229-1.926]	0.176	**1.521*****	[1.124-2.058]	0.235	**1.545*****	[1.111-2.149]	0.26
Age group: 25 - 34	0.933	[0.777-1.121]	0.087	0.866	[0.669-1.123]	0.115	1.018	[0.785-1.322]	0.136
Age group 45 -54	1.075	[0.913-1.266]	0.09	1.069	[0.854-1.339]	0.123	1.091	[0.86-1.384]	0.132
Age group 55 - 65	**1.887*****	[1.56-2.282]	0.183	**1.891*****	[1.46-2.448]	0.249	**1.946*****	[1.47-2.577]	0.279
Single (not married)	**0.736*****	[0.621-0.872]	0.064	0.852	[0.678-1.07]	0.099	**0.64*****	[0.497-0.823]	0.082
Divorced	**0.481*****	[0.401-0.577]	0.045	**0.514*****	[0.393-0.673]	0.071	**0.45*****	[0.353-0.575]	0.056
Widowed	0.902	[0.612-1.332]	0.179	1.176	[0.549-2.52]	0.457	0.832	[0.535-1.294]	0.187
No migration background	0.964	[0.83-1.121]	0.074	1.168	[0.949-1.436]	0.123	**0.777****	[0.623-0.969]	0.087
East Germany2008	1.074	[0.941-1.226]	0.073	1.111	[0.924-1.337]	0.105	1.034	[0.856-1.25]	0.1
Children (0-14)/ HH	**1.084****	[1-1.174]	0.044	**1.17*****	[1.046-1.309]	0.067	0.997	[0.888-1.12]	0.059
Risk-taker	**0.719*****	[0.621-0.832]	0.054	**0.753*****	[0.617-0.918]	0.076	**0.644*****	[0.518-0.801]	0.072
Risk-neutral	**0.849*****	[0.75-0.962]	0.054	**0.801****	[0.669-0.958]	0.073	0.901	[0.757-1.073]	0.08
High Economic worries	**0.708*****	[0.597-0.839]	0.061	**0.662*****	[0.525-0.836]	0.078	**0.795***	[0.619-1.021]	0.101
Medium Economic worries	**0.815*****	[0.709-0.937]	0.058	**0.743*****	[0.616-0.895]	0.071	0.932	[0.757-1.146]	0.098
Constant	**5.44*****	[4.123-7.177]	0.769	**4.825*****	[3.356-6.939]	0.894	**8.413*****	[5.596-12.649]	1.75

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 18: Results of the logistic regression model: Alcohol consumption and the at-risk-of-poverty rate of 2008

Moderate alcohol consumption 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
At-risk-of-poverty	**1.35****	[1.038-1.756]	0.181	**1.512****	[1.093-2.093]	0.251	0.9	[0.585-1.384]	0.198
Low education	**1.316****	[1.052-1.645]	0.15	1.125	[0.853-1.483]	0.159	**1.972*****	[1.378-2.822]	0.361
Medium education	**1.234****	[1.012-1.506]	0.125	1.156	[0.905-1.477]	0.144	**1.461****	[1.068-1.997]	0.233
Low occupational status	**1.581*****	[1.268-1.971]	0.178	**1.386****	[1.064-1.805]	0.187	**3.052*****	[2.048-4.549]	0.621
Medium occupational status	**1.436*****	[1.212-1.701]	0.124	**1.483*****	[1.206-1.824]	0.157	**1.373****	[1.039-1.815]	0.195
Household affected by unemployment	1.011	[0.992-1.03]	0.01	1.01	[0.988-1.032]	0.011	1.011	[0.97-1.054]	0.021
Currently unemployed	**0.787***	[0.601-1.031]	0.108	0.8	[0.582-1.1]	0.13	0.842	[0.492-1.443]	0.231
Health status	**0.9****	[0.83-0.977]	0.038	**0.899****	[0.815-0.992]	0.045	0.928	[0.802-1.074]	0.069
female	**3.86*****	[3.341-4.461]	0.285						
Age group: 17 -14	**1.326***	[0.982-1.791]	0.203	**1.364***	[0.957-1.944]	0.247	1.143	[0.657-1.986]	0.322
Age group: 25 - 34	**1.232***	[0.962-1.577]	0.155	1.117	[0.827-1.508]	0.171	**1.55****	[1.011-2.375]	0.338
Age group 45 -54	**0.789****	[0.645-0.964]	0.081	0.852	[0.668-1.087]	0.106	**0.656****	[0.472-0.91]	0.11
Age group 55 - 65	0.868	[0.694-1.084]	0.099	0.914	[0.699-1.196]	0.125	0.738	[0.504-1.08]	0.143
Single (not married)	1.04	[0.845-1.28]	0.11	1.104	[0.861-1.416]	0.14	0.962	[0.677-1.367]	0.172
Divorced	1.076	[0.844-1.373]	0.134	1.049	[0.773-1.422]	0.163	1.227	[0.828-1.82]	0.247
Widowed	1.066	[0.651-1.746]	0.268	0.799	[0.348-1.838]	0.34	1.219	[0.635-2.34]	0.406
No migration background	**0.658*****	[0.531-0.816]	0.072	**0.721****	[0.558-0.933]	0.095	**0.471*****	[0.319-0.694]	0.093
East Germany2008	0.989	[0.843-1.16]	0.081	0.874	[0.724-1.055]	0.084	**1.375****	[1.009-1.875]	0.217
Children (0-14)/ HH	**1.114****	[1.004-1.236]	0.059	1.101	[0.969-1.25]	0.071	1.12	[0.946-1.326]	0.096
Risk-taker	0.899	[0.746-1.082]	0.085	0.962	[0.772-1.198]	0.108	**0.721***	[0.518-1.003]	0.122
Risk-neutral	1.011	[0.862-1.184]	0.082	1.061	[0.871-1.292]	0.107	0.91	[0.702-1.181]	0.121
High Economic worries	1.106	[0.89-1.375]	0.123	1.013	[0.776-1.323]	0.138	1.351	[0.924-1.976]	0.262
Medium Economic worries	1.124	[0.957-1.32]	0.092	1.069	[0.879-1.3]	0.107	**1.281***	[0.981-1.672]	0.174
Constant	**2.51*****	[1.799-3.503]	0.427	**2.547*****	[1.704-3.806]	0.522	**10.037*****	[5.905-17.059]	2.716

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 19: Results of the logistic regression model: Physical activity and the at-risk-of-poverty rate of 2008

Sufficient physical activity2008	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
At-risk-of-poverty	**0.795****	[0.664-0.952]	0.073	0.905	[0.689-1.188]	0.126	**0.756****	[0.595-0.961]	0.092
Low education	**0.479*****	[0.402-0.571]	0.043	**0.398*****	[0.31-0.51]	0.05	**0.548*****	[0.425-0.707]	0.071
Medium education	**0.724*****	[0.618-0.848]	0.058	**0.62*****	[0.494-0.777]	0.072	**0.817***	[0.653-1.022]	0.093
Low occupational status	**0.595*****	[0.505-0.703]	0.05	**0.594*****	[0.469-0.752]	0.072	**0.586*****	[0.464-0.74]	0.07
Medium occupational status	**0.859****	[0.756-0.975]	0.056	0.941	[0.781-1.134]	0.089	**0.803****	[0.675-0.957]	0.072
Household affected by unemployment	**0.969*****	[0.951-0.987]	0.009	0.987	[0.963-1.011]	0.012	**0.946*****	[0.921-0.972]	0.013
Currently unemployed	**0.82***	[0.652-1.031]	0.096	**0.607*****	[0.441-0.837]	0.099	1.079	[0.785-1.483]	0.175
Health status	**1.28*****	[1.201-1.363]	0.041	**1.323*****	[1.205-1.452]	0.063	**1.23*****	[1.129-1.34]	0.054
female	**1.209*****	[1.088-1.343]	0.065						
Age group: 17 -14	**1.404*****	[1.126-1.75]	0.158	**1.987*****	[1.459-2.705]	0.313	0.997	[0.721-1.376]	0.164
Age group: 25 - 34	1.033	[0.862-1.237]	0.095	1.235	[0.948-1.609]	0.167	0.884	[0.69-1.133]	0.112
Age group 45 -54	0.967	[0.829-1.128]	0.076	0.896	[0.719-1.118]	0.101	1.042	[0.838-1.295]	0.116
Age group 55 - 65	0.985	[0.827-1.173]	0.088	0.995	[0.771-1.285]	0.13	0.983	[0.772-1.253]	0.122
Single (not married)	**1.228****	[1.044-1.444]	0.102	**1.283****	[1.019-1.617]	0.151	1.207	[0.957-1.522]	0.143
Divorced	0.89	[0.741-1.068]	0.083	1.091	[0.827-1.441]	0.155	**0.777****	[0.607-0.995]	0.098
Widowed	1.023	[0.714-1.465]	0.187	0.784	[0.337-1.828]	0.339	0.944	[0.63-1.413]	0.194
No migration background	**1.517*****	[1.31-1.757]	0.114	1.169	[0.947-1.443]	0.125	**1.888*****	[1.539-2.316]	0.197
East Germany2008	**0.698*****	[0.614-0.793]	0.046	**0.737*****	[0.612-0.887]	0.07	**0.66*****	[0.552-0.79]	0.06
Children (0-14)/ HH	**0.916****	[0.849-0.989]	0.036	0.992	[0.889-1.107]	0.055	**0.864*****	[0.775-0.964]	0.048
Risk-taker	**1.393*****	[1.209-1.605]	0.101	**1.344*****	[1.102-1.639]	0.136	**1.418*****	[1.145-1.755]	0.154
Risk-neutral	**1.227*****	[1.089-1.383]	0.075	**1.233****	[1.024-1.485]	0.117	**1.242*****	[1.062-1.453]	0.099
High Economic worries	**0.774*****	[0.656-0.913]	0.065	0.827	[0.649-1.052]	0.102	**0.733*****	[0.584-0.92]	0.085
Medium Economic worries	0.929	[0.82-1.053]	0.059	0.966	[0.808-1.155]	0.088	0.895	[0.75-1.067]	0.08
Constant	**0.804***	[0.624-1.035]	0.104	0.976	[0.684-1.393]	0.177	0.834	[0.593-1.173]	0.145

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 20: Results of the logistic regression model: Combined health behavior and the at-risk-of-poverty rate of 2008

Health-oriented behavior	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
At-risk-of-poverty	**0.777*****	[0.645-0.936]	0.074	0.912	[0.691-1.205]	0.129	**0.716*****	[0.561-0.914]	0.089
Low education	**0.404*****	[0.335-0.489]	0.039	**0.347*****	[0.268-0.449]	0.046	**0.463*****	[0.348-0.615]	0.067
Medium education	**0.643*****	[0.542-0.763]	0.056	**0.545*****	[0.431-0.689]	0.065	**0.757****	[0.587-0.975]	0.098
Low occupational status	**0.593*****	[0.5-0.704]	0.052	**0.602*****	[0.474-0.764]	0.073	**0.587*****	[0.459-0.751]	0.074
Medium occupational status	**0.806*****	[0.707-0.919]	0.054	0.88	[0.729-1.061]	0.084	**0.744*****	[0.618-0.895]	0.07
Household affected by unemployment	**0.968*****	[0.952-0.984]	0.008	**0.979***	[0.957-1.001]	0.011	**0.959*****	[0.937-0.982]	0.011
Currently unemployed	**0.758****	[0.605-0.95]	0.087	**0.687****	[0.497-0.95]	0.114	0.815	[0.598-1.111]	0.129
Health status	**1.187*****	[1.113-1.266]	0.039	**1.191*****	[1.084-1.309]	0.057	**1.18*****	[1.08-1.29]	0.053
female	**1.908*****	[1.711-2.126]	0.106						
Age group: 17 -14	1.089	[0.865-1.372]	0.128	**1.454****	[1.065-1.985]	0.231	0.823	[0.586-1.155]	0.143
Age group: 25 - 34	0.936	[0.78-1.122]	0.087	0.989	[0.762-1.284]	0.132	0.888	[0.69-1.143]	0.114
Age group 45 -54	1.029	[0.875-1.21]	0.085	0.992	[0.79-1.246]	0.115	1.067	[0.844-1.35]	0.128
Age group 55 - 65	**1.625*****	[1.35-1.955]	0.153	**1.613*****	[1.247-2.089]	0.212	**1.65*****	[1.261-2.158]	0.226
Single (not married)	0.949	[0.803-1.121]	0.081	0.977	[0.777-1.228]	0.114	0.933	[0.73-1.192]	0.117
Divorced	**0.749*****	[0.622-0.902]	0.071	**0.765***	[0.581-1.009]	0.108	**0.748****	[0.579-0.966]	0.098
Widowed	1.023	[0.721-1.45]	0.182	0.91	[0.419-1.977]	0.36	0.982	[0.658-1.466]	0.201
No migration background	1.077	[0.905-1.281]	0.095	1.168	[0.909-1.499]	0.149	0.994	[0.781-1.264]	0.122
East Germany2008	0.952	[0.835-1.086]	0.064	0.913	[0.76-1.096]	0.085	0.988	[0.818-1.193]	0.095
Children (0-14)/ HH	0.998	[0.92-1.083]	0.042	1.014	[0.905-1.136]	0.059	0.984	[0.874-1.108]	0.06
Risk-taker	**1.174****	[1.013-1.361]	0.088	1.171	[0.957-1.433]	0.121	1.172	[0.937-1.465]	0.134
Risk-neutral	1.105	[0.978-1.248]	0.069	1.131	[0.942-1.357]	0.105	1.093	[0.928-1.288]	0.092
High Economic worries	**0.763*****	[0.644-0.904]	0.066	**0.787***	[0.616-1.004]	0.098	**0.743****	[0.586-0.942]	0.09
Medium Economic worries	**0.85****	[0.746-0.969]	0.057	0.868	[0.725-1.039]	0.08	**0.839***	[0.693-1.015]	0.082
Constant	**1.739*****	[1.318-2.296]	0.246	**1.657*****	[1.129-2.431]	0.324	**3.447*****	[2.339-5.08]	0.682

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 21: Results of the logistic regression model: Diet and the combined poverty indicator of 2008

Healthy diet 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty	0.924	[0.702-1.216]	0.13	1.193	[0.798-1.784]	0.245	0.772	[0.54-1.102]	0.14
Moderate poverty	**0.784****	[0.633-0.971]	0.086	0.963	[0.69-1.344]	0.164	**0.672*****	[0.511-0.885]	0.094
Permanent one-sided poverty	0.891	[0.718-1.106]	0.098	1.136	[0.836-1.544]	0.178	**0.717****	[0.538-0.956]	0.105
Permanent vulnerability	0.864	[0.698-1.071]	0.094	**0.73***	[0.525-1.015]	0.123	0.951	[0.712-1.27]	0.141
Fragile Prosperity	1.058	[0.927-1.208]	0.071	0.992	[0.818-1.203]	0.098	1.122	[0.93-1.353]	0.107
Low education	**0.666*****	[0.557-0.797]	0.061	**0.669*****	[0.522-0.857]	0.085	**0.664*****	[0.511-0.862]	0.088
Medium education	**0.814****	[0.693-0.956]	0.067	**0.764****	[0.61-0.957]	0.088	0.851	[0.671-1.078]	0.103
Low occupational status	**0.669*****	[0.566-0.793]	0.058	**0.684*****	[0.536-0.872]	0.085	**0.659*****	[0.522-0.831]	0.078
Medium occupational status	**0.828*****	[0.729-0.942]	0.054	**0.783****	[0.648-0.946]	0.075	0.867	[0.727-1.035]	0.078
Currently unemployed	0.913	[0.758-1.099]	0.086	0.992	[0.75-1.311]	0.141	**0.819***	[0.645-1.039]	0.1
Health status	**1.137*****	[1.07-1.208]	0.035	**1.096****	[1-1.2]	0.051	**1.177*****	[1.086-1.275]	0.048
female	**2.458*****	[2.214-2.727]	0.131						
Age group: 17 -14	**0.622*****	[0.497-0.777]	0.071	**0.686****	[0.496-0.948]	0.113	**0.577*****	[0.424-0.786]	0.091
Age group: 25 - 34	**0.822****	[0.693-0.974]	0.071	**0.748****	[0.576-0.972]	0.1	0.864	[0.686-1.088]	0.102
Age group 45 -54	**1.181****	[1.012-1.377]	0.093	**1.206***	[0.966-1.505]	0.136	1.129	[0.91-1.4]	0.124
Age group 55 - 65	**1.925*****	[1.618-2.29]	0.171	**1.989*****	[1.552-2.548]	0.251	**1.78*****	[1.397-2.268]	0.22
Single (not married)	1.019	[0.867-1.196]	0.084	1.001	[0.797-1.258]	0.117	1.011	[0.806-1.269]	0.117
Divorced	0.972	[0.815-1.16]	0.088	0.851	[0.647-1.12]	0.119	1.091	[0.861-1.382]	0.132
Widowed	1.183	[0.835-1.675]	0.21	1.361	[0.626-2.957]	0.539	1.203	[0.818-1.768]	0.236
No migration background	0.92	[0.792-1.069]	0.07	0.961	[0.766-1.205]	0.111	0.901	[0.739-1.098]	0.091
East Germany2008	**1.14****	[1.004-1.294]	0.074	1.076	[0.896-1.292]	0.101	**1.21****	[1.011-1.447]	0.11
Children (0-14)/ HH	**1.094****	[1.014-1.18]	0.042	1.02	[0.913-1.139]	0.058	**1.148****	[1.031-1.277]	0.063
Risk-taker	**1.222*****	[1.064-1.404]	0.086	1.178	[0.967-1.435]	0.118	**1.32*****	[1.083-1.61]	0.133
Risk-neutral	**1.136****	[1.011-1.277]	0.068	1.159	[0.969-1.386]	0.106	1.11	[0.952-1.295]	0.087
High Economic worries	0.978	[0.832-1.148]	0.08	0.934	[0.739-1.182]	0.112	0.989	[0.792-1.236]	0.112
Medium Economic worries	0.916	[0.809-1.037]	0.058	0.94	[0.788-1.122]	0.085	0.877	[0.734-1.046]	0.079
Constant	**0.764****	[0.595-0.981]	0.098	0.762	[0.532-1.094]	0.14	**1.946*****	[1.398-2.708]	0.328

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 22: Results of the logistic regression model: Smoking and the combined poverty indicator of 2008

Non-smoking 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty	**0.647*****	[0.498-0.84]	0.086	**0.626****	[0.434-0.904]	0.117	**0.673****	[0.462-0.978]	0.129
Moderate poverty	**0.693*****	[0.558-0.861]	0.077	0.77	[0.561-1.056]	0.124	**0.674****	[0.498-0.913]	0.104
Permanent one-sided poverty	**0.669*****	[0.539-0.83]	0.074	**0.767***	[0.57-1.031]	0.116	**0.625*****	[0.459-0.852]	0.099
Permanent vulnerability	**0.734*****	[0.583-0.923]	0.086	**0.643*****	[0.467-0.886]	0.105	0.856	[0.614-1.193]	0.145
Fragile Prosperity	0.963	[0.834-1.111]	0.07	**0.825***	[0.68-1.002]	0.082	1.164	[0.941-1.439]	0.126
Low education	**0.417*****	[0.34-0.512]	0.044	**0.41*****	[0.311-0.541]	0.058	**0.428*****	[0.315-0.581]	0.067
Medium education	**0.631*****	[0.521-0.765]	0.062	**0.584*****	[0.449-0.761]	0.079	**0.7****	[0.529-0.927]	0.1
Low occupational status	**0.855***	[0.717-1.019]	0.077	0.861	[0.681-1.09]	0.103	0.843	[0.644-1.104]	0.116
Medium occupational status	**0.83*****	[0.721-0.955]	0.059	0.93	[0.765-1.131]	0.093	**0.728*****	[0.595-0.891]	0.075
Currently unemployed	**0.571*****	[0.482-0.676]	0.049	**0.484*****	[0.378-0.619]	0.061	**0.658*****	[0.52-0.832]	0.079
Health status	**1.11*****	[1.043-1.183]	0.036	**1.083***	[0.992-1.182]	0.049	**1.15*****	[1.05-1.259]	0.053
female	**1.439*****	[1.29-1.605]	0.08						
Age group: 17 -14	**1.56*****	[1.247-1.951]	0.178	**1.55*****	[1.145-2.099]	0.239	**1.555*****	[1.12-2.16]	0.261
Age group: 25 - 34	0.952	[0.791-1.145]	0.09	0.876	[0.675-1.137]	0.116	1.045	[0.804-1.36]	0.14
Age group 45 -54	1.074	[0.912-1.265]	0.09	1.065	[0.85-1.334]	0.122	1.078	[0.85-1.367]	0.131
Age group 55 - 65	**1.89*****	[1.564-2.285]	0.183	**1.886*****	[1.458-2.439]	0.248	**1.919*****	[1.45-2.541]	0.275
Single (not married)	**0.756*****	[0.637-0.897]	0.066	0.866	[0.69-1.086]	0.1	**0.663*****	[0.513-0.857]	0.087
Divorced	**0.501*****	[0.418-0.601]	0.046	**0.522*****	[0.399-0.683]	0.072	**0.475*****	[0.373-0.606]	0.059
Widowed	0.931	[0.628-1.381]	0.187	1.178	[0.551-2.517]	0.456	0.873	[0.558-1.367]	0.2
No migration background	**0.852****	[0.726-0.999]	0.069	1.07	[0.858-1.333]	0.12	**0.678*****	[0.539-0.854]	0.08
East Germany2008	1.082	[0.948-1.236]	0.073	1.136	[0.943-1.37]	0.108	1.029	[0.851-1.244]	0.1
Children (0-14)/ HH	**1.103****	[1.017-1.197]	0.046	**1.193*****	[1.065-1.337]	0.069	1.007	[0.896-1.132]	0.06
Risk-taker	**0.722*****	[0.623-0.835]	0.054	**0.753*****	[0.617-0.918]	0.076	**0.647*****	[0.521-0.805]	0.072
Risk-neutral	**0.846*****	[0.747-0.959]	0.054	**0.806****	[0.674-0.966]	0.074	0.891	[0.748-1.061]	0.079
High Economic worries	**0.741*****	[0.624-0.879]	0.065	**0.684*****	[0.542-0.865]	0.082	0.834	[0.649-1.072]	0.107
Medium Economic worries	**0.831*****	[0.722-0.956]	0.059	**0.753*****	[0.624-0.909]	0.072	0.949	[0.771-1.167]	0.1
Constant	**6.231*****	[4.715-8.235]	0.887	**5.561*****	[3.853-8.026]	1.041	**9.525*****	[6.336-14.319]	1.981

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 23: Results of the logistic regression model: Alcohol consumption and the combined poverty indicator of 2008

Moderate alcohol consumption 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty	**1.838*****	[1.232-2.741]	0.375	**2.096*****	[1.307-3.362]	0.505	1.147	[0.52-2.528]	0.463
Moderate poverty	**1.656*****	[1.181-2.321]	0.285	**2.216*****	[1.467-3.348]	0.466	0.804	[0.469-1.377]	0.221
Permanent one-sided poverty	1.226	[0.924-1.626]	0.177	**1.35***	[0.963-1.893]	0.233	1.022	[0.623-1.676]	0.258
Permanent vulnerability	1.134	[0.842-1.529]	0.173	1.236	[0.861-1.773]	0.228	0.857	[0.501-1.465]	0.235
Fragile Prosperity	**1.233****	[1.033-1.471]	0.111	**1.278****	[1.034-1.579]	0.138	1.124	[0.822-1.536]	0.179
Low education	**1.29****	[1.032-1.613]	0.147	1.097	[0.834-1.444]	0.154	**1.99*****	[1.385-2.859]	0.368
Medium education	**1.225****	[1.005-1.494]	0.124	1.145	[0.897-1.461]	0.142	**1.463****	[1.069-2.002]	0.234
Low occupational status	**1.486*****	[1.182-1.868]	0.173	1.258	[0.957-1.656]	0.176	**3.075*****	[2.026-4.668]	0.655
Medium occupational status	**1.404*****	[1.184-1.665]	0.122	**1.443*****	[1.172-1.778]	0.154	**1.374****	[1.038-1.819]	0.197
Currently unemployed	**0.778****	[0.606-0.999]	0.099	**0.758***	[0.561-1.025]	0.117	0.912	[0.585-1.422]	0.207
Health status	**0.903****	[0.832-0.98]	0.038	**0.902****	[0.818-0.994]	0.045	0.93	[0.805-1.075]	0.069
female	**3.865*****	[3.345-4.465]	0.285						
Age group: 17 -14	**1.312***	[0.974-1.767]	0.199	1.327	[0.934-1.884]	0.237	1.136	[0.656-1.968]	0.319
Age group: 25 - 34	**1.233***	[0.964-1.578]	0.155	1.12	[0.831-1.51]	0.171	**1.542****	[1.005-2.365]	0.336
Age group 45 -54	**0.785****	[0.643-0.959]	0.08	0.843	[0.661-1.075]	0.105	**0.663****	[0.477-0.92]	0.111
Age group 55 - 65	0.862	[0.69-1.077]	0.098	0.902	[0.69-1.18]	0.123	0.741	[0.507-1.084]	0.144
Single (not married)	1.029	[0.836-1.266]	0.109	1.095	[0.855-1.403]	0.138	0.965	[0.673-1.384]	0.177
Divorced	1.06	[0.832-1.351]	0.131	1.03	[0.761-1.393]	0.159	1.216	[0.818-1.808]	0.246
Widowed	1.054	[0.644-1.725]	0.265	0.768	[0.333-1.77]	0.327	1.223	[0.634-2.36]	0.41
No migration background	**0.728*****	[0.586-0.905]	0.081	0.842	[0.649-1.093]	0.112	**0.462*****	[0.31-0.689]	0.094
East Germany2008	0.983	[0.839-1.152]	0.08	0.862	[0.716-1.039]	0.082	**1.392****	[1.017-1.906]	0.223
Children (0-14)/ HH	1.091	[0.982-1.212]	0.059	1.067	[0.937-1.215]	0.071	1.12	[0.942-1.33]	0.098
Risk-taker	0.898	[0.746-1.081]	0.085	0.954	[0.766-1.188]	0.107	**0.722***	[0.519-1.004]	0.122
Risk-neutral	1.011	[0.863-1.184]	0.082	1.054	[0.865-1.283]	0.106	0.909	[0.699-1.181]	0.122
High Economic worries	1.074	[0.86-1.34]	0.122	0.964	[0.735-1.264]	0.133	1.361	[0.923-2.006]	0.269
Medium Economic worries	1.105	[0.939-1.299]	0.091	1.043	[0.856-1.27]	0.105	1.28*	[0.98-1.672]	0.174
Constant	2.204***	[1.58-3.076]	0.375	2.139***	[1.431-3.197]	0.439	9.792***	[5.797-16.54]	2.619

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 24: Results of the logistic regression model: Physical activity and the combined poverty indicator of 2008

Sufficient physical activity 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty	**0.446*****	[0.331-0.6]	0.068	**0.589****	[0.383-0.904]	0.129	**0.353*****	[0.234-0.533]	0.074
Moderate poverty	**0.449*****	[0.357-0.565]	0.053	**0.574*****	[0.413-0.797]	0.096	**0.364*****	[0.265-0.499]	0.059
Permanent one-sided poverty	**0.577*****	[0.464-0.716]	0.064	**0.694****	[0.511-0.943]	0.109	**0.502*****	[0.372-0.676]	0.076
Permanent vulnerability	**0.559*****	[0.443-0.706]	0.067	**0.598*****	[0.433-0.827]	0.099	**0.512*****	[0.37-0.709]	0.085
Fragile Prosperity	**0.794*****	[0.695-0.906]	0.054	0.907	[0.746-1.103]	0.09	**0.701*****	[0.585-0.841]	0.065
Low education	**0.495*****	[0.415-0.591]	0.045	**0.406*****	[0.317-0.521]	0.052	**0.573*****	[0.443-0.74]	0.075
Medium education	**0.734*****	[0.627-0.86]	0.059	**0.624*****	[0.498-0.783]	0.072	0.833	[0.666-1.043]	0.096
Low occupational status	**0.686*****	[0.578-0.815]	0.06	**0.662*****	[0.519-0.845]	0.082	**0.706*****	[0.553-0.902]	0.088
Medium occupational status	0.91	[0.8-1.034]	0.06	0.974	[0.807-1.177]	0.094	0.877	[0.734-1.047]	0.079
Currently unemployed	**0.77*****	[0.636-0.934]	0.076	**0.635*****	[0.479-0.841]	0.091	0.883	[0.679-1.148]	0.118
Health status	**1.271*****	[1.193-1.355]	0.041	**1.312*****	[1.195-1.441]	0.063	**1.222*****	[1.12-1.332]	0.054
female	**1.227*****	[1.104-1.363]	0.066						
Age group: 17 -14	**1.44*****	[1.155-1.794]	0.162	**2.067*****	[1.512-2.825]	0.33	1.004	[0.73-1.382]	0.164
Age group: 25 - 34	1.056	[0.88-1.268]	0.098	**1.252***	[0.959-1.635]	0.17	0.92	[0.715-1.182]	0.118
Age group 45 -54	0.974	[0.835-1.137]	0.077	0.905	[0.725-1.129]	0.102	1.046	[0.841-1.302]	0.117
Age group 55 - 65	0.997	[0.837-1.187]	0.089	1.008	[0.78-1.302]	0.132	0.999	[0.784-1.274]	0.124
Single (not married)	**1.279*****	[1.086-1.506]	0.107	**1.306****	[1.035-1.649]	0.155	**1.303****	[1.031-1.648]	0.156
Divorced	0.935	[0.777-1.126]	0.088	1.113	[0.843-1.471]	0.158	0.845	[0.658-1.084]	0.108
Widowed	1.06	[0.736-1.527]	0.197	0.809	[0.339-1.93]	0.359	0.99	[0.656-1.492]	0.207
No migration background	**1.252*****	[1.07-1.466]	0.101	0.999	[0.796-1.256]	0.116	**1.53*****	[1.232-1.9]	0.169
East Germany2008	**0.71*****	[0.624-0.807]	0.047	**0.757*****	[0.629-0.912]	0.072	**0.667*****	[0.557-0.798]	0.061
Children (0-14)/ HH	0.953	[0.882-1.03]	0.038	1.021	[0.913-1.142]	0.058	**0.912***	[0.817-1.017]	0.051
Risk-taker	**1.406*****	[1.22-1.621]	0.102	**1.363*****	[1.117-1.662]	0.138	**1.44*****	[1.164-1.781]	0.156
Risk-neutral	**1.226*****	[1.088-1.382]	0.075	**1.247****	[1.036-1.501]	0.118	**1.226****	[1.047-1.435]	0.099
High Economic worries	0.832**	[0.704-0.982]	0.07	0.868	[0.68-1.107]	0.108	**0.806***	[0.642-1.013]	0.094
Medium Economic worries	0.964	[0.85-1.093]	0.062	0.985	[0.823-1.178]	0.09	0.945	[0.792-1.128]	0.085
Constant	1.008	[0.779-1.305]	0.133	1.144	[0.794-1.649]	0.213	1.113	[0.787-1.574]	0.197

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 25: Results of the logistic regression model: Combined health behavior and the combined poverty indicator of 2008

Health-oriented behavior	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty	**0.485*****	[0.345-0.681]	0.084	**0.606***	[0.367-1.002]	0.155	**0.413*****	[0.264-0.646]	0.094
Moderate poverty	**0.615*****	[0.481-0.786]	0.077	0.8	[0.555-1.155]	0.15	**0.519*****	[0.376-0.715]	0.085
Permanent one-sided poverty	**0.578*****	[0.445-0.749]	0.077	0.848	[0.589-1.221]	0.158	**0.446*****	[0.315-0.63]	0.079
Permanent vulnerability	**0.676*****	[0.543-0.843]	0.076	**0.646*****	[0.47-0.887]	0.105	**0.685****	[0.505-0.93]	0.107
Fragile Prosperity	0.966	[0.846-1.103]	0.065	0.95	[0.787-1.148]	0.092	0.98	[0.81-1.184]	0.095
Low education	**0.41*****	[0.339-0.496]	0.04	**0.35*****	[0.27-0.453]	0.046	**0.476*****	[0.359-0.631]	0.068
Medium education	**0.649*****	[0.547-0.771]	0.057	**0.546*****	[0.432-0.69]	0.065	**0.777****	[0.604-0.998]	0.1
Low occupational status	**0.639*****	[0.536-0.761]	0.057	**0.634*****	[0.496-0.811]	0.08	**0.643*****	[0.499-0.829]	0.083
Medium occupational status	**0.829*****	[0.726-0.947]	0.056	0.897	[0.742-1.085]	0.087	**0.775*****	[0.642-0.935]	0.074
Currently unemployed	**0.684*****	[0.561-0.834]	0.069	**0.648*****	[0.483-0.87]	0.098	**0.699*****	[0.538-0.907]	0.093
Health status	**1.177*****	[1.104-1.256]	0.039	**1.181*****	[1.075-1.298]	0.057	**1.173*****	[1.074-1.282]	0.053
female	**1.931*****	[1.733-2.153]	0.107						
Age group: 17 -14	1.116	[0.886-1.404]	0.131	**1.487****	[1.086-2.036]	0.238	0.841	[0.602-1.175]	0.143
Age group: 25 - 34	0.965	[0.803-1.158]	0.09	1.003	[0.771-1.306]	0.135	0.928	[0.72-1.194]	0.12
Age group 45 -54	1.036	[0.881-1.218]	0.086	0.992	[0.79-1.247]	0.116	1.073	[0.848-1.358]	0.129
Age group 55 - 65	**1.636*****	[1.359-1.968]	0.154	**1.612*****	[1.244-2.089]	0.213	**1.666*****	[1.274-2.177]	0.228
Single (not married)	0.977	[0.827-1.155]	0.083	0.992	[0.788-1.248]	0.116	0.98	[0.767-1.251]	0.122
Divorced	**0.791****	[0.656-0.953]	0.075	**0.78***	[0.593-1.028]	0.11	0.808	[0.624-1.047]	0.107
Widowed	1.076	[0.755-1.535]	0.195	0.888	[0.406-1.942]	0.354	1.069	[0.708-1.614]	0.225
No migration background	1.048	[0.88-1.248]	0.093	1.125	[0.874-1.447]	0.145	0.976	[0.767-1.244]	0.121
East Germany2008	0.953	[0.836-1.087]	0.064	0.925	[0.77-1.111]	0.086	0.978	[0.81-1.179]	0.094
Children (0-14)/ HH	1.023	[0.942-1.111]	0.043	1.029	[0.918-1.154]	0.06	1.018	[0.904-1.145]	0.061
Risk-taker	**1.181****	[1.019-1.368]	0.089	1.178	[0.962-1.442]	0.122	1.181	[0.946-1.474]	0.134
Risk-neutral	1.102	[0.975-1.245]	0.069	1.139	[0.949-1.368]	0.106	1.078	[0.914-1.271]	0.091
High Economic worries	**0.795*****	[0.67-0.944]	0.07	**0.801***	[0.625-1.027]	0.101	**0.792***	[0.623-1.006]	0.097
Medium Economic worries	**0.862****	[0.756-0.983]	0.058	0.873	[0.728-1.047]	0.081	0.857	[0.708-1.037]	0.083
Constant	**1.818*****	[1.38-2.396]	0.256	**1.763*****	[1.202-2.585]	0.344	**3.566*****	[2.432-5.229]	0.696

