DEPRESSIVE SYMPTOMS IN THE GENERAL POPULATION

A MULTIFACTORIAL SOCIAL APPROACH

Depressive symptoms in the general population

a multifactorial social approach

Depressieve symptomen in de algemene populatie

een multifactoriële sociale benadering

Een wetenschappelijke proeve op het gebied van de Medische Wetenschappen

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Vivian Petronella Meertens
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Promotor:	Prof. dr. P. Scheepers
Co-promotor:	Dr. B. Tax

Manuscriptcommissie:	Prof. dr. A. Felling
	Prof. dr. S. Lindenberg (Rijksuniversiteit Groningen)
	Prof. dr. P. Hodiamont (Universiteit van Tilburg)

Image & cover design:	Kitty de Vos
Proofreading & correction:	Kumar Jamdagni
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Vivian Meertens

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1 A multifactorial social approach to depressive symptoms: introducing the research problem

In the preamble of the World Health Organization (WHO) constitution, it has been stated that "mental health and mental illness is a complex phenomenon which is determined by multiple social, environmental, biological and psychological factors" (Sartorius 1993).

1.1 Introduction

The quotation in the above heading clearly indicates the importance of investigating mental disorders using different perspectives. In the last few decades, mental disorders have become an important research topic of several disciplines (Berkman & Kawachi 2000; Horwitz & Scheid 1999; Tsuang Tohen & Zahner 1995). A review of the research literature shows the scientific interest for various types of mental disorders, as well as different models and approaches for understanding its etiology (Aneshensel & Phelan 1999; Berkman & Kawachi 2000; Dohrenwend 1998; Horwitz & Scheid 1999).

In this study, we will examine depressive symptoms using *a multifactorial social approach*. Accordingly in this chapter, we explicate several arguments that demonstrate how important it is to examine social determinants of mental disorders in general, and depressive symptoms in particular. These arguments are derived from previous research findings, several research traditions, and different perspectives and disciplines.

A key point concerns the variety of mental disorders that exists and the specific disciplines that investigate their etiological factors. A discipline such as psychiatry tends to emphasise severe pathologies that have a powerful genetic etiology, such as schizophrenia and bipolar affective disorders. Psychology on the other hand, places relatively more emphasis on cognitive styles, personal identities, and socialisation processes, which may induce disorders such as anti-social personality and substance abuse. In addition, disciplines like medical science and biology focus on the genetic and neuro-chemical factors of mental disorders, such as major depression, manic episodes, psychosis, schizophrenia and dementia. In general, these disciplines use a *bio-medical perspectiv*e *of mental disorders*: they start with a particular disorder and work back to a broad range of potential genetic, neurological, bio-chemical, and cognitive causes (Horwitz & Scheid 1999; De Jong Ormel van den Brink & Wiersma 1999). Furthermore, these disciplines identify and diagnose individual cases in need of treatment and consequently, evaluate therapeutic practice and pharmaceutical drug therapies.

Other disciplines, such as social epidemiology and sociology, assess the distribution of various mental disorders in the general population in order to identify social etiological factors, i.e., specific high risk social categories that suffer more from particular types of mental disorders. Previous epidemiological studies have shown that the risk of suffering from severe mental disorders, such as schizophrenia, manic-depressive disorder, dementia, and anti-social personality, shows a rather non-systematic pattern in general society. This means that people from all social classes are equally prone to suffering from these severe mental disorders (Horwitz & Scheid 1999). It has been suggested that psychological, genetic, and biological features are quite important etiological factors regarding these types of severe mental disorders, and that these

typical mental disorders seemed to be triggered independently of people's positions (Horwitz & Scheid 1999). For this reason, in this study we will not be focussing on these severe mental disorders.

An argument that demonstrates the importance of studying depressive symptoms using a *multifactorial social approach,* can be derived from existing research findings. Epidemiological studies based on samples of the general population, particular subgroups, and primary care settings, have consistently demonstrated statistical associations between people's positions and depressive symptoms, anxiety, psychological distress, and alcohol abuse (Berkman & Kawachi 2000; Horwitz & Scheid 1999). It appeared that various indicators of disadvantaged positions could be linked to these aspects of mental disorders. Empirical studies have shown that suffering from depressive symptoms can be associated with people's positions such as economic position, marital status, religious denomination, geographic area, as well as with life style differences, physical health, medicine use, and help seeking behaviour (Aneshensel & Phelan 1999; Brown & Harris 1978; Koenig 1997; Tausig Michello & Subedi 1999). These empirical findings indicate the importance of a 'social etiology' of mental disorders, i.e., understanding more profoundly the social risk factors of depressive symptoms in society.

A quite central aspect that clarifies the choice for depressive symptoms is the fact that the relationship with several social categories appeared to be essential with respect to this particular type of mental disorder. In several handbooks, a fundamental discussion is described that stresses the importance of emphasising one specific type of mental disorder in order to identify specific causes and consequences, based on a specific biological, psychological, epidemiological or sociological approach (Aneshensel & Phelan 1999; Horwitz & Scheid 1999). It has been stated that sociologists should focus on aspects of mental disorders, that are likely to have a powerful 'social etiology' (Aneshensel & Phelan 1999; Tausig et al. 1999; Thoits 1999). And, to reach a useful comparison of the negative psychological impact of several positions, a sociological study should include mental disorders such as depressive symptoms, anxiety or substance abuse, which characterise the likely response of all social groups under consideration, i.e., the complete general population. People who suffer from severe mental disorders such as schizophrenia, manic episodes, dementia, and major depressive disorder, are less suitable in a study that uses large-scale data from the general population. These mental disorders have relatively low prevalence rates in general society, compared to the prevalence of mental disorders such as anxiety, depressive symptoms, social phobia, and alcohol abuse (Bijl Ravelli & van Zessen 1998a, 1998b; Sartorius 1993). Also, information about people who suffer from such severe mental disorders is rather difficult to obtain in samples of the general population when using survey research methods (Dohrenwend Egri & Mendelsohn 1971). Therefore, a more specific type of mental disorders - like *depressive symptoms* - is 'best' suitable in research of the general population since these symptoms may reflect the consequences of people's positions, and substantially vary among different social groups (Aneshensel & Phelan 1999; Brown & Harris 1978; Dohrenwend Shrout Egri & Mendelsohn 1980; Mirowsky & Ross 1989; Pearlin 1989).

An additional aspect that has awakened the scientific interest for depressive symptoms is its relatively high prevalence in the general population. Population-based studies have shown that depressive symptoms are, among all aspects of mental disorders, the most prevalent type of mental disorder in the Netherlands and in other European countries, as well as in the United States. Current estimates show that between 10 and 20 percent of the people in the general adult population experience depressive symptoms at some point in their lives (Beaudet 1996; Bijl et al.

1998a, 1998b; Garssen & Hoeymans 2002; Kessler Zhao Blazer & Swartz 1997). This relatively high prevalence of depressive symptoms in the general population compared to other types of mental disorders obviously demonstrates the societal relevance for studying and understanding differences among people suffering from depressive symptoms. In addition, the relation between depressive symptoms and a clinical diagnosis of major depression according to the Diagnostic Statistical Manual of Mental Disorders, fourth Edition (DSM-IV) (American Psychiatric Association (APA) 1994) appeared to be substantial. Studies have shown that people suffering from depressive symptoms are 4.4 times more likely to develop first-onset major depression during a one-year period (Horwath Johnson Klerman & Weissman 1992). This association between depressive symptoms and first-onset of major depression in the general population highlights the importance of studying depressive symptoms in general society from a public health perspective (Weich 1997). Since people in general society who suffer from depressive symptoms are not always recognised in clinical practice and the primary care setting, it might be stated that the identification of social risk factors of depressive symptoms could have implications for the prevention of major depression and the development of effective treatments in the general population (Hodiamont et al. 1986; Ormel & van den Brink 1992). These arguments further underline the societal relevance of studying depressive symptoms in the general population, using a multifactorial social approach.

Another essential point for studying depressive symptoms concerns the developments in sociological theory and methodology that have been taken place over the last century, based on the classical work of Durkheim (1897/1951) (Aneshensel & Phelan 1999; Braam 1999a; Thoits 1999). Durkheim was one of the first sociologists to demonstrate clear empirical evidence for a 'social etiology' of mental disorders, i.e., the impact of the social structure of society, such as the level of social integration and type of religious denomination on suicide. Even today, Durkheim's theoretical elements and empirical evidence emphasise the importance of studying people's positions in society in relation with suffering from depressive symptoms and suicide, as many studies have demonstrated (Faupel Kowalski & Starr 1987; Koenig 1997; Kposowa 2001; Stack 1990; Ventis 1995). Furthermore, consistent empirical evidence has shown that suffering from depressive symptoms is a high risk factor in predicting suicide (Blair-West Cantor Mellsop & Eyeson-Annan 1999; Malone Hass Sweeney & Mann 1995). The challenge of this study to contribute to a sociological understanding of depressive symptoms lies precisely within this parallel between depressive symptoms and suicide, both being important aspects of mental disorders.

Consequently, for reasons of consistency and comparability with much of contemporary research on the 'social etiology' of mental disorders, in this study we will focus on depressive symptoms (Aneshensel & Phelan 1999; Horwitz & Scheid 1999; Mirowsky & Ross 1989; Tausig et al. 1999). These symptoms may reflect the mental consequences due to people's positions (Aneshensel & Phelan 1999; Horwitz & Scheid 1999). Although co-morbidity of depressive symptoms and anxiety has been frequently emphasised, most studies on the mental effects of people's positions have focused more intensively on depressive symptoms than on anxiety symptoms (Horwath & Weissman 1995; Mirowsky & Ross 1983). Probably, people's positions are more likely to cause effects that trigger depressive symptoms than they are to cause anxiety-provoking fear.

To summarise then, the main objective of this study is to contribute to a better understanding of suffering from *depressive symptoms.* Since suffering from depressive symptoms

is a sensitive psychological barometer of strains in many areas of social life, they can be linked with disadvantaged positions in the system of social stratification and social integration, like work, family, church, social networks and neighbourhoods (Aneshensel 1992; Brown & Harris 1978; Durkheim 1897/1951; Mirowsky & Ross 1989; Thoits 1999). Accordingly, building on previous empirical results and sociological theories, we aim in this study to contribute to broader theoretical insights and empirical evidence of the impact of micro- and macro- circumstances on suffering from depressive symptoms in the general population.

1.2 A multifactorial social approach

Research on depressive symptoms has been strongly influenced by the conceptual and empirical work of Brown and Harris (1978). Their pioneering work on the social origins of depression has demonstrated that suffering from depressive symptoms notably depends on people's positions in society. Based on representative community data, these sociologists showed that various social factors, such as marriage and church membership act as vulnerability factors that induce suffering from depressive symptoms. They also showed that stressors that represent a situation of loss, threat of loss or long-term difficulty induce depressive symptoms (Brown & Harris 1978). This elementary work on the social etiology of depressive symptoms has influenced many other studies that have investigated the association between people's positions in society and suffering from depressive symptoms.

With respect to this social approach, the state of the art in this research field has recently been extensively reviewed in several handbooks (Aneshensel & Phelan 1999; Berkman & Kawachi 2000; Horwitz & Scheid 1999; Mirowsky & Ross 1989; Tausig et al. 1999). Many studies have focused on the relation between socio-economic factors and depressive symptoms (Kessler 1982; Ortega & Corzine 1990). Socio-economic factors can be related to socio-economic inequality, disadvantaged positions, and lack of material opportunities, - factors that actually refer to sociological research on social stratification (Blau & Duncan 1967; Ganzeboom Treiman & Ultee 1991). Based on this research tradition, many empirical studies have shown the relation between lower socio-economic status and depressive symptoms (see for example Fryers Melzer & Jenkins 2003; Kessler & Clearly 1980; Ortega & Corzine 1990; Ross & Wu 1995). Furthermore, factors such as social isolation and social support are associated with depressive symptoms. Research has compellingly shown that an absence of social relationships and a lack of social support induce vulnerability to depressive symptoms (House Landis & Umberson 1988b; Hughes & Gove 1981; Turner & Marino 1994). With respect to cultural factors, numerous studies have documented the influence of a lack of religious affiliation and religious involvement on depressive symptoms (Braam 1999a; Koenig 1997; Ventis 1995). Both social and cultural factors elaborate on a research tradition that actually has its origin in Durkheim's theory on suicide (Durkheim 1897/1951).

Although each of these separate research traditions on 'structural strain theory' (Thoits 1999) has generated a number of insights into the relationships between people's differences in particular positions and depressive symptoms, in general, no cross-references between these traditions have been consistently made (House 2002; Mirowsky & Ross 1989; Thoits 1999). This would imply that no advantage has been taken of theoretical insights or empirical evidence of studies which have emphasised various social determinants of depressive symptoms. Research in each of these traditions has failed to control, systematically, for a number of social factors that might show what the decisive social determinants of depressive symptoms are.

Theoretical syntheses and methodological improvements need to be made by applying *a multi-factorial social approach on depressive symptoms.* In such an approach, a synthesis of several research traditions that theoretically elaborate on various aspects of people's positions that might induce depressive symptoms will be established and tested simultaneously. The incorporation of a multifactorial element into a social approach of depressive symptoms seems to be fruitful and imperative for establishing a theoretical framework. And, such a perspective promotes a profound empirical design whereby various aspects of people's positions are tested simultaneously, which might show what the decisive social determinants of suffering from depressive symptoms in the general population are (House 2002; Mirowsky & Ross 1989; Thoits 1999).

Consequently, a crucial contribution of this study is to make *theoretical progress* using an integrated theoretical framework. Social Production Function Theory (SPF-theory) (Ormel Lindenberg Steverink & Vonkhorff 1997; Ormel Lindenberg Steverink & Verbrugge 1999) provides such a theoretical framework that stands for a social approach to mental disorders. This theoretical framework offers possibilities to systematically elaborate on the association between differences in specific people's positions and psychological well-being (or a lack of it), i.e., suffering from depressive symptoms. As people's positions can be considered as levels of economic, social and cultural resources, subsequently, we elaborate on the association between people's levels of resources and depressive symptoms. We hypothesise on people's specific positions and conditions that may account for differences in suffering from depressive symptoms in the general population.

Furthermore, in this study, we aim to contribute to a social approach on depressive symptoms, testing hypotheses simultaneously, using multivariate analyses based on large-scale data, representative of the general population. Unfortunately, in the Netherlands, most existing studies have focused on sampled data from specific sub-populations such as the elderly, adolescents, samples of institutionalised people, or samples from high-risk groups, such as the unemployed or divorced women (Braam 1999a; Bracke 1998; Fokkema & Dykstra 2001; Ruiter Veltman & Hosman 1998; Van Ekkel 2000). Despite the importance of these studies, data from these specific sub-samples do not allow any generalisation to the general society. Only one Dutch study (NEMESIS) employed a representative sample of the adult general population (Bijl et al. 1998a, 1998b). However, this study focused mainly on prevalence rates and co-morbidity numbers and used bi-variate analyses to describe which socio-demographic categories are more vulnerable to several types of mental disorders and to show specific help seeking behaviour (Bijl et al. 1998a, 1998b).

Accordingly, in this study, we will aim to improve upon previous research, making *empirical* and *methodological progress,* using an appropriate and strong research design that is based on the use of large-scale representative data from the general adult population. Consequently, we will employ several cross-sectional datasets based on representative samples of the national Dutch population of the Netherlands aged between 18 and 75 years (several years of the Cultural Changes surveys collected by the Social and Cultural Planning Office (SCP); Becker 1997). Also, we use a large-scale survey of the general population aged between 18 and 75, conducted in a region in the eastern part of the Netherlands (Nijmegen Health Area project (NHA-2 study); König-Zahn Furer & Tax 1999). Based on these two types of large-scale representative data from the general population, i.e., national and regional data, it is possible to test a multifactorial social approach on depressive symptoms more profoundly.

Applying several techniques of multivariate analyses might show which particular positions affect depressive symptoms if we are able to control systematically for a number of other social indicators.

1.3 Theoretical framework and propositions

One major advantage of this study is that we will make theoretical progress by developing a theoretical framework that explicitly accounts for and synthesises previous theoretical approaches and empirical findings of several research traditions on depressive symptoms. Social Production Function Theory (SPF-theory) (Ormel et al. 1997, 1999) provides such a theoretical framework that stands for a a multifactorial social approach on depressive symptoms since this framework synthesise several research traditions that theoretically elaborate on associations between several aspects of people's positions and depressive symptoms. As these positions can be considered as levels of resources, subsequently, we theoretically elaborate on the association between people's levels of resources and suffering from depressive symptoms. SPF-theory views humans as actively attaining their ultimate goal of 'psychological well-being', using different resources to fulfil instrumental goals and universal needs. SPF-theory assumes a hierarchy in reaching this ultimate goal. At the lowest level, social, economic and cultural resources (such as having an intimate relationship, money, knowledge, a comfortable home) are important. These resources are needed at a second level to fulfil instrumental goals such as status attainment, behavioural confirmation, affection, stimulation, and internal and external comfort. At a higher level, these resources contribute to the fulfilment of the universal needs of social and physical well-being, which in turn contribute to fulfilling the ultimate goal of psychological well-being (Ormel et al. 1997, 1999).

As is stated in SPF-theory (Ormel et al. 1997, 1999), when important goals are not met due to low –or lower– levels of resources, people are not able to fulfil goals of status attainment, behavioural confirmation or affection sufficiently, and will consequently achieve less social well-being. This, in turn, will reduce people's psychological well-being, which eventually might induce suffering from depressive symptoms. Since we consider depressive symptoms indicative of a lack of psychological well-being, these theoretical notions about the effects of low - or lower - levels of resources may be a fruitful theoretical approach for explaining differences in people's positions and suffering from depressive symptoms of people in the general population. In this study, we will focus on a broad range of levels of resources such as economic resources (education, socio-economic class, income), social resources (marital status, social network) and cultural resources (religious affiliation, church attendance). Accordingly, based on SPF-theory, we state as a first general proposition: *lower levels of economic, social, and cultural resources induce suffering from depressive symptoms.*

1.3.1 A static and a dynamic perspective

In addition to current positions, depressive symptoms may also be associated with dynamic positions (George 1993). The importance of taking a dynamic perspective on depressive symptoms in addition to a static perspective on depressive symptoms, has already been shown in previous research on life change events and health (Brown Harris & Peto 1973; Holmes & Masuda 1974; Paykel 1978; Rabkin & Streuning 1976). Life change events are brief periods that mark a transition in people's positions. They include life transitions such as getting married, getting divorced, having children, becoming jobless, moving home, becoming physically ill, as

well as losing a partner or a close friend. Life change events require people to adapt and readjust their activities, opportunities, positions and social relations.

A great amount of studies have shown a significant relationship between the number of life change events that people experienced and the onset of depressive symptoms and anxiety (Paykel 1978; Tausig 1982; Thoits 1983). These studies, which used cumulation indexes of several types of events, have been frequently criticised (Dohrenwend 1973; Ross & Mirowsky 1979; Tausig 1982; Thoits 1983). The main criticisms concern the fact that these indexes are conceptually unclear and that they add quite different aspects of life events together, i.e., both positive and negative events. Additionally, researchers found that when events were divided into desirable (positive) and undesirable (negative) types, undesirable events were more strongly associated with depressive symptoms and other psychological problems than desirable positive events were (Brown & Harris 1978; Dohrenwend & Shrout 1985; Ross & Mirowsky 1979; Tausig 1982). Undesirable life change events increase feelings of helplessness and powerlessness and are most detrimental to psychological well-being and consequently induce depressive symptoms (Ross & Mirowsky 1979; Mirowsky & Ross 1989).

More recently, in the literature on life change events, the distinction between random stressors and systematic stressors has been frequently made (Pearlin Morton Lieberman Menaghan & Mullan 1981; Thoits 1983). This conceptual reorientation of social stress and life change events is relevant when trying to understand the 'social etiology' of depressive symptoms. Random stressors are not imbedded in people's positions: these life changes occur with equal probabilities across all social groups. Random stressors are important only as predictors of overall risks of suffering from depressive symptoms: they do not help to explain the links between particular positions and suffering from depressive symptoms. Systematic social stressors, however, are relevant in understanding the relationship between several indicators of people's positions and suffering from depressive symptoms. Consequently, when both approaches of life change events, i.e., the distinction between positive and negative life change events, and the distinction between random and systematic social stressors are synthesised, one might state that undesirable negative life change events can be considered as systematic stressors that mark transitions that worsen positions. Dohrenwend (1973, 1985) called these 'status loss events', i.e., life change events that mark a transition to positions of lower status, for example from employed to unemployed, from married to divorced. More in general, SPF-theory (Ormel et al. 1997, 1999) suggests that some of these changes represent a decrease in income, power, affection, or prestige. In terms of SPF-theory, it is not the life change event per se that is important, but what the change signifies in terms of losses or decreases in levels of resources.

Unfortunately, much research into life change events has failed in theorising the unequal distribution of negative life change events and the crucial importance on suffering from depressive symptoms in the general population. Nevertheless, Thoits (1995) has stressed the importance of examining theoretically relevant subsets of life change events and has studied some particular events in combination. This approach acknowledges the heterogeneity and homogeneity of particular life change events and their impact on mental disorders, i.e., depressive symptoms.

Accordingly, in this study, based on the theoretical framework of SPF-theory, *a dynamic perspective on depressive symptoms* is incorporated that proposes that undesirable negative life change events mark transitions to lower positions, and are associated with decreasing levels of resources (Lin & Ensel 1989). Hence, a crucial extension is made, which proposes that the inability to fulfil the ultimate goal of psychological well-being can be related to decreasing levels

of economic, social and/or cultural resources. People may have experienced a change in their lives that involved a disturbance in their levels of resources at that time. These decreasing resources may lead to an inability to fulfil instrumental goals which may consequently push people to a lower level of psychological well-being. SPF-theory suggests that people will compensate for decreasing levels of resources by seeking additional resources or by substituting resources to improve or maintain their level of psychological well-being (Nieboer 1997; Ormel et al. 1997, 1999). This possibility of substituting or using alternative resources will lead to the fulfilment of universal needs and these resources will, ultimately, contribute to psychological well-being.