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 26: Results of the logistic regression model: Diet and SES of 2008

Healthy diet 2008	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Low SES	**0.585*****	[0.502-0.682]	0.046	**0.598*****	[0.48-0.745]	0.067	**0.596*****	[0.482-0.736]	0.064
Medium SES	**0.75*****	[0.661-0.851]	0.048	**0.641*****	[0.536-0.766]	0.058	0.881	[0.737-1.053]	0.08
Household affected by unemployment	**0.982****	[0.967-0.998]	0.008	0.981	[0.957-1.006]	0.012	**0.983***	[0.963-1.003]	0.01
Currently unemployed	1.004	[0.806-1.25]	0.112	1.16	[0.832-1.617]	0.197	0.865	[0.652-1.147]	0.125
Health status	**1.151*****	[1.083-1.222]	0.035	**1.105****	[1.01-1.21]	0.051	**1.193*****	[1.101-1.292]	0.049
female	**2.469*****	[2.226-2.739]	0.13						
Age group: 17 -14	**0.567*****	[0.455-0.706]	0.064	**0.635*****	[0.462-0.872]	0.103	**0.519*****	[0.382-0.704]	0.081
Age group: 25 - 34	**0.809****	[0.683-0.959]	0.07	**0.738****	[0.568-0.959]	0.099	0.846	[0.672-1.066]	0.1
Age group 45 -54	**1.152***	[0.989-1.342]	0.09	1.189	[0.953-1.483]	0.134	1.103	[0.891-1.365]	0.12
Age group 55 - 65	**1.889*****	[1.593-2.241]	0.164	**1.97*****	[1.541-2.517]	0.247	**1.756*****	[1.384-2.227]	0.213
Single (not married)	1.051	[0.896-1.233]	0.086	1.025	[0.816-1.288]	0.119	1.055	[0.842-1.321]	0.121
Divorced	0.979	[0.821-1.168]	0.088	0.833	[0.632-1.097]	0.117	1.108	[0.874-1.405]	0.134
Widowed	1.171	[0.82-1.671]	0.213	1.636	[0.764-3.504]	0.636	1.134	[0.772-1.667]	0.223
No migration background	0.995	[0.866-1.143]	0.071	0.941	[0.765-1.158]	0.099	1.046	[0.87-1.257]	0.098
East Germany2008	**1.187*****	[1.05-1.342]	0.074	1.118	[0.935-1.336]	0.102	**1.26*****	[1.061-1.496]	0.11
Children (0-14)/ HH	**1.086****	[1.009-1.169]	0.041	1.019	[0.913-1.138]	0.057	**1.135****	[1.023-1.26]	0.06
Risk-taker	**1.225*****	[1.067-1.406]	0.086	**1.185***	[0.973-1.442]	0.119	**1.31*****	[1.075-1.598]	0.133
Risk-neutral	**1.149****	[1.023-1.29]	0.068	**1.164***	[0.974-1.391]	0.106	1.131	[0.971-1.319]	0.088
High Economic worries	0.94	[0.802-1.103]	0.076	0.912	[0.721-1.153]	0.109	0.938	[0.754-1.168]	0.105
Medium Economic worries	**0.895***	[0.791-1.012]	0.056	0.922	[0.774-1.099]	0.082	**0.853***	[0.716-1.015]	0.076
Constant	**0.609*****	[0.483-0.768]	0.072	**0.688****	[0.494-0.958]	0.116	**1.375****	[1.02-1.853]	0.21

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 27: Results of the logistic regression model: Smoking and SES of 2008

Non-smoking 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES	**0.378*****	[0.319-0.449]	0.033	**0.383*****	[0.304-0.483]	0.045	**0.381*****	[0.296-0.49]	0.049
Medium SES	**0.567*****	[0.489-0.656]	0.042	**0.568*****	[0.465-0.693]	0.058	**0.572*****	[0.461-0.71]	0.063
Household affected by unemployment	**0.98*****	[0.967-0.993]	0.006	**0.983***	[0.964-1.002]	0.01	**0.976*****	[0.959-0.993]	0.009
Currently unemployed	**0.629*****	[0.517-0.765]	0.063	**0.52*****	[0.391-0.691]	0.076	**0.765***	[0.583-1.005]	0.107
Health status	**1.125*****	[1.056-1.198]	0.036	**1.097****	[1.005-1.198]	0.049	**1.16*****	[1.06-1.27]	0.054
female	**1.455*****	[1.305-1.622]	0.081						
Age group: 17 -14	**1.338*****	[1.074-1.668]	0.15	**1.295***	[0.964-1.74]	0.195	**1.393****	[1.007-1.926]	0.23
Age group: 25 - 34	0.947	[0.79-1.136]	0.088	0.885	[0.683-1.146]	0.117	1.031	[0.798-1.334]	0.135
Age group 45 -54	1.033	[0.879-1.215]	0.085	1.035	[0.829-1.293]	0.117	1.038	[0.819-1.314]	0.125
Age group 55 - 65	**1.861*****	[1.542-2.245]	0.178	**1.893*****	[1.465-2.447]	0.248	**1.878*****	[1.424-2.477]	0.265
Single (not married)	**0.812****	[0.687-0.961]	0.069	0.936	[0.747-1.173]	0.108	**0.701*****	[0.547-0.898]	0.089
Divorced	**0.524*****	[0.437-0.629]	0.049	**0.539*****	[0.413-0.704]	0.073	**0.502*****	[0.392-0.642]	0.063
Widowed	0.891	[0.608-1.307]	0.174	1.011	[0.457-2.235]	0.409	0.851	[0.552-1.313]	0.188
No migration background	0.91	[0.786-1.055]	0.068	1.09	[0.889-1.337]	0.113	**0.753*****	[0.608-0.934]	0.083
East Germany2008	**1.181****	[1.038-1.343]	0.077	**1.223****	[1.021-1.464]	0.112	1.14	[0.949-1.369]	0.106
Children (0-14)/ HH	**1.075***	[0.992-1.165]	0.044	**1.162*****	[1.04-1.298]	0.066	0.993	[0.884-1.115]	0.059
Risk-taker	**0.72*****	[0.622-0.832]	0.053	**0.749*****	[0.615-0.913]	0.075	**0.645*****	[0.519-0.802]	0.071
Risk-neutral	**0.849*****	[0.749-0.961]	0.054	**0.796****	[0.665-0.953]	0.073	0.897	[0.754-1.067]	0.079
High Economic worries	**0.735*****	[0.62-0.872]	0.064	**0.682*****	[0.54-0.862]	0.082	0.831	[0.648-1.066]	0.105
Medium Economic worries	**0.824*****	[0.717-0.947]	0.058	**0.752*****	[0.624-0.906]	0.071	0.938	[0.764-1.152]	0.098
Constant	**4.543*****	[3.527-5.851]	0.586	**4.131*****	[2.958-5.769]	0.704	**6.943*****	[4.831-9.979]	1.285

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 28: Results of the logistic regression model: Alcohol consumption and SES of 2008

Moderate alcohol consumption 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES	**2.255*****	[1.838-2.766]	0.235	**1.865*****	[1.46-2.383]	0.233	**3.738*****	[2.547-5.487]	0.732
Medium SES	**1.666*****	[1.421-1.952]	0.135	**1.479*****	[1.218-1.797]	0.147	**2.184*****	[1.683-2.835]	0.291
Household affected by unemployment	**1.016***	[0.997-1.035]	0.01	1.016	[0.995-1.038]	0.011	1.014	[0.975-1.055]	0.02
Currently unemployed	0.801	[0.612-1.049]	0.11	0.836	[0.611-1.145]	0.134	0.78	[0.459-1.325]	0.211
Health status	**0.901****	[0.829-0.978]	0.038	**0.897****	[0.813-0.989]	0.045	0.928	[0.801-1.076]	0.07
female	**3.869*****	[3.346-4.474]	0.287						
Age group: 17 -14	**1.406****	[1.051-1.882]	0.209	**1.416****	[1.005-1.994]	0.247	1.302	[0.758-2.234]	0.359
Age group: 25 - 34	**1.244***	[0.971-1.594]	0.157	1.142	[0.845-1.544]	0.176	**1.554****	[1.014-2.381]	0.338
Age group 45 -54	**0.807****	[0.66-0.986]	0.083	0.871	[0.681-1.113]	0.109	**0.673****	[0.486-0.933]	0.112
Age group 55 - 65	0.845	[0.677-1.055]	0.096	0.886	[0.678-1.157]	0.121	0.731	[0.5-1.068]	0.141
Single (not married)	0.994	[0.806-1.225]	0.106	1.068	[0.831-1.374]	0.137	0.823	[0.579-1.17]	0.148
Divorced	1.023	[0.803-1.302]	0.126	0.988	[0.73-1.339]	0.153	1.057	[0.712-1.567]	0.212
Widowed	1.028	[0.616-1.715]	0.268	0.882	[0.361-2.154]	0.402	1.062	[0.563-2.001]	0.343
No migration background	**0.659*****	[0.534-0.815]	0.071	**0.725****	[0.562-0.934]	0.094	**0.48*****	[0.328-0.703]	0.093
East Germany2008	0.983	[0.841-1.149]	0.078	0.897	[0.745-1.08]	0.085	1.262	[0.931-1.71]	0.196
Children (0-14)/ HH	**1.122****	[1.012-1.244]	0.059	1.107	[0.975-1.256]	0.071	1.127	[0.952-1.334]	0.097
Risk-taker	0.897	[0.745-1.08]	0.085	0.949	[0.761-1.184]	0.107	**0.743***	[0.535-1.03]	0.124
Risk-neutral	1.004	[0.857-1.176]	0.081	1.049	[0.861-1.279]	0.106	0.922	[0.711-1.196]	0.122
High Economic worries	1.099	[0.883-1.368]	0.123	0.998	[0.765-1.303]	0.136	1.347	[0.921-1.971]	0.261
Medium Economic worries	1.11	[0.944-1.304]	0.091	1.048	[0.861-1.276]	0.105	**1.279***	[0.979-1.67]	0.174
Constant	**2.634*****	[1.911-3.629]	0.431	**2.673*****	[1.82-3.927]	0.524	**10.855*****	[6.468-18.217]	2.867

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 29: Results of the logistic regression model: Physical activity and SES of 2008

Sufficient physical activity 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES	**0.397*****	[0.34-0.463]	0.031	**0.367*****	[0.293-0.46]	0.042	**0.418*****	[0.337-0.518]	0.046
Medium SES	**0.689*****	[0.607-0.781]	0.044	**0.663*****	[0.553-0.796]	0.062	**0.704*****	[0.59-0.839]	0.063
Household affected by unemployment	**0.961*****	[0.944-0.979]	0.009	0.981	[0.958-1.005]	0.012	**0.939*****	[0.914-0.964]	0.013
Currently unemployed	0.837	[0.667-1.049]	0.097	**0.618*****	[0.449-0.851]	0.101	1.113	[0.814-1.521]	0.177
Health status	**1.288*****	[1.21-1.371]	0.041	**1.335*****	[1.217-1.464]	0.063	**1.234*****	[1.134-1.344]	0.053
female	**1.253*****	[1.129-1.392]	0.067						
Age group: 17 -14	1.166	[0.94-1.445]	0.128	**1.593*****	[1.179-2.152]	0.244	0.853	[0.623-1.168]	0.137
Age group: 25 - 34	1.023	[0.855-1.223]	0.093	1.236	[0.951-1.606]	0.165	0.873	[0.683-1.116]	0.109
Age group 45 -54	0.931	[0.799-1.084]	0.072	0.863	[0.694-1.072]	0.096	1.008	[0.812-1.25]	0.111
Age group 55 - 65	0.972	[0.819-1.154]	0.085	0.98	[0.764-1.259]	0.125	0.979	[0.771-1.244]	0.12
Single (not married)	**1.34*****	[1.141-1.575]	0.11	**1.39*****	[1.106-1.746]	0.162	**1.321****	[1.05-1.662]	0.155
Divorced	0.951	[0.792-1.142]	0.089	1.129	[0.856-1.491]	0.16	0.834	[0.653-1.065]	0.104
Widowed	1.023	[0.71-1.474]	0.191	0.723	[0.29-1.803]	0.337	0.961	[0.64-1.441]	0.199
No migration background	**1.514*****	[1.31-1.749]	0.112	1.166	[0.946-1.437]	0.124	**1.896*****	[1.553-2.315]	0.193
East Germany2008	**0.753*****	[0.664-0.853]	0.048	**0.812****	[0.676-0.974]	0.076	**0.703*****	[0.592-0.835]	0.062
Children (0-14)/ HH	**0.91****	[0.845-0.981]	0.035	0.984	[0.884-1.095]	0.054	**0.864*****	[0.777-0.961]	0.047
Risk-taker	**1.395*****	[1.212-1.607]	0.101	**1.359*****	[1.115-1.657]	0.137	**1.391*****	[1.125-1.719]	0.15
Risk-neutral	**1.24*****	[1.101-1.397]	0.075	**1.245****	[1.034-1.498]	0.118	**1.254*****	[1.073-1.466]	0.1
High Economic worries	**0.76*****	[0.645-0.895]	0.063	**0.804***	[0.632-1.023]	0.099	**0.723*****	[0.577-0.905]	0.083
Medium Economic worries	0.915	[0.809-1.035]	0.058	0.945	[0.792-1.127]	0.085	0.883	[0.742-1.052]	0.079
Constant	**0.636*****	[0.501-0.807]	0.077	**0.74***	[0.53-1.034]	0.126	**0.705****	[0.513-0.969]	0.114

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 30: Results of the logistic regression model: Combined health behavior and SES of 2008

Health-oriented behavior	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES	**0.345*****	[0.293-0.406]	0.029	**0.341*****	[0.271-0.43]	0.04	**0.357*****	[0.283-0.45]	0.042
Medium SES	**0.599*****	[0.524-0.684]	0.041	**0.555*****	[0.462-0.667]	0.052	**0.648*****	[0.533-0.788]	0.065
Household affected by unemployment	**0.962*****	[0.947-0.978]	0.008	**0.973****	[0.951-0.996]	0.011	**0.953*****	[0.932-0.974]	0.011
Currently unemployed	**0.769****	[0.617-0.959]	0.087	**0.692****	[0.503-0.952]	0.113	0.841	[0.621-1.138]	0.13
Health status	**1.199*****	[1.125-1.277]	0.039	**1.204*****	[1.097-1.321]	0.057	**1.188*****	[1.088-1.297]	0.053
female	**1.962*****	[1.761-2.185]	0.108						
Age group: 17 -14	0.883	[0.706-1.105]	0.101	1.131	[0.835-1.532]	0.175	**0.7****	[0.503-0.973]	0.118
Age group: 25 - 34	0.929	[0.776-1.112]	0.085	0.988	[0.761-1.282]	0.131	0.887	[0.692-1.136]	0.112
Age group 45 -54	0.983	[0.838-1.153]	0.08	0.94	[0.752-1.175]	0.107	1.031	[0.817-1.299]	0.122
Age group 55 - 65	**1.572*****	[1.313-1.884]	0.145	**1.555*****	[1.207-2.002]	0.2	**1.612*****	[1.241-2.093]	0.215
Single (not married)	1.048	[0.89-1.233]	0.087	1.072	[0.855-1.343]	0.123	1.023	[0.806-1.297]	0.124
Divorced	**0.809****	[0.671-0.976]	0.077	0.796	[0.604-1.05]	0.112	0.811	[0.627-1.049]	0.107
Widowed	1.012	[0.706-1.449]	0.185	0.808	[0.351-1.859]	0.343	0.999	[0.663-1.506]	0.209
No migration background	1.047	[0.883-1.241]	0.091	1.122	[0.876-1.437]	0.142	0.983	[0.777-1.244]	0.118
East Germany2008	1.039	[0.916-1.179]	0.067	1.011	[0.846-1.208]	0.092	1.066	[0.892-1.274]	0.097
Children (0-14)/ HH	0.986	[0.911-1.068]	0.04	1.006	[0.901-1.123]	0.057	0.974	[0.867-1.094]	0.058
Risk-taker	**1.162****	[1.003-1.346]	0.087	1.162	[0.949-1.422]	0.12	1.14	[0.914-1.422]	0.129
Risk-neutral	**1.109***	[0.982-1.252]	0.069	1.128	[0.941-1.354]	0.105	1.097	[0.932-1.293]	0.092
High Economic worries	**0.75*****	[0.633-0.889]	0.065	**0.767****	[0.599-0.981]	0.096	**0.734*****	[0.58-0.929]	0.088
Medium Economic worries	**0.837*****	[0.735-0.953]	0.055	**0.85***	[0.711-1.015]	0.077	**0.825****	[0.682-0.997]	0.08
Constant	**1.361****	[1.051-1.763]	0.18	1.285	[0.896-1.841]	0.236	**2.783*****	[1.953-3.967]	0.503

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 31: Results of the logistic regression model: Diet and the permanent at-risk-of-poverty rate of 2004-2008

Healthy diet	Total sample			Male sample			Female sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty_2008	0.964	[0.774-1.2]	0.108	0.977	[0.696-1.372]	0.169	0.947	[0.714-1.255]	0.136
Low education	**0.644*****	[0.528-0.786]	0.065	**0.687*****	[0.519-0.908]	0.098	**0.59*****	[0.443-0.787]	0.087
Medium education	**0.812****	[0.679-0.971]	0.074	**0.778***	[0.605-1.001]	0.1	0.818	[0.63-1.063]	0.109
Low occupational status	**0.748*****	[0.626-0.893]	0.068	**0.733****	[0.568-0.945]	0.095	**0.757****	[0.591-0.968]	0.095
Medium occupational status	**0.873***	[0.759-1.004]	0.062	0.859	[0.698-1.057]	0.091	0.881	[0.728-1.067]	0.086
Household affected by unemployment	0.987	[0.97-1.005]	0.009	0.989	[0.963-1.017]	0.014	0.987	[0.964-1.01]	0.012
Currently unemployed	0.983	[0.763-1.265]	0.127	1.179	[0.809-1.719]	0.227	0.814	[0.591-1.122]	0.133
Health status	**1.147*****	[1.072-1.228]	0.04	**1.126****	[1.017-1.248]	0.059	**1.17*****	[1.07-1.28]	0.053
female	**2.217*****	[1.975-2.489]	0.131						
Age group: 17 -14	**0.612*****	[0.476-0.787]	0.078	**0.652****	[0.454-0.934]	0.12	**0.595*****	[0.422-0.838]	0.104
Age group: 25 - 34	**0.772*****	[0.636-0.937]	0.076	**0.708****	[0.524-0.957]	0.109	0.818	[0.63-1.061]	0.109
Age group 45 -54	1.105	[0.934-1.306]	0.095	1.148	[0.899-1.466]	0.143	1.07	[0.847-1.351]	0.127
Age group 55 - 65	**1.877*****	[1.55-2.272]	0.183	**1.934*****	[1.467-2.549]	0.273	**1.819*****	[1.394-2.374]	0.247
Single (not married)	0.975	[0.814-1.167]	0.09	1.046	[0.808-1.354]	0.138	0.887	[0.692-1.138]	0.112
Divorced	0.977	[0.803-1.188]	0.097	0.887	[0.655-1.2]	0.137	1.06	[0.814-1.38]	0.143
Widowed	1.173	[0.793-1.735]	0.234	1.701	[0.751-3.852]	0.709	1.083	[0.702-1.672]	0.24
No migration background	1.004	[0.856-1.178]	0.082	0.946	[0.749-1.195]	0.113	1.064	[0.857-1.32]	0.117
East Germany2008	1.074	[0.934-1.235]	0.076	1.08	[0.883-1.322]	0.111	1.063	[0.876-1.29]	0.105
Children (0-14)/ HH	**1.133*****	[1.045-1.229]	0.047	1.062	[0.943-1.197]	0.065	**1.196*****	[1.065-1.342]	0.07
Risk-taker	**1.176****	[1.008-1.373]	0.093	1.117	[0.896-1.393]	0.126	**1.297****	[1.038-1.62]	0.147
Risk-neutral	**1.12***	[0.985-1.274]	0.074	1.156	[0.948-1.409]	0.117	1.089	[0.918-1.291]	0.095
High Economic worries	1.015	[0.851-1.212]	0.092	0.989	[0.764-1.28]	0.13	1.006	[0.787-1.286]	0.126
Medium Economic worries	1.011	[0.883-1.159]	0.07	1.045	[0.86-1.27]	0.104	0.967	[0.798-1.172]	0.095
Constant	**0.689*****	[0.522-0.911]	0.098	**0.684***	[0.457-1.022]	0.14	**1.613****	[1.112-2.338]	0.306

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 32: Results of the logistic regression model: Smoking and the permanent at-risk-of-poverty rate of 2004-2008

Non-smoking 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty_2008	**0.748*****	[0.605-0.927]	0.081	**0.701****	[0.51-0.964]	0.114	0.799	[0.597-1.069]	0.119
Low education	**0.41*****	[0.326-0.515]	0.048	**0.439*****	[0.324-0.595]	0.068	**0.376*****	[0.264-0.533]	0.067
Medium education	**0.595*****	[0.48-0.738]	0.065	**0.598*****	[0.448-0.799]	0.088	**0.598*****	[0.432-0.828]	0.099
Low occupational status	0.971	[0.806-1.171]	0.093	0.947	[0.736-1.219]	0.122	1.006	[0.759-1.333]	0.145
Medium occupational status	0.902	[0.774-1.05]	0.07	0.989	[0.799-1.224]	0.107	**0.827***	[0.665-1.028]	0.092
Household affected by unemployment	**0.985****	[0.971-1]	0.007	0.989	[0.967-1.012]	0.011	**0.981***	[0.962-1.001]	0.01
Currently unemployed	**0.561*****	[0.448-0.702]	0.064	**0.507*****	[0.366-0.702]	0.084	**0.616*****	[0.452-0.84]	0.098
Health status	**1.14*****	[1.063-1.223]	0.041	**1.122****	[1.015-1.239]	0.057	**1.17*****	[1.06-1.291]	0.059
female	**1.464*****	[1.296-1.655]	0.091						
Age group: 17 -14	**1.746*****	[1.354-2.252]	0.227	**1.67*****	[1.186-2.35]	0.291	**1.828*****	[1.257-2.658]	0.349
Age group: 25 - 34	1.051	[0.855-1.293]	0.111	0.957	[0.708-1.294]	0.147	1.158	[0.872-1.538]	0.168
Age group 45 -54	1.085	[0.909-1.296]	0.098	1.138	[0.892-1.452]	0.142	1.05	[0.811-1.361]	0.139
Age group 55 - 65	**2.045*****	[1.665-2.512]	0.215	**2.079*****	[1.572-2.75]	0.297	**2.106*****	[1.552-2.857]	0.328
Single (not married)	**0.705*****	[0.583-0.852]	0.068	0.872	[0.674-1.128]	0.115	**0.57*****	[0.434-0.749]	0.079
Divorced	**0.507*****	[0.414-0.621]	0.053	**0.586*****	[0.432-0.794]	0.091	**0.439*****	[0.334-0.577]	0.061
Widowed	0.843	[0.549-1.295]	0.185	0.811	[0.372-1.766]	0.322	0.81	[0.486-1.349]	0.211
No migration background	0.948	[0.802-1.12]	0.081	1.033	[0.82-1.302]	0.122	0.845	[0.662-1.08]	0.106
East Germany2008	1.102	[0.952-1.276]	0.083	1.164	[0.948-1.429]	0.122	1.03	[0.835-1.271]	0.11
Children (0-14)/ HH	**1.099****	[1.005-1.203]	0.05	**1.163****	[1.023-1.323]	0.076	1.041	[0.917-1.182]	0.067
Risk-taker	**0.706*****	[0.599-0.832]	0.059	**0.74*****	[0.595-0.922]	0.083	**0.632*****	[0.492-0.811]	0.08
Risk-neutral	**0.816*****	[0.711-0.937]	0.058	**0.766*****	[0.626-0.936]	0.078	0.875	[0.723-1.06]	0.085
High Economic worries	**0.717*****	[0.594-0.864]	0.069	**0.624*****	[0.482-0.807]	0.082	0.862	[0.654-1.137]	0.122
Medium Economic worries	**0.863***	[0.74-1.006]	0.068	**0.775****	[0.63-0.953]	0.082	0.992	[0.791-1.242]	0.114
Constant	**4.956*****	[3.638-6.75]	0.781	**4.444*****	[2.95-6.695]	0.929	**7.924*****	[5.037-12.464]	1.831

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 33: Results of the logistic regression model: Alcohol consumption and the permanent at-risk-of-poverty rate of 2004-2008

Moderate alcohol consumption 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty_2008	1.255	[0.923-1.706]	0.197	**1.413***	[0.966-2.067]	0.274	0.882	[0.537-1.449]	0.224
Low education	**1.285****	[1.004-1.645]	0.162	1.12	[0.824-1.524]	0.176	**1.812*****	[1.223-2.684]	0.363
Medium education	1.062	[0.858-1.314]	0.116	0.996	[0.762-1.303]	0.136	1.272	[0.915-1.767]	0.214
Low occupational status	**1.645*****	[1.291-2.097]	0.204	**1.52*****	[1.14-2.027]	0.223	**2.591*****	[1.65-4.067]	0.596
Medium occupational status	**1.357*****	[1.129-1.632]	0.128	**1.459*****	[1.162-1.831]	0.169	1.177	[0.874-1.586]	0.179
Household affected by unemployment	**1.019***	[0.997-1.041]	0.011	1.016	[0.99-1.042]	0.013	1.028	[0.984-1.075]	0.023
Currently unemployed	0.807	[0.598-1.089]	0.123	0.871	[0.608-1.246]	0.159	0.727	[0.421-1.256]	0.203
Health status	**0.911****	[0.835-0.994]	0.041	0.932	[0.841-1.033]	0.049	0.875	[0.742-1.033]	0.074
female	**3.94*****	[3.372-4.604]	0.313						
Age group: 17 -14	1.168	[0.841-1.622]	0.196	1.21	[0.816-1.795]	0.243	0.952	[0.54-1.681]	0.276
Age group: 25 - 34	1.244	[0.928-1.669]	0.186	1.163	[0.806-1.68]	0.218	1.435	[0.917-2.245]	0.328
Age group 45 -54	**0.751*****	[0.605-0.933]	0.083	**0.784***	[0.603-1.019]	0.105	**0.658****	[0.454-0.953]	0.125
Age group 55 - 65	**0.798***	[0.627-1.016]	0.098	0.825	[0.616-1.105]	0.123	0.706	[0.463-1.076]	0.152
Single (not married)	1.082	[0.853-1.374]	0.132	1.063	[0.797-1.417]	0.156	1.244	[0.843-1.835]	0.247
Divorced	1.245	[0.955-1.625]	0.169	1.281	[0.918-1.787]	0.218	1.235	[0.801-1.904]	0.273
Widowed	0.963	[0.548-1.69]	0.276	0.792	[0.318-1.975]	0.369	1.042	[0.498-2.182]	0.393
No migration background	**0.725*****	[0.573-0.917]	0.087	0.792	[0.597-1.049]	0.114	**0.553*****	[0.362-0.846]	0.12
East Germany2008	0.999	[0.84-1.189]	0.089	0.891	[0.727-1.091]	0.092	**1.349***	[0.949-1.917]	0.242
Children (0-14)/ HH	**1.122****	[1.001-1.258]	0.065	**1.144***	[0.995-1.316]	0.082	1.045	[0.867-1.261]	0.1
Risk-taker	0.855	[0.699-1.046]	0.088	0.878	[0.69-1.117]	0.108	0.785	[0.549-1.122]	0.143
Risk-neutral	1.032	[0.869-1.226]	0.091	1.058	[0.853-1.313]	0.116	0.984	[0.743-1.302]	0.141
High Economic worries	**1.238***	[0.983-1.559]	0.146	1.133	[0.857-1.499]	0.162	**1.481***	[0.981-2.238]	0.312
Medium Economic worries	1.084	[0.909-1.293]	0.098	1.003	[0.809-1.242]	0.11	**1.307***	[0.972-1.756]	0.197
Constant	**2.6*****	[1.809-3.736]	0.481	**2.696*****	[1.739-4.179]	0.603	**9.948*****	[5.511-17.958]	2.998

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 34: Results of the logistic regression model: Physical activity and the permanent at-risk-of-poverty rate of 2004-2008

Sufficient physical activity 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty_2008	**0.791****	[0.629-0.995]	0.092	0.91	[0.64-1.294]	0.163	**0.717****	[0.532-0.967]	0.109
Low education	**0.493*****	[0.405-0.601]	0.05	**0.432*****	[0.326-0.572]	0.062	**0.536*****	[0.404-0.711]	0.077
Medium education	**0.735*****	[0.615-0.878]	0.067	**0.628*****	[0.486-0.811]	0.082	0.83	[0.647-1.065]	0.105
Low occupational status	**0.592*****	[0.495-0.709]	0.054	**0.592*****	[0.458-0.764]	0.077	**0.594*****	[0.461-0.766]	0.077
Medium occupational status	**0.852****	[0.741-0.98]	0.061	0.934	[0.761-1.146]	0.098	**0.801****	[0.661-0.971]	0.079
Household affected by unemployment	**0.974****	[0.954-0.994]	0.01	0.994	[0.968-1.02]	0.013	**0.947*****	[0.918-0.977]	0.015
Currently unemployed	**0.791***	[0.606-1.033]	0.108	**0.559*****	[0.382-0.819]	0.109	1.124	[0.775-1.63]	0.213
Health status	**1.303*****	[1.212-1.401]	0.048	**1.331*****	[1.196-1.482]	0.073	**1.262*****	[1.145-1.391]	0.063
female	**1.247*****	[1.108-1.403]	0.075						
Age group: 17 -14	**1.605*****	[1.251-2.058]	0.204	**2.376*****	[1.678-3.365]	0.422	1.032	[0.721-1.478]	0.189
Age group: 25 - 34	1.138	[0.926-1.397]	0.119	**1.371****	[1.013-1.856]	0.212	0.971	[0.735-1.283]	0.138
Age group 45 -54	1.057	[0.893-1.25]	0.091	1.005	[0.787-1.284]	0.126	1.094	[0.864-1.384]	0.132
Age group 55 - 65	1.088	[0.898-1.32]	0.107	1.248	[0.939-1.66]	0.182	0.96	[0.737-1.251]	0.129
Single (not married)	**1.203****	[1.003-1.443]	0.111	**1.345****	[1.039-1.742]	0.177	1.131	[0.877-1.457]	0.146
Divorced	**0.823***	[0.671-1.008]	0.086	1.084	[0.789-1.49]	0.176	**0.691*****	[0.529-0.902]	0.094
Widowed	1.032	[0.684-1.555]	0.216	0.883	[0.332-2.35]	0.441	0.957	[0.595-1.54]	0.232
No migration background	**1.523*****	[1.288-1.802]	0.131	**1.254***	[0.985-1.597]	0.155	**1.801*****	[1.426-2.273]	0.214
East Germany2008	**0.723*****	[0.626-0.834]	0.053	**0.753*****	[0.611-0.928]	0.08	**0.683*****	[0.56-0.832]	0.069
Children (0-14)/ HH	0.976	[0.895-1.064]	0.043	1.088	[0.959-1.235]	0.07	**0.892***	[0.791-1.005]	0.055
Risk-taker	**1.414*****	[1.207-1.655]	0.114	**1.403*****	[1.123-1.752]	0.159	**1.407*****	[1.113-1.779]	0.168
Risk-neutral	**1.328*****	[1.163-1.517]	0.09	**1.339*****	[1.088-1.647]	0.142	**1.339*****	[1.125-1.595]	0.119
High Economic worries	**0.792****	[0.659-0.951]	0.074	0.867	[0.666-1.13]	0.117	**0.732****	[0.568-0.943]	0.095
Medium Economic worries	0.996	[0.868-1.143]	0.07	1.082	[0.89-1.314]	0.108	0.914	[0.751-1.112]	0.091
Constant	**0.627*****	[0.47-0.836]	0.092	**0.64****	[0.424-0.966]	0.134	0.779	[0.53-1.145]	0.153

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 35: Results of the logistic regression model: Combined health behavior and the permanent at-risk-of-poverty rate of 2004-2008

Health-oriented behavior	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty_2008	**0.69****	[0.542-0.878]	0.085	**0.688****	[0.474-0.998]	0.131	**0.69****	[0.502-0.949]	0.112
Low education	**0.422****	[0.342-0.521]	0.045	**0.414****	[0.311-0.55]	0.06	**0.407****	[0.299-0.555]	0.064
Medium education	**0.673****	[0.557-0.813]	0.065	**0.616****	[0.476-0.798]	0.081	**0.713****	[0.539-0.942]	0.101
Low occupational status	**0.662****	[0.55-0.796]	0.062	**0.612****	[0.474-0.791]	0.08	**0.71****	[0.542-0.932]	0.098
Medium occupational status	**0.822****	[0.711-0.951]	0.061	0.912	[0.743-1.118]	0.095	**0.756****	[0.615-0.929]	0.08
Household affected by unemployment	**0.973****	[0.956-0.991]	0.009	0.991	[0.967-1.017]	0.013	**0.959****	[0.935-0.984]	0.013
Currently unemployed	**0.754****	[0.584-0.975]	0.099	**0.702***	[0.482-1.023]	0.135	0.792	[0.561-1.118]	0.139
Health status	**1.199****	[1.116-1.289]	0.044	**1.199****	[1.079-1.333]	0.065	**1.204****	[1.092-1.327]	0.06
female	**1.876****	[1.664-2.116]	0.115						
Age group: 17 -14	1.192	[0.92-1.546]	0.158	**1.501****	[1.06-2.126]	0.267	0.955	[0.655-1.393]	0.184
Age group: 25 - 34	1.026	[0.837-1.258]	0.107	0.997	[0.737-1.349]	0.154	1.059	[0.805-1.394]	0.148
Age group 45 -54	1.009	[0.847-1.202]	0.09	0.985	[0.767-1.264]	0.125	1.046	[0.813-1.344]	0.134
Age group 55 - 65	**1.694****	[1.384-2.072]	0.174	**1.716****	[1.291-2.282]	0.25	**1.724****	[1.29-2.304]	0.255
Single (not married)	0.898	[0.745-1.082]	0.086	1.089	[0.84-1.412]	0.144	**0.748****	[0.574-0.976]	0.101
Divorced	**0.771****	[0.627-0.948]	0.081	0.864	[0.635-1.174]	0.135	**0.71****	[0.535-0.943]	0.103
Widowed	0.945	[0.635-1.405]	0.191	0.81	[0.36-1.824]	0.335	0.876	[0.55-1.396]	0.208
No migration background	1.109	[0.908-1.354]	0.113	1.101	[0.83-1.46]	0.159	1.103	[0.835-1.456]	0.156
East Germany2008	0.956	[0.828-1.104]	0.07	0.981	[0.802-1.2]	0.101	0.91	[0.742-1.117]	0.095
Children (0-14)/ HH	1.04	[0.955-1.132]	0.045	1.056	[0.936-1.19]	0.065	1.032	[0.914-1.167]	0.064
Risk-taker	**1.223****	[1.038-1.442]	0.103	1.198	[0.958-1.498]	0.137	**1.259***	[0.979-1.619]	0.162
Risk-neutral	**1.131***	[0.99-1.292]	0.077	1.167	[0.955-1.427]	0.119	1.109	[0.927-1.328]	0.102
High Economic worries	**0.768****	[0.637-0.926]	0.073	**0.757****	[0.579-0.99]	0.104	**0.769***	[0.59-1.002]	0.104
Medium Economic worries	0.905	[0.784-1.045]	0.066	0.932	[0.765-1.136]	0.094	0.875	[0.71-1.079]	0.093
Constant	**1.437****	[1.052-1.963]	0.229	1.312	[0.848-2.029]	0.292	**3.055****	[1.992-4.685]	0.667

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 36: Results of the logistic regression model: Diet and the permanent combined poverty indicator of 2004-2008

Healthy diet 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty	**0.682***	[0.459-1.014]	0.138	0.649	[0.352-1.196]	0.202	0.698	[0.417-1.169]	0.184
Permanent moderate poverty	**0.758***	[0.554-1.038]	0.121	0.894	[0.56-1.426]	0.213	**0.634****	[0.424-0.946]	0.13
Permanent one-sided poverty	1.083	[0.696-1.684]	0.244	1.417	[0.755-2.658]	0.455	0.846	[0.487-1.471]	0.239
Permanent vulnerability	0.826	[0.653-1.044]	0.099	0.824	[0.578-1.174]	0.149	0.811	[0.589-1.115]	0.132
Permanent fragile prosperity	0.978	[0.834-1.147]	0.079	1.023	[0.809-1.294]	0.122	0.93	[0.75-1.154]	0.102
Low education	**0.629*****	[0.509-0.777]	0.068	**0.664*****	[0.494-0.892]	0.1	**0.575*****	[0.422-0.783]	0.091
Medium education	**0.803****	[0.666-0.97]	0.077	**0.772***	[0.592-1.006]	0.104	0.804	[0.611-1.057]	0.112
Low occupational status	**0.808****	[0.659-0.99]	0.084	**0.741****	[0.555-0.99]	0.11	0.867	[0.651-1.155]	0.127
Medium occupational status	0.904	[0.777-1.051]	0.07	0.877	[0.704-1.091]	0.098	0.935	[0.759-1.153]	0.1
Currently unemployed	0.927	[0.731-1.175]	0.112	1.201	[0.848-1.702]	0.213	**0.731****	[0.542-0.988]	0.112
Health status	**1.112*****	[1.032-1.197]	0.042	1.091	[0.976-1.221]	0.062	**1.134****	[1.029-1.25]	0.056
female	**2.38*****	[2.101-2.696]	0.152						
Age group: 17 -14	**0.532*****	[0.405-0.7]	0.074	**0.594*****	[0.401-0.88]	0.119	**0.506*****	[0.35-0.732]	0.095
Age group: 25 - 34	**0.768****	[0.619-0.952]	0.084	**0.724***	[0.515-1.02]	0.126	0.797	[0.6-1.059]	0.116
Age group 45 -54	1.001	[0.835-1.199]	0.092	1.068	[0.819-1.393]	0.145	0.94	[0.731-1.21]	0.121
Age group 55 - 65	**1.75*****	[1.423-2.153]	0.185	**1.914*****	[1.421-2.579]	0.291	**1.608*****	[1.204-2.148]	0.238
Single (not married)	0.985	[0.811-1.197]	0.098	1.112	[0.843-1.465]	0.157	0.848	[0.649-1.107]	0.115
Divorced	1.011	[0.823-1.243]	0.107	0.897	[0.657-1.224]	0.142	1.1	[0.828-1.461]	0.159
Widowed	1.196	[0.774-1.847]	0.265	1.953	[0.775-4.925]	0.922	1.066	[0.658-1.728]	0.263
No migration background	1.019	[0.823-1.261]	0.111	1.073	[0.782-1.471]	0.173	0.996	[0.748-1.326]	0.145
East Germany2008	1.031	[0.889-1.195]	0.078	1.02	[0.823-1.265]	0.112	1.043	[0.849-1.28]	0.109
Children (0-14)/ HH	**1.097****	[1.004-1.198]	0.049	1.033	[0.907-1.176]	0.068	**1.156****	[1.018-1.312]	0.075
Risk-taker	**1.3*****	[1.098-1.539]	0.112	1.207	[0.949-1.535]	0.148	**1.494*****	[1.171-1.907]	0.186
Risk-neutral	**1.211*****	[1.054-1.391]	0.086	**1.264****	[1.02-1.566]	0.138	**1.178***	[0.981-1.416]	0.11
High Economic worries	1.046	[0.86-1.272]	0.104	0.923	[0.696-1.226]	0.134	1.134	[0.864-1.49]	0.158
Medium Economic worries	1.018	[0.878-1.18]	0.077	1.006	[0.815-1.241]	0.108	1.023	[0.831-1.259]	0.108
Constant	**0.686****	[0.497-0.948]	0.113	**0.616****	[0.385-0.985]	0.148	**1.831*****	[1.199-2.794]	0.395

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 37: Results of the logistic regression model: Smoking and the permanent combined poverty indicator of 2004-2008

Non-smoking 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty	**0.444*****	[0.306-0.644]	0.084	**0.395*****	[0.231-0.676]	0.108	**0.474*****	[0.281-0.8]	0.127
Permanent moderate poverty	**0.418*****	[0.313-0.559]	0.062	**0.464*****	[0.304-0.708]	0.1	**0.393*****	[0.263-0.587]	0.08
Permanent one-sided poverty	**0.609****	[0.397-0.935]	0.133	0.642	[0.35-1.181]	0.2	0.602	[0.327-1.108]	0.187
Permanent vulnerability	**0.729****	[0.571-0.931]	0.091	**0.673****	[0.481-0.943]	0.116	0.797	[0.558-1.138]	0.145
Permanent fragile prosperity	**0.822****	[0.693-0.975]	0.072	0.832	[0.657-1.054]	0.1	0.826	[0.646-1.056]	0.104
Low education	**0.443*****	[0.345-0.569]	0.057	**0.509*****	[0.366-0.709]	0.086	**0.372*****	[0.253-0.545]	0.073
Medium education	**0.634*****	[0.503-0.799]	0.075	**0.673****	[0.493-0.919]	0.107	**0.588*****	[0.415-0.835]	0.105
Low occupational status	1.024	[0.827-1.268]	0.112	0.925	[0.693-1.235]	0.136	1.149	[0.833-1.585]	0.189
Medium occupational status	0.938	[0.793-1.108]	0.08	0.946	[0.751-1.191]	0.111	0.938	[0.738-1.193]	0.115
Currently unemployed	**0.616*****	[0.498-0.762]	0.067	**0.562*****	[0.414-0.763]	0.088	**0.656*****	[0.486-0.885]	0.1
Health status	**1.143*****	[1.06-1.234]	0.044	**1.14****	[1.021-1.273]	0.064	**1.153*****	[1.037-1.281]	0.062
female	**1.505*****	[1.318-1.719]	0.102						
Age group: 17 -14	**1.906*****	[1.44-2.522]	0.272	**1.754*****	[1.205-2.553]	0.336	**2.05*****	[1.352-3.109]	0.436
Age group: 25 - 34	1.123	[0.892-1.413]	0.132	0.97	[0.689-1.367]	0.17	1.288	[0.948-1.75]	0.201
Age group 45 -54	1.09	[0.899-1.321]	0.107	1.172	[0.9-1.527]	0.158	1.009	[0.761-1.336]	0.145
Age group 55 - 65	**1.885*****	[1.512-2.351]	0.212	**1.851*****	[1.374-2.493]	0.281	**1.974*****	[1.418-2.748]	0.333
Single (not married)	**0.657*****	[0.534-0.808]	0.069	0.807	[0.611-1.067]	0.115	**0.53*****	[0.392-0.718]	0.082
Divorced	**0.503*****	[0.405-0.625]	0.056	**0.555*****	[0.404-0.763]	0.09	**0.449*****	[0.334-0.605]	0.068
Widowed	0.812	[0.511-1.289]	0.192	0.644	[0.297-1.395]	0.254	0.821	[0.47-1.433]	0.233
No migration background	0.843	[0.67-1.062]	0.099	0.985	[0.718-1.353]	0.159	**0.734***	[0.526-1.026]	0.125
East Germany2008	1.127	[0.963-1.318]	0.09	**1.21***	[0.97-1.51]	0.137	1.043	[0.835-1.302]	0.118
Children (0-14)/ HH	1.058	[0.96-1.166]	0.052	1.11	[0.969-1.271]	0.077	1.005	[0.874-1.156]	0.072
Risk-taker	**0.789*****	[0.658-0.945]	0.073	0.82	[0.645-1.041]	0.1	**0.721****	[0.546-0.95]	0.102
Risk-neutral	**0.871***	[0.75-1.011]	0.066	**0.818***	[0.658-1.017]	0.091	0.938	[0.764-1.151]	0.098
High Economic worries	**0.81****	[0.658-0.999]	0.086	**0.706****	[0.529-0.944]	0.104	0.973	[0.72-1.314]	0.149
Medium Economic worries	0.891	[0.754-1.053]	0.076	**0.77****	[0.614-0.965]	0.089	1.055	[0.827-1.345]	0.131
Constant	**5.256*****	[3.697-7.472]	0.943	**4.49*****	[2.808-7.178]	1.075	**8.902*****	[5.375-14.743]	2.291

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 38: Results of the logistic regression model: Alcohol consumption and the permanent combined poverty indicator of 2004-2008

Moderate alcohol consumption 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty	1.257	[0.765-2.063]	0.318	1.466	[0.81-2.656]	0.444	0.734	[0.301-1.791]	0.334
Permanent moderate poverty	**1.476***	[0.954-2.286]	0.329	**1.558***	[0.919-2.64]	0.419	1.272	[0.598-2.707]	0.49
Permanent one-sided poverty	**2.642*****	[1.432-4.877]	0.826	**2.922*****	[1.428-5.979]	1.067	2.145	[0.657-7.001]	1.295
Permanent vulnerability	1.253	[0.925-1.699]	0.194	1.225	[0.852-1.763]	0.228	1.398	[0.781-2.502]	0.415
Permanent fragile prosperity	**1.222***	[0.995-1.501]	0.128	**1.286****	[1.003-1.648]	0.163	1.066	[0.748-1.521]	0.193
Low education	**1.31****	[1.011-1.696]	0.173	1.195	[0.87-1.642]	0.194	**1.626****	[1.052-2.513]	0.361
Medium education	1.142	[0.915-1.424]	0.129	1.067	[0.809-1.407]	0.15	1.327	[0.932-1.888]	0.239
Low occupational status	**1.399****	[1.074-1.822]	0.188	1.249	[0.913-1.709]	0.2	**2.374*****	[1.429-3.942]	0.614
Medium occupational status	**1.318*****	[1.087-1.599]	0.13	**1.379*****	[1.086-1.751]	0.168	1.24	[0.906-1.698]	0.199
Currently unemployed	0.936	[0.695-1.262]	0.143	0.977	[0.695-1.374]	0.17	0.879	[0.484-1.597]	0.268
Health status	**0.923***	[0.841-1.013]	0.044	0.95	[0.85-1.063]	0.054	0.88	[0.743-1.043]	0.076
female	**4.057*****	[3.44-4.786]	0.342						
Age group: 17 -14	1.068	[0.754-1.512]	0.19	1.018	[0.671-1.546]	0.217	1.127	[0.617-2.06]	0.347
Age group: 25 - 34	1.159	[0.85-1.58]	0.183	1.06	[0.719-1.563]	0.21	1.392	[0.851-2.276]	0.349
Age group 45 -54	**0.802***	[0.639-1.006]	0.093	0.836	[0.634-1.101]	0.118	**0.719***	[0.487-1.061]	0.143
Age group 55 - 65	0.862	[0.669-1.111]	0.112	0.888	[0.652-1.208]	0.14	0.764	[0.492-1.186]	0.172
Single (not married)	1.132	[0.883-1.452]	0.144	1.18	[0.873-1.594]	0.181	1.111	[0.733-1.684]	0.236
Divorced	1.226	[0.934-1.609]	0.17	1.301	[0.926-1.829]	0.226	1.117	[0.715-1.745]	0.254
Widowed	0.997	[0.548-1.813]	0.304	1.126	[0.408-3.109]	0.583	0.849	[0.402-1.793]	0.324
No migration background	0.846	[0.634-1.129]	0.125	1.005	[0.706-1.43]	0.181	**0.529****	[0.316-0.888]	0.14
East Germany2008	0.984	[0.82-1.18]	0.091	0.881	[0.712-1.09]	0.096	1.352	[0.931-1.964]	0.258
Children (0-14)/ HH	1.097	[0.972-1.238]	0.068	1.1	[0.949-1.275]	0.083	1.067	[0.873-1.304]	0.109
Risk-taker	0.872	[0.705-1.077]	0.094	0.89	[0.69-1.146]	0.115	0.819	[0.562-1.193]	0.157
Risk-neutral	1.035	[0.863-1.242]	0.096	1.064	[0.847-1.336]	0.124	0.971	[0.721-1.307]	0.147
High Economic worries	1.111	[0.867-1.424]	0.141	1.01	[0.75-1.361]	0.154	1.33	[0.849-2.085]	0.305
Medium Economic worries	1.045	[0.869-1.257]	0.099	0.925	[0.74-1.157]	0.105	**1.383****	[1.011-1.891]	0.221
Constant	**2.001*****	[1.334-3.002]	0.414	**1.921****	[1.164-3.168]	0.49	**9.568*****	[5.064-18.079]	3.106

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 39: Results of the logistic regression model: Physical activity and the permanent combined poverty indicator of 2004-2008

Sufficient physical activity 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty	**0.353*****	[0.224-0.556]	0.082	**0.521****	[0.272-0.997]	0.173	**0.274*****	[0.154-0.49]	0.081
Permanent moderate poverty	**0.405*****	[0.288-0.569]	0.07	**0.618***	[0.38-1.007]	0.154	**0.28*****	[0.174-0.45]	0.068
Permanent one-sided poverty	**0.401*****	[0.259-0.62]	0.089	**0.532****	[0.288-0.98]	0.166	**0.305*****	[0.164-0.569]	0.097
Permanent vulnerability	**0.523*****	[0.405-0.675]	0.068	**0.611*****	[0.423-0.882]	0.114	**0.458*****	[0.321-0.654]	0.083
Permanent fragile prosperity	**0.65*****	[0.553-0.764]	0.054	**0.684*****	[0.54-0.868]	0.083	**0.629*****	[0.503-0.786]	0.071
Low education	**0.578*****	[0.467-0.716]	0.063	**0.521*****	[0.386-0.704]	0.08	**0.602*****	[0.442-0.82]	0.095
Medium education	**0.782****	[0.647-0.946]	0.076	**0.672*****	[0.511-0.882]	0.093	0.875	[0.669-1.144]	0.12
Low occupational status	**0.695*****	[0.565-0.854]	0.073	**0.689****	[0.513-0.925]	0.103	**0.698****	[0.52-0.937]	0.105
Medium occupational status	0.887	[0.762-1.033]	0.069	0.937	[0.751-1.168]	0.106	0.868	[0.704-1.071]	0.093
Currently unemployed	**0.768****	[0.601-0.981]	0.096	**0.66****	[0.459-0.95]	0.123	0.877	[0.633-1.215]	0.146
Health status	**1.244*****	[1.15-1.345]	0.05	**1.29*****	[1.144-1.453]	0.079	**1.199*****	[1.08-1.33]	0.064
female	**1.325*****	[1.167-1.505]	0.086						
Age group: 17 -14	**1.519*****	[1.158-1.991]	0.21	**2.069*****	[1.416-3.022]	0.4	1.078	[0.73-1.593]	0.215
Age group: 25 - 34	1.196	[0.952-1.503]	0.139	**1.482****	[1.053-2.086]	0.258	0.988	[0.731-1.336]	0.152
Age group 45 -54	1.011	[0.844-1.211]	0.093	0.918	[0.707-1.193]	0.123	1.086	[0.842-1.4]	0.141
Age group 55 - 65	1.06	[0.864-1.302]	0.111	1.205	[0.89-1.631]	0.186	0.954	[0.722-1.262]	0.136
Single (not married)	**1.258****	[1.033-1.531]	0.126	**1.36****	[1.024-1.807]	0.197	1.199	[0.914-1.574]	0.166
Divorced	0.982	[0.788-1.224]	0.11	1.267	[0.907-1.769]	0.216	0.836	[0.622-1.125]	0.127
Widowed	1.074	[0.696-1.658]	0.238	0.636	[0.263-1.539]	0.287	1.075	[0.645-1.793]	0.28
No migration background	**1.232***	[0.977-1.554]	0.146	0.968	[0.686-1.366]	0.17	**1.483****	[1.084-2.029]	0.237
East Germany2008	**0.809*****	[0.696-0.941]	0.062	0.839	[0.675-1.043]	0.093	**0.764****	[0.618-0.943]	0.082
Children (0-14)/ HH	1.029	[0.936-1.132]	0.05	**1.146***	[0.997-1.318]	0.082	0.953	[0.837-1.087]	0.064
Risk-taker	**1.297*****	[1.093-1.54]	0.113	**1.243***	[0.975-1.584]	0.154	**1.36****	[1.054-1.757]	0.177
Risk-neutral	**1.255*****	[1.087-1.448]	0.092	**1.253****	[1.003-1.565]	0.142	**1.266****	[1.049-1.529]	0.122
High Economic worries	0.813**	[0.665-0.994]	0.083	0.816	[0.61-1.093]	0.122	0.811	[0.616-1.069]	0.114
Medium Economic worries	1.04	[0.897-1.206]	0.078	1.097	[0.89-1.353]	0.117	0.996	[0.807-1.229]	0.107
Constant	0.818	[0.584-1.145]	0.14	0.907	[0.558-1.475]	0.225	1.033	[0.667-1.6]	0.231

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 40: Results of the logistic regression model: Combined health behavior and the permanent combined poverty indicator of 2004-2008

Health-oriented behavior	Total Sample			Male Sample			Female Sample		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Permanent extreme poverty	**0.328*****	[0.214-0.503]	0.072	**0.251*****	[0.131-0.481]	0.083	**0.38*****	[0.218-0.66]	0.107
Permanent moderate poverty	**0.381*****	[0.278-0.522]	0.061	**0.515*****	[0.323-0.823]	0.123	**0.305*****	[0.203-0.458]	0.063
Permanent one-sided poverty	**0.584****	[0.374-0.912]	0.133	0.773	[0.421-1.421]	0.24	**0.463****	[0.249-0.861]	0.147
Permanent vulnerability	**0.631*****	[0.496-0.802]	0.077	**0.691****	[0.491-0.973]	0.121	**0.581*****	[0.416-0.811]	0.099
Permanent fragile prosperity	**0.761*****	[0.65-0.892]	0.061	**0.794****	[0.633-0.997]	0.092	**0.737*****	[0.592-0.918]	0.083
Low education	**0.448*****	[0.36-0.557]	0.05	**0.474*****	[0.353-0.636]	0.071	**0.394*****	[0.283-0.548]	0.066
Medium education	**0.677*****	[0.556-0.824]	0.068	**0.664*****	[0.508-0.868]	0.091	**0.658*****	[0.489-0.886]	0.1
Low occupational status	**0.804****	[0.656-0.985]	0.083	**0.708****	[0.535-0.937]	0.101	0.899	[0.669-1.208]	0.135
Medium occupational status	**0.862***	[0.739-1.006]	0.068	0.901	[0.726-1.117]	0.099	0.849	[0.681-1.057]	0.095
Currently unemployed	**0.717*****	[0.566-0.908]	0.086	0.806	[0.565-1.149]	0.146	**0.637*****	[0.47-0.864]	0.099
Health status	**1.18*****	[1.094-1.272]	0.046	**1.2*****	[1.073-1.342]	0.068	**1.162*****	[1.049-1.288]	0.061
female	**1.962*****	[1.731-2.224]	0.126						
Age group: 17 -14	1.202	[0.917-1.575]	0.166	**1.466****	[1.013-2.121]	0.276	0.984	[0.673-1.437]	0.19
Age group: 25 - 34	1.059	[0.853-1.314]	0.117	1.008	[0.729-1.394]	0.167	1.107	[0.83-1.476]	0.163
Age group 45 -54	1	[0.832-1.203]	0.094	1.007	[0.774-1.309]	0.135	0.993	[0.762-1.294]	0.134
Age group 55 - 65	**1.659*****	[1.343-2.048]	0.178	**1.741*****	[1.292-2.346]	0.265	**1.622*****	[1.201-2.19]	0.249
Single (not married)	0.913	[0.75-1.111]	0.092	1.12	[0.851-1.475]	0.157	**0.737****	[0.559-0.971]	0.104
Divorced	**0.78****	[0.628-0.97]	0.087	0.892	[0.646-1.23]	0.146	**0.697****	[0.519-0.936]	0.105
Widowed	0.956	[0.623-1.468]	0.209	0.946	[0.415-2.159]	0.398	0.872	[0.531-1.433]	0.221
No migration background	1.118	[0.895-1.396]	0.127	1.064	[0.78-1.452]	0.169	1.178	[0.865-1.603]	0.185
East Germany2008	1.026	[0.881-1.195]	0.08	1.072	[0.866-1.327]	0.117	0.964	[0.776-1.196]	0.106
Children (0-14)/ HH	**1.079***	[0.986-1.18]	0.049	**1.12***	[0.986-1.271]	0.073	1.056	[0.929-1.2]	0.069
Risk-taker	**1.243****	[1.046-1.477]	0.109	1.206	[0.952-1.527]	0.145	**1.326****	[1.02-1.722]	0.177
Risk-neutral	**1.136***	[0.988-1.307]	0.081	**1.208***	[0.978-1.492]	0.13	1.092	[0.904-1.319]	0.105
High Economic worries	**0.815****	[0.668-0.994]	0.083	**0.74****	[0.556-0.984]	0.108	0.879	[0.663-1.165]	0.126
Medium Economic worries	0.929	[0.799-1.08]	0.071	0.903	[0.734-1.11]	0.095	0.953	[0.766-1.185]	0.106
Constant	**1.45****	[1.044-2.012]	0.243	1.286	[0.813-2.033]	0.301	**3.276*****	[2.087-5.143]	0.754

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 41: Results of the logistic regression model: Diet and the permanent SES of 2004-2008

Healthy diet 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent Low SES	**0.621*****	[0.521-0.742]	0.056	**0.641*****	[0.497-0.827]	0.083	**0.602*****	[0.471-0.769]	0.075
Permanent Medium SES	**0.743*****	[0.644-0.858]	0.054	**0.705*****	[0.575-0.865]	0.073	**0.776****	[0.635-0.95]	0.08
Household affected by unemployment	**0.984***	[0.966-1.002]	0.009	0.986	[0.959-1.013]	0.014	0.983	[0.96-1.007]	0.012
Currently unemployed	1.013	[0.784-1.309]	0.132	1.175	[0.802-1.722]	0.229	0.863	[0.623-1.196]	0.144
Health status	**1.153*****	[1.077-1.235]	0.04	**1.128****	[1.018-1.25]	0.059	**1.18*****	[1.078-1.292]	0.055
female	**2.245*****	[2-2.52]	0.132						
Age group: 17 -14	**0.55*****	[0.43-0.705]	0.07	**0.594*****	[0.416-0.847]	0.108	**0.532*****	[0.379-0.748]	0.092
Age group: 25 - 34	**0.775*****	[0.638-0.942]	0.077	**0.715****	[0.527-0.968]	0.111	0.817	[0.628-1.062]	0.109
Age group 45 -54	1.085	[0.918-1.283]	0.093	1.145	[0.897-1.462]	0.143	1.037	[0.821-1.309]	0.123
Age group 55 - 65	**1.847*****	[1.529-2.231]	0.178	**1.938*****	[1.476-2.546]	0.27	**1.758*****	[1.351-2.287]	0.236
Single (not married)	1.019	[0.85-1.221]	0.094	1.079	[0.832-1.398]	0.143	0.94	[0.733-1.205]	0.119
Divorced	1.026	[0.843-1.249]	0.103	0.913	[0.673-1.24]	0.143	1.128	[0.866-1.468]	0.152
Widowed	1.169	[0.777-1.76]	0.244	1.77	[0.767-4.086]	0.756	1.069	[0.68-1.681]	0.247
No migration background	0.994	[0.849-1.164]	0.08	0.933	[0.741-1.175]	0.11	1.062	[0.858-1.313]	0.115
East Germany2008	**1.14***	[0.995-1.306]	0.079	1.132	[0.928-1.38]	0.114	1.138	[0.945-1.37]	0.108
Children (0-14)/ HH	**1.135*****	[1.046-1.232]	0.048	1.066	[0.946-1.202]	0.065	**1.195*****	[1.062-1.344]	0.072
Risk-taker	**1.185****	[1.015-1.383]	0.093	1.125	[0.903-1.403]	0.127	**1.307****	[1.046-1.633]	0.148
Risk-neutral	**1.134***	[0.997-1.29]	0.075	1.17	[0.96-1.426]	0.118	1.099	[0.927-1.303]	0.096
High Economic worries	0.986	[0.826-1.178]	0.089	0.978	[0.754-1.268]	0.13	0.968	[0.758-1.238]	0.121
Medium Economic worries	1.005	[0.876-1.152]	0.07	1.043	[0.857-1.271]	0.105	0.958	[0.789-1.162]	0.095
Constant	**0.603*****	[0.464-0.784]	0.081	**0.607****	[0.414-0.89]	0.119	**1.367***	[0.978-1.913]	0.234

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 42: Results of the logistic regression model: Smoking and the permanent SES of 2004-2008

Non-smoking 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent Low SES	**0.424*****	[0.349-0.516]	0.042	**0.439*****	[0.336-0.574]	0.06	**0.411*****	[0.308-0.548]	0.06
Permanent Medium SES	**0.596*****	[0.504-0.703]	0.051	**0.612*****	[0.488-0.767]	0.07	**0.581*****	[0.455-0.742]	0.073
Household affected by unemployment	**0.983****	[0.969-0.998]	0.007	0.986	[0.964-1.007]	0.011	**0.98***	[0.96-1.001]	0.01
Currently unemployed	**0.565*****	[0.449-0.71]	0.066	**0.502*****	[0.361-0.696]	0.084	**0.641*****	[0.466-0.883]	0.105
Health status	**1.14*****	[1.062-1.224]	0.041	**1.127****	[1.019-1.246]	0.058	**1.16*****	[1.05-1.282]	0.059
female	**1.474*****	[1.303-1.667]	0.092						
Age group: 17 -14	**1.477*****	[1.145-1.904]	0.191	**1.392***	[0.989-1.96]	0.243	**1.588****	[1.095-2.303]	0.301
Age group: 25 - 34	1.083	[0.88-1.332]	0.114	0.983	[0.725-1.332]	0.153	1.198	[0.902-1.591]	0.174
Age group 45 -54	1.032	[0.864-1.233]	0.094	1.085	[0.85-1.386]	0.136	0.996	[0.769-1.29]	0.131
Age group 55 - 65	**1.998*****	[1.626-2.456]	0.21	**2.038*****	[1.539-2.699]	0.292	**2.026*****	[1.492-2.752]	0.317
Single (not married)	**0.765*****	[0.633-0.925]	0.074	0.922	[0.712-1.195]	0.122	**0.628*****	[0.479-0.824]	0.087
Divorced	**0.56*****	[0.455-0.688]	0.059	**0.644*****	[0.476-0.87]	0.099	**0.488*****	[0.369-0.645]	0.07
Widowed	0.882	[0.573-1.358]	0.194	0.867	[0.399-1.887]	0.344	0.85	[0.509-1.419]	0.222
No migration background	0.872	[0.74-1.028]	0.073	0.971	[0.772-1.222]	0.114	**0.773****	[0.609-0.982]	0.094
East Germany2008	**1.216*****	[1.053-1.403]	0.089	**1.236****	[1.01-1.511]	0.127	**1.189***	[0.969-1.459]	0.124
Children (0-14)/ HH	**1.087***	[0.992-1.191]	0.051	**1.149****	[1.01-1.307]	0.076	1.031	[0.905-1.175]	0.069
Risk-taker	**0.702*****	[0.595-0.828]	0.059	**0.744*****	[0.597-0.927]	0.084	**0.623*****	[0.485-0.801]	0.08
Risk-neutral	**0.824*****	[0.717-0.946]	0.058	**0.781****	[0.638-0.956]	0.081	0.87	[0.719-1.054]	0.085
High Economic worries	**0.723*****	[0.599-0.873]	0.069	**0.625*****	[0.481-0.812]	0.083	0.88	[0.671-1.155]	0.122
Medium Economic worries	**0.865***	[0.741-1.009]	0.068	**0.771****	[0.626-0.949]	0.082	1.003	[0.801-1.256]	0.115
Constant	**4.364*****	[3.294-5.783]	0.627	**4.048*****	[2.756-5.946]	0.794	**6.678*****	[4.537-9.829]	1.317

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 43: Results of the logistic regression model: Alcohol consumption and the permanent SES of 2004-2008

Moderate alcohol consumption 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent Low SES	**2.129*****	[1.682-2.694]	0.256	**1.839*****	[1.383-2.446]	0.268	**3.224*****	[2.093-4.965]	0.71
Permanent Medium SES	**1.429*****	[1.2-1.703]	0.128	**1.32****	[1.063-1.641]	0.146	**1.693*****	[1.279-2.242]	0.243
Household affected by unemployment	**1.022****	[1-1.045]	0.011	1.021	[0.995-1.047]	0.013	1.026	[0.983-1.071]	0.023
Currently unemployed	0.825	[0.607-1.122]	0.129	0.924	[0.64-1.333]	0.173	0.685	[0.393-1.193]	0.194
Health status	**0.907****	[0.831-0.991]	0.041	0.929	[0.837-1.03]	0.049	**0.869***	[0.737-1.025]	0.073
female	**3.909*****	[3.342-4.572]	0.312						
Age group: 17 -14	1.307	[0.946-1.806]	0.216	1.344	[0.913-1.98]	0.266	1.107	[0.639-1.918]	0.31
Age group: 25 - 34	1.264	[0.94-1.7]	0.191	1.187	[0.82-1.72]	0.224	1.438	[0.913-2.266]	0.334
Age group 45 -54	**0.781****	[0.628-0.972]	0.087	0.807	[0.619-1.052]	0.109	**0.704***	[0.486-1.02]	0.133
Age group 55 - 65	0.818	[0.641-1.044]	0.102	0.844	[0.628-1.134]	0.127	0.728	[0.478-1.11]	0.157
Single (not married)	1.031	[0.813-1.308]	0.125	1.018	[0.763-1.359]	0.15	1.106	[0.748-1.633]	0.22
Divorced	1.149	[0.881-1.5]	0.156	1.182	[0.847-1.649]	0.201	1.058	[0.687-1.63]	0.233
Widowed	0.907	[0.512-1.609]	0.265	0.702	[0.273-1.81]	0.339	1.016	[0.478-2.158]	0.39
No migration background	**0.726*****	[0.574-0.918]	0.087	0.799	[0.603-1.059]	0.115	**0.545*****	[0.358-0.83]	0.117
East Germany2008	0.97	[0.818-1.151]	0.084	0.876	[0.716-1.072]	0.09	1.305	[0.923-1.844]	0.23
Children (0-14)/ HH	**1.125****	[1.003-1.262]	0.066	**1.142***	[0.992-1.315]	0.082	1.057	[0.873-1.28]	0.103
Risk-taker	**0.842***	[0.687-1.031]	0.087	0.851	[0.667-1.085]	0.105	0.803	[0.56-1.15]	0.147
Risk-neutral	1.026	[0.863-1.219]	0.09	1.04	[0.837-1.291]	0.115	1.004	[0.758-1.33]	0.144
High Economic worries	**1.243***	[0.982-1.572]	0.149	1.142	[0.86-1.517]	0.165	**1.434***	[0.942-2.183]	0.307
Medium Economic worries	1.068	[0.893-1.277]	0.097	0.987	[0.794-1.227]	0.11	1.279	[0.947-1.726]	0.196
Constant	**2.669*****	[1.882-3.786]	0.476	**2.788*****	[1.832-4.244]	0.598	**10.43*****	[5.845-18.611]	3.081