However, according to inequalities of society, some people may experience more disturbance in their levels of resources and where they possess fewer resources, fewer advantages and opportunities, they are less able to solve or substitute these decreasing levels of resources, compared with other people. Moreover, some life change events can lead to decreasing levels of resources, that are so severe and have such serious consequences that there is no chance to substitute or to use alternative resources. Consequently, these changes will reduce psychological well-being and induce depressive symptoms (Nieboer 1997; Ormel et al. 1997, 1999).

In addition, many studies on life change events have focused on predicting, rather than explaning the processes through which life change events affect people who are lacking psychological well-being, i.e., suffering from depressive symptoms (George 1993; Thoits 1995). As a result, little attention has been paid to the episode during which the life change event took place, and the time lag between the occurrence of an event and its consequences (George 1993). However, the episode during which a negative life change event affected people's levels of resources appeared to be important. If a person becomes unemployed, this leads to a decrease in economic resources, the event itself is distressing and the risk of suffering from depressive symptoms will be increased. However, if the person remains unemployed for a prolonged episode this might lead to a reduction in the distressing effect as a result of adapting to the new situation (Holmes & Masuda 1974). Thus, a recent decrease in resources affects the level of psychological well-being more severely than a less recent decrease. In the intervening period, people might have compensated or substituted for their decreasing resources.

Accordingly, in this study, we made a contribution and extension of the theoretical framework of SPF- theory by applying a dynamic perspective. Consequently, we state as a second general proposition: *decreasing levels of economic, social, and cultural resources induce suffering from depressive symptoms, where a recent decrease induces suffering from depressive symptoms more severely than a less recent decrease.*

1.3.2 A contextual perspective

The theoretical framework of SPF-theory is rather individualistic, i.e., it focuses primarily on the impact of lower levels of resources at the individual level. However, suffering from depressive symptoms may, in addition to being associated with people's positions, also be associated with contextual conditions (Jacobson 1989). Previous research has explored variations in suffering from depressive symptoms due to living in different social contexts, research that is actually based on Faris' and Dunham's (1939) pioneering work on mental disorders in urban areas. Results have shown that conditions of the local social environment, i.e., the neighbourhood, can be related to depressive symptoms (Aneshensel & Sucoff 1996; Macintyre MacIver & Sooman 1993; Ross 2000). Based on this contextual approach, many studies have emphasised associations

between socio-economic features of the social context and several aspects of mental disorders and physical illness (Dooley Catalano & Rook 1988; Pickett & Pearl 2001; Robert 1999). Based on Durkheim (1897/1951), a number of studies have focused on the religious climate and the relation with suicide rates and depressive symptoms (Braam et al. 1999b; Ellison Burr McCall 1997; Faupel et al. 1987; Pescosolido 1990). More recently, social capital as a contextual characteristic has been introduced as an important factor for mental and physical health differences that were found between geographic areas, neighbourhoods and cities (Kawachi Kennedy & Glass 1999; Kawachi & Berkman 2001; McKenzie Whitley & Weich 2002). Presumably, contextual conditions might also be decisive determinants of depressive symptoms in the general population.

However, until now, extensive theoretical and empirical research in the Netherlands using the social context has been lacking. Therefore, our challenge in this study is to enhance previous research by making progress through the exploration of the impact of the social context on depressive symptoms in the general population. We aim to contribute to a theoretical model that synthesises several contextual features and their impact on suffering from depressive symptoms, in addition to people's positions. Since the social context contains resources that might contribute to attaining the ultimate goal of psychological well-being, conversely, lower levels of contextual resources may induce feelings of insecurity, dissatisfaction, and hopelessness, which might damage people's psychological well-being and consequently, induce suffering from depressive symptoms. Elaboration of this contextual perspective in this study might bring about more understanding about the contextual conditions under which people suffer from depressive symptoms.

Moreover, some previous research on the relation between the social context and depressive symptoms based its results on aggregated data. They showed correlations between on the one hand geographic areas, neighbourhoods, and cities, and on the other hand, depressive symptoms, suicide rates and physical health outcomes (Dooley et al. 1988; Durkheim 1897/1951; Gove & Hughes 1980; Kawachi et al. 1999). Although, these studies have provided valuable information on the variations between social contexts and depressive symptoms, they have neglected compositional and individual differences between these contextual areas.

However, in recent years, a number of studies have been performing multilevel analysis (Braam et al. 1999b; Pickett & Pearl 2001; Ross 2000). This method incorporates some methodological advantages that offer possibilities to examine more appropriately, the effects of contextual characteristics on aspects of mental disorders, adjusting for individual characteristics (Bryk & Raudenbusch 1992; Snijders & Bosker 1999, p.13-15). In this study, therefore, we also aim to make empirical progress, to improve upon previous research by taking into account, simultaneously, individual-level and contextual-level characteristics in one research design using multilevel analysis.

Consequently, we will incorporate *a contextual perspective on depressive symptoms* into the theoretical framework of SPF-theory, and formulate a more specific proposition about contextual resources and suffering from depressive symptoms. The social context in which people live can be indicated using various types of social surroundings like the society, a geographic area, the city, the neighbourhood, or even the street. Previous studies have shown that conditions of the local social environment, i.e., the neighbourhood, can be related to depressive symptoms (Aneshensel & Sucoff 1996; Macintyre et al. 1993; Silver Mulvey & Swanson 2002; Ross 2000). In this study we use the neighbourhood as an indicator of the social context people live in, as neighbourhoods are considered as rather socio-culturally homogenous areas reflecting 'real'

communities (Reijneveld Verheij & Bakker 2000; Ross 2000; Sooman & Macintryre 1995). Previous research has shown that people are likely to be affected by their daily experiences and the facing of threatening or disadvantaged neighbourhood conditions that have an influence on their psychological well-being and, consequently, induce depressive symptoms. Therefore, most studies have focused on the neighbourhood as a valid indicator of the social context. Various characteristics of the neighbourhood can contribute to understanding the influence of the social context on depressive symptoms. We will elaborate on levels of resources in the neighbourhood and their impact on suffering from depressive symptoms, in addition to people's levels of resources. Elaboration on this contextual perspective might produce more understanding about the effects of of people's positions and contextual conditions on suffering from depressive symptoms. We state as a third general proposition then: *lower levels of economic, social, and cultural resources of the neighbourhood induce suffering from depressive symptoms.*

Moreover, in most studies, contextual effects and mental disorders were analysed in relation to static conditions of the social context. Just as these contemporary levels of contextual resources may affect depressive symptoms, changes in these contextual resources may also provoke depressive symptoms (George 1993). Previous epidemiological research has suggested that an increase in economic deprivation or social isolation in society, the urban area, the neighbourhood or other social surroundings, affects aspects of physical health and psychological well-being, and influences the risk of suicide (Boyle Gatrell & Duke-Williams 2001; Brenner & Mooney 1983; Dooley & Catalano 1980; Ross & Reynolds 2000; Tausig & Fenwick 1999). Presumably, changes in contextual conditions might also be decisive determinants to induce depressive symptoms in the general population, in addition to static conditions. A deterioration in the conditions of the neighbourhood, i.e., decreasing levels of contextual resources, might increase feelings of insecurity, anomie, isolation, and hopelessness, and consequently induce depressive symptoms (Boyle et al. 2001; Dooley & Catalano 1980; Ross & Reynolds 2000). Consequently, based on SPF- theory, we state as a fourth general proposition: *decreasing levels of economic, social and cultural resources of the neighbourhood induce suffering from depressive symptoms.*

1.3.3 A longitudinal perspective

In public debate, it is often suggested that in recent decades rates of depressive symptoms have sharply increased, since it is considered as a "disease of modernisation" (Elsevier 1999; Sartorius 1993). In support of this popular view, longitudinal research in the United States has shown evidence for a continuous increase in the rates of major depression since the Second World War, a steady increase in the period between 1960 and 1980 for all age categories, and a decrease in the age of onset for all birth cohorts (Klerman & Weissman 1989; Wickramaratne Weissman Leaf & Holford 1989). Other longitudinal studies in Canada, Great Britain, Finland, and New Zealand showed mixed results of over-time variations in rates of depressive symptoms: a steady increase in depressive symptoms over time, stable rates, and some research showed short-term fluctuations in the 1980s and 1990s. In addition, some cohort effects have been reported: people born between 1930 and 1940 and between 1966 and 1975 have, on average, higher rates of depressive symptoms (Hagnell Lanke Rorsman & Ösesjö 1982; Joyce Oakley-Browne Wells Bushnell & Hornblow 1990; Lehtinen Lindholm Veijola Väisänen & Puukka 1991; Murphy Laird Monson Sobol & Leighton 2000; Paykel 2000; Sacker & Wiggins 2002; Wickramaratne et al. 1989). Unfortunately, up till now in the Netherlands, no valid empirical evidence has been presented for

the longitudinal trend in depressive symptoms, due to a lack of systematic longitudinal research (Garssen & Hoeymans 2002; Van den Berg & van der Wulp 1999).

An appropriate way to gain more general insights in the over-time variations in depressive symptoms, is by means of a similar measurement of depressive symptoms applied in representative large-scale samples of the general population that covers a relatively large period. Fortunately, we found longitudinal data based on representative samples of the national population of the Netherlands, in which depressive symptoms had been recorded over a period of more than two decades using a similar measurement (surveys of Cultural Changes project 1975-1996; Social and Cultural Planning Office (SCP), Becker 1997). These representative large-scale data from repeated cross-national surveys offer a possibility to fill lacunas in empirical research on the longitudinal trend of depressive symptoms in the general adult population of the Netherlands.

Furthermore, previous longitudinal research on mental disorders has suggested that temporal rate changes may be sensitive to fundamental social changes in society. Several scholars have argued that a longitudinal trend of depressive symptoms in the general population may be associated with changes in the economic climate, such as changing unemployment rates, shifts in occupational patterns, and growing participation of women in the labour market (Dooley & Catalano 1980; Klerman & Weissman 1988; Murphy 1986). Others have suggested that demographic developments such as changes in family structures, an increase in the number of single-parent families, more geographic mobility, as well as cultural processes like secularisation and increased migration, might contribute to temporal changes in rates of depressive symptoms (Braam 1999a; Crawford & Prince 1999; Klerman & Weisman 1988, 1989; Koenig 1997).

However, previous longitudinal research on depressive symptoms has been mainly descriptive: theoretical implications about the relevance of social changes in society in explaining over-time variations in depressive symptoms have been less common (Kessler & McRae 1981; Klerman & Weissman 1989). For these reasons, several studies summarised in their concluding lines: 'further research on social structural risk factors related to changing trends of depressive symptoms is worthwhile' (see for example Murphy 1986, p. 126).