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 44: Results of the logistic regression model: Physical activity and the permanent SES of 2004-2008

Sufficient physical activity 2008	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent Low SES	**0.332*****	[0.277-0.399]	0.031	**0.316*****	[0.243-0.413]	0.043	**0.346*****	[0.269-0.446]	0.045
Permanent Medium SES	**0.576*****	[0.498-0.665]	0.042	**0.568*****	[0.462-0.699]	0.06	**0.571*****	[0.467-0.698]	0.059
Household affected by unemployment	**0.967*****	[0.946-0.988]	0.011	0.988	[0.963-1.014]	0.013	**0.94*****	[0.909-0.971]	0.016
Currently unemployed	0.842	[0.644-1.102]	0.115	**0.587*****	[0.403-0.856]	0.113	1.211	[0.83-1.766]	0.233
Health status	**1.308*****	[1.217-1.407]	0.048	**1.333*****	[1.198-1.484]	0.073	**1.272*****	[1.154-1.402]	0.063
female	**1.293*****	[1.149-1.454]	0.078						
Age group: 17 -14	**1.345****	[1.053-1.716]	0.168	**1.957*****	[1.393-2.75]	0.34	0.889	[0.623-1.268]	0.161
Age group: 25 - 34	1.167	[0.95-1.434]	0.123	**1.449****	[1.067-1.967]	0.226	0.976	[0.738-1.289]	0.139
Age group 45 -54	0.999	[0.843-1.184]	0.086	0.976	[0.762-1.249]	0.123	1.016	[0.801-1.289]	0.123
Age group 55 - 65	1.056	[0.871-1.28]	0.104	1.248	[0.938-1.662]	0.182	0.907	[0.696-1.183]	0.123
Single (not married)	**1.304*****	[1.087-1.565]	0.121	**1.482*****	[1.14-1.927]	0.199	1.198	[0.93-1.543]	0.155
Divorced	0.921	[0.75-1.13]	0.096	1.226	[0.887-1.696]	0.203	**0.75****	[0.575-0.978]	0.102
Widowed	1.072	[0.694-1.654]	0.237	0.988	[0.35-2.785]	0.522	0.966	[0.588-1.588]	0.245
No migration background	**1.513*****	[1.281-1.787]	0.128	**1.237***	[0.973-1.572]	0.152	**1.808*****	[1.437-2.275]	0.212
East Germany2008	**0.773*****	[0.672-0.889]	0.055	**0.827***	[0.673-1.016]	0.087	**0.724*****	[0.598-0.876]	0.071
Children (0-14)/ HH	0.96	[0.88-1.047]	0.042	1.098	[0.966-1.247]	0.071	**0.862****	[0.766-0.971]	0.052
Risk-taker	**1.402*****	[1.197-1.642]	0.113	**1.396*****	[1.116-1.747]	0.16	**1.37*****	[1.085-1.73]	0.163
Risk-neutral	**1.344*****	[1.176-1.537]	0.092	**1.353*****	[1.098-1.667]	0.144	**1.352*****	[1.134-1.612]	0.121
High Economic worries	**0.794****	[0.66-0.954]	0.075	0.872	[0.666-1.141]	0.12	**0.733****	[0.568-0.945]	0.095
Medium Economic worries	1.012	[0.881-1.162]	0.071	1.088	[0.894-1.324]	0.109	0.939	[0.772-1.142]	0.094
Constant	**0.568*****	[0.432-0.747]	0.079	**0.541*****	[0.367-0.798]	0.107	0.771	[0.534-1.113]	0.144

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 45: Results of the logistic regression model: Combined health behavior and the permanent SES of 2004-2008

Health-oriented behavior	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent Low SES	**0.354*****	[0.293-0.428]	0.034	**0.329*****	[0.25-0.433]	0.046	**0.367*****	[0.279-0.481]	0.051
Permanent Medium SES	**0.569*****	[0.49-0.661]	0.044	**0.59*****	[0.481-0.724]	0.062	**0.534*****	[0.426-0.668]	0.061
Household affected by unemployment	**0.964*****	[0.947-0.982]	0.009	0.982	[0.958-1.007]	0.012	**0.949*****	[0.924-0.974]	0.013
Currently unemployed	**0.786***	[0.609-1.014]	0.102	**0.708***	[0.489-1.024]	0.133	0.867	[0.613-1.227]	0.153
Health status	**1.212*****	[1.127-1.302]	0.044	**1.203*****	[1.082-1.337]	0.065	**1.219*****	[1.105-1.344]	0.061
female	**1.909*****	[1.693-2.152]	0.117						
Age group: 17 -14	0.954	[0.742-1.227]	0.122	1.168	[0.833-1.638]	0.201	0.785	[0.544-1.134]	0.147
Age group: 25 - 34	1.043	[0.85-1.28]	0.109	1.043	[0.767-1.419]	0.164	1.055	[0.802-1.389]	0.148
Age group 45 -54	0.951	[0.798-1.133]	0.085	0.94	[0.732-1.206]	0.12	0.976	[0.759-1.255]	0.125
Age group 55 - 65	**1.611*****	[1.319-1.967]	0.164	**1.665*****	[1.255-2.21]	0.241	**1.583*****	[1.188-2.108]	0.232
Single (not married)	0.972	[0.807-1.169]	0.092	1.188	[0.916-1.541]	0.158	**0.795***	[0.612-1.033]	0.106
Divorced	0.854	[0.691-1.054]	0.092	0.98	[0.717-1.339]	0.156	**0.762***	[0.573-1.013]	0.111
Widowed	0.96	[0.63-1.463]	0.206	0.912	[0.384-2.165]	0.402	0.864	[0.531-1.406]	0.215
No migration background	1.053	[0.865-1.282]	0.106	1.061	[0.807-1.396]	0.148	1.039	[0.787-1.371]	0.147
East Germany2008	1.042	[0.906-1.197]	0.074	1.058	[0.868-1.289]	0.107	1.017	[0.837-1.235]	0.101
Children (0-14)/ HH	1.024	[0.94-1.116]	0.045	1.058	[0.937-1.194]	0.065	1.004	[0.888-1.135]	0.063
Risk-taker	**1.213****	[1.028-1.431]	0.102	1.196	[0.954-1.499]	0.138	1.233	[0.959-1.585]	0.158
Risk-neutral	**1.144****	[1.001-1.308]	0.078	1.183	[0.968-1.447]	0.122	1.114	[0.93-1.333]	0.102
High Economic worries	**0.744*****	[0.616-0.898]	0.072	**0.748****	[0.569-0.984]	0.105	**0.735****	[0.565-0.956]	0.099
Medium Economic worries	0.898	[0.778-1.036]	0.066	0.917	[0.753-1.117]	0.092	0.876	[0.711-1.079]	0.093
Constant	1.259	[0.939-1.689]	0.188	1.093	[0.729-1.638]	0.226	**2.81*****	[1.879-4.202]	0.577

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 46: Results of the fixed effects logistic regression model: Diet and the at-risk-of-poverty rate of 2010

Healthy diet	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
At-risk-of-poverty	**1.131****	[1.02-1.254]	0.06	1.098	[0.928-1.299]	0.094	**1.145****	[1.003-1.307]	0.077
Low education	**0.695*****	[0.532-0.909]	0.095	**0.535*****	[0.347-0.827]	0.119	0.81	[0.574-1.144]	0.143
Medium education	0.865	[0.692-1.082]	0.099	**0.697****	[0.486-1]	0.128	0.992	[0.743-1.324]	0.146
Low occupational status	1.027	[0.906-1.163]	0.065	0.906	[0.746-1.1]	0.09	1.094	[0.928-1.291]	0.092
Medium occupational status	0.926	[0.84-1.021]	0.046	0.888	[0.764-1.033]	0.069	0.942	[0.829-1.071]	0.062
Household affected by unemployment	1	[0.99-1.009]	0.005	0.992	[0.978-1.006]	0.007	1.009	[0.996-1.022]	0.007
Currently unemployed	0.93	[0.829-1.042]	0.054	**1.163***	[0.978-1.383]	0.103	**0.767*****	[0.657-0.894]	0.06
Health status	1.022	[0.983-1.063]	0.02	0.971	[0.915-1.032]	0.03	**1.068****	[1.015-1.125]	0.028
Age group: 17 -14	**0.825***	[0.678-1.003]	0.082	**1.336***	[0.981-1.821]	0.211	**0.609*****	[0.472-0.786]	0.079
Age group: 25 - 34	0.959	[0.843-1.09]	0.063	**1.303****	[1.059-1.603]	0.138	**0.784*****	[0.664-0.925]	0.066
Age group 45 -54	0.957	[0.849-1.079]	0.058	0.906	[0.764-1.075]	0.079	1.006	[0.85-1.189]	0.086
Age group 55 - 65	0.926	[0.779-1.1]	0.082	0.843	[0.656-1.084]	0.108	0.997	[0.786-1.266]	0.121
Single (not married)	0.942	[0.802-1.107]	0.077	1.033	[0.801-1.332]	0.134	0.914	[0.741-1.127]	0.098
Divorced	1.044	[0.869-1.254]	0.098	1.194	[0.898-1.589]	0.174	0.928	[0.729-1.182]	0.114
Widowed	0.93	[0.574-1.507]	0.229	0.997	[0.403-2.465]	0.46	0.875	[0.493-1.552]	0.256
East Germany	**0.678****	[0.493-0.934]	0.111	**0.475****	[0.241-0.937]	0.165	0.79	[0.547-1.142]	0.149
Children (0-14)/ HH	**1.144*****	[1.071-1.223]	0.039	0.977	[0.888-1.075]	0.048	**1.333*****	[1.214-1.464]	0.064
Risk-taker	1.071	[0.984-1.166]	0.047	**1.211*****	[1.067-1.375]	0.078	1.01	[0.897-1.136]	0.061
Risk-neutral	1.004	[0.942-1.07]	0.032	**1.163*****	[1.05-1.288]	0.061	**0.922****	[0.849-1]	0.038
High Economic worries	**1.164*****	[1.056-1.284]	0.058	**1.235*****	[1.064-1.434]	0.094	**1.123***	[0.985-1.28]	0.075
Medium Economic worries	**1.118*****	[1.034-1.209]	0.045	**1.196*****	[1.066-1.343]	0.07	1.067	[0.959-1.188]	0.058

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 47: Results of the fixed effects logistic regression model: Smoking and the at-risk-of-poverty rate of 2010

Non-smoking	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
At-risk-of-poverty	**1.192****	[1.008-1.41]	0.102	**1.395****	[1.08-1.801]	0.182	1.056	[0.841-1.327]	0.123
Low education	**1.767****	[1.142-2.734]	0.393	**2.229****	[1.204-4.128]	0.701	1.431	[0.754-2.713]	0.467
Medium education	0.96	[0.667-1.381]	0.178	1.23	[0.714-2.117]	0.341	0.752	[0.456-1.238]	0.191
Low occupational status	**1.344*****	[1.106-1.634]	0.134	1.077	[0.809-1.434]	0.157	**1.595*****	[1.214-2.095]	0.222
Medium occupational status	1.09	[0.934-1.273]	0.086	0.962	[0.758-1.22]	0.117	**1.202***	[0.977-1.48]	0.128
Household affected by unemployment	0.993	[0.978-1.008]	0.008	0.989	[0.968-1.01]	0.011	0.999	[0.977-1.021]	0.011
Currently unemployed	0.91	[0.75-1.103]	0.09	0.832	[0.633-1.094]	0.116	0.971	[0.737-1.281]	0.137
Health status	**0.935****	[0.875-0.999]	0.031	**0.912***	[0.827-1.005]	0.045	0.948	[0.866-1.039]	0.044
Age group: 17 -14	**0.417*****	[0.3-0.58]	0.07	**0.508*****	[0.312-0.827]	0.126	**0.378*****	[0.239-0.6]	0.089
Age group: 25 - 34	**0.617*****	[0.49-0.778]	0.073	0.787	[0.57-1.085]	0.129	**0.512*****	[0.364-0.719]	0.089
Age group 45 -54	**2.475*****	[2.026-3.025]	0.253	**2.67*****	[2.011-3.543]	0.386	**2.373*****	[1.778-3.167]	0.35
Age group 55 - 65	**3.964*****	[2.917-5.386]	0.62	**3.674*****	[2.401-5.624]	0.798	**4.694*****	[2.985-7.382]	1.084
Single (not married)	**0.467*****	[0.363-0.599]	0.06	**0.515*****	[0.349-0.758]	0.102	**0.419*****	[0.301-0.584]	0.071
Divorced	**0.703****	[0.526-0.94]	0.104	**0.616****	[0.417-0.909]	0.122	0.812	[0.522-1.262]	0.183
Widowed	1.822	[0.75-4.428]	0.825	0.752	[0.2-2.823]	0.508	**4.572****	[1.148-18.205]	3.223
East Germany	**0.457*****	[0.284-0.736]	0.111	**0.432****	[0.222-0.84]	0.147	**0.408****	[0.202-0.824]	0.146
Children (0-14)/ HH	0.935	[0.844-1.036]	0.049	1.043	[0.896-1.215]	0.081	**0.883***	[0.766-1.017]	0.064
Risk-taker	**0.833*****	[0.726-0.956]	0.059	**1.266****	[1.033-1.552]	0.132	**0.589*****	[0.484-0.717]	0.059
Risk-neutral	0.942	[0.842-1.053]	0.054	**1.367*****	[1.145-1.633]	0.124	**0.735*****	[0.635-0.851]	0.055
High Economic worries	**1.276*****	[1.09-1.493]	0.103	1.083	[0.87-1.348]	0.121	**1.573*****	[1.248-1.982]	0.186
Medium Economic worries	1.051	[0.925-1.195]	0.069	0.983	[0.826-1.17]	0.087	1.167	[0.962-1.416]	0.115

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 48: Results of the fixed effects logistic regression model: Physical activity and the at-risk-of-poverty rate of 2009

Sufficient physical activity	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
At-risk-of-poverty	1.024	[0.898-1.168]	0.069	**1.408*** **	[1.142-1.737]	0.151	**0.763*** **	[0.642-0.908]	0.067
Low education	**1.358***	[0.975-1.892]	0.23	0.947	[0.533-1.684]	0.278	**1.713****	[1.131-2.595]	0.363
Medium education	0.825	[0.631-1.079]	0.113	**0.466*** **	[0.293-0.741]	0.11	1.068	[0.763-1.495]	0.183
Low occupational status	0.966	[0.831-1.122]	0.074	1.156	[0.91-1.47]	0.141	**0.838***	[0.688-1.02]	0.084
Medium occupational status	**1.128****	[1.004-1.266]	0.067	**1.315*** **	[1.087-1.592]	0.128	1.009	[0.87-1.171]	0.076
Household affected by unemployment	1.006	[0.993-1.019]	0.006	**1.016***	[0.998-1.035]	0.009	1.001	[0.984-1.018]	0.009
Currently unemployed	1.008	[0.872-1.166]	0.075	0.971	[0.779-1.211]	0.109	1.014	[0.833-1.234]	0.102
Health status	**1.202*** **	[1.145-1.261]	0.03	**1.3*** **	[1.204-1.403]	0.051	**1.149*** **	[1.079-1.223]	0.037
Age group: 17 -14	**0.566*** **	[0.428-0.747]	0.08	0.759	[0.493-1.168]	0.167	**0.445*** **	[0.308-0.644]	0.084
Age group: 25 - 34	**0.722*** **	[0.601-0.868]	0.068	0.92	[0.698-1.213]	0.13	**0.575*** **	[0.448-0.738]	0.073
Age group 45 -54	1.139	[0.958-1.354]	0.101	1.001	[0.772-1.298]	0.133	**1.278****	[1.013-1.614]	0.152
Age group 55 - 65	**1.413****	[1.082-1.844]	0.192	1.245	[0.825-1.877]	0.261	**1.542****	[1.085-2.192]	0.277
Single (not married)	**1.382*** **	[1.101-1.735]	0.16	**1.711*** **	[1.199-2.442]	0.31	1.157	[0.852-1.569]	0.18
Divorced	0.917	[0.706-1.192]	0.123	0.821	[0.526-1.281]	0.186	0.971	[0.699-1.348]	0.162
Widowed	**2.28****	[1.195-4.349]	0.751	0.299	[0.038-2.336]	0.313	**3.069*** **	[1.498-6.287]	1.123
East Germany	0.929	[0.679-1.271]	0.149	**3.268*** **	[1.806-5.913]	0.989	**0.484*** **	[0.323-0.724]	0.1
Children (0-14)/ HH	**0.9****	[0.822-0.985]	0.042	**0.88***	[0.768-1.008]	0.061	0.933	[0.825-1.056]	0.059
Risk-taker	1.005	[0.914-1.103]	0.048	0.9	[0.791-1.025]	0.06	**1.129***	[0.983-1.296]	0.08
Risk-neutral	**0.71*** **	[0.667-0.757]	0.023	**0.726*** **	[0.658-0.801]	0.036	**0.693*** **	[0.637-0.754]	0.03
High Economic worries	**1.13****	[1.005-1.27]	0.068	**1.26****	[1.05-1.511]	0.117	1.02	[0.873-1.191]	0.081
Medium Economic worries	1.045	[0.956-1.143]	0.048	**1.203*** **	[1.051-1.376]	0.083	0.926	[0.82-1.045]	0.057

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 49: Results of the fixed effects logistic regression model: Diet and the combined poverty indicator of 2010

Healthy diet	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Extreme poverty	1.099	[0.918-1.314]	0.1	0.964	[0.716-1.297]	0.146	1.176	[0.936-1.479]	0.137
Moderate poverty	1.067	[0.926-1.229]	0.077	1.075	[0.851-1.357]	0.128	1.067	[0.89-1.28]	0.099
One-sided poverty	0.986	[0.857-1.134]	0.07	1.136	[0.899-1.436]	0.136	0.896	[0.75-1.069]	0.081
Vulnerability	0.928	[0.814-1.058]	0.062	**0.803****	[0.646-1]	0.09	0.999	[0.845-1.181]	0.085
Fragile Prosperity	1.055	[0.977-1.14]	0.042	**1.131****	[1.008-1.269]	0.066	0.99	[0.891-1.101]	0.053
Low education	**0.696*****	[0.533-0.91]	0.095	**0.542*****	[0.351-0.837]	0.12	0.823	[0.583-1.162]	0.145
Medium education	0.867	[0.694-1.085]	0.099	**0.692****	[0.483-0.993]	0.127	1	[0.749-1.334]	0.147
Low occupational status	1.042	[0.919-1.181]	0.067	0.906	[0.745-1.1]	0.09	1.128	[0.955-1.331]	0.095
Medium occupational status	0.93	[0.843-1.025]	0.046	0.882	[0.758-1.027]	0.068	0.958	[0.843-1.09]	0.063
Currently unemployed	0.929	[0.84-1.028]	0.048	1.126	[0.96-1.321]	0.092	**0.805*****	[0.705-0.92]	0.055
Health status	1.022	[0.983-1.063]	0.02	0.969	[0.913-1.03]	0.03	**1.068****	[1.015-1.125]	0.028
Age group: 17 -14	**0.825***	[0.678-1.003]	0.082	**1.342***	[0.984-1.829]	0.212	**0.608*****	[0.471-0.784]	0.079
Age group: 25 - 34	0.957	[0.842-1.089]	0.063	**1.31****	[1.064-1.612]	0.139	**0.78*****	[0.661-0.921]	0.066
Age group 45 -54	0.957	[0.85-1.079]	0.058	0.905	[0.762-1.073]	0.079	1.007	[0.851-1.191]	0.086
Age group 55 - 65	0.926	[0.779-1.101]	0.082	0.839	[0.653-1.079]	0.108	0.997	[0.785-1.266]	0.121
Single (not married)	0.942	[0.802-1.106]	0.077	1.016	[0.788-1.309]	0.132	0.919	[0.746-1.134]	0.098
Divorced	1.046	[0.871-1.256]	0.098	1.175	[0.884-1.563]	0.171	0.933	[0.733-1.187]	0.115
Widowed	0.937	[0.579-1.517]	0.23	1.009	[0.409-2.489]	0.465	0.889	[0.502-1.575]	0.259
East Germany	**0.677****	[0.492-0.932]	0.11	**0.492****	[0.248-0.974]	0.171	0.786	[0.544-1.136]	0.148
Children (0-14)/ HH	**1.143*****	[1.07-1.222]	0.039	0.977	[0.888-1.076]	0.048	**1.33*****	[1.211-1.46]	0.064
Risk-taker	1.071	[0.984-1.167]	0.047	**1.216*****	[1.071-1.38]	0.079	1.012	[0.9-1.139]	0.061
Risk-neutral	1.005	[0.943-1.071]	0.033	**1.171*****	[1.057-1.298]	0.061	**0.923***	[0.851-1.002]	0.038
High Economic worries	**1.164*****	[1.055-1.284]	0.058	**1.234*****	[1.062-1.433]	0.094	**1.122***	[0.984-1.279]	0.075
Medium Economic worries	**1.117*****	[1.033-1.208]	0.045	**1.187*****	[1.057-1.332]	0.07	1.067	[0.959-1.188]	0.058

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 50: Results of the fixed effects logistic regression model: Smoking and the combined poverty indicator of 2010

Non-smoking	Total Sample			Male Sample			Female Sample		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Extreme poverty	**1.472****	[1.094-1.98]	0.223	**1.721****	[1.096-2.701]	0.396	1.334	[0.893-1.994]	0.273
Moderate poverty	1.125	[0.899-1.407]	0.128	1.274	[0.911-1.782]	0.218	1.069	[0.786-1.453]	0.168
One-sided poverty	0.919	[0.734-1.152]	0.106	0.822	[0.587-1.152]	0.141	1.049	[0.769-1.432]	0.166
Vulnerability	**0.821***	[0.663-1.016]	0.089	**0.661****	[0.474-0.921]	0.112	0.986	[0.739-1.316]	0.145
Fragile Prosperity	0.924	[0.815-1.048]	0.059	0.947	[0.793-1.131]	0.086	0.919	[0.767-1.102]	0.085
Low education	**1.758****	[1.135-2.724]	0.393	**2.206****	[1.189-4.095]	0.696	1.389	[0.732-2.638]	0.455
Medium education	0.969	[0.672-1.396]	0.181	1.195	[0.693-2.061]	0.332	0.746	[0.452-1.232]	0.191
Low occupational status	**1.352*****	[1.113-1.642]	0.134	1.096	[0.823-1.459]	0.16	**1.57*****	[1.197-2.061]	0.218
Medium occupational status	1.106	[0.947-1.291]	0.087	0.98	[0.773-1.243]	0.119	**1.201***	[0.976-1.479]	0.127
Currently unemployed	**0.846***	[0.712-1.005]	0.074	**0.761****	[0.592-0.979]	0.098	0.936	[0.736-1.189]	0.114
Health status	**0.934****	[0.874-0.997]	0.031	**0.914***	[0.829-1.007]	0.045	0.945	[0.863-1.035]	0.044
Age group: 17 -14	**0.422*****	[0.304-0.587]	0.071	**0.49*****	[0.301-0.799]	0.122	**0.384*****	[0.242-0.61]	0.09
Age group: 25 - 34	**0.621*****	[0.493-0.783]	0.073	0.782	[0.567-1.078]	0.128	**0.517*****	[0.368-0.727]	0.09
Age group 45 -54	**2.474*****	[2.024-3.024]	0.253	**2.608*****	[1.965-3.461]	0.377	**2.385*****	[1.786-3.186]	0.352
Age group 55 - 65	**4.04*****	[2.972-5.491]	0.632	**3.702*****	[2.418-5.667]	0.804	**4.75*****	[3.021-7.467]	1.096
Single (not married)	**0.46*****	[0.358-0.591]	0.059	**0.513*****	[0.348-0.758]	0.102	**0.414*****	[0.297-0.577]	0.07
Divorced	**0.687****	[0.513-0.92]	0.102	**0.617****	[0.417-0.913]	0.123	0.785	[0.503-1.224]	0.178
Widowed	1.865	[0.766-4.541]	0.847	0.814	[0.217-3.053]	0.549	**4.637****	[1.157-18.575]	3.283
East Germany	**0.457*****	[0.284-0.734]	0.11	**0.457****	[0.236-0.886]	0.154	**0.414****	[0.205-0.836]	0.148
Children (0-14)/ HH	0.928	[0.837-1.028]	0.049	1.02	[0.876-1.189]	0.08	**0.882***	[0.765-1.017]	0.064
Risk-taker	**0.832*****	[0.725-0.955]	0.059	**1.268****	[1.033-1.555]	0.132	**0.587*****	[0.482-0.714]	0.059
Risk-neutral	0.94	[0.841-1.052]	0.054	**1.371*****	[1.147-1.639]	0.125	**0.734*****	[0.634-0.85]	0.055
High Economic worries	**1.265*****	[1.08-1.481]	0.102	1.089	[0.874-1.356]	0.122	**1.559*****	[1.236-1.968]	0.185
Medium Economic worries	1.056	[0.929-1.201]	0.069	0.992	[0.833-1.182]	0.088	1.171	[0.965-1.421]	0.116

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 51: Results of the fixed effects logistic regression model: Physical activity and the combined poverty indicator of 2009

Sufficient physical activity	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty	0.884	[0.699-1.118]	0.106	1.27	[0.901-1.792]	0.223	**0.646*****	[0.466-0.896]	0.108
Moderate poverty	0.871	[0.732-1.037]	0.078	1.195	[0.91-1.57]	0.166	**0.673*****	[0.534-0.847]	0.079
One-sided poverty	1.116	[0.956-1.303]	0.088	**1.567*****	[1.237-1.985]	0.189	**0.808****	[0.657-0.995]	0.086
Vulnerability	0.956	[0.819-1.116]	0.075	1.073	[0.841-1.369]	0.133	0.86	[0.702-1.053]	0.089
Fragile Prosperity	0.994	[0.908-1.088]	0.046	**1.179****	[1.02-1.361]	0.087	**0.893***	[0.794-1.004]	0.053
Low education	**1.393****	[1-1.94]	0.235	1.014	[0.569-1.807]	0.299	**1.725*****	[1.139-2.612]	0.365
Medium education	0.833	[0.638-1.089]	0.114	**0.476*****	[0.299-0.758]	0.113	1.08	[0.771-1.513]	0.186
Low occupational status	0.977	[0.841-1.136]	0.075	1.154	[0.907-1.468]	0.142	**0.847***	[0.696-1.031]	0.085
Medium occupational status	**1.129****	[1.005-1.268]	0.067	**1.301*****	[1.074-1.576]	0.127	1.021	[0.88-1.185]	0.078
Currently unemployed	1.066	[0.938-1.211]	0.069	1.063	[0.873-1.295]	0.107	1.075	[0.906-1.276]	0.094
Health status	**1.202*****	[1.145-1.261]	0.03	**1.302*****	[1.206-1.406]	0.051	**1.152*****	[1.082-1.227]	0.037
Age group: 17 -14	**0.574*****	[0.434-0.758]	0.081	0.779	[0.505-1.199]	0.172	**0.447*****	[0.309-0.647]	0.084
Age group: 25 - 34	**0.725*****	[0.603-0.872]	0.068	0.934	[0.708-1.232]	0.132	**0.569*****	[0.444-0.73]	0.072
Age group 45 -54	1.135	[0.955-1.35]	0.1	1.008	[0.777-1.307]	0.134	**1.276****	[1.011-1.611]	0.152
Age group 55 - 65	**1.416*****	[1.085-1.848]	0.192	1.295	[0.858-1.955]	0.272	**1.549****	[1.09-2.202]	0.278
Single (not married)	**1.392*****	[1.108-1.747]	0.162	**1.744*****	[1.222-2.488]	0.316	1.176	[0.866-1.595]	0.183
Divorced	0.924	[0.71-1.201]	0.124	0.801	[0.513-1.251]	0.182	0.966	[0.695-1.343]	0.162
Widowed	**2.273****	[1.191-4.337]	0.749	0.265	[0.034-2.079]	0.278	**3.146*****	[1.534-6.451]	1.153
East Germany	0.926	[0.677-1.267]	0.148	**3.305*****	[1.812-6.029]	1.014	**0.499*****	[0.334-0.746]	0.102
Children (0-14)/ HH	**0.907****	[0.829-0.993]	0.042	**0.885***	[0.772-1.013]	0.061	0.94	[0.831-1.064]	0.059
Risk-taker	1.003	[0.913-1.102]	0.048	**0.893***	[0.784-1.018]	0.059	**1.126***	[0.98-1.293]	0.08
Risk-neutral	**0.71*****	[0.667-0.757]	0.023	**0.727*****	[0.659-0.802]	0.037	**0.694*****	[0.638-0.755]	0.03
High Economic worries	**1.132****	[1.007-1.273]	0.068	**1.262****	[1.052-1.514]	0.117	1.026	[0.878-1.199]	0.081
Medium Economic worries	1.042	[0.952-1.139]	0.048	**1.199*****	[1.047-1.373]	0.083	0.929	[0.823-1.048]	0.057

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 52: Results of the fixed effects logistic regression model: Diet and SES of 2010

Healthy diet	**c**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Low SES	1.055	[0.917-1.214]	0.075	0.958	[0.766-1.198]	0.109	1.131	[0.944-1.356]	0.105
Medium SES	**0.89****	[0.799-0.991]	0.049	**0.735*****	[0.621-0.87]	0.063	1.019	[0.885-1.173]	0.073
Household affected by unemployment	1	[0.991-1.009]	0.005	0.992	[0.979-1.006]	0.007	1.01	[0.997-1.022]	0.007
Currently unemployed	0.932	[0.832-1.044]	0.054	1.143	[0.961-1.359]	0.101	**0.77*****	[0.661-0.898]	0.06
Health status	1.023	[0.984-1.063]	0.02	0.973	[0.916-1.033]	0.03	**1.067****	[1.014-1.123]	0.028
Age group: 17 -14	**0.788****	[0.65-0.956]	0.078	1.245	[0.916-1.69]	0.194	**0.595*****	[0.462-0.766]	0.077
Age group: 25 - 34	0.951	[0.836-1.081]	0.062	**1.287****	[1.046-1.583]	0.136	**0.777*****	[0.659-0.917]	0.066
Age group 45 -54	0.952	[0.845-1.073]	0.058	0.908	[0.765-1.077]	0.079	0.991	[0.839-1.172]	0.085
Age group 55 - 65	0.919	[0.774-1.093]	0.081	0.84	[0.654-1.08]	0.108	0.983	[0.775-1.247]	0.119
Single (not married)	0.94	[0.8-1.104]	0.077	1.017	[0.789-1.311]	0.132	0.918	[0.745-1.131]	0.098
Divorced	1.044	[0.869-1.254]	0.098	1.178	[0.884-1.57]	0.173	0.943	[0.742-1.199]	0.116
Widowed	0.881	[0.545-1.422]	0.215	0.928	[0.376-2.294]	0.429	0.814	[0.461-1.438]	0.236
East Germany	**0.655*****	[0.477-0.901]	0.107	**0.461****	[0.234-0.908]	0.159	0.764	[0.53-1.101]	0.142
Children (0-14)/ HH	**1.145*****	[1.071-1.223]	0.039	0.981	[0.891-1.08]	0.048	**1.329*****	[1.21-1.458]	0.063
Risk-taker	1.068	[0.98-1.162]	0.046	**1.218*****	[1.074-1.383]	0.079	1	[0.889-1.125]	0.06
Risk-neutral	1.005	[0.943-1.07]	0.032	**1.165*****	[1.052-1.291]	0.061	**0.921****	[0.849-0.999]	0.038
High Economic worries	**1.166*****	[1.057-1.286]	0.058	**1.243*****	[1.07-1.443]	0.095	**1.128***	[0.99-1.285]	0.075
Medium Economic worries	**1.122*****	[1.038-1.214]	0.045	**1.193*****	[1.063-1.339]	0.07	1.077	[0.967-1.199]	0.059

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 53: Results of the fixed effects logistic regression model: Smoking and SES of 2010