Consequently, our study sets out to explore the relationship between levels of individual and contextual resources and depressive symptoms in the general population over time more systematically. Based on *a longitudinal perspective on depressive symptoms*, we will elaborate on SPF-theory to derive testable hypotheses on over-time changes in people's individual positions and national (i.e., period and cohort effects) conditions and suffering from depressive symptoms in the general Dutch population. Consequently, based on SPF-theory, we state as a fifth general proposition: *lower and changing levels of individual and national economic, social, and cultural resources induce suffering from depressive symptoms over time.*

1.3.4 An explanatory perspective

Previous studies have focused on the mechanisms behind the association between positions and depressive symptoms. Based on traditions like 'stress theory', as well as on aspects of 'cognitive psychology theory', much research has focused on a range of psychological factors, that may affect depressive symptoms directly or mediate the relationship between specific social categories, distress and depressive symptoms (Cohen & Wills 1985; Landau 1995; Lazarus 1966). Certain psychological traits such as locus of control, coping abilities, mastery, self-efficacy and

self-esteem may act as a buffer in the presence of distress, to overcome depressive symptoms (Cohen & Wills 1985; Landau 1995; Lazarus 1966; Pearlin & Schooler 1978).

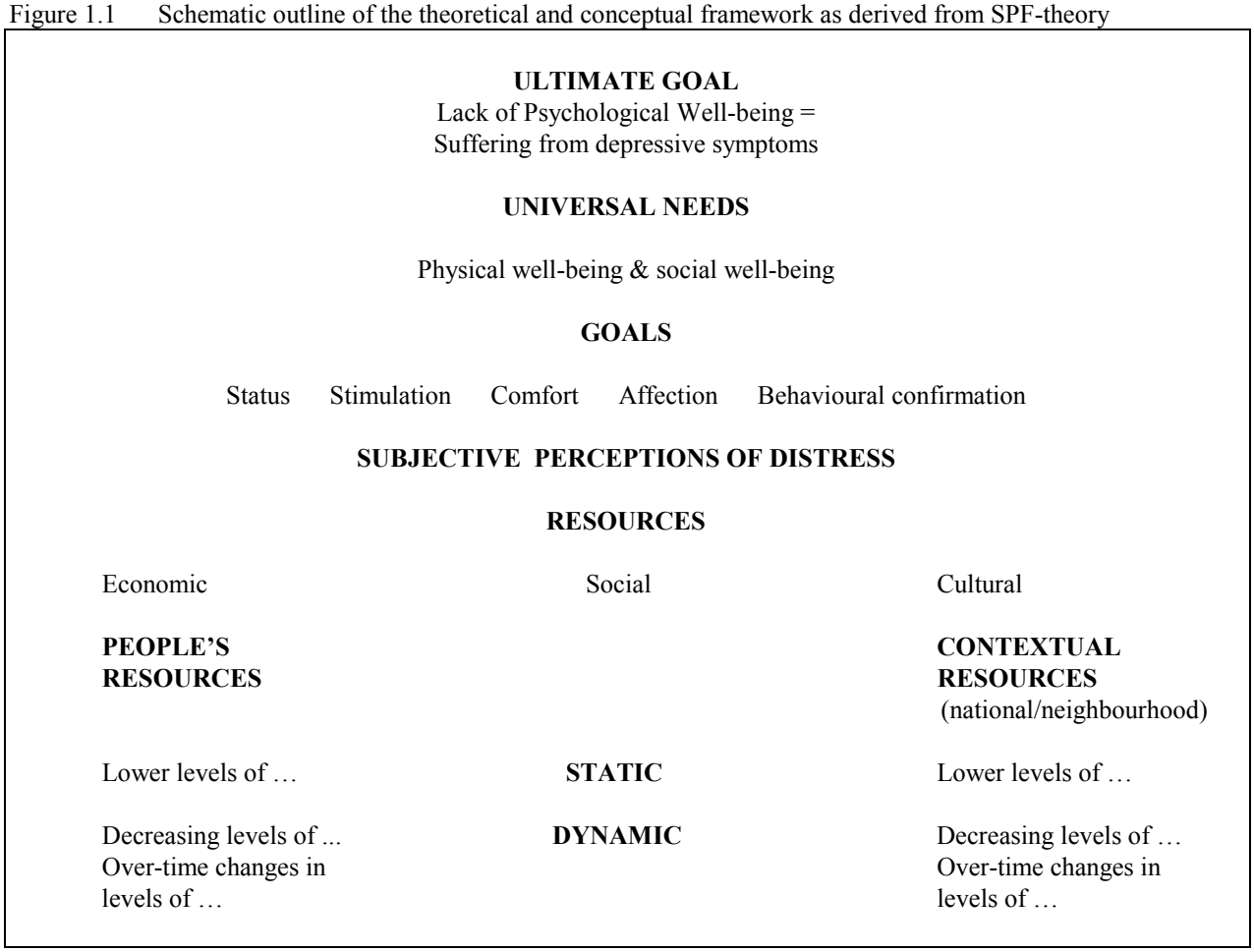
However, recently it has been suggested that these factors that affect distress and depressive symptoms need more theory-based specificity to determine under which specific conditions this distress and these psychological dispositions appear (Pearlin 1989). A shortcoming of stress research is the fact that there is insufficient attention paid to the mechanisms that mediate the link between position, distress, and depressive symptoms. This mechanism contains aspects of meanings and subjective perceptions that people attach to their individual positions, as well as to their social context (Frohlich Corin & Potvin 2003; Ross 1993; Sooman & Macintyre 1995). Subjective perceptions reflect people's circumstances, experiences, meanings, and expectations depending on social references. Moreover, of crucial importance to a social approach of depressive symptoms is the finding that people's levels of resources are unequally distributed across the population, and that various social categories differ regarding depressive symptoms (Landau 1995; Thoits 1999; Turner & Marino 1994; Turner 1995). Consequently, based on 'structural strain theory', the origins of distress and suffering from depressive symptoms can be related to a broader social organisation of society, where some social groups are disadvantaged compared to others (Durkheim 1897/1951; Turner & Lloyd 1999; Thoits 1999). Objective indicators of people's levels of resources may be reflected in subjective indicators of people's positions and conditions, depending on social references and expectations. Additionally, people with low or lower levels of resources might experience status strains such as subjective perceptions of financial dissatisfaction, economic disadvantage or social isolation, which are presumably affecting depressive symptoms. These considerations suggest that people's disadvantaged positions and contextual conditions which affect suffering from depressive symptoms might be additionnaly be explained by their subjective perceptions of these circumstances (Aneshensel et al. 1991; House 2002; Mirowksy & Ross 1999; Pearlin 1989; Ross & Reynolds 2000; Thoits 1999; Turner 1995; Turner & Lloyd 1999). Consequently, in this study we will theoretically elaborate and empirically test *an explanatory perspective on depressive symptoms* using subjective perceptions of distress.

In line with SPF-theory (Ormel et al. 1997, 1999), it might be stated that lower levels of resources may obstruct goals related to status attainment, affection, comfort and behavioural confirmation and may increase subjective perceptions of distress, which in turn induces a lack of psychological well-being, i.e., depressive symptoms. Aneshensel et al. (1991,1992) stated that the discrepancy between people's positions and people's needs, wants, and goals might evoke subjective perceptions of distress. This distress is reflected in people's perception and evaluation of the situation i.e., the level of resources on the one hand, and, on the other hand, goals and possibilities that people have to fulfil. If a person feels unable to fulfil instrumental goals due to lower levels of resources, this may lead to subjective feelings of threat, disadvantage, despair, and social isolation. Subsequently, these subjective perceptions of distress may induce depressive symptoms. Accordingly, we state as a sixth general proposition: *subjective perceptions of distress induce suffering from depressive symptoms.*

Subsequently, in this study, we systematically elaborate on these six rather general propositions by formulating more specific hypotheses on people's static and dynamic positions, static and dynamic contextual conditions, longitudinal changes, and subjective perceptions of distress induce suffering from depressive symptoms. These specific hypotheses can be based on previous theoretical approaches and research findings on depressive symptoms, which can be

synthesised into this theoretical framework as derived from SPF-theory (Aneshensel & Phelan 1999; Ormel et al. 1997, 1999; Thoits 1999). Figure 1.1 presents the theoretical framework as derived from SPF-theory. This schematic outline provides an integrative and heuristic theoretical and conceptual framework, that can function as a basic model to derive testable hypotheses on depressive symptoms as will be done in the following chapters (see also House 2002, p. 129):

Figure 1.1 Schematic outline of the theoretical and conceptual framework as derived from SPF-theory



1.4 Gender differences and depressive symptoms

In previous research, consistent empirical evidence has shown a gender difference in depressive symptoms: women suffer more from depressive symptoms than men do (Culbertson 1997; Nolen-Hoeksema 1987). It was convincingly shown that female and male positions differ fundamentally (Chatab van Doorne-Huiskes & Ultee 1987). Consequently, in this study, we aim to contribute to previous findings on the association between gender and depressive symptoms, and gender differences in positions. We aim to gain insights that are more general to gender differences in depressive symptoms in the population, by following a multifactorial social approach. Based on a this approach, we intend to derive hypotheses from SPF-theory, and simultaneously test whether the effects of lower levels of resources on depressive symptoms, differ between men and women in the general population (Mirola 1999; Nazroo Edwars & Brown 1998; Mirowsky & Ross 1995; Umberson Chen & House 1996).

1.5 Social selection or social causation?

Social selection and social causation processes have become the subject of a persistent discussion in mental health and illness research (Dohrenwend 1992; Fox 1990). Social selection processes refer to the fact that people may drift into lower positions as a result of former depressive symptoms. In these cases, a relationship between current lower levels of resources and depressive symptoms would be reversed and it would be incorrect to suggest that lower levels of resources are a causal factor in the production of depressive symptoms. Previous research, however, has shown robust empirical evidence for the social causation hypothesis (Miech Caspi Moffit Wright & Silva 1999; Ritsher Warner Johnson & Dohrenwend 2001).

Many researchers have argued that the most appropriate way to apply a severe test of the social selection hypothesis requires a follow-up study, i.e., panel data. In this study, however, we use a cross-sectional data set and information on previous periods of depressive symptoms were lacking. Nevertheless, in recent studies, models have been employed in which childhood circumstances are included as sources of 'indirect' social selection. These procedures have become a topic in social selection and social causation research on physical and mental health differences (Amato & Sobolewski 2001; Lundberg 1991; Miech et al. 1999; Van der Mheen Stonks van den Bos & Mackenbach 1997). In addition to previous periods of depressive symptoms, unfavourable childhood circumstances may also cause people to drift into lower positions that in turn affect adult levels of depressive symptoms. Parental social resources such as conflicts in the family or parental divorce, may influence present marital status, and have an indirect effect on depressive symptoms of the respondent (Amato & Sobolewski 2001; Moors Cronkite & Moos 1998). Also, parental economic resources such as occupational status and educational attainment of the parents, may play an important role in selection processes on depressive symptoms. Because of lower levels of parental economic resources, people may drift into lower economic positions, i.e., lower levels of economic resources and consequently suffering more from depressive symptoms (Miech et al. 1999; Ritsher et al. 2001).

In this study, we have the possibility to examine to what extent 'indirect' social selection contributes to variations in the effects of levels of resources on depressive symptoms (Poulton et al. 2002). In the cross-sectional data set of the NHA-2 study, that we will be using here, some information is available of unfavourable childhood circumstances, parental socio-economic status, and familial psychopathology. As a result, we have the possibility to examine what the contribution of these factors is in the explanation of 'a social etiology' of depressive symptoms.

Consequently, in this study, we will follow a procedure, whereby people's unfavourable childhood circumstances, their socio-economic parental background, and their familial psychopathology are included in status attainment models on economic and social status (Amato & Sobolewski 2001; Blau & Duncan 1967; Fox 1990; Poulton et al. 2002; Ritsher et al. 2001). The hypothesis we propose to test reads: *due to unfavourable childhood circumstances, lower parental socio-economic status, and familial psychopathology, some people may have been hampered in the past in attaining higher levels of resources, and as a result they are currently suffering more from depressive symptoms.*

1.6 Research questions

We aim to contribute to and improve upon former research by elaborating on a *multifactorial social approach* to depressive symptoms. First, *a longitudinal perspective on depressive symptoms* is presented. Using large-scale national and longitudinal data over the period 1975-1996, we will test the extent to which, over time, the prevalence of depressive symptoms has changed in the national population of the Netherlands. These samples of the national population of the Netherlands also contain information on various indicators of levels of resources, i.e., socio-demographic characteristics. These indicators make it possible, to test differences in suffering from depressive symptoms between social cateogories, and gender differences in this particular period, i.e., 1975-1996, and whether these differences in social categories as well as gender differences, have changed over time.

Furthermore, we use national-level time series that indicate contextual conditions at the society level to test whether economic, social and cultural national resources may be related to depressive symptoms in the Netherlands, as well as changes in these national resources over time. Based on large-scale national and longitudinal data from the Social and Cultural Planning Office (survey Cultural Changes 1975-1996; Becker 1997), and based on national-level time series indicating national characteristics, i.e., representing period and cohort effects (Statistics Netherlands 1994a, 1999), we will be able to answer the first set of research questions, which read:

1a) What has been the longitudinal trend in depressive symptoms over the period 1975-1996 in the Netherlands?

1b) To what extent do people's levels of resources affect depressive symptoms in the period 1975-1996 in the Netherlands?

1c) To what extent do effects of people's levels of resources on depressive symptoms differ for men and women in this period?

1d) To what extent do effects of people's levels of resources on depressive symptoms and gender differences in these effects, change over this period?

1e) To what extent do levels of national resources, i.e., period and cohort characteristics affect depressive symptoms, in addition to people's levels of resources in the period 1975-1996 in the Netherlands?

These research questions following from a longitudinal perspective on depressive symptoms will be answered using national population data for a period of more than two decades between 1975 and 1996. Moreover, to find empirical evidence to support our other four generally formulated propositions, we use a large-scale cross-sectional data set of the general population derived from a survey, conducted in the eastern part of the Netherlands (Nijmegen Health Area project (NHA-2 study), König-Zahn et al. 1999). This regional data set was collected between 1997 and 1998, and in fact, follows chronologically upon the national data set, from which the latest survey year was conducted in 1996.

Second, *a static and dynamic perspective on depressive symptoms* is examined. We aim to identify the extent to which both static and dynamic positions affect depressive symptoms. Based on SPF-theory, we propose that people's decreasing levels of resources induce depressive symptoms, in addition to people's lower and static levels of resources. Hence, we address the question of whether inter- and intra-generational mobility affects depressive symptoms. We also focus on whether the effects of lower and decreasing levels of resources on depressive symptoms differ between men and women. We use a large-scale cross-sectional data set of the general population (NHA-2 study, König-Zahn et al. 1999). These regional data include various indicators of people's lower and decreasing levels of resources i.e., questions on life transitions and the episode (i.e., recent, less recent) during which these life change events have occurred. These data offer possibilities in this study for answering the second set of research questions, which read:

2a) To what extent do people's lower levels of resources affect depressive symptoms?

2b) To what extent do people's decreasing levels of resources, in addition to people's lower levels of resources, affect depressive symptoms?

2c) To what extent do the effects of people's lower levels of resources and decreasing levels of resources on depressive symptoms, differ for men and women?

Third, we introduce *a contextual perspective on depressive symptoms*. We propose that specific aspects of the social context representing with the neighbourhood, have a substantial effect on depressive symptoms. We focus on a number of contextual conditions of the neighbourhood in which people live that may be associated with depressive symptoms, in addition to people's positions. Based on SPF-theory, hypotheses are derived about lower levels of neighbourhood's resources and suffering from depressive symptoms. Moreover, as the proposed impact of a dynamic perspective of decreasing levels of people's resources on depressive symptoms, based on SPF-theory, we also hypothesise on decreasing neighbourhood resources and suffering from depressive symptoms. Based on the postal codes of the data from the NHA-2 study (König-Zahn et al. 1999), we employ indicators of static and dynamic contextual conditions, i.e., characteristics of neighbourhoods over a period of five years. These data from neighbourhoods are derived from the statistical publications of the Dutch Office of Statistics (CBS) (Statistics Netherlands 1994b, 1997b), and from a marketing research office (Wegener 2001). Using these data on the individual level as well as on the contextual level, we are able to answer the third research question of our study, which reads:

3) To what extent do lower levels of neighbourhood's resources and decreasing levels of neighbourhood's resources affect depressive symptoms, in addition to people's lower and decreasing levels of resources?

Fourth, we include *an explanatory perspective on depressive symptoms* exploring the impact of subjective perceptions of distress. Based on SPF-theory, we proposed that suffering from depressive symptoms can be explained by particular subjective perceptions of distress that occur when people's levels of resources impede fulfilment of the ultimate goal of psychological well-

being. Aneshensel (1992) has stated that perceived distress is evoked when people have limited or lower levels of resources and are unable to fulfil goals that they have set themselves. This may lead to perceived feelings of threat, despair, deprivation, and social isolation, and consequently induce depressive symptoms. The relationship between objective positions and subjective perception of these positions are possible explanations of why people with lower resources suffer more from depressive symptoms. The NHA-2 study (König-Zahn et al. 1999) contains information on particular subjective perceptions of distress. Consequently, the fourth research question of this study reads:

> *4) To what extent can the relationships between people's lower and decreasing levels of resources and depressive symptoms and the relationships between lower and decreasing levels of neighbourhood's resources and depressive symptoms, be explained by particular subjective perceptions of distress?*

1.7 Outline of this study

To conclude this introduction, we present the outline of the subsequent chapters of this book. In Chapter 2, we address issues on different concepts and different measurement procedures, in order to construct a valid and reliable measurement of depressive symptoms applicable in this study using representative data of the general population. Several measurement instruments and operationalisation procedures are described. Various aspects on validity and reliability are presented, empirically tested and reported. The aforementioned research questions will then be answered in Chapters 3, 4 and 5.

In Chapter 3, we address a longitudinal perspective on depressive symptoms and present the longitudinal trend in depressive symptoms in the general population of the Netherlands in the period 1975-1996, based on large-scale national and longitudinal data of the Social and Cultural Planning Office (Becker 1997). We address theoretically and empirically differences in suffering from depressive symptoms in people's individual positions, i.e., socio-demographic characteristics, and in contextual national conditions, i.e. cohort and period characteristics, and changes over time in these individual and national characteristics. Attention is paid to gender differences in variations over time of socio-demographic characteristics and depressive symptoms in this period between 1975 and 1996 in the Netherlands.

In Chapter 4, we elaborate on a static and dynamic perspective on depressive symptoms. Based on the general and theoretical framework of SPF-theory, we derive hypotheses on indicators of lower levels and decreasing levels of resources and suffering from depressive symptoms. Using large-scale regional data (König-Zahn et al. 1999), these hypotheses are simultaneously tested, applying multivariate analyses. In addition, we address, in a rather explorative manner, gender differences in indicators of lower and decreasing levels of resources and depressive symptoms. Moreover, empirical evidence is presented with respect to (indirect) social selection and social causation processes.

In Chapter 5, we test hypotheses on people's individual positions and contextual neighbourhood conditions, changes in these circumstances, and subjective perceptions of distress, simultaneously. We apply multilevel analyses based on individual level data (NHA-2 study; König-Zahn et al. 1999) and based on contextual level data represented with characteristics of neighbourhoods (Statistics Netherlands 1994b, 1997b; Wegener 2001). In Chapter 6, we conclude this study by summarising and discussing the main findings of this book.

2 Measurements of depressive symptoms

2.1 Introduction

In this study we aim to use a measurement of depressive symptoms applicable in survey-based research, using a representative sample of the general population. Therefore, we will consider several reviews of previous validation research in order to choose appropriate items that should represent a valid and reliable measurement for assessing depressive symptoms in the general population.

A central issue that has to be emphasised at this point is the specificity of the core concept of depressive symptoms of this study. In previous clinical and epidemiological research literature, a variety of concepts are used like depressive disorder, psychological disorder, mental disorder, mental illness, major depression, unipolar depression, depressive symptoms, and depressive symptomatology. In general, these concepts have to be considered in terms of a specific research approach that requires specific and non-specific concepts. In this study based on a multifactorial social approach, the predominant concept we will be using is *depressive symptoms*.

In section 2.2, we describe several conceptual issues with respect to the measurement of depressive symptoms that can be applied in population-based research. It is of key importance whether the measurement provides a valid assessment of the particular concept of interest. To ascertain this conceptual clarity, depressive symptoms as embodied in the Diagnostic Statistical Manual of Mental Disorders (fourth Edition (DSM-IV) (American Psychiatric Association (APA) 1994) are presented. Knowledge of the specific symptoms is useful for attaining precision and clarity with regard to the items that indicate the core concept of depressive symptoms in this study. Furthermore, we give a summary of several types of measurement instruments that assess depressive symptoms in contemporary research. In addition, several critical aspects with respect to these types of measurements are reviewed[1]. Accordingly, we describe a number of criteria that a measurement has to meet in order to be used as a valid and reliable operationalisation of depressive symptoms in survey research on the general population.

In section 2.3, we present the operationalisation and scale validation of dimensional measurements of depressive symptoms as used in this study. In this section, the survey-based data of the Nijmegen Health Area Study (NHA-2 study; König-Zahn et al.1999) are presented and discussed. Because of particular measurement scales available in this data set, we were forced to use specific sets of items. Initially, these specific items appeared to ascertain a degree of equivalence with respect to content and formulation and were considered to represent depressive symptoms appropriately, due to face validity. Subsequently, several validity criteria, as formulated in section 2.2, are evaluated in an empirical research design and, based on the large-scale data of the NHA-2 study, we conducted several statistical analyses like principal factor analysis and Likert analysis.

Consequently, due to a critical review of the research literature and these empirical results, we present and evaluate the construction of two valid and reliable measurement scales to assess depressive symptoms in the general population.

2.2 Conceptualisation and operationalisation of depressive symptoms in previous research

2.2.1 Depressive symptoms according to the DSM-IV

We propose that *content validity* of central items embodied in most measurement instruments on depressive symptoms have to be based on the specific symptoms defined in the DSM-IV (APA 1994)[2]. Therefore, knowledge of DSM-IV definitions, symptoms and concepts, has particular relevance for attaining *conceptual clarity,* and for evaluating measurements applied in epidemiological and sociological research.