Non-smoking	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES	1.156	[0.924-1.447]	0.132	1.224	[0.879-1.703]	0.206	1.054	[0.772-1.439]	0.167
Medium SES	1.056	[0.885-1.259]	0.095	1.059	[0.817-1.374]	0.141	1.03	[0.808-1.313]	0.128
Household affected by unemployment	0.995	[0.98-1.01]	0.008	0.989	[0.968-1.01]	0.011	1.004	[0.982-1.026]	0.011
Currently unemployed	0.919	[0.759-1.111]	0.089	0.859	[0.657-1.124]	0.118	0.954	[0.726-1.252]	0.133
Health status	**0.938***	[0.879-1.002]	0.031	**0.906****	[0.822-0.997]	0.045	0.954	[0.871-1.044]	0.044
Age group: 17 -14	**0.457*****	[0.331-0.632]	0.075	**0.59****	[0.366-0.951]	0.144	**0.387*****	[0.246-0.609]	0.089
Age group: 25 - 34	**0.624*****	[0.496-0.785]	0.073	0.791	[0.575-1.087]	0.129	**0.513*****	[0.366-0.719]	0.088
Age group 45 -54	**2.447*****	[2.003-2.988]	0.25	**2.641*****	[1.993-3.501]	0.38	**2.352*****	[1.763-3.136]	0.346
Age group 55 - 65	**3.866*****	[2.85-5.243]	0.601	**3.54*****	[2.321-5.398]	0.762	**4.718*****	[3.002-7.416]	1.089
Single (not married)	**0.462*****	[0.36-0.593]	0.059	**0.514*****	[0.349-0.758]	0.102	**0.413*****	[0.297-0.576]	0.07
Divorced	**0.745****	[0.561-0.99]	0.108	**0.68****	[0.466-0.994]	0.132	0.805	[0.52-1.247]	0.18
Widowed	1.903	[0.783-4.623]	0.862	0.788	[0.211-2.946]	0.53	**4.878****	[1.229-19.366]	3.432
East Germany	**0.462*****	[0.288-0.741]	0.111	**0.449****	[0.235-0.86]	0.149	**0.385*****	[0.191-0.778]	0.138
Children (0-14)/ HH	0.934	[0.844-1.035]	0.049	1.05	[0.903-1.221]	0.081	**0.869***	[0.755-1.001]	0.063
Risk-taker	**0.838****	[0.731-0.962]	0.059	**1.284****	[1.048-1.572]	0.133	**0.596*****	[0.491-0.724]	0.059
Risk-neutral	0.933	[0.835-1.043]	0.053	**1.372*****	[1.15-1.637]	0.124	**0.723*****	[0.625-0.836]	0.054
High Economic worries	**1.273*****	[1.088-1.489]	0.102	1.089	[0.876-1.353]	0.121	**1.564*****	[1.242-1.97]	0.184
Medium Economic worries	1.05	[0.924-1.193]	0.068	1.006	[0.847-1.195]	0.089	1.144	[0.944-1.386]	0.112

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 54: Results of the fixed effects logistic regression model: Physical activity and SES of 2009

Sufficient physical activity	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES	1.118	[0.946-1.32]	0.095	**1.632*****	[1.257-2.119]	0.217	**0.784****	[0.628-0.978]	0.088
Medium SES	**1.188*****	[1.048-1.347]	0.076	**1.373*****	[1.13-1.669]	0.137	1.017	[0.861-1.2]	0.086
Household affected by unemployment	1.007	[0.995-1.02]	0.006	**1.018***	[0.999-1.036]	0.009	1.002	[0.985-1.019]	0.009
Currently unemployed	0.977	[0.846-1.128]	0.072	0.967	[0.779-1.2]	0.107	0.987	[0.812-1.198]	0.098
Health status	**1.201*****	[1.145-1.26]	0.029	**1.3*****	[1.204-1.404]	0.051	**1.154*****	[1.084-1.228]	0.037
Age group: 17 -14	**0.57*****	[0.432-0.751]	0.08	0.77	[0.502-1.182]	0.168	**0.46*****	[0.32-0.663]	0.086
Age group: 25 - 34	**0.723*****	[0.602-0.868]	0.068	0.947	[0.719-1.248]	0.133	**0.571*****	[0.445-0.732]	0.072
Age group 45 -54	1.129	[0.949-1.342]	0.1	0.982	[0.757-1.274]	0.13	**1.272****	[1.007-1.606]	0.151
Age group 55 - 65	**1.389****	[1.065-1.812]	0.189	1.22	[0.81-1.838]	0.255	**1.542****	[1.085-2.192]	0.277
Single (not married)	**1.35*****	[1.076-1.695]	0.157	**1.559****	[1.094-2.223]	0.282	1.154	[0.852-1.565]	0.179
Divorced	0.924	[0.711-1.201]	0.123	0.782	[0.502-1.219]	0.177	0.994	[0.717-1.378]	0.166
Widowed	**2.261****	[1.186-4.311]	0.744	0.295	[0.038-2.305]	0.31	**3.188*****	[1.56-6.515]	1.163
East Germany	1.102	[0.815-1.49]	0.17	**3.223*****	[1.792-5.799]	0.966	**0.652****	[0.449-0.949]	0.125
Children (0-14)/ HH	**0.9****	[0.823-0.985]	0.041	**0.883***	[0.771-1.012]	0.061	0.935	[0.827-1.056]	0.058
Risk-taker	1.004	[0.914-1.103]	0.048	0.911	[0.801-1.037]	0.06	**1.124***	[0.98-1.29]	0.079
Risk-neutral	**0.715*****	[0.671-0.762]	0.023	**0.735*****	[0.666-0.81]	0.037	**0.704*****	[0.648-0.765]	0.03
High Economic worries	**1.123***	[0.999-1.262]	0.067	**1.246****	[1.04-1.492]	0.115	1.024	[0.878-1.195]	0.081
Medium Economic worries	1.044	[0.955-1.142]	0.048	**1.198*****	[1.047-1.37]	0.082	0.927	[0.822-1.046]	0.057

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 55: Results of the fixed effects logistic regression model: Diet and the permanent at risk-of-poverty-rate of 2006-2010

Healthy diet	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty	0.975	[0.822-1.155]	0.084	**0.659*** **	[0.492-0.883]	0.098	**1.226***	[0.991-1.517]	0.133
Low education	**0.552*** **	[0.413-0.739]	0.082	**0.523*** **	[0.329-0.831]	0.123	**0.58*** **	[0.398-0.847]	0.112
Medium education	**0.7*** **	[0.549-0.891]	0.086	**0.666** **	[0.455-0.975]	0.129	**0.73** **	[0.532-1.001]	0.118
Low occupational status	1.045	[0.916-1.193]	0.07	0.949	[0.775-1.162]	0.098	1.1	[0.923-1.311]	0.099
Medium occupational status	**0.889** **	[0.801-0.986]	0.047	0.887	[0.758-1.038]	0.071	**0.88***	[0.766-1.011]	0.062
Household affected by unemployment	1.002	[0.992-1.012]	0.005	1.002	[0.987-1.017]	0.008	1.005	[0.992-1.019]	0.007
Currently unemployed	0.915	[0.809-1.033]	0.057	1.134	[0.94-1.368]	0.109	**0.758*** **	[0.644-0.892]	0.063
Health status	1.025	[0.984-1.069]	0.022	0.961	[0.902-1.025]	0.031	**1.076*** **	[1.019-1.137]	0.03
Age group: 17 -14	0.904	[0.733-1.116]	0.097	1.26	[0.904-1.756]	0.213	**0.718** **	[0.545-0.945]	0.101
Age group: 25 - 34	1.009	[0.88-1.157]	0.07	**1.253** **	[1.004-1.564]	0.142	0.874	[0.734-1.042]	0.078
Age group 45 -54	0.96	[0.846-1.088]	0.062	0.901	[0.753-1.078]	0.082	1.023	[0.857-1.221]	0.092
Age group 55 - 65	0.899	[0.749-1.08]	0.084	**0.779***	[0.596-1.018]	0.106	1.003	[0.779-1.292]	0.13
Single (not married)	1.113	[0.935-1.325]	0.099	1.193	[0.882-1.615]	0.184	1.175	[0.945-1.46]	0.131
Divorced	1.153	[0.945-1.406]	0.117	**1.434** **	[1.05-1.958]	0.228	0.952	[0.734-1.236]	0.127
Widowed	1.072	[0.649-1.771]	0.275	1.062	[0.407-2.768]	0.519	1.047	[0.581-1.888]	0.315
East Germany	**0.72***	[0.512-1.014]	0.126	**0.51***	[0.255-1.02]	0.18	0.905	[0.607-1.348]	0.184
Children (0-14)/ HH	**1.212*** **	[1.13-1.301]	0.044	1.004	[0.908-1.111]	0.052	**1.456*** **	[1.317-1.609]	0.074
Risk-taker	**1.092***	[0.998-1.195]	0.05	**1.119***	[0.979-1.278]	0.076	1.102	[0.973-1.249]	0.07
Risk-neutral	1.051	[0.982-1.124]	0.036	1.091	[0.98-1.214]	0.06	1.035	[0.949-1.13]	0.046
High Economic worries	**1.219*** **	[1.099-1.353]	0.065	**1.336*** **	[1.14-1.566]	0.108	**1.153** **	[1.003-1.325]	0.082
Medium Economic worries	**1.121*** **	[1.032-1.218]	0.047	**1.211*** **	[1.072-1.368]	0.076	1.062	[0.947-1.19]	0.062

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 56: Results of the fixed effects logistic regression model: Smoking and the permanent at risk-of-poverty-rate of 2006-2010

Non-smoking	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty	0.839	[0.645-1.092]	0.113	1.267	[0.807-1.99]	0.292	**0.685****	[0.492-0.955]	0.116
Low education	**2.237*****	[1.378-3.633]	0.553	**3.088*****	[1.588-6.005]	1.048	1.431	[0.68-3.012]	0.543
Medium education	1.097	[0.735-1.639]	0.225	1.443	[0.805-2.589]	0.43	0.712	[0.399-1.27]	0.21
Low occupational status	**1.383*****	[1.123-1.705]	0.147	1.207	[0.886-1.646]	0.191	**1.532*****	[1.144-2.053]	0.229
Medium occupational status	1.08	[0.913-1.277]	0.092	1.064	[0.82-1.379]	0.141	1.095	[0.875-1.369]	0.125
Household affected by unemployment	0.99	[0.974-1.006]	0.008	0.992	[0.97-1.015]	0.011	0.991	[0.968-1.014]	0.012
Currently unemployed	0.973	[0.791-1.196]	0.102	0.885	[0.657-1.192]	0.134	1.035	[0.775-1.384]	0.153
Health status	0.957	[0.892-1.027]	0.034	0.934	[0.842-1.036]	0.049	0.966	[0.876-1.065]	0.048
Age group: 17 -14	**0.498*****	[0.35-0.71]	0.09	**0.514****	[0.305-0.864]	0.136	**0.533****	[0.323-0.878]	0.136
Age group: 25 - 34	**0.599*****	[0.469-0.765]	0.075	**0.726***	[0.517-1.019]	0.126	**0.529*****	[0.37-0.756]	0.096
Age group 45 -54	**2.548*****	[2.063-3.149]	0.275	**2.465*****	[1.85-3.284]	0.361	**2.693*****	[1.957-3.706]	0.439
Age group 55 - 65	**3.879*****	[2.793-5.387]	0.65	**3.426*****	[2.177-5.392]	0.793	**4.643*****	[2.848-7.57]	1.158
Single (not married)	**0.456*****	[0.35-0.594]	0.062	**0.523*****	[0.349-0.784]	0.108	**0.401*****	[0.281-0.572]	0.073
Divorced	**0.714****	[0.522-0.976]	0.114	**0.607****	[0.396-0.931]	0.133	0.874	[0.547-1.395]	0.209
Widowed	**2.295***	[0.904-5.824]	1.09	0.893	[0.222-3.592]	0.634	**5.035****	[1.25-20.284]	3.58
East Germany	**0.42*****	[0.25-0.704]	0.111	**0.392*****	[0.195-0.79]	0.14	**0.35*****	[0.158-0.774]	0.142
Children (0-14)/ HH	**0.895****	[0.802-0.999]	0.05	0.997	[0.85-1.171]	0.081	**0.854****	[0.732-0.997]	0.067
Risk-taker	**0.793*****	[0.686-0.918]	0.059	**1.209***	[0.976-1.498]	0.132	**0.559*****	[0.453-0.688]	0.059
Risk-neutral	**0.899***	[0.798-1.012]	0.055	**1.392*****	[1.156-1.677]	0.132	**0.652*****	[0.556-0.764]	0.053
High Economic worries	**1.322*****	[1.113-1.571]	0.116	1.064	[0.838-1.351]	0.13	**1.727*****	[1.337-2.23]	0.225
Medium Economic worries	1.106	[0.96-1.275]	0.08	0.987	[0.817-1.194]	0.096	**1.301****	[1.047-1.618]	0.144

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 57: Results of the fixed effects logistic regression model: Physical activity and the permanent at risk-of-poverty-rate of 2005-2009

Sufficient physical activity	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty	0.856	[0.698-1.05]	0.089	0.924	[0.664-1.287]	0.156	0.81	[0.622-1.057]	0.11
Low education	1.243	[0.875-1.767]	0.223	0.978	[0.533-1.797]	0.304	**1.451***	[0.932-2.259]	0.328
Medium education	0.867	[0.651-1.156]	0.127	**0.49*****	[0.299-0.801]	0.123	1.088	[0.756-1.567]	0.202
Low occupational status	0.928	[0.792-1.087]	0.075	1.235	[0.955-1.597]	0.162	**0.731*****	[0.595-0.897]	0.076
Medium occupational status	1.07	[0.947-1.21]	0.067	**1.311*****	[1.069-1.607]	0.136	0.933	[0.798-1.091]	0.075
Household affected by unemployment	1.008	[0.995-1.021]	0.007	**1.024****	[1.004-1.044]	0.01	0.998	[0.981-1.016]	0.009
Currently unemployed	0.954	[0.819-1.112]	0.074	0.959	[0.761-1.208]	0.113	0.961	[0.782-1.183]	0.102
Health status	**1.2*****	[1.141-1.263]	0.031	**1.312*****	[1.208-1.426]	0.055	**1.155*****	[1.081-1.233]	0.039
Age group: 17 -14	**0.618*****	[0.457-0.835]	0.095	0.802	[0.498-1.293]	0.195	**0.502*****	[0.339-0.744]	0.101
Age group: 25 - 34	**0.694*****	[0.571-0.843]	0.069	0.878	[0.649-1.186]	0.135	**0.574*****	[0.443-0.743]	0.076
Age group 45 -54	1.152	[0.957-1.387]	0.109	0.986	[0.748-1.3]	0.139	**1.339****	[1.042-1.721]	0.171
Age group 55 - 65	**1.456****	[1.083-1.958]	0.22	1.119	[0.714-1.754]	0.257	**1.756*****	[1.182-2.606]	0.354
Single (not married)	**1.374****	[1.064-1.775]	0.179	**1.698****	[1.132-2.549]	0.352	1.178	[0.842-1.647]	0.202
Divorced	0.911	[0.679-1.223]	0.137	0.857	[0.528-1.392]	0.212	0.944	[0.648-1.376]	0.181
Widowed	**2.949*****	[1.469-5.921]	1.049	0.293	[0.037-2.296]	0.308	**4.32*****	[1.945-9.595]	1.759
East Germany	1.073	[0.773-1.489]	0.179	**4.214*****	[2.26-7.859]	1.34	**0.585****	[0.385-0.888]	0.125
Children (0-14)/ HH	**0.901****	[0.818-0.993]	0.045	0.917	[0.791-1.063]	0.069	0.911	[0.799-1.039]	0.061
Risk-taker	1.031	[0.933-1.14]	0.053	0.919	[0.8-1.056]	0.065	**1.141***	[0.987-1.32]	0.085
Risk-neutral	**0.711*****	[0.666-0.76]	0.024	**0.714*****	[0.644-0.793]	0.038	**0.705*****	[0.646-0.769]	0.031
High Economic worries	1.103	[0.976-1.247]	0.069	**1.241****	[1.026-1.502]	0.121	1	[0.85-1.176]	0.083
Medium Economic worries	1.026	[0.933-1.129]	0.05	**1.219*****	[1.057-1.406]	0.089	**0.893***	[0.786-1.016]	0.059

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 58: Results of the fixed effects logistic regression model: Diet and the permanent combined poverty indicator of 2006-2010

Healthy diet	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty	**0.485*****	[0.357-0.658]	0.076	**0.547****	[0.324-0.923]	0.146	**0.469*****	[0.32-0.688]	0.092
Permanent moderate poverty	**0.623*****	[0.502-0.773]	0.069	**0.501*****	[0.348-0.723]	0.094	**0.708****	[0.539-0.928]	0.098
Permanent one-sided poverty	**0.768***	[0.578-1.021]	0.112	0.727	[0.438-1.206]	0.188	0.793	[0.56-1.121]	0.14
Permanent vulnerability	**0.724*****	[0.615-0.852]	0.06	**0.683*****	[0.522-0.894]	0.094	**0.75*****	[0.61-0.923]	0.079
Permanent fragile prosperity	**0.839*****	[0.758-0.928]	0.043	0.916	[0.778-1.078]	0.076	**0.803*****	[0.704-0.915]	0.054
Low education	**0.575*****	[0.425-0.779]	0.089	**0.503*****	[0.309-0.82]	0.125	**0.622****	[0.42-0.919]	0.124
Medium education	**0.709*****	[0.55-0.912]	0.091	**0.626****	[0.419-0.937]	0.129	**0.758***	[0.546-1.052]	0.127
Low occupational status	1.039	[0.901-1.198]	0.076	0.913	[0.733-1.138]	0.102	1.126	[0.931-1.362]	0.109
Medium occupational status	**0.872****	[0.783-0.971]	0.048	0.902	[0.766-1.063]	0.075	**0.846****	[0.732-0.977]	0.062
Currently unemployed	**0.871****	[0.777-0.975]	0.05	1.051	[0.879-1.257]	0.096	**0.748*****	[0.645-0.868]	0.057
Health status	1.01	[0.966-1.056]	0.023	**0.925****	[0.864-0.99]	0.032	**1.074****	[1.013-1.14]	0.032
Age group: 17 -14	0.864	[0.687-1.088]	0.102	1.35	[0.939-1.942]	0.25	**0.649*****	[0.48-0.878]	0.1
Age group: 25 - 34	0.961	[0.827-1.118]	0.074	**1.255***	[0.983-1.602]	0.156	**0.799****	[0.657-0.972]	0.08
Age group 45 -54	0.911	[0.797-1.042]	0.062	0.929	[0.767-1.126]	0.091	0.895	[0.742-1.079]	0.086
Age group 55 - 65	0.877	[0.722-1.064]	0.087	0.817	[0.617-1.083]	0.117	0.913	[0.698-1.194]	0.125
Single (not married)	1.008	[0.831-1.222]	0.099	**1.314***	[0.953-1.811]	0.215	0.971	[0.757-1.246]	0.124
Divorced	1.144	[0.922-1.418]	0.126	**1.333***	[0.964-1.842]	0.22	0.968	[0.723-1.295]	0.144
Widowed	1.187	[0.707-1.992]	0.314	1.665	[0.578-4.792]	0.898	1.066	[0.588-1.935]	0.324
East Germany	**0.613*****	[0.427-0.88]	0.113	**0.453****	[0.222-0.924]	0.165	0.715	[0.467-1.094]	0.155
Children (0-14)/ HH	**1.16*****	[1.073-1.253]	0.046	0.952	[0.851-1.066]	0.055	**1.385*****	[1.241-1.546]	0.078
Risk-taker	1.044	[0.947-1.151]	0.052	1.076	[0.931-1.244]	0.079	1.052	[0.919-1.204]	0.072
Risk-neutral	1.016	[0.945-1.092]	0.037	1.056	[0.94-1.185]	0.062	1.005	[0.915-1.104]	0.048
High Economic worries	**1.255*****	[1.123-1.404]	0.072	**1.323*****	[1.117-1.569]	0.115	**1.24*****	[1.066-1.442]	0.095
Medium Economic worries	**1.124*****	[1.029-1.228]	0.051	**1.164****	[1.022-1.325]	0.077	**1.114***	[0.985-1.258]	0.069

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 59: Results of the fixed effects logistic regression model: Smoking and the permanent combined poverty indicator of 2006-2010

Non-smoking	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty	1.411	[0.847-2.35]	0.367	1.177	[0.517-2.682]	0.495	**1.788***	[0.914-3.5]	0.613
Permanent moderate poverty	1.011	[0.71-1.439]	0.182	1.325	[0.756-2.322]	0.379	0.93	[0.581-1.487]	0.223
Permanent one-sided poverty	0.993	[0.635-1.553]	0.227	1.378	[0.671-2.831]	0.506	0.908	[0.503-1.639]	0.274
Permanent vulnerability	1.038	[0.795-1.356]	0.141	**0.696***	[0.467-1.036]	0.142	**1.459****	[1.004-2.121]	0.278
Permanent fragile prosperity	**1.253*****	[1.058-1.485]	0.109	1.185	[0.933-1.506]	0.145	**1.4*****	[1.093-1.794]	0.177
Low education	**1.782****	[1.054-3.015]	0.478	**2.794*****	[1.387-5.628]	0.998	0.801	[0.34-1.888]	0.35
Medium education	0.87	[0.557-1.359]	0.198	1.312	[0.711-2.419]	0.41	**0.393****	[0.19-0.814]	0.146
Low occupational status	**1.356*****	[1.085-1.696]	0.155	1.106	[0.798-1.534]	0.184	**1.623*****	[1.178-2.236]	0.265
Medium occupational status	1.045	[0.877-1.244]	0.093	1.015	[0.776-1.328]	0.139	1.069	[0.844-1.355]	0.129
Currently unemployed	0.929	[0.767-1.126]	0.091	**0.771***	[0.58-1.024]	0.112	1.043	[0.798-1.362]	0.142
Health status	0.964	[0.894-1.039]	0.037	0.913	[0.819-1.018]	0.051	0.993	[0.894-1.105]	0.054
Age group: 17 -14	**0.52*****	[0.353-0.768]	0.103	0.619	[0.348-1.101]	0.182	**0.482****	[0.275-0.843]	0.138
Age group: 25 - 34	**0.701*****	[0.536-0.918]	0.096	1.032	[0.708-1.502]	0.198	**0.518*****	[0.347-0.774]	0.106
Age group 45 -54	**2.316*****	[1.86-2.884]	0.259	**2.251*****	[1.666-3.04]	0.345	**2.45*****	[1.766-3.399]	0.409
Age group 55 - 65	**3.194*****	[2.279-4.477]	0.55	**2.927*****	[1.835-4.669]	0.697	**3.678*****	[2.234-6.055]	0.936
Single (not married)	**0.414*****	[0.31-0.553]	0.061	**0.505*****	[0.324-0.785]	0.114	**0.338*****	[0.228-0.502]	0.068
Divorced	0.781	[0.56-1.09]	0.133	**0.588****	[0.376-0.918]	0.134	1.113	[0.66-1.877]	0.297
Widowed	**2.367***	[0.933-6.007]	1.125	0.868	[0.217-3.475]	0.614	**5.49****	[1.33-22.662]	3.971
East Germany	**0.413*****	[0.243-0.703]	0.112	**0.399*****	[0.198-0.803]	0.142	**0.292*****	[0.123-0.696]	0.129
Children (0-14)/ HH	**0.815*****	[0.722-0.92]	0.05	1.011	[0.851-1.2]	0.089	**0.704*****	[0.589-0.843]	0.065
Risk-taker	**0.774*****	[0.662-0.904]	0.062	**1.222***	[0.974-1.534]	0.142	**0.498*****	[0.398-0.623]	0.057
Risk-neutral	**0.887***	[0.782-1.006]	0.057	**1.346*****	[1.107-1.636]	0.134	**0.649*****	[0.547-0.769]	0.056
High Economic worries	**1.381*****	[1.149-1.659]	0.129	1.049	[0.812-1.355]	0.137	**1.833*****	[1.392-2.414]	0.257
Medium Economic worries	1.1	[0.946-1.278]	0.084	0.943	[0.771-1.155]	0.097	**1.288****	[1.021-1.624]	0.152

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 60: Results of the fixed effects logistic regression model: Physical activity and the permanent combined poverty indicator of 2005-2009

Sufficient physical activity	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty	1.018	[0.637-1.628]	0.244	**2.311****	[1.153-4.635]	0.82	0.734	[0.379-1.421]	0.248
Permanent moderate poverty	1.103	[0.814-1.495]	0.171	**2.545*****	[1.537-4.213]	0.655	0.79	[0.532-1.173]	0.159
Permanent one-sided poverty	0.837	[0.59-1.187]	0.149	**3.192*****	[1.765-5.774]	0.965	**0.403*****	[0.256-0.634]	0.093
Permanent vulnerability	0.974	[0.788-1.204]	0.105	**1.885*****	[1.313-2.706]	0.348	**0.761****	[0.582-0.996]	0.104
Permanent fragile prosperity	0.994	[0.869-1.136]	0.068	**1.582*****	[1.266-1.977]	0.18	**0.797*****	[0.671-0.946]	0.07
Low education	1.166	[0.809-1.68]	0.217	0.999	[0.534-1.87]	0.32	1.225	[0.768-1.954]	0.292
Medium education	0.804	[0.597-1.083]	0.122	**0.471*****	[0.285-0.778]	0.121	0.916	[0.622-1.349]	0.181
Low occupational status	0.959	[0.811-1.135]	0.082	**1.3***	[0.98-1.726]	0.188	**0.758****	[0.611-0.939]	0.083
Medium occupational status	1.066	[0.94-1.21]	0.069	**1.363*****	[1.101-1.688]	0.148	0.923	[0.786-1.084]	0.076
Currently unemployed	0.984	[0.857-1.129]	0.069	1.047	[0.846-1.296]	0.114	0.96	[0.797-1.155]	0.091
Health status	**1.225*****	[1.161-1.292]	0.034	**1.378*****	[1.262-1.505]	0.062	**1.158*****	[1.081-1.241]	0.041
Age group: 17 -14	**0.706****	[0.513-0.971]	0.115	1.112	[0.667-1.853]	0.29	**0.527*****	[0.348-0.799]	0.112
Age group: 25 - 34	**0.719*****	[0.583-0.887]	0.077	1.037	[0.749-1.436]	0.172	**0.544*****	[0.411-0.72]	0.078
Age group 45 -54	1.053	[0.87-1.274]	0.102	0.843	[0.632-1.124]	0.124	**1.286***	[0.996-1.66]	0.167
Age group 55 - 65	**1.3***	[0.96-1.761]	0.201	0.917	[0.575-1.462]	0.218	**1.685****	[1.125-2.523]	0.347
Single (not married)	1.245	[0.952-1.628]	0.17	1.43	[0.92-2.225]	0.322	1.123	[0.795-1.586]	0.198
Divorced	0.943	[0.692-1.286]	0.149	0.884	[0.537-1.456]	0.225	1.011	[0.675-1.513]	0.208
Widowed	**2.888*****	[1.436-5.808]	1.03	0.22	[0.027-1.802]	0.236	**4.281*****	[1.924-9.527]	1.747
East Germany	1.083	[0.774-1.517]	0.186	**5.134*****	[2.701-9.758]	1.682	**0.537*****	[0.346-0.833]	0.12
Children (0-14)/ HH	**0.857*****	[0.772-0.951]	0.046	**0.837****	[0.711-0.984]	0.069	0.892	[0.776-1.025]	0.063
Risk-taker	0.993	[0.894-1.104]	0.054	**0.823****	[0.709-0.957]	0.063	**1.171****	[1.005-1.364]	0.091
Risk-neutral	**0.679*****	[0.633-0.728]	0.024	**0.665*****	[0.595-0.743]	0.038	**0.69*****	[0.63-0.756]	0.032
High Economic worries	**1.135***	[0.998-1.291]	0.075	**1.301****	[1.062-1.593]	0.135	1.031	[0.87-1.222]	0.089
Medium Economic worries	1.035	[0.938-1.142]	0.052	**1.266*****	[1.091-1.469]	0.096	**0.891***	[0.78-1.018]	0.06

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 61: Results of the fixed effects logistic regression model: Diet and the permanent SES of 2006-2010

Healthy diet	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent Low SES	0.863	[0.71-1.049]	0.086	**0.627*** **	[0.459-0.856]	0.1	1.092	[0.847-1.408]	0.142
Permanent Medium SES	**0.879***	[0.763-1.013]	0.064	**0.731*** **	[0.585-0.913]	0.083	1.003	[0.833-1.208]	0.095
Household affected by unemployment	1	[0.99-1.011]	0.005	0.999	[0.983-1.015]	0.008	1.004	[0.991-1.019]	0.007
Currently unemployed	0.9	[0.794-1.021]	0.058	1.144	[0.943-1.389]	0.113	**0.723*** **	[0.611-0.855]	0.062
Health status	1.031	[0.989-1.076]	0.022	0.953	[0.894-1.017]	0.032	**1.098*** **	[1.038-1.161]	0.031
Age group: 17 -14	0.867	[0.7-1.074]	0.095	**1.336***	[0.955-1.867]	0.228	**0.63*** **	[0.475-0.834]	0.09
Age group: 25 - 34	0.992	[0.863-1.141]	0.071	**1.276****	[1.021-1.596]	0.146	**0.824****	[0.688-0.987]	0.076
Age group 45 -54	0.961	[0.846-1.092]	0.063	0.9	[0.748-1.082]	0.085	1.013	[0.847-1.211]	0.092
Age group 55 - 65	0.91	[0.755-1.097]	0.087	**0.775***	[0.59-1.017]	0.108	1.02	[0.787-1.32]	0.134
Single (not married)	1.084	[0.904-1.299]	0.1	1.224	[0.902-1.66]	0.19	1.12	[0.889-1.412]	0.132
Divorced	**1.212***	[0.988-1.486]	0.126	**1.512*** **	[1.106-2.067]	0.241	1.008	[0.769-1.323]	0.14
Widowed	1.086	[0.657-1.796]	0.279	1.105	[0.423-2.888]	0.542	1.007	[0.557-1.819]	0.304
East Germany	**0.705***	[0.495-1.005]	0.127	**0.466****	[0.228-0.95]	0.169	0.881	[0.584-1.328]	0.185
Children (0-14)/ HH	**1.218*** **	[1.134-1.308]	0.044	1.02	[0.921-1.131]	0.053	**1.445*** **	[1.305-1.599]	0.075
Risk-taker	1.056	[0.963-1.158]	0.05	1.094	[0.955-1.253]	0.076	1.058	[0.931-1.202]	0.069
Risk-neutral	1.035	[0.966-1.109]	0.036	1.083	[0.971-1.209]	0.061	1.014	[0.927-1.108]	0.046
High Economic worries	**1.175*** **	[1.057-1.306]	0.063	**1.23****	[1.047-1.446]	0.102	**1.149***	[0.998-1.324]	0.083
Medium Economic worries	**1.09****	[1.002-1.187]	0.047	**1.113***	[0.983-1.261]	0.071	1.084	[0.965-1.217]	0.064

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 62: Results of the fixed effects logistic regression model: Smoking and the permanent SES of 2006-2010

Non-smoking	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent Low SES	**0.447*****	[0.327-0.612]	0.071	**0.639***	[0.408-1.002]	0.147	**0.302*****	[0.194-0.472]	0.069
Permanent Medium SES	**0.488*****	[0.386-0.617]	0.059	**0.566*****	[0.406-0.79]	0.096	**0.404*****	[0.289-0.565]	0.069
Household affected by unemployment	0.992	[0.976-1.008]	0.008	0.991	[0.968-1.014]	0.012	0.995	[0.972-1.019]	0.012
Currently unemployed	0.942	[0.766-1.158]	0.099	0.892	[0.663-1.2]	0.135	0.971	[0.727-1.298]	0.144
Health status	0.963	[0.898-1.034]	0.035	0.949	[0.855-1.052]	0.05	0.95	[0.861-1.048]	0.048
Age group: 17 -14	**0.609*****	[0.428-0.868]	0.11	**0.631***	[0.375-1.064]	0.168	**0.629***	[0.381-1.038]	0.161
Age group: 25 - 34	**0.641*****	[0.5-0.821]	0.081	0.798	[0.565-1.127]	0.14	**0.533*****	[0.37-0.767]	0.099
Age group 45 -54	**2.422*****	[1.957-2.996]	0.263	**2.261*****	[1.692-3.022]	0.335	**2.734*****	[1.989-3.759]	0.444
Age group 55 - 65	**3.621*****	[2.607-5.029]	0.607	**3.039*****	[1.929-4.789]	0.705	**4.829*****	[2.963-7.87]	1.204
Single (not married)	**0.447*****	[0.34-0.588]	0.062	**0.541*****	[0.357-0.821]	0.115	**0.365*****	[0.252-0.529]	0.069
Divorced	**0.716****	[0.523-0.982]	0.115	**0.598****	[0.39-0.919]	0.131	0.879	[0.546-1.416]	0.214
Widowed	**2.414***	[0.96-6.071]	1.136	0.921	[0.231-3.681]	0.651	**5.8****	[1.468-22.919]	4.066
East Germany	**0.487*****	[0.29-0.817]	0.129	**0.496****	[0.249-0.988]	0.174	**0.337*****	[0.151-0.754]	0.138
Children (0-14)/ HH	**0.872****	[0.781-0.975]	0.049	0.952	[0.81-1.118]	0.078	**0.864***	[0.738-1.011]	0.069
Risk-taker	**0.813*****	[0.702-0.943]	0.061	**1.222***	[0.985-1.515]	0.134	**0.584*****	[0.472-0.721]	0.063
Risk-neutral	0.927	[0.822-1.046]	0.057	**1.4*****	[1.162-1.686]	0.133	**0.677*****	[0.576-0.797]	0.056
High Economic worries	**1.284*****	[1.08-1.527]	0.114	0.986	[0.775-1.254]	0.121	**1.786*****	[1.381-2.308]	0.234
Medium Economic worries	1.096	[0.951-1.264]	0.08	0.952	[0.787-1.153]	0.093	**1.348*****	[1.083-1.678]	0.151

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 63: Results of the fixed effects logistic regression model: Physical activity and the permanent SES of 2005-2009

Sufficient physical activity	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent low SES	**0.657*****	[0.511-0.845]	0.084	0.773	[0.52-1.149]	0.156	**0.549*****	[0.395-0.763]	0.092
Permanent medium SES	**0.756*****	[0.632-0.903]	0.069	**0.726****	[0.55-0.957]	0.103	**0.708*****	[0.558-0.898]	0.086
Household affected by unemployment	**1.012***	[0.998-1.026]	0.007	**1.025****	[1.005-1.046]	0.01	1.003	[0.984-1.023]	0.01
Currently unemployed	0.935	[0.801-1.091]	0.074	0.954	[0.757-1.202]	0.112	0.949	[0.768-1.171]	0.102
Health status	**1.206*****	[1.146-1.27]	0.032	**1.322*****	[1.217-1.436]	0.056	**1.157*****	[1.083-1.236]	0.039
Age group: 17 -14	**0.629*****	[0.465-0.849]	0.097	0.846	[0.525-1.364]	0.206	**0.514*****	[0.348-0.76]	0.103
Age group: 25 - 34	**0.704*****	[0.579-0.857]	0.071	0.919	[0.679-1.242]	0.141	**0.579*****	[0.446-0.752]	0.077
Age group 45 -54	1.156	[0.96-1.393]	0.11	0.986	[0.748-1.301]	0.139	**1.335****	[1.037-1.718]	0.172
Age group 55 - 65	**1.447****	[1.076-1.947]	0.219	1.119	[0.713-1.757]	0.257	**1.733*****	[1.166-2.575]	0.35
Single (not married)	**1.394****	[1.079-1.801]	0.182	**1.71*****	[1.138-2.569]	0.355	1.201	[0.859-1.679]	0.205
Divorced	0.925	[0.689-1.241]	0.139	0.862	[0.531-1.397]	0.213	0.958	[0.658-1.396]	0.184
Widowed	**3.059*****	[1.509-6.198]	1.102	0.314	[0.04-2.449]	0.329	**4.461*****	[1.988-10.009]	1.839
East Germany	1.243	[0.907-1.703]	0.2	**4.62*****	[2.508-8.514]	1.441	**0.72***	[0.487-1.064]	0.143
Children (0-14)/ HH	**0.913***	[0.828-1.007]	0.046	0.915	[0.789-1.061]	0.069	0.925	[0.811-1.056]	0.062
Risk-taker	1.032	[0.934-1.141]	0.053	0.92	[0.8-1.058]	0.065	**1.156***	[0.999-1.337]	0.086
Risk-neutral	**0.714*****	[0.668-0.763]	0.024	**0.719*****	[0.648-0.798]	0.038	**0.71*****	[0.65-0.774]	0.032
High Economic worries	1.103	[0.976-1.248]	0.069	**1.245****	[1.029-1.508]	0.122	0.997	[0.847-1.173]	0.083
Medium Economic worries	1.023	[0.93-1.125]	0.05	**1.215*****	[1.053-1.401]	0.089	**0.891***	[0.783-1.014]	0.059

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Appendix 7: Cross-sectional analyses 2009 and 2010

Table A 64: Results of the logistic regression model: Diet and the at-risk-of-poverty rate of 2010

Healthy Diet 2010	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
At-risk-of-poverty 2010	0.918	[0.755-1.116]	0.091	1.163	[0.863-1.568]	0.177	**0.805***	[0.629-1.03]	0.101
Low education_2010	**0.674*****	[0.556-0.818]	0.066	**0.782***	[0.597-1.023]	0.107	**0.576*****	[0.432-0.767]	0.084
Medium education_2010	**0.793*****	[0.667-0.944]	0.07	**0.802***	[0.626-1.027]	0.101	**0.763****	[0.59-0.986]	0.1
Low occupational status_2010	**0.817****	[0.68-0.983]	0.077	0.861	[0.659-1.126]	0.118	**0.757****	[0.586-0.976]	0.098
Medium occupational status_2010	**0.887***	[0.771-1.021]	0.064	0.897	[0.73-1.103]	0.094	0.863	[0.708-1.053]	0.087
Household affected by unemployment2010	**0.978****	[0.959-0.998]	0.01	**0.963****	[0.932-0.994]	0.016	0.989	[0.964-1.014]	0.013
Currently unemployed_2010	1.021	[0.791-1.317]	0.133	1.141	[0.789-1.649]	0.214	0.92	[0.652-1.297]	0.161
Health status 2010	**1.115*****	[1.043-1.192]	0.038	**1.137****	[1.025-1.26]	0.06	**1.095****	[1.003-1.196]	0.049
female	**2.585*****	[2.302-2.902]	0.153						
Age group: 17 -14_2010	**0.508*****	[0.393-0.658]	0.067	**0.467*****	[0.323-0.677]	0.088	**0.573*****	[0.403-0.812]	0.102
Age group: 25 - 34_2010	0.86	[0.701-1.056]	0.09	0.829	[0.605-1.137]	0.133	0.873	[0.667-1.142]	0.12
Age group 45 -54_2010	**1.327*****	[1.117-1.578]	0.117	**1.26***	[0.979-1.624]	0.163	**1.398*****	[1.102-1.774]	0.17
Age group 55 - 65_2010	**1.859*****	[1.53-2.259]	0.185	**1.744*****	[1.313-2.316]	0.253	**1.993*****	[1.523-2.609]	0.274
Single (not married)_2010	1.136	[0.946-1.365]	0.106	1.213	[0.934-1.576]	0.162	1.012	[0.787-1.301]	0.13
Divorced_2010	1.041	[0.857-1.265]	0.104	0.967	[0.712-1.313]	0.151	1.096	[0.848-1.416]	0.143
Widowed_2010	1.004	[0.661-1.526]	0.214	1.077	[0.422-2.749]	0.515	1.048	[0.65-1.69]	0.255
No migration background	1.04	[0.887-1.219]	0.084	1.023	[0.807-1.296]	0.124	1.061	[0.857-1.312]	0.115
East Germany_2010	0.995	[0.865-1.145]	0.071	1.062	[0.861-1.31]	0.114	0.928	[0.769-1.12]	0.089
Children (0-14)/ HH_2010	**1.096****	[1.009-1.189]	0.046	0.983	[0.87-1.112]	0.062	**1.208*****	[1.075-1.357]	0.072
Risk-taker_2010	**1.172***	[0.998-1.377]	0.096	1.109	[0.885-1.389]	0.128	**1.219***	[0.968-1.536]	0.143
Risk-neutral_2010	1.062	[0.935-1.207]	0.069	0.969	[0.796-1.181]	0.098	1.138	[0.962-1.346]	0.098
High Economic worries_2010	0.898	[0.756-1.067]	0.079	0.879	[0.685-1.129]	0.112	0.888	[0.695-1.136]	0.111
Medium Economic worries_2010	**0.876***	[0.762-1.008]	0.063	0.931	[0.764-1.136]	0.094	**0.817****	[0.668-0.998]	0.084
Constant	**0.602*****	[0.46-0.788]	0.083	**0.568*****	[0.385-0.838]	0.113	**1.752*****	[1.223-2.511]	0.321

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 65: Results of the logistic regression model: Smoking and the at-risk-of-poverty rate of 2010

Non-smoking 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
At-risk-of-poverty 2010	**0.733*****	[0.61-0.881]	0.069	**0.654*****	[0.498-0.858]	0.091	**0.779***	[0.606-1.003]	0.1
Low education_2010	**0.46*****	[0.366-0.578]	0.054	**0.425*****	[0.314-0.577]	0.066	**0.473*****	[0.337-0.664]	0.082
Medium education_2010	**0.693*****	[0.561-0.856]	0.075	**0.595*****	[0.444-0.797]	0.089	0.812	[0.599-1.1]	0.126
Low occupational status_2010	**0.813****	[0.672-0.983]	0.079	**0.704*****	[0.545-0.91]	0.092	0.973	[0.731-1.295]	0.142
Medium occupational status_2010	**0.827****	[0.709-0.966]	0.065	0.918	[0.743-1.134]	0.099	**0.75****	[0.599-0.939]	0.086
Household affected by unemployment2010	**0.971*****	[0.955-0.988]	0.008	**0.975****	[0.952-0.998]	0.012	**0.968*****	[0.945-0.992]	0.012
Currently unemployed_2010	0.931	[0.731-1.186]	0.115	0.952	[0.687-1.32]	0.159	0.895	[0.623-1.284]	0.165
Health status 2010	**1.194*****	[1.113-1.28]	0.042	**1.181*****	[1.071-1.302]	0.059	**1.207*****	[1.092-1.335]	0.062
female	**1.335*****	[1.18-1.51]	0.084						
Age group: 17 -14_2010	**1.73*****	[1.331-2.248]	0.231	**1.68*****	[1.185-2.382]	0.299	**1.883*****	[1.258-2.817]	0.387
Age group: 25 - 34_2010	0.944	[0.758-1.174]	0.105	1.039	[0.762-1.416]	0.164	0.882	[0.645-1.204]	0.14
Age group 45 -54_2010	1.057	[0.878-1.273]	0.1	1.195	[0.922-1.549]	0.158	0.944	[0.722-1.233]	0.129
Age group 55 - 65_2010	**1.643*****	[1.327-2.033]	0.179	**1.651*****	[1.226-2.224]	0.251	**1.663*****	[1.22-2.269]	0.263
Single (not married)_2010	**0.794****	[0.652-0.965]	0.079	0.869	[0.671-1.126]	0.115	**0.702****	[0.523-0.942]	0.105
Divorced_2010	**0.501*****	[0.411-0.61]	0.051	**0.497*****	[0.366-0.674]	0.077	**0.495*****	[0.38-0.644]	0.066
Widowed_2010	0.878	[0.574-1.343]	0.191	0.825	[0.353-1.928]	0.357	0.865	[0.531-1.407]	0.215
No migration background	**0.819****	[0.69-0.974]	0.072	1.002	[0.789-1.272]	0.122	**0.652*****	[0.506-0.84]	0.084
East Germany_2010	1.016	[0.88-1.173]	0.074	1.003	[0.818-1.23]	0.104	1.03	[0.84-1.262]	0.107
Children (0-14)/ HH_2010	1.069	[0.978-1.169]	0.049	1.01	[0.89-1.145]	0.065	**1.128***	[0.989-1.287]	0.076
Risk-taker_2010	**0.554*****	[0.468-0.656]	0.048	**0.564*****	[0.45-0.708]	0.065	**0.533*****	[0.411-0.692]	0.071
Risk-neutral_2010	**0.744*****	[0.648-0.854]	0.052	**0.77****	[0.63-0.941]	0.079	**0.714*****	[0.591-0.864]	0.069
High Economic worries_2010	**0.696*****	[0.577-0.839]	0.066	**0.713*****	[0.553-0.919]	0.092	**0.671*****	[0.51-0.884]	0.094
Medium Economic worries_2010	**0.778*****	[0.664-0.911]	0.063	**0.749*****	[0.602-0.931]	0.083	**0.808***	[0.64-1.02]	0.096
Constant	**6.584*****	[4.838-8.961]	1.035	**5.766*****	[3.764-8.831]	1.254	**10.431*****	[6.782-16.042]	2.291

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 66: Results of the logistic regression model: Alcohol consumption and the at-risk-of-poverty rate of 2010

Moderate alcohol consumption 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
At-risk-of-poverty 2010	1.167	[0.865-1.574]	0.178	1.34	[0.937-1.917]	0.245	0.736	[0.431-1.258]	0.201
Low education_2010	**1.376****	[1.069-1.773]	0.178	**1.307***	[0.963-1.773]	0.203	**1.53***	[0.987-2.371]	0.342
Medium education_2010	**1.217***	[0.985-1.502]	0.131	1.092	[0.838-1.423]	0.147	**1.589*****	[1.145-2.205]	0.266
Low occupational status_2010	**1.273***	[0.999-1.623]	0.158	1.017	[0.766-1.35]	0.147	**2.921*****	[1.798-4.743]	0.723
Medium occupational status_2010	**1.273****	[1.057-1.534]	0.121	1.196	[0.953-1.501]	0.139	**1.505****	[1.096-2.067]	0.244
Household affected by unemployment2010	1.014	[0.989-1.041]	0.013	1.013	[0.983-1.045]	0.016	1.017	[0.971-1.065]	0.024
Currently unemployed_2010	1.024	[0.737-1.423]	0.172	0.991	[0.669-1.469]	0.199	1.212	[0.681-2.157]	0.356
Health status 2010	0.941	[0.866-1.023]	0.04	0.96	[0.864-1.067]	0.052	0.908	[0.796-1.037]	0.061
female	**3.58*****	[3.049-4.204]	0.294						
Age group: 17 -14_2010	**1.487****	[1.063-2.079]	0.254	**1.42***	[0.952-2.117]	0.289	**1.721***	[0.948-3.127]	0.524
Age group: 25 - 34_2010	1.214	[0.927-1.591]	0.168	1.246	[0.897-1.73]	0.209	1.063	[0.664-1.701]	0.255
Age group 45 -54_2010	**0.752****	[0.599-0.944]	0.087	0.887	[0.674-1.167]	0.124	**0.462*****	[0.308-0.693]	0.095
Age group 55 - 65_2010	0.828	[0.64-1.069]	0.108	0.951	[0.696-1.299]	0.152	**0.529*****	[0.34-0.824]	0.119
Single (not married)_2010	1.04	[0.821-1.319]	0.126	1.117	[0.842-1.482]	0.161	0.876	[0.58-1.323]	0.184
Divorced_2010	1.193	[0.91-1.564]	0.165	1.108	[0.785-1.562]	0.194	**1.449***	[0.933-2.25]	0.325
Widowed_2010	**1.734****	[1.003-2.999]	0.485	1.615	[0.707-3.69]	0.681	1.879	[0.885-3.987]	0.721
No migration background	**0.712*****	[0.56-0.906]	0.088	0.798	[0.6-1.063]	0.116	**0.522*****	[0.327-0.836]	0.125
East Germany_2010	1.023	[0.857-1.222]	0.092	0.908	[0.732-1.126]	0.1	**1.456****	[1.054-2.01]	0.24
Children (0-14)/ HH_2010	**1.15****	[1.025-1.291]	0.068	**1.15***	[0.998-1.326]	0.084	1.082	[0.899-1.301]	0.102
Risk-taker_2010	**0.746*****	[0.607-0.917]	0.078	**0.741****	[0.581-0.946]	0.092	**0.679****	[0.463-0.996]	0.133
Risk-neutral_2010	**0.819****	[0.688-0.974]	0.073	**0.749*****	[0.601-0.933]	0.084	1.006	[0.761-1.328]	0.143
High Economic worries_2010	**1.249***	[0.99-1.577]	0.148	**1.306***	[0.987-1.728]	0.187	1.04	[0.687-1.574]	0.22
Medium Economic worries_2010	1.118	[0.937-1.335]	0.101	1.083	[0.873-1.344]	0.119	1.152	[0.853-1.555]	0.176
Constant	**3.208*****	[2.246-4.583]	0.584	**3.234*****	[2.114-4.947]	0.701	**13.645*****	[7.331-25.397]	4.325

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 67: Results of the logistic regression model: Physical activity and the at-risk-of-poverty rate of 2009

Sufficient physical activity2009	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
At-risk-of-poverty 2009	**0.766****	[0.618-0.95]	0.084	0.948	[0.685-1.312]	0.157	**0.673*****	[0.505-0.897]	0.099
Low education 2009	**0.498*****	[0.41-0.604]	0.049	**0.51*****	[0.385-0.674]	0.073	**0.481*****	[0.366-0.632]	0.067
Medium education 2009	**0.766*****	[0.643-0.912]	0.068	**0.729****	[0.562-0.945]	0.096	**0.792***	[0.623-1.007]	0.097
Low occupational status 2009	**0.611*****	[0.505-0.739]	0.059	**0.613*****	[0.468-0.804]	0.085	**0.577*****	[0.44-0.756]	0.079
Medium occupational status 2009	**0.772*****	[0.673-0.886]	0.054	**0.728*****	[0.592-0.895]	0.077	**0.806****	[0.669-0.972]	0.077
Household affected by unemployment2009	**0.959*****	[0.937-0.982]	0.012	**0.956****	[0.919-0.993]	0.019	**0.959*****	[0.931-0.988]	0.015
Currently unemployed 2009	0.879	[0.659-1.172]	0.129	0.706	[0.463-1.078]	0.152	1.091	[0.737-1.617]	0.219
Health status_2009	**1.374*****	[1.278-1.477]	0.051	**1.36*****	[1.222-1.514]	0.074	**1.383*****	[1.253-1.525]	0.069
female	**1.242*****	[1.102-1.4]	0.076						
Age group: 17 -14 2009	**1.654*****	[1.282-2.134]	0.215	**2.237*****	[1.555-3.218]	0.415	1.195	[0.832-1.718]	0.221
Age group: 25 - 34 2009	**1.267****	[1.023-1.568]	0.138	**1.604*****	[1.168-2.203]	0.26	1.021	[0.764-1.364]	0.151
Age group 45 -54 2009	1.107	[0.929-1.319]	0.099	1.056	[0.815-1.367]	0.139	1.169	[0.918-1.487]	0.144
Age group 55 - 65 2009	1.164	[0.951-1.425]	0.12	1.023	[0.756-1.383]	0.158	**1.344****	[1.023-1.765]	0.187
Single (not married)_2009	1.075	[0.894-1.292]	0.101	1.009	[0.775-1.314]	0.136	1.165	[0.896-1.516]	0.156
Divorced_2009	**0.718*****	[0.581-0.887]	0.078	0.817	[0.586-1.139]	0.139	**0.649*****	[0.491-0.857]	0.092
Widowed_2009	0.749	[0.483-1.162]	0.168	0.738	[0.25-2.175]	0.407	0.679	[0.418-1.102]	0.168
No migration background	**1.431*****	[1.205-1.7]	0.126	1.18	[0.921-1.513]	0.149	**1.661*****	[1.308-2.11]	0.203
East Germany_2009	**0.549*****	[0.474-0.636]	0.041	**0.691*****	[0.558-0.856]	0.075	**0.437*****	[0.358-0.534]	0.045
Children (0-14)/ HH 2009	0.992	[0.91-1.08]	0.043	1.043	[0.922-1.18]	0.066	0.974	[0.863-1.099]	0.06
Risk-taker_2009	**1.468*****	[1.215-1.773]	0.141	**1.45*****	[1.122-1.873]	0.189	**1.467*****	[1.107-1.944]	0.211
Risk-neutral_2009	**1.239*****	[1.091-1.407]	0.08	**1.252****	[1.034-1.516]	0.122	**1.229****	[1.034-1.461]	0.108
High Economic worries 2009	**0.812****	[0.674-0.979]	0.077	**0.664*****	[0.505-0.873]	0.093	0.986	[0.762-1.277]	0.13
Medium Economic worries 2009	**0.847****	[0.73-0.983]	0.064	**0.767****	[0.62-0.949]	0.083	0.933	[0.758-1.149]	0.099
Constant	**0.727****	[0.548-0.964]	0.105	0.904	[0.606-1.348]	0.184	0.756	[0.519-1.101]	0.145

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 68: Results of the logistic regression model: Diet and the permanent at-risk-of-poverty rate of 2006-2010

Healthy diet 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
At-risk-of-poverty 2010	0.933	[0.751-1.16]	0.104	1.098	[0.793-1.522]	0.183	0.868	[0.655-1.151]	0.125
Low education 2010	**0.634*****	[0.521-0.772]	0.064	**0.737****	[0.56-0.971]	0.104	**0.531*****	[0.396-0.714]	0.08
Medium education 2010	**0.755*****	[0.632-0.9]	0.068	**0.775****	[0.602-0.998]	0.1	**0.71****	[0.545-0.924]	0.095
Low occupational status 2010	0.867	[0.72-1.043]	0.082	0.941	[0.721-1.23]	0.128	**0.777***	[0.601-1.004]	0.102
Medium occupational status 2010	0.888	[0.77-1.025]	0.065	0.951	[0.77-1.173]	0.102	**0.821***	[0.672-1.003]	0.084
Household affected by unemployment2010	**0.977****	[0.957-0.997]	0.01	**0.963****	[0.932-0.995]	0.016	0.988	[0.962-1.014]	0.013
Currently unemployed 2010	1.072	[0.821-1.399]	0.146	1.244	[0.846-1.829]	0.245	0.922	[0.644-1.319]	0.169
Health status 2010	**1.12*****	[1.046-1.2]	0.039	**1.141****	[1.027-1.268]	0.061	**1.1****	[1.005-1.205]	0.051
female	**2.644*****	[2.348-2.977]	0.16						
Age group: 17 -14_2010	**0.529*****	[0.405-0.689]	0.072	**0.509*****	[0.349-0.744]	0.098	**0.575*****	[0.4-0.828]	0.107
Age group: 25 - 34 _2010	0.85	[0.688-1.051]	0.092	0.863	[0.621-1.199]	0.145	0.828	[0.628-1.092]	0.117
Age group 45 -54_2010	**1.239****	[1.039-1.478]	0.111	1.227	[0.949-1.587]	0.161	**1.278***	[0.999-1.635]	0.16
Age group 55 - 65_2010	**1.72*****	[1.41-2.097]	0.174	**1.647*****	[1.234-2.2]	0.243	**1.843*****	[1.399-2.429]	0.259
Single (not married)_2010	1.073	[0.889-1.295]	0.103	1.128	[0.862-1.475]	0.154	0.979	[0.754-1.272]	0.131
Divorced_2010	1.017	[0.83-1.245]	0.105	0.99	[0.721-1.358]	0.16	1.037	[0.793-1.355]	0.142
Widowed_2010	0.947	[0.619-1.447]	0.205	0.79	[0.308-2.023]	0.379	1.014	[0.627-1.641]	0.249
No migration background	1.042	[0.885-1.227]	0.087	1.017	[0.798-1.298]	0.126	1.066	[0.857-1.327]	0.119
East Germany_2010	0.963	[0.835-1.11]	0.07	1.009	[0.815-1.251]	0.11	0.909	[0.75-1.101]	0.089
Children (0-14)/ HH_2010	**1.126*****	[1.035-1.224]	0.048	1.003	[0.884-1.136]	0.064	**1.263*****	[1.118-1.427]	0.079
Risk-taker_2010	1.147	[0.973-1.352]	0.096	1.159	[0.919-1.461]	0.137	1.121	[0.886-1.417]	0.134
Risk-neutral_2010	1.052	[0.923-1.199]	0.07	1.028	[0.838-1.26]	0.107	1.071	[0.901-1.273]	0.094
High Economic worries_2010	0.889	[0.746-1.058]	0.079	0.837	[0.65-1.08]	0.109	0.916	[0.715-1.174]	0.116
Medium Economic worries_2010	**0.876***	[0.76-1.01]	0.064	0.909	[0.742-1.113]	0.094	**0.84***	[0.686-1.03]	0.087
Constant	**0.661*****	[0.502-0.871]	0.093	**0.58*****	[0.389-0.866]	0.119	**2.077*****	[1.435-3.006]	0.392

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 69: Results of the logistic regression model: Smoking and the permanent at-risk-of-poverty rate of 2006-2010

Non-smoking 2010	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Permanent at-risk-of-poverty_2010	0.89	[0.723-1.095]	0.094	0.838	[0.618-1.137]	0.13	0.888	[0.666-1.184]	0.13
Low education_2010	**0.48*****	[0.379-0.607]	0.057	**0.458*****	[0.334-0.628]	0.074	**0.477*****	[0.337-0.674]	0.084
Medium education_2010	**0.714*****	[0.575-0.888]	0.079	**0.624*****	[0.461-0.844]	0.096	0.819	[0.6-1.118]	0.13
Low occupational status_2010	**0.807****	[0.664-0.979]	0.08	**0.701*****	[0.539-0.912]	0.094	0.958	[0.717-1.28]	0.142
Medium occupational status_2010	**0.869***	[0.741-1.019]	0.071	0.96	[0.772-1.195]	0.107	**0.792****	[0.631-0.996]	0.092
Household affected by unemployment2010	**0.969*****	[0.953-0.987]	0.009	**0.974****	[0.95-0.998]	0.012	**0.966*****	[0.942-0.99]	0.012
Currently unemployed_2010	0.89	[0.698-1.135]	0.11	0.899	[0.641-1.26]	0.155	0.882	[0.618-1.258]	0.16
Health status 2010	**1.2*****	[1.116-1.29]	0.044	**1.203*****	[1.087-1.331]	0.062	**1.196*****	[1.077-1.327]	0.063
female	**1.299*****	[1.144-1.474]	0.084						
Age group: 17 -14_2010	**1.828*****	[1.398-2.389]	0.25	**1.668*****	[1.166-2.386]	0.305	**2.129*****	[1.407-3.224]	0.451
Age group: 25 - 34_2010	1.002	[0.797-1.26]	0.117	1.08	[0.777-1.501]	0.181	0.947	[0.686-1.307]	0.156
Age group 45 -54_2010	1.074	[0.888-1.298]	0.104	1.208	[0.927-1.575]	0.163	0.96	[0.73-1.263]	0.134
Age group 55 - 65_2010	**1.683*****	[1.354-2.092]	0.187	**1.693*****	[1.247-2.297]	0.264	**1.714*****	[1.25-2.349]	0.276
Single (not married)_2010	**0.756*****	[0.618-0.925]	0.078	0.884	[0.675-1.157]	0.122	**0.626*****	[0.465-0.844]	0.095
Divorced_2010	**0.488*****	[0.398-0.598]	0.051	**0.487*****	[0.354-0.669]	0.079	**0.481*****	[0.367-0.629]	0.066
Widowed_2010	0.794	[0.51-1.236]	0.179	0.579	[0.235-1.428]	0.267	0.812	[0.487-1.354]	0.212
No migration background	**0.839***	[0.703-1]	0.076	0.995	[0.778-1.274]	0.125	**0.689*****	[0.533-0.891]	0.09
East Germany_2010	1.046	[0.902-1.212]	0.079	1.052	[0.852-1.3]	0.113	1.044	[0.847-1.285]	0.111
Children (0-14)/ HH_2010	1.08	[0.984-1.185]	0.051	1.031	[0.904-1.175]	0.069	**1.134***	[0.989-1.301]	0.079
Risk-taker_2010	**0.528*****	[0.443-0.628]	0.047	**0.546*****	[0.432-0.691]	0.065	**0.495*****	[0.379-0.646]	0.067
Risk-neutral_2010	**0.734*****	[0.637-0.846]	0.053	**0.76*****	[0.618-0.935]	0.08	**0.706*****	[0.582-0.857]	0.07
High Economic worries_2010	**0.677*****	[0.56-0.818]	0.065	**0.68*****	[0.525-0.88]	0.09	**0.669*****	[0.508-0.881]	0.094
Medium Economic worries_2010	**0.789*****	[0.672-0.927]	0.065	**0.745*****	[0.597-0.93]	0.084	0.839	[0.663-1.062]	0.101
Constant	**6.07*****	[4.426-8.325]	0.978	**5.256*****	[3.392-8.143]	1.174	**9.416*****	[6.064-14.62]	2.114

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 70: Results of the logistic regression model: Alcohol consumption and the permanent at-risk-of-poverty rate of 2006-2010

Moderate alcohol consumption 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent at-risk-of-poverty_2010	**1.689*****	[1.203-2.372]	0.293	**1.785*****	[1.181-2.698]	0.376	1.312	[0.724-2.377]	0.398
Low education_2010	**1.462*****	[1.134-1.886]	0.19	**1.375****	[1.006-1.878]	0.219	**1.662****	[1.084-2.549]	0.363
Medium education_2010	**1.262****	[1.019-1.564]	0.138	1.15	[0.877-1.508]	0.159	**1.595*****	[1.145-2.222]	0.27
Low occupational status_2010	**1.25***	[0.976-1.601]	0.158	1.072	[0.801-1.435]	0.16	**2.237*****	[1.365-3.663]	0.563
Medium occupational status_2010	**1.303*****	[1.078-1.575]	0.126	**1.266****	[1.002-1.6]	0.151	**1.417****	[1.038-1.934]	0.225
Household affected by unemployment2010	1.004	[0.978-1.031]	0.014	1.004	[0.972-1.037]	0.016	1.004	[0.959-1.052]	0.024
Currently unemployed_2010	0.977	[0.703-1.357]	0.164	0.963	[0.649-1.431]	0.194	1.115	[0.623-1.995]	0.331
Health status 2010	0.962	[0.881-1.049]	0.043	0.991	[0.888-1.105]	0.055	0.914	[0.796-1.049]	0.064
female	**3.558*****	[3.024-4.186]	0.295						
Age group: 17 -14_2010	**1.447****	[1.027-2.04]	0.254	**1.43***	[0.949-2.155]	0.299	1.523	[0.835-2.778]	0.467
Age group: 25 - 34_2010	1.243	[0.937-1.647]	0.179	1.25	[0.885-1.766]	0.22	1.148	[0.705-1.872]	0.286
Age group 45 -54_2010	**0.759****	[0.602-0.956]	0.09	0.891	[0.674-1.178]	0.127	**0.47*****	[0.31-0.712]	0.1
Age group 55 - 65_2010	0.834	[0.641-1.085]	0.112	0.979	[0.71-1.35]	0.161	**0.515*****	[0.327-0.81]	0.119
Single (not married)_2010	1.027	[0.801-1.317]	0.13	1.102	[0.819-1.482]	0.167	0.849	[0.553-1.304]	0.186
Divorced_2010	1.145	[0.867-1.511]	0.162	1.085	[0.761-1.546]	0.196	1.324	[0.858-2.044]	0.293
Widowed_2010	1.467	[0.852-2.525]	0.406	1.229	[0.545-2.772]	0.51	1.657	[0.791-3.472]	0.625
No migration background	**0.736****	[0.574-0.943]	0.093	0.836	[0.623-1.123]	0.126	**0.51*****	[0.313-0.833]	0.127
East Germany_2010	1.04	[0.87-1.243]	0.095	0.935	[0.752-1.162]	0.104	**1.419****	[1.027-1.96]	0.234
Children (0-14)/ HH_2010	**1.117***	[0.994-1.255]	0.067	**1.132***	[0.979-1.307]	0.083	1.01	[0.84-1.215]	0.095
Risk-taker_2010	**0.739*****	[0.599-0.911]	0.079	**0.726****	[0.565-0.934]	0.093	**0.717***	[0.489-1.049]	0.139
Risk-neutral_2010	**0.823****	[0.689-0.983]	0.075	**0.76****	[0.607-0.953]	0.088	0.976	[0.736-1.293]	0.14
High Economic worries_2010	**1.249***	[0.987-1.58]	0.15	**1.311***	[0.988-1.74]	0.189	1.02	[0.675-1.54]	0.215
Medium Economic worries_2010	1.074	[0.897-1.287]	0.099	1.018	[0.816-1.27]	0.115	1.171	[0.868-1.579]	0.179
Constant	**2.972*****	[2.069-4.268]	0.549	**2.874*****	[1.856-4.452]	0.642	**13.975*****	[7.66-25.494]	4.287

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 71: Results of the logistic regression model: Physical activity and the permanent at-risk-of-poverty rate of 2005-2009

Sufficient physical activity 2009	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Permanent at-risk-of-poverty_2009	**0.795***	[0.62-1.019]	0.101	0.987	[0.677-1.439]	0.19	**0.702****	[0.506-0.975]	0.117
Low education_2009	**0.467*****	[0.378-0.577]	0.051	**0.502*****	[0.37-0.682]	0.078	**0.433*****	[0.32-0.586]	0.067
Medium education_2009	**0.708*****	[0.585-0.858]	0.069	**0.725****	[0.547-0.962]	0.104	**0.689*****	[0.528-0.899]	0.094
Low occupational status_2009	**0.654*****	[0.533-0.804]	0.069	**0.704****	[0.527-0.942]	0.104	**0.574*****	[0.429-0.767]	0.085
Medium occupational status_2009	**0.787*****	[0.677-0.916]	0.061	**0.784****	[0.624-0.984]	0.091	**0.78****	[0.635-0.958]	0.082
Household affected by unemployment2009	**0.957*****	[0.932-0.982]	0.013	**0.947****	[0.905-0.991]	0.022	**0.96*****	[0.93-0.99]	0.015
Currently unemployed_2009	0.841	[0.613-1.155]	0.136	0.715	[0.44-1.16]	0.177	1.025	[0.665-1.58]	0.226
Health status_2009	**1.372*****	[1.265-1.486]	0.056	**1.317*****	[1.17-1.481]	0.079	**1.412*****	[1.265-1.575]	0.079
female	**1.224*****	[1.073-1.397]	0.082						
Age group: 17 -14_2009	**1.781*****	[1.357-2.339]	0.248	**2.325*****	[1.579-3.424]	0.459	1.344	[0.912-1.982]	0.266
Age group: 25 - 34_2009	1.215	[0.96-1.539]	0.146	**1.573****	[1.105-2.239]	0.283	0.973	[0.707-1.339]	0.159
Age group 45 -54_2009	1.067	[0.883-1.29]	0.103	1.103	[0.832-1.463]	0.159	1.04	[0.801-1.349]	0.138
Age group 55 - 65_2009	1.094	[0.878-1.362]	0.122	1.126	[0.809-1.568]	0.19	1.092	[0.813-1.469]	0.165
Single (not married)_2009	1.016	[0.832-1.241]	0.104	1.025	[0.765-1.374]	0.153	1.032	[0.779-1.366]	0.148
Divorced_2009	**0.8***	[0.632-1.014]	0.097	0.935	[0.645-1.355]	0.177	**0.721****	[0.528-0.983]	0.114
Widowed_2009	0.922	[0.564-1.508]	0.231	0.788	[0.231-2.683]	0.493	0.892	[0.515-1.547]	0.251
No migration background	**1.305*****	[1.08-1.578]	0.126	1.044	[0.792-1.376]	0.147	**1.569*****	[1.207-2.039]	0.21
East Germany_2009	**0.573*****	[0.487-0.673]	0.047	**0.677*****	[0.534-0.859]	0.082	**0.479*****	[0.385-0.596]	0.053
Children (0-14)/ HH_2009	1.007	[0.917-1.106]	0.048	**1.133***	[0.988-1.299]	0.079	0.93	[0.815-1.06]	0.062
Risk-taker_2009	**1.496*****	[1.216-1.841]	0.158	**1.543*****	[1.165-2.043]	0.221	**1.377****	[1.016-1.866]	0.214
Risk-neutral_2009	**1.305*****	[1.135-1.501]	0.093	**1.347*****	[1.091-1.663]	0.145	**1.278****	[1.057-1.544]	0.123
High Economic worries_2009	**0.81****	[0.662-0.992]	0.084	**0.68****	[0.504-0.918]	0.104	0.966	[0.732-1.275]	0.137
Medium Economic worries_2009	**0.864***	[0.733-1.019]	0.073	**0.781****	[0.617-0.99]	0.094	0.956	[0.761-1.202]	0.112
Constant	0.778	[0.571-1.062]	0.123	0.825	[0.53-1.283]	0.186	0.909	[0.601-1.374]	0.191