In the DSM-IV, definitions and symptoms are based on clinical studies of diagnostic practice, as well as on psychiatric epidemiology, concerning various forms of mental disorders such as depression, anxiety, schizophrenia, and anti-social personality (APA 1994). DSM-IV criteria have been widely used by clinical researchers, psychiatrists, psychologists, and general practitioners in the US and elsewhere. For each DSM-IV diagnosis, the criteria are defined as follows. First, a specific cluster of symptoms, usually occurring simultaneously, must be present for a minimal period. Second, these symptoms must reach a minimum threshold of severity, mostly indicated by clinically significant distress or impairment in social, occupational or other types of functioning. Third, exclusion criteria are applied so that a symptom does not contribute to a diagnosis if the symptom is, for example, due to medical illness, medication use or substance abuse (APA 1994).

Another rather important aspect of *content validity* is the distinction between bipolar and unipolar depressive disorders in the DSM-IV (APA 1994). An individual with bipolar depressive disorders may suffer from depressive episodes together with hypo manic episodes. During hypo manic episodes, the individual's mood is abnormally euphoric, while a person with a unipolar depressive disorder never suffers from hypomania. Unipolar depressive disorders are indicated by a negative and unpleasant mood disturbance like feelings of loneliness, worthlessness, and guilt. This type of depressive disorder is considerably more prevalent than the bipolar depressive disorders (APA 1994; Kessler et al. 1997). In the DSM-IV, the concept of unipolar major depression is used to diagnose a person who suffers from several explicit depressive symptoms that have to be present between two and four days in a period of at least two weeks.
These seven depressive symptoms are:

1) *Significant changes in appetite or weight*
2) *Insomnia (problems staying asleep, or extensive need of sleep)*
3) *Changes in psychomotor activity*
4) *Feelings of worthlessness and excessive or inappropriate guilt*
5) *Feelings of hopelessness*
6) *Diminished ability to think, concentrate or make decisions*
7) *Recurrent thoughts of death or suicidal ideation, plans or attempts*

Another aspect of *content validity* concerns the feature of severity as defined by the DSM-IV. Severity is an essential feature of depression and concerns the number and intensity of the characteristics of the symptoms. A few mild but persistent symptoms suggest a mood disturbance. More numerous or more severe symptoms suggest a major depressive disorder.

Severity is associated with the distinction between dysphoric mood and syndromal depressive affect as defined in the DSM-IV (APA 1994). Feeling depressed, blue, and sad and experiencing a considerable loss of interest or pleasure in nearly all activities characterize a dysphoric mood. In general, a dysphoric mood is a normal response to loss and other adverse circumstances, and is usually not regarded as clinically significant unless other depressive symptoms are found at the same time. Therefore, according to the DSM-IV, to meet criteria for a clinical diagnosis of an episode of major depression, i.e., a syndromal depressive affect, in addition to a dysphoric mood, an individual must also experience at least four specific depressive symptoms from a list of seven as presented above. However, the diagnostic classification of major depression under the DSM-IV has been frequently accused of using somewhat arbitrary exclusion criteria (Wakefield 1992b). Exclusion criteria for a diagnosis of depressive disorder are bereavement and medical illness, although these exclusions are not specified for other negative life events like job loss or divorce. This would mean that people suffering from depressive symptoms evoked by such negative life events, do not need to be diagnosed or treated. However, recent studies suggest that relatively mild episodes of depression (other terms that have been used are minor depression, sub-syndromal or sub-threshold depression) may also have clinical relevance, and require treatment and institutionalisation (Beck & Koenig 1996; Beekman et al. 1995; Kessler et al. 1997; Van den Berg Oldenhinkel Brilman Bouhuys & Ormel 2000). Furthermore, studies have shown that persons who register positively on a number of depressive symptoms but do not meet the criteria for a diagnosis of suffering from a major depression, experienced similar distress and life disruptions to function (Rapaport & Judd 1998; Wakefield 1992a, 1992b, 1999).

Consequently, it was stated that the inclusion of a minor depressive disorder in addition to a diagnostic classification of major depression has a high potential for enhancing the understanding of the etiology of depression and depressive symptomatology in the general population (Aneshensel et al. 1991; Brown & Harris 1978; Mirowsky & Ross 1989; Turner & Lloyd 1999). Accordingly, some revisions of the DSM-IV diagnostic manual have been made and the concept of minor depression has been included, although it is not formally recognised. The criteria proposed by DSM-IV for minor depression are similar to those for major depression. A minor depressive disorder may be present when between two to four depressive symptoms (at least one of which must be dysphoric mood) persist for at least two weeks. Additionally, well-designed symptom scales generally correlate highly with diagnostic criteria, so that respondents who score highly on symptom scales, i.e., depressive symptoms, are also most likely to meet clinical diagnostic criteria for the corresponding disorder, i.e., major depression, although this correspondence is far from perfect (Horwath et al. 1992).

Most measurement instruments derived c*ontent validity* from conceptual distinctions between minor and major depression, dysphoric mood and syndromal depressive affect as well as unipolar and bipolar depressive disorders (Angst & Merkingas 1997; APA 1994; Furer König-Zahn & Tax 1995; Sartorius & Ban 1986; Van den Berg et al. 2000). Therefore, knowledge of DSM-IV definitions, symptoms, and concepts has particular relevance when concepts,

definitions, and symptoms of the measurement instruments applied in sociological and epidemiological research have to be evaluated (Horwitz & Scheid 1999; Sartorius & Ban 1986).

2.2.2 Diagnostic and dimensional instruments: dichotomous and continuous categorisations

Based on a number of symptoms as defined in the DSM-IV, several instruments were constructed to identify disorders such as major depression, schizophrenia, anxiety, or personality disorders with people in clinical and primary care settings. In such a disease-orientated research design, individuals might be diagnosed as case and non-case due to the results of a standardised psychiatric interview schedule such as the Present State Examination (PSE), the Structural Clinical Assessment for Neuropsychiatry Disorders (SCAN), the Structured Clinical Interview for DSM-IV (SCID) and the Schedule for Affective Disorders and Schizophrenia (SADS) (Furer et al. 1995; Wakefield 1992a, 1999). For other purposes, this standardised psychiatric interview has relatively high costs as skilled clinicians and psychiatrists need to administer these types of diagnostic instruments to detect case and non-cases in clinical settings. In an attempt to lower the costs and applying these diagnostic instruments in epidemiological studies, full-structured or semi-structured interviews have been developed such as the Composite International Diagnostic Interview (CIDI), and the Diagnostic Interview Schedule (DIS) that could be administrated by lay interviewers (APA 1994; Furer et al. 1995; Üstün & Tien 1995).

In general, both types of instruments, i.e., the standardised psychiatric interviews schedules and the semi-structured diagnostic instruments, have been based on the idea that specific disorders are discrete entities grounded in clinical and diagnostic criteria. These measurements place individuals into specific disease categories through the identification of their specific symptoms that differentiate between case and non-case. Within this *dichotomous model,* it is important to decide whether the person meets the necessary clinical criteria based on a discrete judgment as formulated in the DSM-IV (APA 1994). This type of measurement is most appropriate in a biomedical approach of mental disorders that focuses on individuals with a specific disorder and consequently aims at identifying individual cases in need of treatment, recommends appropriate treatment, or evaluates prevention and intervention studies of institutionalised patients (APA 1994; Furer et al. 1995; Wakefield 1999)[3].

Other approaches in mental illness research, however, require applications of measures in broader research contexts with a higher number of observations. This has led to the development of several full-structured and self-administered questionnaires, which could be applied in large-scale surveys (Furer et al. 1995; Wakefield 1999). Several measurements were designed to assess *depressive symptoms,* such as the Hamilton Depression Inventory (HDI) (Hamilton 1960), the Beck Depression Inventory (Beck 1961), the Self Rating Depression Scale (SDS) (Zung 1965) and the Center for Epidemiologic Studies of Depression Scale (CES-D) (Radloff 1977). Other types of self-administered questionnaires assess a number of symptoms that refer to multiple domains of mental disorders, such as the Affect Balance Scale (ABS) (Bradburn 1969), the RAND Mental Health Inventory (MHI) (Ware Johnston Davies-Avery & Brook 1979), the General Health Questionnaire (GHQ-28) (Goldberg & Hillier 1979) and the Hopkins Symptom Checklist (HSCL-90) (Derogatis Lipman Rickers Uhlenhuth & Covi 1974) (a review of other questionnaires like the State-Trait Anxiety Inventory (STAI) and the Langner 22-item scale is discussed in Furer et al. 1995). These measurements were very effective when applied in large-scale surveys and yield insights into the distribution of symptoms referring *to* mental disorders among a large number of people in various contexts such as communities, social groups, and the

elderly, as well as the general population (Furer et al. 1995; Wakefield 1999). In these types of questionnaires, respondents are asked to rate the presence or absence, and frequency or intensity of several symptoms.

In addition, these full-structured questionnaires can be employed as screening instruments, using threshold scale scores or cut-off points. Based on threshold scores of, for example, the GHQ, people can, in a second step, be assigned to a sub-sample on which a standardised psychiatric interview such as the PSE or the SCAN is performed (Furer et al. 1995; Heydendael & Furer 1986). With this diagnostic interview, people can be identified as case or non-case. The use of threshold scores of full-structured questionnaires in combination with the results from a psychiatric interview in a sub-sample, appeared to be an appropriate approach in epidemiological research for estimating prevalence, incidence and co-morbidity of mental disorders, as well as detecting people in need of treatment, in a research design based on data from the non-institutionalised general population (Furer et al. 1995; Gureje & Obikoya 1990; Heydendael & Furer 1986; Hodiamont & Velling 1984).

In this study, we aim to systematically study differences in the extent of suffering from depressive symptoms associated with people's social positions in the general population (Mirowsky & Ross 1983, 1989; Wakefield 1999). As Pearlin has stated: 'The medical researcher, the psychiatrist, and the epidemiologist need to elaborate diagnostic instruments that can yield an accurate count of the prevalence and incidence of various mental disorders and that can identify cases in need of treatment. The social scientist needs symptom scales as a sensitive psychological barometer of life strains to rank people according to the intensity of stressful social indicators' (Pearlin 1989, p. 253). Therefore, it is more appropriate to use a *continuous model* of scores, i.e., an over-all score based on a sum or average of scale scores that situate people along a continuum of symptom severity and indicate a degree of depressive symptomatology. Such a *continuous model* of scale scores based on specific symptoms of full-structured and self-administered questionnaires is frequently applied in sociological and epidemiological survey research in the general population (Aneshensel & Phelan 1999; Mirowsky & Ross 1989). This application of dimensional measurements using a continuous categorisation of scale scores converge the purpose of this study to examine *depressive symptoms* in the general population. However, earlier researchers has raised doubts about the validity of these dimensional measurements with respect to valid and reliable assessment of specific mental disorders such as depressive symptoms, anxiety or personality dysfunction in samples of the general population (Dohrenwend & Dohrenwend 1965, 1982; Dohrenwend 1995). They stated that these instruments measure a more general factor such as non-specific psychological distress or general demoralisation.