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 72: Results of the logistic regression model: Diet and the combined poverty indicator of 2010

Healthy diet 2010	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Extreme poverty_2010	0.781	[0.55-1.108]	0.139	1.301	[0.789-2.145]	0.332	**0.549*** **	[0.352-0.857]	0.125
Moderate poverty_2010	0.916	[0.715-1.174]	0.116	0.909	[0.622-1.328]	0.176	0.929	[0.667-1.292]	0.157
One-sided poverty_2010	**0.72*** **	[0.562-0.922]	0.091	0.828	[0.575-1.193]	0.154	**0.645*** **	[0.465-0.895]	0.108
Vulnerability_2010	**0.618*** **	[0.478-0.798]	0.081	**0.66** **	[0.442-0.987]	0.135	**0.589*** **	[0.424-0.818]	0.099
Fragile Prosperity_2010	0.915	[0.793-1.057]	0.067	0.886	[0.714-1.099]	0.098	0.934	[0.768-1.137]	0.094
Low education_2010	**0.684*** **	[0.563-0.831]	0.068	**0.778***	[0.593-1.022]	0.108	**0.593*** **	[0.446-0.788]	0.086
Medium education_2010	**0.801** **	[0.673-0.953]	0.071	**0.809***	[0.631-1.038]	0.103	**0.77** **	[0.598-0.991]	0.099
Low occupational status_2010	**0.843***	[0.697-1.019]	0.082	0.894	[0.68-1.175]	0.125	**0.777***	[0.598-1.01]	0.104
Medium occupational status_2010	0.912	[0.79-1.052]	0.066	0.924	[0.75-1.137]	0.098	0.887	[0.725-1.085]	0.091
Currently unemployed_2010	0.884	[0.715-1.093]	0.096	0.847	[0.623-1.153]	0.133	0.897	[0.671-1.199]	0.133
Health status 2010	**1.115*** **	[1.043-1.191]	0.038	**1.128** **	[1.019-1.249]	0.059	**1.094** **	[1.002-1.194]	0.049
female	**2.596*** **	[2.312-2.915]	0.153						
Age group: 17 -14_2010	**0.501*** **	[0.387-0.647]	0.066	**0.466*** **	[0.322-0.675]	0.088	**0.562*** **	[0.396-0.799]	0.101
Age group: 25 - 34_2010	0.864	[0.705-1.059]	0.09	0.836	[0.611-1.144]	0.134	0.88	[0.674-1.149]	0.12
Age group 45 -54_2010	**1.319*** **	[1.11-1.567]	0.116	**1.255***	[0.974-1.618]	0.163	**1.399*** **	[1.102-1.775]	0.17
Age group 55 - 65_2010	**1.848*** **	[1.521-2.245]	0.183	**1.729*** **	[1.301-2.296]	0.25	**2.002*** **	[1.528-2.621]	0.275
Single (not married)_2010	1.141	[0.951-1.37]	0.106	1.228	[0.947-1.592]	0.163	1.014	[0.789-1.303]	0.13
Divorced_2010	1.047	[0.863-1.27]	0.103	0.982	[0.722-1.338]	0.155	1.097	[0.851-1.414]	0.142
Widowed_2010	1.035	[0.686-1.561]	0.217	1.113	[0.437-2.835]	0.531	1.054	[0.666-1.668]	0.247
No migration background	0.993	[0.842-1.172]	0.084	1.039	[0.809-1.334]	0.132	0.967	[0.774-1.207]	0.109
East Germany_2010	1.004	[0.874-1.154]	0.071	1.078	[0.876-1.327]	0.114	0.94	[0.78-1.133]	0.089
Children (0-14)/ HH_2010	**1.105** **	[1.017-1.2]	0.047	0.99	[0.875-1.12]	0.062	**1.226*** **	[1.09-1.38]	0.074
Risk-taker_2010	**1.186** **	[1.01-1.392]	0.097	1.114	[0.887-1.397]	0.129	**1.242***	[0.986-1.564]	0.146
Risk-neutral_2010	1.066	[0.938-1.212]	0.07	0.972	[0.798-1.184]	0.098	1.14	[0.964-1.349]	0.098
High Economic worries_2010	0.909	[0.764-1.08]	0.08	0.877	[0.682-1.128]	0.113	0.908	[0.71-1.16]	0.113
Medium Economic worries_2010	0.881*	[0.765-1.014]	0.063	0.944	[0.773-1.153]	0.096	0.819*	[0.669-1.003]	0.084
Constant	0.657***	[0.5-0.862]	0.091	0.6**	[0.404-0.891]	0.121	1.96***	[1.367-2.811]	0.36

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 73: Results of the logistic regression model: Smoking and the combined poverty indicator of 2010

Non-smoking 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty_2010	**0.434*****	[0.312-0.604]	0.073	**0.469*****	[0.292-0.752]	0.113	**0.391*****	[0.244-0.627]	0.094
Moderate poverty_2010	**0.577*****	[0.449-0.74]	0.074	**0.526*****	[0.371-0.747]	0.094	**0.625****	[0.433-0.903]	0.117
One-sided poverty_2010	**0.727****	[0.566-0.934]	0.093	**0.672****	[0.475-0.951]	0.119	0.8	[0.552-1.159]	0.151
Vulnerability_2010	**0.755****	[0.585-0.974]	0.098	**0.651****	[0.453-0.935]	0.12	0.884	[0.616-1.269]	0.163
Fragile Prosperity_2010	**0.816****	[0.697-0.954]	0.065	**0.808****	[0.653-0.999]	0.088	0.827	[0.657-1.04]	0.097
Low education_2010	**0.475*****	[0.378-0.598]	0.056	**0.444*****	[0.327-0.602]	0.069	**0.484*****	[0.345-0.679]	0.084
Medium education_2010	**0.702*****	[0.568-0.867]	0.076	**0.607*****	[0.453-0.813]	0.091	0.817	[0.604-1.106]	0.126
Low occupational status_2010	0.87	[0.716-1.058]	0.087	**0.754****	[0.58-0.98]	0.101	1.041	[0.774-1.399]	0.157
Medium occupational status_2010	**0.856***	[0.732-1.001]	0.068	0.956	[0.773-1.183]	0.104	**0.768****	[0.611-0.964]	0.089
Currently unemployed_2010	**0.83***	[0.678-1.016]	0.086	0.87	[0.662-1.143]	0.121	0.785	[0.578-1.067]	0.123
Health status 2010	**1.193*****	[1.112-1.279]	0.042	**1.185*****	[1.076-1.306]	0.059	**1.203*****	[1.088-1.33]	0.062
female	**1.336*****	[1.181-1.512]	0.084						
Age group: 17 -14_2010	**1.738*****	[1.34-2.255]	0.231	**1.69*****	[1.195-2.392]	0.299	**1.87*****	[1.253-2.791]	0.382
Age group: 25 - 34_2010	0.952	[0.765-1.184]	0.106	1.048	[0.768-1.43]	0.166	0.881	[0.646-1.204]	0.14
Age group 45 -54_2010	1.065	[0.885-1.281]	0.101	1.216	[0.937-1.577]	0.161	0.935	[0.716-1.219]	0.127
Age group 55 - 65_2010	**1.646*****	[1.33-2.037]	0.179	**1.657*****	[1.229-2.235]	0.253	**1.666*****	[1.221-2.272]	0.264
Single (not married)_2010	**0.794****	[0.652-0.967]	0.08	0.865	[0.666-1.122]	0.115	**0.708****	[0.526-0.952]	0.107
Divorced_2010	**0.499*****	[0.41-0.607]	0.05	**0.484*****	[0.359-0.654]	0.074	**0.505*****	[0.388-0.657]	0.068
Widowed_2010	0.883	[0.575-1.357]	0.194	0.792	[0.335-1.87]	0.347	0.876	[0.534-1.439]	0.222
No migration background	**0.712*****	[0.592-0.856]	0.067	0.86	[0.667-1.109]	0.112	**0.571*****	[0.436-0.75]	0.079
East Germany_2010	1.027	[0.889-1.186]	0.076	1.013	[0.825-1.244]	0.106	1.041	[0.849-1.276]	0.108
Children (0-14)/ HH_2010	**1.105****	[1.01-1.209]	0.051	1.043	[0.92-1.183]	0.067	**1.167****	[1.021-1.333]	0.079
Risk-taker_2010	**0.552*****	[0.466-0.653]	0.048	**0.555*****	[0.442-0.696]	0.064	**0.537*****	[0.413-0.697]	0.072
Risk-neutral_2010	**0.738*****	[0.643-0.847]	0.052	**0.764*****	[0.625-0.934]	0.078	**0.707*****	[0.585-0.854]	0.068
High Economic worries_2010	0.709***	[0.588-0.856]	0.068	**0.72****	[0.557-0.93]	0.094	**0.685*****	[0.519-0.903]	0.097
Medium Economic worries_2010	0.791***	[0.674-0.929]	0.065	0.763**	[0.612-0.95]	0.086	0.822	[0.65-1.039]	0.098
Constant	7.967***	[5.83-10.888]	1.27	7.054***	[4.552-10.929]	1.576	12.535***	[8.137-19.311]	2.764

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 74: Results of the logistic regression model: Alcohol consumption and the combined poverty indicator of 2010

Moderate alcohol consumption 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty_2010	**2.446*****	[1.305-4.587]	0.785	**2.822*****	[1.361-5.851]	1.05	1.482	[0.428-5.139]	0.94
Moderate poverty_2010	**1.597****	[1.082-2.357]	0.317	**1.965*****	[1.237-3.122]	0.464	0.911	[0.467-1.776]	0.31
One-sided poverty_2010	**1.401****	[1-1.963]	0.241	**1.535****	[1.025-2.298]	0.316	1.026	[0.566-1.86]	0.311
Vulnerability_2010	**1.382***	[0.969-1.972]	0.251	1.323	[0.857-2.044]	0.294	1.695	[0.876-3.276]	0.57
Fragile Prosperity_2010	**1.262****	[1.038-1.534]	0.126	**1.275****	[1.008-1.614]	0.153	1.229	[0.868-1.74]	0.218
Low education_2010	**1.328****	[1.032-1.711]	0.171	1.251	[0.923-1.696]	0.194	**1.508***	[0.972-2.339]	0.338
Medium education_2010	**1.202***	[0.974-1.483]	0.129	1.073	[0.824-1.397]	0.144	**1.584*****	[1.143-2.195]	0.264
Low occupational status_2010	1.141	[0.888-1.467]	0.146	0.909	[0.676-1.223]	0.138	**2.555*****	[1.588-4.109]	0.619
Medium occupational status_2010	**1.224****	[1.015-1.476]	0.117	1.151	[0.916-1.448]	0.135	**1.428****	[1.042-1.959]	0.23
Currently unemployed_2010	0.978	[0.718-1.333]	0.154	0.924	[0.647-1.32]	0.168	1.223	[0.636-2.354]	0.408
Health status 2010	0.942	[0.867-1.025]	0.04	0.959	[0.863-1.066]	0.052	0.908	[0.795-1.037]	0.062
female	**3.568*****	[3.037-4.191]	0.293						
Age group: 17 -14_2010	**1.465****	[1.045-2.054]	0.253	1.388	[0.926-2.081]	0.287	**1.71***	[0.943-3.101]	0.519
Age group: 25 - 34_2010	1.194	[0.911-1.566]	0.165	1.22	[0.877-1.697]	0.206	1.052	[0.657-1.683]	0.252
Age group 45 -54_2010	**0.743*****	[0.592-0.933]	0.086	0.869	[0.661-1.144]	0.122	**0.463*****	[0.31-0.691]	0.095
Age group 55 - 65_2010	0.816	[0.631-1.055]	0.107	0.931	[0.681-1.274]	0.149	**0.525*****	[0.338-0.815]	0.118
Single (not married)_2010	1.027	[0.809-1.303]	0.125	1.11	[0.834-1.477]	0.162	0.853	[0.566-1.284]	0.178
Divorced_2010	1.186	[0.91-1.545]	0.16	1.12	[0.8-1.568]	0.192	1.369	[0.892-2.101]	0.299
Widowed_2010	**1.735****	[1.003-3.001]	0.485	1.667	[0.727-3.822]	0.706	1.778	[0.843-3.747]	0.676
No migration background	0.813	[0.632-1.046]	0.105	0.958	[0.712-1.288]	0.145	**0.52****	[0.312-0.865]	0.135
East Germany_2010	0.988	[0.828-1.178]	0.089	0.877	[0.708-1.086]	0.096	**1.402****	[1.014-1.939]	0.232
Children (0-14)/ HH_2010	**1.111***	[0.988-1.248]	0.066	1.107	[0.958-1.278]	0.081	1.059	[0.877-1.278]	0.102
Risk-taker_2010	**0.748*****	[0.609-0.919]	0.079	**0.751****	[0.588-0.958]	0.094	**0.666****	[0.454-0.978]	0.13
Risk-neutral_2010	**0.82****	[0.689-0.976]	0.073	**0.752****	[0.603-0.938]	0.085	0.999	[0.755-1.32]	0.142
High Economic worries_2010	1.207	[0.956-1.524]	0.144	**1.27***	[0.959-1.682]	0.182	0.987	[0.656-1.486]	0.206
Medium Economic worries_2010	1.098	[0.92-1.312]	0.1	1.064	[0.857-1.322]	0.117	1.134	[0.839-1.532]	0.174
Constant	2.776***	[1.933-3.985]	0.512	2.665***	[1.729-4.11]	0.589	13.533***	[7.133-25.675]	4.422

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 75: Results of the logistic regression model: Physical activity and the combined poverty indicator of 2009

Sufficient physical activity 2009	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Extreme poverty2009	**0.609*****	[0.429-0.866]	0.109	0.844	[0.51-1.399]	0.218	**0.422*****	[0.256-0.694]	0.107
Moderate poverty2009	**0.545*****	[0.406-0.733]	0.082	0.709	[0.456-1.103]	0.16	**0.455*****	[0.305-0.679]	0.093
One-sided poverty2009	0.84	[0.66-1.071]	0.104	0.915	[0.642-1.305]	0.166	0.769	[0.553-1.07]	0.129
Vulnerability2009	**0.764***	[0.581-1.004]	0.107	0.763	[0.504-1.157]	0.162	**0.726***	[0.502-1.05]	0.137
Fragile Prosperity2009	0.995	[0.854-1.16]	0.078	1.09	[0.87-1.365]	0.125	0.89	[0.723-1.096]	0.094
Low education_2009	**0.509*****	[0.419-0.619]	0.051	**0.521*****	[0.394-0.689]	0.074	**0.492*****	[0.373-0.649]	0.069
Medium education_2009	**0.777*****	[0.652-0.925]	0.069	**0.745****	[0.574-0.966]	0.099	**0.798***	[0.627-1.015]	0.098
Low occupational status_2009	**0.632*****	[0.518-0.771]	0.064	**0.611*****	[0.461-0.81]	0.088	**0.626*****	[0.471-0.832]	0.091
Medium occupational status_2009	**0.785*****	[0.682-0.902]	0.056	**0.729*****	[0.592-0.898]	0.078	**0.835***	[0.69-1.01]	0.081
Currently unemployed_2009	**0.701*****	[0.554-0.886]	0.084	**0.533*****	[0.382-0.744]	0.091	0.905	[0.653-1.255]	0.151
Health status_2009	**1.372*****	[1.276-1.475]	0.051	**1.358*****	[1.22-1.512]	0.074	**1.38*****	[1.251-1.524]	0.07
female	**1.247*****	[1.106-1.406]	0.076						
Age group: 17 -14_2009	**1.635*****	[1.265-2.113]	0.214	**2.21*****	[1.534-3.186]	0.412	1.18	[0.819-1.702]	0.22
Age group: 25 - 34_2009	**1.285****	[1.035-1.594]	0.141	**1.63*****	[1.182-2.247]	0.267	1.034	[0.771-1.387]	0.155
Age group 45 -54_2009	1.097	[0.92-1.308]	0.098	1.059	[0.816-1.373]	0.14	1.147	[0.9-1.461]	0.142
Age group 55 - 65_2009	1.157	[0.945-1.417]	0.12	1.024	[0.756-1.387]	0.158	**1.332****	[1.012-1.755]	0.187
Single (not married)_2009	1.081	[0.898-1.301]	0.102	1.012	[0.775-1.321]	0.138	1.189	[0.913-1.548]	0.16
Divorced_2009	**0.734*****	[0.594-0.908]	0.079	0.824	[0.591-1.147]	0.139	**0.68*****	[0.514-0.899]	0.097
Widowed_2009	0.768	[0.497-1.188]	0.171	0.729	[0.245-2.171]	0.406	0.696	[0.43-1.127]	0.171
No migration background	**1.286*****	[1.07-1.544]	0.12	1.122	[0.86-1.465]	0.153	**1.436*****	[1.115-1.849]	0.185
East Germany_2009	**0.551*****	[0.475-0.638]	0.042	**0.685*****	[0.553-0.85]	0.075	**0.443*****	[0.363-0.542]	0.045
Children (0-14)/ HH_2009	1.008	[0.925-1.099]	0.044	1.05	[0.927-1.189]	0.067	1.003	[0.888-1.132]	0.062
Risk-taker_2009	**1.478*****	[1.221-1.789]	0.144	**1.457*****	[1.127-1.885]	0.191	**1.473*****	[1.108-1.96]	0.214
Risk-neutral_2009	**1.234*****	[1.086-1.401]	0.08	**1.255****	[1.036-1.521]	0.123	**1.21****	[1.019-1.438]	0.107
High Economic worries_2009	0.819**	[0.678-0.989]	0.079	**0.662*****	[0.503-0.872]	0.093	1.011	[0.779-1.313]	0.135
Medium Economic worries_2009	0.85**	[0.732-0.988]	0.065	0.767**	[0.619-0.95]	0.084	0.946	[0.768-1.166]	0.101
Constant	0.841	[0.633-1.117]	0.122	0.977	[0.652-1.466]	0.202	0.926	[0.632-1.356]	0.18

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 76: Results of the logistic regression model: Diet and the permanent combined poverty indicator of 2006-2010

Healthy diet 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty_2010	**0.666****	[0.453-0.979]	0.131	1.027	[0.583-1.808]	0.296	**0.51*****	[0.315-0.824]	0.125
Permanent moderate poverty_2010	**0.618*****	[0.46-0.831]	0.093	**0.635***	[0.389-1.037]	0.159	**0.607*****	[0.417-0.883]	0.116
Permanent one-sided poverty_2010	**0.58****	[0.37-0.91]	0.133	0.744	[0.391-1.417]	0.245	**0.473****	[0.264-0.845]	0.14
Permanent vulnerability_2010	**0.712*****	[0.56-0.906]	0.087	0.755	[0.52-1.096]	0.144	**0.677****	[0.496-0.925]	0.108
Permanent fragile prosperity_2010	**0.835****	[0.714-0.976]	0.067	0.824	[0.652-1.041]	0.098	0.841	[0.68-1.04]	0.091
Low education_2010	**0.613*****	[0.499-0.753]	0.064	**0.701****	[0.525-0.937]	0.104	**0.526*****	[0.388-0.712]	0.081
Medium education_2010	**0.719*****	[0.6-0.863]	0.067	**0.73****	[0.562-0.948]	0.097	**0.682*****	[0.523-0.89]	0.093
Low occupational status_2010	0.927	[0.757-1.136]	0.096	0.905	[0.672-1.219]	0.137	0.914	[0.693-1.206]	0.129
Medium occupational status_2010	0.936	[0.807-1.087]	0.071	0.965	[0.774-1.202]	0.108	0.898	[0.73-1.104]	0.095
Currently unemployed_2010	1.063	[0.845-1.337]	0.125	1.141	[0.83-1.568]	0.185	0.974	[0.709-1.337]	0.157
Health status 2010	**1.074***	[1-1.155]	0.04	1.092	[0.979-1.219]	0.061	1.06	[0.964-1.166]	0.052
female	**2.728*****	[2.411-3.086]	0.172						
Age group: 17 -14_2010	**0.531*****	[0.403-0.701]	0.075	**0.543*****	[0.367-0.802]	0.108	**0.539*****	[0.366-0.793]	0.106
Age group: 25 - 34_2010	0.872	[0.699-1.087]	0.098	0.856	[0.606-1.209]	0.151	0.862	[0.646-1.149]	0.126
Age group 45 -54_2010	**1.268****	[1.054-1.525]	0.119	**1.287***	[0.983-1.685]	0.177	**1.28***	[0.991-1.652]	0.167
Age group 55 - 65_2010	**1.732*****	[1.406-2.135]	0.185	**1.661*****	[1.226-2.251]	0.258	**1.832*****	[1.372-2.446]	0.27
Single (not married)_2010	1.134	[0.935-1.375]	0.112	1.176	[0.894-1.546]	0.164	1.068	[0.816-1.399]	0.147
Divorced_2010	1.115	[0.903-1.377]	0.12	1.107	[0.798-1.537]	0.185	1.135	[0.858-1.502]	0.162
Widowed_2010	1.007	[0.645-1.572]	0.229	0.514	[0.182-1.452]	0.272	1.1	[0.664-1.823]	0.283
No migration background	1.038	[0.849-1.269]	0.106	1.034	[0.763-1.401]	0.16	1.038	[0.792-1.361]	0.143
East Germany_2010	0.991	[0.856-1.147]	0.074	1.062	[0.851-1.326]	0.12	0.926	[0.761-1.125]	0.092
Children (0-14)/ HH_2010	**1.14*****	[1.042-1.247]	0.052	1.011	[0.885-1.154]	0.068	**1.282*****	[1.126-1.459]	0.085
Risk-taker_2010	**1.181***	[0.996-1.401]	0.103	1.123	[0.883-1.428]	0.138	**1.232***	[0.963-1.575]	0.155
Risk-neutral_2010	1.053	[0.919-1.206]	0.073	0.992	[0.803-1.226]	0.107	1.094	[0.916-1.306]	0.099
High Economic worries_2010	0.935	[0.778-1.122]	0.087	0.825	[0.632-1.076]	0.112	1.017	[0.784-1.32]	0.135
Medium Economic worries_2010	0.879*	[0.757-1.02]	0.067	0.917	[0.742-1.133]	0.099	0.847	[0.686-1.047]	0.091
Constant	0.686**	[0.505-0.932]	0.107	0.648*	[0.415-1.013]	0.148	2.105***	[1.401-3.163]	0.437

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 77: Results of the logistic regression model: Smoking and the permanent combined poverty indicator of 2006-2010

Non-smoking 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Permanent extreme poverty_2010	**0.369*****	[0.256-0.53]	0.068	**0.326*****	[0.19-0.559]	0.09	**0.398*****	[0.241-0.659]	0.102
Permanent moderate poverty_2010	**0.612*****	[0.46-0.814]	0.089	**0.472*****	[0.312-0.716]	0.1	0.753	[0.504-1.127]	0.155
Permanent one-sided poverty_2010	**0.695***	[0.461-1.046]	0.145	**0.515****	[0.295-0.9]	0.147	0.97	[0.521-1.807]	0.308
Permanent vulnerability_2010	**0.621*****	[0.495-0.778]	0.072	**0.518*****	[0.377-0.711]	0.084	**0.753***	[0.543-1.045]	0.126
Permanent fragile prosperity_2010	0.875	[0.738-1.036]	0.076	**0.771****	[0.608-0.977]	0.093	1.012	[0.795-1.288]	0.125
Low education_2010	**0.481*****	[0.378-0.612]	0.059	**0.471*****	[0.34-0.651]	0.078	**0.472*****	[0.332-0.67]	0.084
Medium education_2010	**0.714*****	[0.573-0.89]	0.08	**0.636*****	[0.467-0.866]	0.1	0.802	[0.587-1.095]	0.128
Low occupational status_2010	0.899	[0.727-1.112]	0.097	0.821	[0.614-1.098]	0.122	0.981	[0.715-1.345]	0.158
Medium occupational status_2010	0.932	[0.79-1.1]	0.079	1.042	[0.828-1.31]	0.122	0.824	[0.651-1.043]	0.099
Currently unemployed_2010	0.862	[0.696-1.068]	0.094	0.943	[0.709-1.254]	0.137	0.799	[0.574-1.111]	0.135
Health status 2010	**1.19*****	[1.103-1.285]	0.047	**1.186*****	[1.066-1.32]	0.065	**1.195*****	[1.07-1.334]	0.067
female	**1.318*****	[1.154-1.504]	0.089						
Age group: 17 -14_2010	**1.915*****	[1.446-2.537]	0.275	**1.744*****	[1.199-2.536]	0.333	**2.196*****	[1.42-3.398]	0.489
Age group: 25 - 34_2010	1.053	[0.826-1.341]	0.13	1.119	[0.786-1.592]	0.201	0.998	[0.713-1.399]	0.172
Age group 45 -54_2010	1.037	[0.851-1.263]	0.105	1.197	[0.909-1.577]	0.168	0.892	[0.668-1.189]	0.131
Age group 55 - 65_2010	**1.496*****	[1.191-1.877]	0.174	**1.48****	[1.077-2.033]	0.24	**1.533****	[1.1-2.136]	0.259
Single (not married)_2010	**0.729*****	[0.591-0.9]	0.078	0.841	[0.635-1.114]	0.121	**0.603*****	[0.44-0.826]	0.097
Divorced_2010	**0.531*****	[0.429-0.656]	0.057	**0.493*****	[0.356-0.682]	0.082	**0.538*****	[0.404-0.718]	0.079
Widowed_2010	0.808	[0.503-1.298]	0.195	**0.387****	[0.164-0.912]	0.169	0.857	[0.499-1.472]	0.236
No migration background	**0.825***	[0.658-1.034]	0.095	1.116	[0.822-1.514]	0.174	**0.634*****	[0.453-0.889]	0.109
East Germany_2010	1.097	[0.941-1.279]	0.086	1.14	[0.913-1.424]	0.129	1.069	[0.862-1.327]	0.118
Children (0-14)/ HH_2010	**1.1***	[0.996-1.215]	0.056	1.04	[0.906-1.193]	0.073	**1.158***	[0.997-1.344]	0.088
Risk-taker_2010	**0.537*****	[0.447-0.644]	0.05	**0.544*****	[0.425-0.695]	0.068	**0.517*****	[0.389-0.687]	0.075
Risk-neutral_2010	**0.725*****	[0.627-0.84]	0.054	**0.746*****	[0.602-0.925]	0.082	**0.707*****	[0.58-0.862]	0.072
High Economic worries_2010	0.735***	[0.603-0.896]	0.074	**0.752****	[0.573-0.986]	0.104	**0.704****	[0.528-0.939]	0.103
Medium Economic worries_2010	0.828**	[0.7-0.979]	0.071	0.805*	[0.638-1.016]	0.096	0.861	[0.675-1.099]	0.107
Constant	6.503***	[4.612-9.169]	1.14	4.981***	[3.1-8.002]	1.205	10.994***	[6.824-17.71]	2.675

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 78: Results of the logistic regression model: Alcohol consumption and the permanent combined poverty indicator of 2006-2010

Moderate alcohol consumption 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty_2010	1.463	[0.872-2.456]	0.386	1.406	[0.76-2.601]	0.441	1.564	[0.592-4.129]	0.775
Permanent moderate poverty_2010	1.417	[0.909-2.208]	0.321	1.423	[0.821-2.466]	0.399	1.308	[0.592-2.891]	0.529
Permanent one-sided poverty_2010	**2.283*****	[1.311-3.976]	0.646	**2.813*****	[1.426-5.549]	0.975	1.294	[0.518-3.233]	0.605
Permanent vulnerability_2010	**1.371***	[0.981-1.914]	0.234	**1.51****	[0.999-2.282]	0.318	1.121	[0.641-1.961]	0.32
Permanent fragile prosperity_2010	**1.354*****	[1.096-1.671]	0.146	**1.386****	[1.076-1.787]	0.18	1.3	[0.895-1.888]	0.248
Low education_2010	**1.381****	[1.061-1.798]	0.186	1.291	[0.932-1.787]	0.214	**1.582****	[1.023-2.447]	0.352
Medium education_2010	**1.286****	[1.032-1.601]	0.144	1.181	[0.893-1.56]	0.168	**1.586*****	[1.131-2.225]	0.274
Low occupational status_2010	1.217	[0.929-1.595]	0.168	0.995	[0.721-1.375]	0.164	**2.396*****	[1.431-4.01]	0.63
Medium occupational status_2010	**1.265****	[1.038-1.541]	0.127	1.227	[0.96-1.57]	0.154	**1.38****	[1.002-1.9]	0.225
Currently unemployed_2010	1.045	[0.756-1.443]	0.172	1.078	[0.745-1.561]	0.204	1.025	[0.531-1.978]	0.344
Health status 2010	0.973	[0.891-1.062]	0.044	1.002	[0.897-1.119]	0.057	0.926	[0.804-1.067]	0.067
female	**3.547*****	[2.999-4.195]	0.304						
Age group: 17 -14_2010	**1.438****	[1.007-2.053]	0.261	1.411	[0.92-2.165]	0.308	1.493	[0.802-2.781]	0.474
Age group: 25 - 34_2010	1.227	[0.92-1.636]	0.18	1.207	[0.848-1.719]	0.218	1.18	[0.708-1.968]	0.308
Age group 45 -54_2010	**0.778****	[0.612-0.989]	0.095	0.909	[0.681-1.213]	0.134	**0.487*****	[0.318-0.744]	0.105
Age group 55 - 65_2010	0.884	[0.674-1.159]	0.122	1.066	[0.767-1.483]	0.179	**0.514*****	[0.323-0.82]	0.122
Single (not married)_2010	1.041	[0.81-1.337]	0.133	1.149	[0.854-1.545]	0.174	0.821	[0.526-1.281]	0.186
Divorced_2010	1.227	[0.936-1.609]	0.17	1.227	[0.873-1.723]	0.213	1.249	[0.8-1.949]	0.284
Widowed_2010	1.342	[0.779-2.312]	0.373	0.805	[0.36-1.799]	0.33	1.571	[0.745-3.311]	0.598
No migration background	**0.768***	[0.57-1.035]	0.117	0.894	[0.629-1.272]	0.161	**0.512****	[0.274-0.959]	0.164
East Germany_2010	1	[0.833-1.199]	0.093	0.897	[0.717-1.122]	0.102	**1.374***	[0.994-1.9]	0.227
Children (0-14)/ HH_2010	1.061	[0.941-1.196]	0.065	1.076	[0.929-1.248]	0.081	0.966	[0.797-1.171]	0.095
Risk-taker_2010	**0.743*****	[0.599-0.921]	0.082	**0.745****	[0.576-0.963]	0.098	**0.714***	[0.483-1.055]	0.142
Risk-neutral_2010	0.869	[0.725-1.041]	0.08	0.828	[0.659-1.04]	0.096	0.962	[0.719-1.288]	0.143
High Economic worries_2010	1.197	[0.939-1.525]	0.148	1.26	[0.945-1.68]	0.185	0.979	[0.631-1.519]	0.219
Medium Economic worries_2010	1.056	[0.879-1.269]	0.099	0.994	[0.794-1.245]	0.114	1.178	[0.868-1.597]	0.183
Constant	2.597***	[1.751-3.852]	0.522	2.348***	[1.454-3.79]	0.574	13.785***	[6.938-27.388]	4.829

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 79: Results of the logistic regression model: Physical activity and the permanent combined poverty indicator of 2005-2009

Sufficient physical activity 2009	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent extreme poverty_2009	**0.409*****	[0.25-0.668]	0.102	0.581	[0.271-1.243]	0.226	**0.321*****	[0.179-0.578]	0.096
Permanent moderate poverty_2009	**0.408*****	[0.283-0.589]	0.076	**0.456*****	[0.27-0.77]	0.122	**0.365*****	[0.219-0.607]	0.095
Permanent one-sided poverty_2009	0.652	[0.38-1.119]	0.18	1.181	[0.527-2.646]	0.486	**0.383*****	[0.2-0.732]	0.127
Permanent vulnerability_2009	**0.621*****	[0.471-0.817]	0.087	**0.641****	[0.425-0.967]	0.135	**0.592*****	[0.407-0.861]	0.113
Permanent fragile prosperity_2009	**0.771*****	[0.646-0.92]	0.07	0.873	[0.67-1.137]	0.118	**0.69*****	[0.545-0.873]	0.083
Low education_2009	**0.518*****	[0.415-0.648]	0.059	**0.559*****	[0.407-0.769]	0.091	**0.482*****	[0.351-0.661]	0.078
Medium education_2009	**0.744*****	[0.61-0.906]	0.075	**0.761***	[0.569-1.018]	0.113	**0.732****	[0.556-0.963]	0.103
Low occupational status_2009	**0.703*****	[0.558-0.885]	0.083	**0.707****	[0.509-0.982]	0.118	**0.662****	[0.477-0.919]	0.111
Medium occupational status_2009	**0.828****	[0.707-0.97]	0.067	**0.808***	[0.639-1.022]	0.097	0.838	[0.675-1.04]	0.092
Currently unemployed_2009	**0.75****	[0.563-1]	0.11	**0.596****	[0.389-0.913]	0.13	0.911	[0.615-1.347]	0.182
Health status_2009	**1.345*****	[1.234-1.466]	0.059	**1.299*****	[1.144-1.475]	0.084	**1.379*****	[1.227-1.549]	0.082
female	**1.258*****	[1.095-1.445]	0.089						
Age group: 17 -14_2009	**1.676*****	[1.252-2.243]	0.249	**2.142*****	[1.415-3.243]	0.453	1.276	[0.846-1.923]	0.267
Age group: 25 - 34_2009	1.152	[0.9-1.476]	0.146	**1.455***	[0.996-2.127]	0.282	0.94	[0.677-1.303]	0.157
Age group 45 -54_2009	1.051	[0.861-1.282]	0.107	1.066	[0.794-1.432]	0.16	1.036	[0.788-1.362]	0.145
Age group 55 - 65_2009	1.05	[0.834-1.322]	0.123	1.044	[0.739-1.476]	0.184	1.078	[0.79-1.47]	0.171
Single (not married)_2009	1.127	[0.915-1.388]	0.12	1.112	[0.82-1.507]	0.173	1.189	[0.889-1.59]	0.176
Divorced_2009	0.875	[0.686-1.116]	0.109	0.995	[0.686-1.444]	0.189	0.811	[0.589-1.118]	0.133
Widowed_2009	0.937	[0.562-1.565]	0.245	**0.315****	[0.123-0.807]	0.151	0.959	[0.546-1.684]	0.276
No migration background	1.186	[0.921-1.527]	0.153	0.859	[0.59-1.251]	0.165	**1.485****	[1.055-2.089]	0.259
East Germany_2009	**0.611*****	[0.517-0.722]	0.052	**0.725*****	[0.568-0.926]	0.091	**0.512*****	[0.409-0.642]	0.059
Children (0-14)/ HH_2009	1.077	[0.974-1.19]	0.055	**1.195****	[1.032-1.382]	0.089	1	[0.869-1.151]	0.072
Risk-taker_2009	**1.444*****	[1.158-1.801]	0.163	**1.434****	[1.066-1.931]	0.217	**1.393****	[1.005-1.929]	0.232
Risk-neutral_2009	**1.213*****	[1.049-1.404]	0.09	1.2	[0.963-1.496]	0.135	**1.228****	[1.01-1.494]	0.123
High Economic worries_2009	0.85	[0.683-1.057]	0.094	**0.679****	[0.491-0.938]	0.112	1.06	[0.789-1.424]	0.16
Medium Economic worries_2009	0.881	[0.742-1.047]	0.078	0.78**	[0.609-0.999]	0.098	1.004	[0.791-1.273]	0.122
Constant	0.902	[0.634-1.284]	0.163	1.15	[0.695-1.905]	0.296	0.963	[0.605-1.533]	0.228

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 80: Results of the logistic regression model: Diet and SES of 2010

Healthy diet 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES_2010	**0.653*****	[0.55-0.774]	0.057	**0.785***	[0.613-1.005]	0.099	**0.544*****	[0.432-0.685]	0.064
Medium SES_2010	**0.722*****	[0.631-0.827]	0.05	**0.689*****	[0.567-0.837]	0.069	**0.74*****	[0.611-0.897]	0.073
Household affected by unemployment2010	**0.976****	[0.957-0.995]	0.01	**0.965****	[0.935-0.995]	0.015	0.984	[0.96-1.009]	0.013
Currently unemployed_2010	1.008	[0.783-1.299]	0.13	1.134	[0.787-1.635]	0.212	0.9	[0.639-1.266]	0.157
Health status 2010	**1.123*****	[1.051-1.201]	0.038	**1.142*****	[1.032-1.264]	0.059	**1.103****	[1.011-1.204]	0.049
female	**2.599*****	[2.316-2.917]	0.153						
Age group: 17 -14_2010	**0.469*****	[0.364-0.604]	0.06	**0.456*****	[0.318-0.656]	0.084	**0.506*****	[0.359-0.713]	0.088
Age group: 25 - 34_2010	0.863	[0.704-1.059]	0.09	0.837	[0.611-1.147]	0.135	0.875	[0.669-1.143]	0.119
Age group 45 -54_2010	**1.308*****	[1.101-1.554]	0.115	**1.255***	[0.976-1.614]	0.161	**1.371*****	[1.082-1.738]	0.166
Age group 55 - 65_2010	**1.826*****	[1.505-2.215]	0.18	**1.753*****	[1.322-2.325]	0.253	**1.946*****	[1.494-2.536]	0.263
Single (not married)_2010	**1.172***	[0.977-1.406]	0.109	1.226	[0.945-1.59]	0.163	1.073	[0.836-1.377]	0.137
Divorced_2010	1.047	[0.863-1.271]	0.103	0.967	[0.714-1.309]	0.15	1.099	[0.852-1.418]	0.143
Widowed_2010	1.037	[0.681-1.581]	0.223	1.347	[0.541-3.354]	0.627	1.038	[0.646-1.668]	0.251
No migration background	1.059	[0.906-1.239]	0.085	1.037	[0.819-1.313]	0.125	1.095	[0.889-1.348]	0.116
East Germany_2010	1.029	[0.899-1.177]	0.071	1.089	[0.891-1.331]	0.111	0.969	[0.809-1.16]	0.089
Children (0-14)/ HH_2010	**1.089****	[1.004-1.181]	0.045	0.986	[0.872-1.115]	0.062	**1.194*****	[1.064-1.341]	0.07
Risk-taker_2010	**1.165***	[0.994-1.366]	0.095	1.11	[0.887-1.39]	0.127	**1.22***	[0.97-1.534]	0.142
Risk-neutral_2010	1.063	[0.936-1.207]	0.069	0.981	[0.806-1.193]	0.098	1.133	[0.959-1.339]	0.096
High Economic worries_2010	0.874	[0.737-1.038]	0.076	0.876	[0.683-1.125]	0.112	0.859	[0.674-1.093]	0.106
Medium Economic worries_2010	**0.868****	[0.754-0.999]	0.062	0.941	[0.77-1.149]	0.096	**0.801****	[0.655-0.979]	0.082
Constant	**0.545*****	[0.422-0.702]	0.071	**0.541*****	[0.374-0.783]	0.102	**1.457****	[1.051-2.019]	0.243

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 81: Results of the logistic regression model: Smoking and SES of 2010

Non-smoking 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES_2010	**0.462*****	[0.385-0.554]	0.043	**0.399*****	[0.309-0.516]	0.052	**0.537*****	[0.414-0.695]	0.071
Medium SES_2010	**0.617*****	[0.527-0.722]	0.05	**0.564*****	[0.453-0.701]	0.063	**0.69*****	[0.551-0.865]	0.079
Household affected by unemployment2010	**0.963*****	[0.947-0.979]	0.008	**0.963*****	[0.941-0.986]	0.012	**0.961*****	[0.938-0.984]	0.012
Currently unemployed_2010	0.918	[0.72-1.17]	0.114	0.941	[0.677-1.309]	0.158	0.914	[0.637-1.311]	0.168
Health status 2010	**1.206*****	[1.125-1.293]	0.043	**1.184*****	[1.076-1.304]	0.058	**1.228*****	[1.11-1.357]	0.063
female	**1.349*****	[1.194-1.524]	0.084						
Age group: 17 -14_2010	**1.476*****	[1.14-1.912]	0.195	**1.415****	[1.001-2.001]	0.25	**1.624****	[1.097-2.403]	0.325
Age group: 25 - 34_2010	0.947	[0.763-1.176]	0.105	1.019	[0.749-1.386]	0.16	0.893	[0.656-1.215]	0.141
Age group 45 -54_2010	1.033	[0.859-1.242]	0.097	1.153	[0.893-1.489]	0.15	0.929	[0.712-1.212]	0.126
Age group 55 - 65_2010	**1.589*****	[1.286-1.963]	0.171	**1.596*****	[1.19-2.141]	0.239	**1.582*****	[1.163-2.153]	0.249
Single (not married)_2010	**0.834***	[0.688-1.012]	0.082	0.912	[0.705-1.179]	0.119	**0.733****	[0.55-0.978]	0.108
Divorced_2010	**0.516*****	[0.424-0.628]	0.052	**0.516*****	[0.382-0.698]	0.079	**0.501*****	[0.386-0.651]	0.067
Widowed_2010	0.803	[0.531-1.216]	0.17	0.64	[0.251-1.63]	0.305	0.813	[0.504-1.313]	0.199
No migration background	**0.837****	[0.707-0.991]	0.072	1.033	[0.816-1.307]	0.124	**0.677*****	[0.528-0.866]	0.085
East Germany_2010	1.109	[0.965-1.274]	0.079	1.076	[0.884-1.309]	0.108	1.146	[0.943-1.394]	0.114
Children (0-14)/ HH_2010	1.054	[0.965-1.152]	0.048	1.001	[0.885-1.132]	0.063	1.111	[0.975-1.267]	0.074
Risk-taker_2010	**0.55*****	[0.465-0.65]	0.047	**0.553*****	[0.442-0.693]	0.064	**0.541*****	[0.419-0.699]	0.071
Risk-neutral_2010	**0.733*****	[0.639-0.841]	0.051	**0.753*****	[0.616-0.922]	0.078	**0.712*****	[0.59-0.859]	0.068
High Economic worries_2010	**0.673*****	[0.559-0.81]	0.064	**0.676*****	[0.523-0.873]	0.088	**0.674*****	[0.515-0.882]	0.093
Medium Economic worries_2010	**0.758*****	[0.647-0.889]	0.061	**0.725*****	[0.582-0.902]	0.081	**0.796***	[0.631-1.004]	0.094
Constant	**5.413*****	[4.081-7.18]	0.78	**4.726*****	[3.201-6.978]	0.94	**8.228*****	[5.576-12.14]	1.633

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 82: Results of the logistic regression model: Alcohol consumption and SES of 2010

Moderate alcohol consumption 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Low SES_2010	**1.82*****	[1.457-2.274]	0.207	**1.524*****	[1.164-1.996]	0.21	**3.09*****	[2.052-4.651]	0.645
Medium SES_2010	**1.588*****	[1.34-1.881]	0.137	**1.464*****	[1.189-1.802]	0.155	**1.957*****	[1.488-2.573]	0.273
Household affected by unemployment2010	1.019	[0.993-1.045]	0.013	1.02	[0.989-1.052]	0.016	1.014	[0.969-1.061]	0.023
Currently unemployed_2010	1.008	[0.724-1.405]	0.171	0.982	[0.656-1.47]	0.202	1.194	[0.688-2.073]	0.336
Health status 2010	0.942	[0.867-1.024]	0.04	0.961	[0.865-1.067]	0.051	0.917	[0.803-1.047]	0.062
female	**3.563*****	[3.033-4.184]	0.292						
Age group: 17 -14_2010	**1.577*****	[1.135-2.192]	0.265	**1.504****	[1.02-2.218]	0.298	**1.911****	[1.06-3.444]	0.574
Age group: 25 - 34_2010	1.213	[0.926-1.588]	0.167	1.254	[0.904-1.739]	0.209	1.061	[0.664-1.696]	0.254
Age group 45 -54_2010	**0.762****	[0.607-0.955]	0.088	0.905	[0.688-1.189]	0.126	**0.475*****	[0.318-0.71]	0.097
Age group 55 - 65_2010	0.832	[0.645-1.073]	0.108	0.98	[0.718-1.336]	0.155	**0.507*****	[0.328-0.784]	0.113
Single (not married)_2010	1.001	[0.791-1.266]	0.12	1.098	[0.829-1.455]	0.157	0.765	[0.509-1.151]	0.159
Divorced_2010	1.17	[0.896-1.527]	0.159	1.092	[0.776-1.538]	0.191	1.293	[0.844-1.982]	0.282
Widowed_2010	**1.697***	[0.983-2.93]	0.473	1.563	[0.664-3.68]	0.683	1.663	[0.8-3.457]	0.621
No migration background	**0.718*****	[0.565-0.912]	0.088	0.815	[0.615-1.082]	0.118	**0.511*****	[0.319-0.82]	0.123
East Germany_2010	0.996	[0.838-1.184]	0.088	0.876	[0.71-1.081]	0.094	**1.447****	[1.051-1.992]	0.236
Children (0-14)/ HH_2010	**1.158****	[1.035-1.297]	0.067	**1.169****	[1.016-1.345]	0.084	1.069	[0.895-1.276]	0.097
Risk-taker_2010	**0.757*****	[0.616-0.929]	0.079	**0.759****	[0.595-0.969]	0.095	**0.685***	[0.469-1.002]	0.133
Risk-neutral_2010	**0.821****	[0.69-0.976]	0.073	**0.756****	[0.606-0.942]	0.085	0.999	[0.758-1.318]	0.141
High Economic worries_2010	**1.234***	[0.978-1.557]	0.146	**1.298***	[0.98-1.72]	0.186	1.032	[0.691-1.541]	0.211
Medium Economic worries_2010	1.113	[0.932-1.33]	0.101	1.077	[0.867-1.338]	0.119	1.163	[0.865-1.564]	0.176
Constant	**3.269*****	[2.322-4.603]	0.571	**3.027*****	[2.024-4.528]	0.622	**16.226*****	[8.757-30.063]	5.105

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 83: Results of the logistic regression model: Physical activity and SES of 2009

Sufficient physical activity 2009	Total Sample			Male Sample			Female Sample		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Low SES_2009	**0.422*****	[0.354-0.503]	0.038	**0.458*****	[0.356-0.591]	0.059	**0.375*****	[0.293-0.478]	0.047
Medium SES_2009	**0.612*****	[0.534-0.702]	0.043	**0.593*****	[0.486-0.724]	0.06	**0.617*****	[0.512-0.744]	0.059
Household affected by unemployment2009	**0.951*****	[0.929-0.974]	0.011	**0.952****	[0.917-0.989]	0.018	**0.947*****	[0.92-0.975]	0.014
Currently unemployed_2009	0.861	[0.646-1.148]	0.126	**0.662***	[0.43-1.02]	0.146	1.125	[0.767-1.649]	0.219
Health status_2009	**1.387*****	[1.291-1.49]	0.051	**1.377*****	[1.238-1.531]	0.075	**1.391*****	[1.264-1.532]	0.068
female	**1.279*****	[1.135-1.44]	0.078						
Age group: 17 -14_2009	**1.34****	[1.044-1.719]	0.17	**1.85*****	[1.3-2.632]	0.333	0.948	[0.664-1.354]	0.172
Age group: 25 - 34_2009	**1.241****	[1.004-1.535]	0.134	**1.597*****	[1.167-2.185]	0.255	0.99	[0.741-1.322]	0.146
Age group 45 -54_2009	1.05	[0.883-1.249]	0.093	1.021	[0.792-1.315]	0.132	1.098	[0.863-1.398]	0.135
Age group 55 - 65_2009	1.109	[0.908-1.354]	0.113	0.995	[0.741-1.337]	0.15	**1.269***	[0.966-1.667]	0.177
Single (not married)_2009	1.143	[0.951-1.372]	0.107	1.064	[0.817-1.386]	0.143	**1.268***	[0.978-1.645]	0.168
Divorced_2009	**0.762*****	[0.618-0.938]	0.081	0.852	[0.61-1.19]	0.145	**0.693*****	[0.53-0.906]	0.095
Widowed_2009	0.739	[0.476-1.148]	0.166	0.741	[0.232-2.37]	0.44	0.684	[0.423-1.107]	0.168
No migration background	**1.458*****	[1.231-1.727]	0.126	1.176	[0.922-1.501]	0.146	**1.724*****	[1.363-2.18]	0.207
East Germany_2009	**0.608*****	[0.527-0.701]	0.044	**0.76****	[0.616-0.938]	0.082	**0.487*****	[0.403-0.59]	0.048
Children (0-14)/ HH_2009	0.979	[0.9-1.066]	0.042	1.041	[0.922-1.175]	0.064	0.956	[0.849-1.077]	0.058
Risk-taker_2009	**1.479*****	[1.226-1.784]	0.142	**1.468*****	[1.14-1.89]	0.189	**1.447*****	[1.092-1.919]	0.208
Risk-neutral_2009	**1.242*****	[1.094-1.41]	0.08	**1.251****	[1.035-1.513]	0.121	**1.237****	[1.041-1.469]	0.109
High Economic worries_2009	**0.775*****	[0.644-0.932]	0.073	**0.629*****	[0.481-0.822]	0.086	0.956	[0.74-1.237]	0.125
Medium Economic worries_2009	**0.832****	[0.717-0.964]	0.063	**0.74*****	[0.599-0.913]	0.08	0.936	[0.76-1.153]	0.099
Constant	**0.609*****	[0.466-0.797]	0.083	0.76	[0.52-1.111]	0.147	**0.644****	[0.451-0.922]	0.118

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 84: Results of the logistic regression model: Diet and the permanent SES of 2006-2010

Healthy diet 2010	**Total Sample**			**Male Sample**			**Female Sample**		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Permanent low SES_2010	**0.679*****	[0.566-0.814]	0.063	0.836	[0.645-1.085]	0.111	**0.559*****	[0.436-0.716]	0.071
Permanent medium SES_2010	**0.738*****	[0.641-0.849]	0.053	**0.718*****	[0.586-0.879]	0.074	**0.75*****	[0.614-0.915]	0.076
Household affected by unemployment2010	**0.975****	[0.955-0.995]	0.01	**0.961****	[0.93-0.993]	0.016	0.986	[0.961-1.013]	0.013
Currently unemployed_2010	1.063	[0.811-1.393]	0.147	1.238	[0.842-1.819]	0.243	0.907	[0.629-1.308]	0.169
Health status 2010	**1.123*****	[1.048-1.204]	0.04	**1.134****	[1.021-1.259]	0.061	**1.108****	[1.011-1.215]	0.052
female	**2.665*****	[2.366-3.001]	0.162						
Age group: 17 -14_2010	**0.48*****	[0.369-0.626]	0.065	**0.495*****	[0.34-0.719]	0.095	**0.483*****	[0.336-0.695]	0.09
Age group: 25 - 34_2010	0.846	[0.684-1.048]	0.092	0.861	[0.619-1.2]	0.146	0.809	[0.612-1.069]	0.115
Age group 45 -54_2010	**1.22****	[1.023-1.456]	0.11	1.237	[0.957-1.599]	0.162	1.22	[0.954-1.561]	0.153
Age group 55 - 65_2010	**1.684*****	[1.382-2.052]	0.17	**1.658*****	[1.241-2.215]	0.245	**1.761*****	[1.341-2.312]	0.245
Single (not married)_2010	1.109	[0.918-1.339]	0.107	1.152	[0.88-1.507]	0.158	1.048	[0.806-1.361]	0.14
Divorced_2010	1.034	[0.845-1.267]	0.107	0.979	[0.713-1.345]	0.159	1.073	[0.821-1.401]	0.146
Widowed_2010	0.937	[0.608-1.444]	0.207	0.746	[0.294-1.895]	0.355	1.024	[0.623-1.683]	0.26
No migration background	1.034	[0.878-1.217]	0.086	1.007	[0.789-1.286]	0.125	1.071	[0.862-1.331]	0.119
East Germany_2010	1.003	[0.873-1.153]	0.071	1.045	[0.848-1.287]	0.111	0.953	[0.793-1.147]	0.09
Children (0-14)/ HH_2010	**1.131*****	[1.041-1.23]	0.048	1.018	[0.899-1.154]	0.065	**1.265*****	[1.12-1.43]	0.079
Risk-taker_2010	1.142	[0.968-1.346]	0.096	1.173	[0.93-1.48]	0.139	1.116	[0.881-1.413]	0.135
Risk-neutral_2010	1.045	[0.916-1.191]	0.07	1.038	[0.846-1.272]	0.108	1.056	[0.889-1.255]	0.093
High Economic worries_2010	0.864	[0.725-1.029]	0.077	0.827	[0.642-1.066]	0.107	0.883	[0.688-1.132]	0.112
Medium Economic worries_2010	**0.853****	[0.739-0.985]	0.063	0.906	[0.739-1.112]	0.094	**0.803****	[0.654-0.988]	0.085
Constant	**0.593*****	[0.455-0.771]	0.08	**0.55*****	[0.375-0.808]	0.108	**1.687*****	[1.2-2.371]	0.293

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 85: Results of the logistic regression model: Smoking and the permanent SES of 2006-2010

Non-smoking 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**	**Odds Ratio**	**[95% CI]**	**Std. Err.**
Permanent low SES_2010	**0.426*****	[0.349-0.52]	0.043	**0.381*****	[0.289-0.503]	0.054	**0.482*****	[0.362-0.641]	0.07
Permanent medium SES_2010	**0.627*****	[0.528-0.744]	0.055	**0.595*****	[0.47-0.753]	0.072	**0.68*****	[0.532-0.869]	0.085
Household affected by unemployment2010	**0.967*****	[0.951-0.984]	0.009	**0.97****	[0.945-0.995]	0.013	**0.963*****	[0.94-0.986]	0.012
Currently unemployed_2010	0.932	[0.726-1.196]	0.119	0.938	[0.657-1.338]	0.17	0.951	[0.667-1.357]	0.173
Health status 2010	**1.197*****	[1.113-1.288]	0.045	**1.199*****	[1.084-1.327]	0.062	**1.194*****	[1.074-1.326]	0.064
female	**1.33*****	[1.171-1.51]	0.086						
Age group: 17 -14_2010	**1.536*****	[1.174-2.009]	0.21	**1.386***	[0.972-1.978]	0.251	**1.826*****	[1.203-2.772]	0.389
Age group: 25 - 34_2010	1.013	[0.805-1.274]	0.119	1.113	[0.799-1.552]	0.189	0.932	[0.674-1.287]	0.154
Age group 45 -54_2010	1.026	[0.848-1.241]	0.1	1.141	[0.875-1.488]	0.154	0.936	[0.712-1.23]	0.131
Age group 55 - 65_2010	**1.595*****	[1.283-1.984]	0.177	**1.596*****	[1.178-2.164]	0.248	**1.62*****	[1.18-2.224]	0.262
Single (not married)_2010	**0.826***	[0.676-1.009]	0.085	0.923	[0.706-1.206]	0.126	**0.704****	[0.522-0.949]	0.107
Divorced_2010	**0.529*****	[0.431-0.649]	0.055	**0.521*****	[0.38-0.716]	0.084	**0.516*****	[0.394-0.676]	0.071
Widowed_2010	0.834	[0.533-1.306]	0.191	0.595	[0.241-1.472]	0.275	0.845	[0.501-1.426]	0.226
No migration background	**0.805****	[0.675-0.96]	0.072	0.973	[0.759-1.246]	0.123	**0.664*****	[0.515-0.857]	0.086
East Germany_2010	**1.154***	[0.999-1.333]	0.085	1.133	[0.923-1.391]	0.119	1.177	[0.961-1.44]	0.121
Children (0-14)/ HH_2010	**1.088***	[0.99-1.195]	0.052	1.018	[0.894-1.16]	0.068	**1.176****	[1.022-1.354]	0.085
Risk-taker_2010	**0.514*****	[0.432-0.612]	0.046	**0.53*****	[0.418-0.671]	0.064	**0.484*****	[0.372-0.63]	0.065
Risk-neutral_2010	**0.726*****	[0.63-0.838]	0.053	**0.751*****	[0.609-0.927]	0.08	**0.705*****	[0.58-0.857]	0.07
High Economic worries_2010	**0.672*****	[0.556-0.812]	0.065	**0.663*****	[0.511-0.862]	0.089	**0.688*****	[0.523-0.904]	0.096
Medium Economic worries_2010	**0.776*****	[0.659-0.913]	0.065	**0.735*****	[0.587-0.92]	0.084	0.827	[0.652-1.049]	0.1
Constant	**5.659*****	[4.212-7.603]	0.853	**4.872*****	[3.253-7.297]	1.004	**8.483*****	[5.637-12.765]	1.769

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 86: Results of the logistic regression model: Alcohol consumption and the permanent SES of 2006-2010

Moderate alcohol consumption 2010	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent low SES_2010	**2.054*****	[1.614-2.614]	0.253	**1.834*****	[1.372-2.452]	0.271	**2.877*****	[1.828-4.528]	0.666
Permanent medium SES_2010	**1.64*****	[1.379-1.952]	0.145	**1.539*****	[1.243-1.906]	0.168	**1.937*****	[1.463-2.564]	0.277
Household affected by unemployment2010	1.013	[0.987-1.039]	0.013	1.014	[0.983-1.047]	0.016	1.005	[0.961-1.052]	0.023
Currently unemployed_2010	0.981	[0.697-1.38]	0.171	0.955	[0.629-1.449]	0.203	1.14	[0.642-2.023]	0.334
Health status 2010	0.954	[0.874-1.042]	0.043	0.985	[0.881-1.1]	0.056	0.904	[0.786-1.039]	0.064
female	**3.582*****	[3.039-4.222]	0.3						
Age group: 17 -14_2010	**1.595*****	[1.136-2.241]	0.277	**1.524****	[1.018-2.282]	0.314	**1.978****	[1.087-3.598]	0.604
Age group: 25 - 34_2010	1.262	[0.949-1.679]	0.184	1.275	[0.899-1.81]	0.228	1.174	[0.722-1.907]	0.291
Age group 45 -54_2010	**0.785****	[0.623-0.99]	0.093	0.923	[0.698-1.221]	0.132	**0.501*****	[0.332-0.755]	0.105
Age group 55 - 65_2010	0.855	[0.658-1.111]	0.114	1.004	[0.728-1.386]	0.165	**0.537*****	[0.345-0.837]	0.121
Single (not married)_2010	0.993	[0.774-1.274]	0.126	1.078	[0.799-1.455]	0.165	0.752	[0.49-1.155]	0.165
Divorced_2010	1.109	[0.841-1.464]	0.157	1.03	[0.721-1.472]	0.187	1.244	[0.796-1.945]	0.283
Widowed_2010	1.421	[0.826-2.446]	0.394	1.159	[0.526-2.556]	0.468	1.536	[0.731-3.227]	0.582
No migration background	**0.753****	[0.589-0.963]	0.094	0.867	[0.647-1.161]	0.129	**0.518*****	[0.319-0.841]	0.128
East Germany_2010	1.008	[0.845-1.202]	0.091	0.899	[0.725-1.114]	0.098	**1.397****	[1.013-1.925]	0.228
Children (0-14)/ HH_2010	**1.129****	[1.007-1.266]	0.066	**1.144***	[0.992-1.319]	0.083	1.031	[0.863-1.233]	0.094
Risk-taker_2010	**0.754*****	[0.611-0.931]	0.081	**0.748****	[0.581-0.962]	0.096	0.726	[0.494-1.067]	0.142
Risk-neutral_2010	**0.825****	[0.689-0.987]	0.075	**0.771****	[0.614-0.968]	0.09	0.963	[0.725-1.279]	0.139
High Economic worries_2010	**1.235***	[0.975-1.564]	0.149	**1.298***	[0.976-1.726]	0.189	1.042	[0.694-1.563]	0.216
Medium Economic worries_2010	1.072	[0.893-1.286]	0.1	1.02	[0.816-1.275]	0.116	1.178	[0.872-1.59]	0.18
Constant	**2.953*****	[2.075-4.201]	0.531	**2.668*****	[1.748-4.071]	0.575	**15.567*****	[8.625-28.096]	4.69

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Table A 87: Results of the logistic regression model: Physical activity and the permanent SES of 2005-2009

Sufficient physical activity 2009	Total Sample			Male Sample			Female Sample		
	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.	Odds Ratio	[95% CI]	Std. Err.
Permanent low SES_2009	**0.359*****	[0.294-0.439]	0.037	**0.439*****	[0.326-0.591]	0.067	**0.29*****	[0.221-0.381]	0.04
Permanent medium SES_2009	**0.538*****	[0.462-0.627]	0.042	**0.59*****	[0.472-0.738]	0.067	**0.485*****	[0.394-0.596]	0.051
Household affected by unemployment2009	**0.946*****	[0.921-0.972]	0.013	**0.941****	[0.897-0.986]	0.023	**0.947*****	[0.918-0.978]	0.015
Currently unemployed_2009	0.902	[0.652-1.247]	0.149	0.784	[0.471-1.303]	0.203	1.077	[0.702-1.651]	0.235
Health status_2009	**1.367*****	[1.26-1.481]	0.056	**1.312*****	[1.166-1.477]	0.079	**1.412*****	[1.266-1.576]	0.079
female	**1.25*****	[1.095-1.427]	0.084						
Age group: 17 -14_2009	**1.438*****	[1.095-1.887]	0.2	**1.89*****	[1.286-2.777]	0.371	1.077	[0.73-1.589]	0.214
Age group: 25 - 34_2009	**1.239***	[0.979-1.568]	0.149	**1.607*****	[1.128-2.289]	0.29	1.003	[0.729-1.379]	0.163
Age group 45 -54_2009	1.002	[0.828-1.212]	0.098	1.034	[0.78-1.371]	0.149	0.98	[0.753-1.275]	0.132
Age group 55 - 65_2009	1.027	[0.826-1.278]	0.114	1.044	[0.752-1.449]	0.175	1.042	[0.775-1.402]	0.158
Single (not married)_2009	1.1	[0.898-1.347]	0.114	1.081	[0.804-1.454]	0.164	1.159	[0.871-1.543]	0.169
Divorced_2009	0.862	[0.683-1.089]	0.103	0.997	[0.685-1.449]	0.19	0.786	[0.582-1.062]	0.121
Widowed_2009	0.951	[0.58-1.561]	0.24	0.872	[0.231-3.293]	0.591	0.909	[0.527-1.566]	0.252
No migration background	**1.282*****	[1.061-1.549]	0.124	1.013	[0.769-1.334]	0.142	**1.564*****	[1.203-2.035]	0.21
East Germany_2009	**0.638*****	[0.545-0.747]	0.051	**0.749****	[0.593-0.946]	0.089	**0.539*****	[0.437-0.665]	0.058
Children (0-14)/ HH_2009	0.99	[0.903-1.086]	0.047	1.116	[0.975-1.278]	0.077	0.909	[0.799-1.034]	0.06
Risk-taker_2009	**1.504*****	[1.223-1.85]	0.159	**1.542*****	[1.166-2.037]	0.219	**1.372****	[1.009-1.866]	0.215
Risk-neutral_2009	**1.319*****	[1.147-1.517]	0.094	**1.34*****	[1.085-1.654]	0.144	**1.303*****	[1.079-1.573]	0.125
High Economic worries_2009	**0.787****	[0.642-0.965]	0.082	**0.64*****	[0.475-0.863]	0.097	0.957	[0.722-1.269]	0.138
Medium Economic worries_2009	**0.852***	[0.722-1.005]	0.072	**0.758****	[0.599-0.959]	0.091	0.961	[0.761-1.214]	0.114
Constant	**0.718****	[0.532-0.969]	0.11	0.78	[0.51-1.193]	0.169	0.836	[0.563-1.243]	0.169

***. **. * denote significance level at the 1%. 5% and 10% level respectively

Appendix 8: Health lifestyles paradigm according to Cockerham

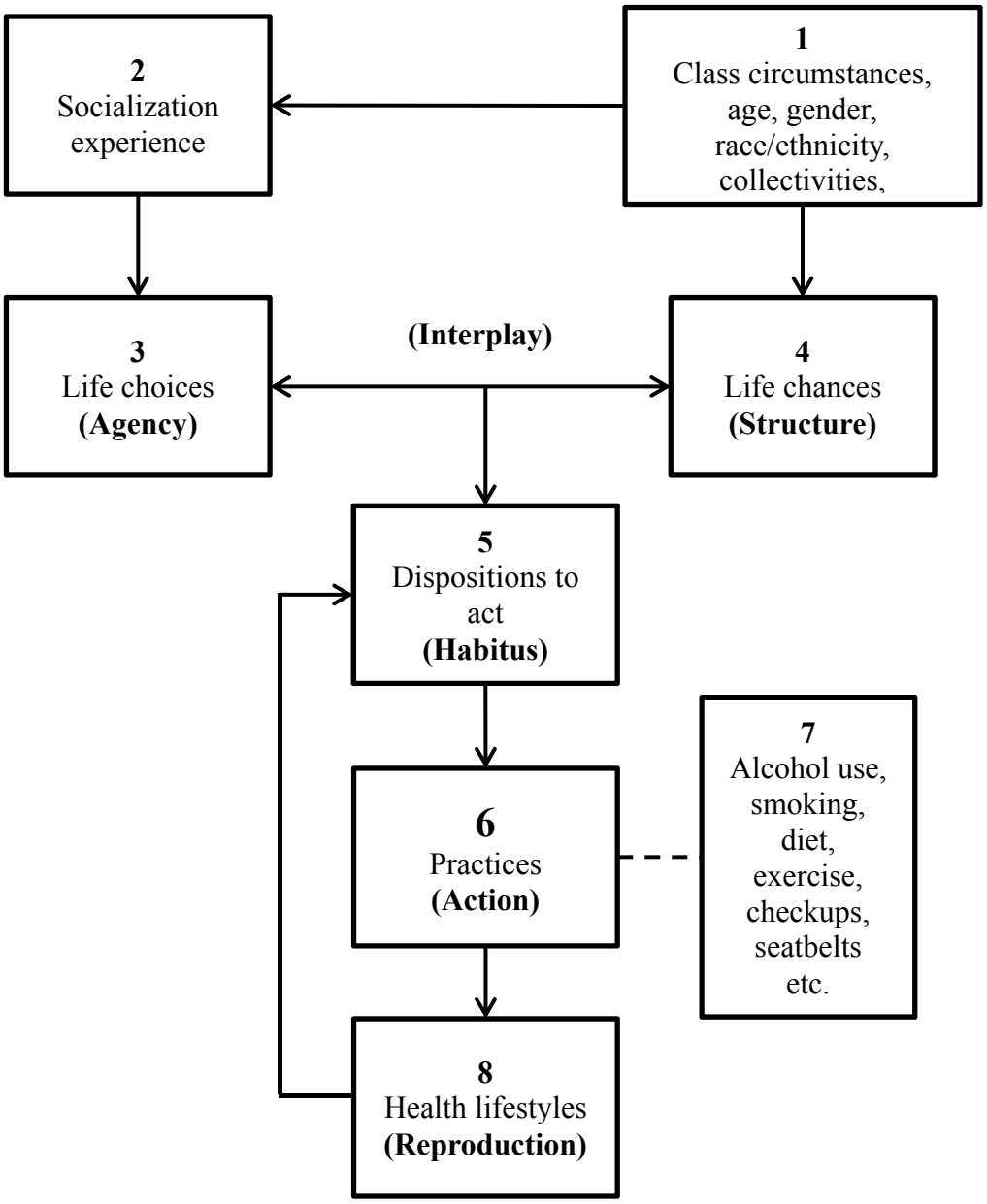

Figure A 2 Health lifestyles paradigm

Source: Cockerham 2005

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