To avoid this lack of conceptual clarity in our study, it is essential for the measurement to provide a valid and reliable assessment of the particular construct of interest, namely *depressive symptoms*. Therefore, in the next section, we will review several aspects with regard to conceptual clarity of dimensional measurements.

2.2.3 Measurements of depressive symptoms: aspects of validity and reliability

In this section, we discuss central aspects of validity and reliability of a number of previously evaluated and reviewed dimensional measurements. The following dimensional measurement scales applied in contemporary and previous research are presented: the Self Rating Depression Scale (SDS) (Zung 1965), the Center for Epidemiologic Studies of Depression Scale (CES-D) (Radloff 1977), the Affect Balance Scale (ABS) (Bradburn 1969), the RAND Mental Health

Inventory (MHI) (Ware et al. 1979), the Hopkins Symptom Checklist (HSCL-90) (Derogatis et al. 1974) and the scaled version of the General Health Questionnaire (GHQ), 28-item version, GHQ-28 (Goldberg & Hillier 1979).

Some of these measurements include multiple items that can be associated with depressive symptoms, anxiety, somatic complaints, and social dysfunction or represent a measurement of general symptomatology (Furer et al. 1995). However, in this study we aim to use a questionnaire that incorporates items that do not represent general concepts such as psychological distress, general symptomatology, mental illness or a lack of psychological well-being, but specific items that strictly refer to the concept of depressive symptoms. Additionally, measurement issues with respect to validity (severity, duration, negatively and positively formulated items, and conceptual clarity) and reliability (internal consistency of the items that constitute a measurement scale) will have to be considered in the present study.

A prime aspect with regard to *content validity* concerns *severity*. Severity is an essential feature of the concept of depressive symptoms and is included in most symptom scales (Beck 1961; Goldberg & Hillier 1979; Hamilton 1960; Radloff 1977). Severity of depressive symptoms is largely a question of number and intensity of the characteristics of the symptoms. A few mild but persistent symptoms suggest mood disturbance or dysthymia. More numerous or more severe symptoms suggest a depressive disorder. Severity is associated with the distinction between dysphoric mood and syndromal depressive affect as defined in the DSM-IV (APA 1994). A dysphoric mood includes symptoms of sadness, disappointment or considerable loss of interest or pleasure in nearly all activities, and feeling blue. A syndromal depressive affect is a complex of intense, pervasive, and persistent symptoms like feelings of worthlessness, suicidal ideation and diminished ability to think or concentrate that interfere with normal functioning and are usually considered as being clinically relevant. With regard to severity, well-designed symptom scales should generally correlate highly with diagnostic criteria, so that respondents who score highly on symptom scales, i.e., depressive symptoms, are also likely to meet criteria for the corresponding disorder, i.e., major depression. However, previous research has established that a dysphoric mood may also be regarded as clinically significant although less severe depressive symptoms are present and people are able to function normally (APA 1994; Radloff 1977). To establish severity in a measurement of depressive symptoms, it is most appropriate to use dimensional measurements that contain items whose formulation refers to common symptoms of sadness, disappointment, and loneliness (depressive dysphoric mood) and items whose formulation refers to more severe symptoms like hopelessness, worthlessness, diminished ability to think or concentrate (syndromal depressive affect). To assess the aspect of severity in a measurement of depressive symptoms, in this study we aim to choose two dimensional measurements. One dimensional measurement contains specific items, whose content refer to a depressive dysphoric mood, and another measurement refers to a syndromal depressive affect. Moreover, based on a number of items, these dimensional measurements produce a total score on a continuum ranging from ‘suffering little from depressive symptoms’ to ‘suffering considerably from depressive symptoms’ *(content validity).*

A second aspect with respect to *content validity* is *duration*. According to the DSM-IV, disorders like depression and anxiety are considered state-like, or episodic in nature. In contrast, a disorder like schizophrenia or substance abuse is generally regarded as predominantly chronic, with at least some symptoms that usually persist through much of the individual’s lifetime after initial onset (APA 1994). Criteria for most DSM-IV disorders for making a clinical diagnosis of

depression require that symptoms must be present on most days for at least a two-week period. Although most dimensional scales that measure depressive symptoms in the general population refer to an episodic time period, they differ in the details provided in the time period assessed, i.e., current state, last week, previous two weeks or past month (Furer et al, 1995; Wakefield 1999). In addition, it is well established that in survey research, people report more accurately on current or recent states, rather than on long-term memories, which may be influenced by current feelings or psychological problems (Fowler 1993). Therefore, with regard to this aspect of duration, in this study we aim to choose a measurement of depressive symptoms that embodies responses to a period for at least the previous two weeks to the previous month at most.

A third aspect with regard to *content validity* concerns *the type of formulation of the measurement items*. In several depressive symptom scales, a component is included that represents some positively worded items to reduce the effect of response set as well as to assess a positive affect or aspects of psychological well-being (or the absence of it) (Furer et al. 1995; Wakefield 1999). In a healthy population, positive and negative affects are expected to co-exist. It is suggested that people who suffer from depressive symptoms are characterized by an absence of a positive affect and the predominant presence of a negative affect. Although psychological well-being and depressive symptoms can be considered to be opposite poles of the same emotional dimension, some researchers state that questions about positive affect are not the opposite of questions about negative affect (see for example the items of the Positive Affect and Negative Affect of the ABS scale (Bradburn 1969), the items on psychological well-being of the MHI (Ware et al. 1979) and the items of positive mood of the CES-D (Radloff 1977)). Psychological well-being includes items about a general sense of hopefulness, happiness and optimism about the future, while depressive symptoms include items that are sensitive indicators of feelings of hopelessness, and worthlessness. Consequently, one might state that negatively and positively formulated items measure two relatively independent factors, i.e., depressive affect and positive affect. In order to attain *content validity* in the present study, we chose a measurement of depressive symptoms that includes merely negatively formulated items. These items should be mixed together with positively formulated items that can contribute to reduce or prevent the possible effect of response set in the complete questionnaire.

A fourth aspect with regard to *content validity* has to do with the *conceptual clarity* of a measurement whose aim is to assess depressive symptoms. In general, previous validation research showed various dimensions that represent depressive symptoms, somatic symptoms, anxiety symptoms in combination with symptoms of worries, as well as a distinct dimension of symptoms that refer to social or personal dysfunction and a dimension of appetite and weight problems (Goldberg & Hillier 1979, Goldberg 1996, Graetz 1991, Mirowsky & Ross 1983, 1989; Radloff 1977). In most of these studies, the items of the dimension that represents depressive symptoms shared the largest proportion of variance and showed a high internal consistency. Despite this persuasive empirical evidence of a separate cluster of items that represents depressive symptoms, most epidemiological research chooses to employ a total score based on the sum of scores of the total items in the scale. Consequently, these studies define an overall score with general concepts like psychological distress, mental illness or psychological disorder (Graetz 1991; Mirowsky & Ross 1983, 1989; Radloff 1977; Ross & Mirowsky 1984). From a theoretical point of view, one might expect that these symptoms correlate moderately *(convergent validity)* and that the underlying dimensions refer to a general construct of mental disorders. However, one might also hold that these items represent distinct constructs like depressive

symptoms, social dysfunction, and anxiety, as empirical evidence has convincingly shown (Goldberg & Hillier 1979; Graetz 1991).

Additionally, it is questionable whether depressive symptoms and anxiety symptoms are distinguishable disorders. Compared to relatively low co-morbidity rates of depressive and anxiety disorders in population-based research, research in medical care settings where general practitioner or therapist signalled people showed relatively high co-morbidity rates (Bijl et al. 1998b; Breslau 1985). Other studies showed rather high correlation coefficients of anxiety symptoms with somatic complaints and insomnia (Furer et al. 1995). Some researchers hold the view that anxiety is a core phenomenon that underlies all kinds of disorders, as high correlation coefficients between anxiety scales, and scales of general mental illness have shown (Furer et al. 1995; Goldberg & Hillier 1979; Graetz 1991). In general, an anxiety dimension subsumes a set of symptoms that represents items like restlessness, nervousness, tension, trembling hands, and sudden attacks of panic and fear. This specific content of items that refer to anxiety can be clearly distinguished from the specific content of items that represent depressive symptoms, like pointlessness, hopelessness, worthlessness, concentration problems, insomnia and suicidal ideation. Moreover, it was also suggested that it is essential to consider depressive symptoms and anxiety as distinct mental disorders since most therapeutic treatment is designed to target anxiety and depressive symptomatology separately.

Another aspect that concerns *conceptual clarity* of a measurement of depressive symptoms is the distinction between *mood and malaise* (Mirowsky & Ross 1983, 1989; Ross & Mirowsky 1984). Most measurements of depressive symptoms asked questions about mood, such as feelings of hopelessness and worthlessness, in addition to more physical indicators such as loss of appetite and weight, sleep disturbance and other physical impairments. This malaise, or somatic dimension, of a measurement of depressive symptoms has been frequently criticised (Ernst & Angst 1995; Christensen et al. 999; Henderson et al. 1998). Previous research suggests that it is more valid to use purely psychological symptoms to measure depressive symptoms in the general population in order to avoid items that are sensitive to the relatively high prevalence of physical illnesses like, for example, in the elderly, ethnic minorities or women (Bebbington et al. 1998; Christensen et al. 1999; Ernst & Angst 1995; Mirowsky & Ross 1983, 1989; Ross & Mirowsky 1984). Consequently, we aim to demonstrate that several conceptual dimensions such as anxiety and depression, social dysfunction and somatic complaints can, theoretically and empirically, be distinguished in a large-scale sample of the general population. In addition, items that represent somatic complaints, appetite and weight problems, and insomnia, are eliminated from a dimensional measurement of depressive symptoms. Only specific items of which the content refers to a pure psychological dimension of depressive symptoms are selected *(content validity)*.

A fifth aspect concerns *reliability*. Reliability of a measurement is defined as the extent to which it is free from random measurement errors. If the crucial assumption can be held that all the items measure the same construct, i.e., depressive symptoms, inter-item correlation coefficients can serve as an estimate of the influence of random measurement errors. Small random measurement errors would mean that each item measures the same underlying characteristics of the construct. As items are highly correlated, this indicates the proportion of item variance explained by the underlying core concept of depressive symptoms. Based on these inter-item correlations of each item with every other item, the measure of internal consistency, Cronbach's alpha is derived. Cronbach's alpha ranges from zero to one, with value zero

indicating complete unreliability and value one indicating perfect reliability (Cronbach 1951). Most dimensional measurements of depressive symptoms show reasonable values of internal consistency: Cronbach's alphas range between 0.83 and 0.89 and inter-item correlations show consistent patterns of sufficient correlations (> 0.40) (Furer et al. 1995; Goldberg & Hillier 1979; Radloff 1977; Wakefield 1999). Nevertheless, reliability coefficients were mostly based on studies using data from institutionalised settings, i.e., people who suffer from depressive symptoms, or subpopulations (Banks 1983; Hobbs et al. 1984). To attain *reliability* in the present study based on a sample of the general population, we applied item analyses in order to determine the degree of internal consistency of the items that intend to constitute a reliable scale of depressive symptoms. Based on conventional criteria, the items should show a consistent pattern of positive correlations of at least a value of 0.30. Also, inter-item correlations should produce a reasonable degree of internal consistency, i.e., minimum value of Cronbach's alpha is 0.80 in relation to a number of 15 items (Cronbach 1951; Fowler 1993).

To summarise then, to address certain aspects of *validity* and *reliability* of the operationalisation of a measurement scale of depressive symptoms applicable in the general population, the following five aspects have to be considered:

1) *Severity:* operationalisation of the concept of depressive symptoms into two dimensional measurements that contain specific items whose formulations refer to a depressive dysphoric mood and a syndromal depressive affect. These items produce a total score on a continuum that ranges from suffering little from depressive symptoms to suffering considerably from depressive symptoms *(content validity).*
2) *Duration*: a measurement that addresses the episodic state-like nature of depressive symptoms using answer categories that incorporate a time period of at least the previous two weeks and at most the previous month *(content validity)*
3) *Item formulation*: positively worded items are not explicitly included in a measurement of depressive symptoms. Those items serve the reduction of the possible effect of response set in the complete questionnaire *(content validity).*
4) *Conceptual clarity:* the assumption of a clear distinction of several dimensions of symptomatology like anxiety, depression, social dysfunction, and somatic complaints, should be empirically tested (*convergent validity).* Specific items, of which the content refers to somatic complaints, insomnia, and appetite and weight problems, are eliminated from a dimensional measurement of depressive symptoms *(content validity).*
5) *Reliability:* items that intend to measure depressive symptoms should show a consistent pattern of positive inter-item correlations of at least a value of 0.30, and these inter-item correlations should produce a reasonable degree of internal consistency, i.e., Cronbach's alpha value of at least 0.80 in relation to the number of items in the final scale *(reliability).*

Scheme 2.1 Central types of items from several depressive symptoms measurement scales

Depressive symptoms (dysphoric mood) [a b c f]
- I felt depressed
- I felt lonely
- I felt in a bad mood
- I could not get going
- I felt that everything I did was an effort
- I thought my life had been a failure
- I felt downhearted and blue
- I felt moody about things
- I felt very low or in very low spirits
- I felt bored
- I felt restless

Depressive symptoms (syndromal depressive affect) [b c f]
- I experienced feelings of worthlessness
- I experienced feelings that life is hopeless
- I felt not able to do anything because of feelings of unrest
- I felt like I wanted to die
- I felt so low and thought of committing suicide
- I felt that others would be better off if I was dead
- I felt that life was not worth living
- I recently considered ending my life
- I have thoughts about dying
- I have thoughts about taking my life

Depressive symptoms (malaise) [a b c f]
- My appetite was poor
- I had troubles staying asleep
- I had crying spells
- My sleep was restless

Anxiety symptoms (mood) [a b]
- I felt anxious about something
- I worried about a lot of things
- I felt restless, fidgety or impatient
- I had difficulty in calming down
- I was easily irritated
- I was a very nervous person
- I was suddenly scared for no reason

Anxiety symptoms (malaise) [a b c d]
- I had trouble falling asleep
- I had cold and hot spells
- I had trembling hands

Positively worded symptoms [a b d e]
- I felt pleased about having accomplished something
- Things were going my way
- I felt proud because someone complimented me
- I felt particularly excited or interested in something
- I felt on top of the world
- I felt that the future looked hopeful or promising
- I have in general enjoyed doing things
- I felt cheerful and light-hearted
- I felt calm and peaceful
- I felt relaxed and free from tension

Somatic complaints [b c e]
- I had pain in my heart or chest
- I felt as if I was ill
- I was bothered by breathlessness when not exercising or working hard
- I was troubled because of headaches and pain in the head

Symptoms of social dysfunction [a b c f]
- I talked less than usual
- I felt that I was just as good as other people
- I felt that I was watched or talked about by others
- I felt that people were unfriendly or disliked me
- I felt removed from other people
- I felt upset because someone criticized me

[a] Items distracted from the CES-D (Radloff 1977, and a modified version of Mirowsky & Ross 1983, 1989; Ross & Mirowsky 1984)
How many days during the past week did you feel …

- Rarely or none of the time (less than 1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of time (3-4 days)
- Most or all of the time (5-7 days)

[b] Items distracted from the GHQ-28 (Goldberg & Hillier 1979)
Have you in general over the past four weeks been feeling …

- Not at all
- Less more than usual
- Rather more than usual
- A lot more than usual

[c] Items distracted from the Hopkins Symptom Checklist (HSCL-90)
(Derogatis et al. 1974)
During the past week, including today, how much were you bothered by …

- Not at all
- A little bit
- Moderately
- Quite a bit
- Extremely

[d] Items distracted from the Mental Health Inventory (MHI)
(Ware et al. 1979) *During the past month, how much of the time did you feel …*

- Never
- Hardly ever
- Some days
- Most days
- Almost every day

[e] Items distracted from the Affect Balance Scale (ABS) (Bradburn 1969)
During the past week have you ever feel …

- Yes
- No

[f] Items distracted from the Self Rating Depression Scale (SDS) (Zung 1965)
Lately, did you feel …

- Hardly ever
- Sometimes
- Often
- All the time

In the list above, the central types of items are presented. These items can be found in several dimensional measurements and have been reviewed with respect to several critical aspects as mentioned above. These measurement aspects of validity and reliability will be validated in an empirical design using large-scale survey data. The empirical evaluation to assess depressive symptoms in the general population will be discussed in the next section.

2.3 Operationalisation of depressive symptoms in this study

2.3.1 The NHA-2 study

In this section, we will present and evaluate the empirical results of the measurement procedures of depressive symptoms. Before we discuss these results of the operationalisation, however, we will briefly describe the large-scale data of the Nijmegen Health Area study (NHA-2 study).

The data of the NHA-2 study (König-Zahn et al. 1999) were gathered to answer research questions from various disciplines like medicine, psychiatry, and general practice. This psychiatric-epidemiological research project is partially a replication and extension of a previous version of the Nijmegen Health Area Project, which was conducted successfully in 1983 (NHA-1 study; Furer & Tax 1987). The NHA-2 study was designed in a two-stage (general practitioners-respondents) and two-phase (screening instrument-psychiatric interview) procedure. Since nearly every inhabitant of the Netherlands is registered at a general practice, the degree of this registration is equivalent to that of register offices. In this study, 32 general practitioners (11 working in the city of Nijmegen and 21 in the surrounding communities) were recruited. They all meet the criteria that they had been working in the same practice within the Nijmegen Health Area for at least two years, and that they had access to an automated information system for patient data that had been operational for at least one year. The large-scale data set of this NHA-2 study is based on a multi-stage stratified random sample of people aged 18 to 75. The sample is derived from patient-files of 32 general practitioners in the city of Nijmegen and its surrounding villages. The final number of interviewed people was 1,813 persons (a response of nearly 140 respondents per practice, response rate 51 percent). The survey sample has been proven to be a good reflection of the general population according to gender, age and medicine use. Detailed information can be found in Appendix A and König-Zahn et al. 1999).

2.3.2 The General Health Questionnaire (GHQ)

The predominant concept of depressive symptoms is measured with two dimensional measurements that are related to depressive symptomatology and depressive mood. These two measurements are operationalised with items distracted from two versions of the General Health Questionnaire (GHQ) (Goldberg & Hillier 1979; Goldberg 1996; Goldberg & Williams 1988; Koeter & Ormel 1991). The original General Health Questionnaire (GHQ) contains 60 items and was designed as a self-administered questionnaire that could be used as a screening instrument to identify respondents with a heightened risk of suffering from mental disorders in the general population and in primary care settings (Goldberg & Hillier 1979; Gureje & Obikoya 1990; Koeter & Ormel 1991). Based on the original 60 items, several versions were developed to detect presence and severity of specific disorders or general mental illness in the general population or primary care settings. The GHQ-30 has evoked into a self-report questionnaire of multiple symptoms. The GHQ-12 has been developed as a general measure of psychological distress (Goldberg & Williams 1988). And the GHQ-28 was developed as a scaled version to assess

different dimensions of symptomatology in the general population (Goldberg & Hillier 1979; Goldberg & Williams 1988; Koeter & Ormel 1991). The NHA-2 study included these three versions of the General Health Questionnaire, i.e., a 30-item version (GHQ-30), a 28-item version (GHQ-28) and a 12-item version (GHQ-12) (König-Zahn et al. 1999). From the original set of 60 items from the GHQ-60, several items were distracted to construct these three versions. Although, these items of the various versions - GHQ-30, GHQ-28 and GHQ-12 - are not mutually exclusive, the number of items is not cumulative in these separate versions.

2.3.3 Depressive symptomatology

The conceptual dimension of depressive symptomatology has been operationalised with several items distracted from the 28-item version of the General Health Questionnaire (GHQ-28). This questionnaire is evaluated with respect to *validity* and *reliability* criteria that appeared from previous validation research and have been reviewed and summarised in the previous section. The exact formulations of the 28 items of the complete questionnaire of the GHQ-28 are presented in Appendix A[4].

One aspect that is accomplished in this measurement is *severity*. As can be seen from Appendix A (Table A.2), the GHQ-28 contains seven items whose content refers to feelings of worthlessness, hopelessness, concentration problems and suicidal ideation. The formulations of these items contain aspects that actually make up a syndromal depressive affect which can be associated with the content of depressive symptoms as originally formulated in the DSM-IV (APA 1994; Goldberg & Hillier 1979; Goldberg & Williams 1988) *(content validity)*[5]. Moreover, these items when taken together, may produce continuous scale scores that range from less severe to extremely severe depressive symptomatology.

A second aspect of content validity concerns *duration*. Within the GHQ-28, respondents have to answer questions on several symptoms that refer to a period of the previous four weeks. Hence, the duration criterion of a minimal period of at least two previous weeks is fulfilled. Answer categories range from ‘not at all’, ‘no more than usual’, ‘rather more than usual’ and ‘much more than usual’ (Goldberg & Hillier 1979; Goldberg & Williams 1988).

A third aspect has to do with the incorporation of *positively worded items* only to avoid response set. It appeared that the complete questionnaire of the GHQ-28 includes several positively worded items. As can be seen in Appendix A, item A1, item B6, item C1, item C3, item C4, item C5 and item C6 are positively worded and expected to break response set in the answer patterns of the complete questionnaire of the GHQ-28, as was already shown in previous research (Goldberg & Hillier 1979; Goldberg et al. 1997). Since the positively formulated items are only used to break response set in the full questionnaire, and the items that represent the subscale of depressive symptoms incorporate only negatively formulated items, this aspect of *content validity* is accomplished.

A fourth aspect is multidimensionality of symptomatology in order to assess *conceptual clarity*. As the scaled version of the GHQ-28 includes several items that refer to several dimensions of symptomatology, scale techniques can actually identify the conceptual differentiation of various dimensions of symptomatology. Based on data of the NHA-2 study, principal factor analysis with oblique rotation was applied to detect the various dimensions of symptomatology. The results of the factor structure are presented in Table 2.1.

We use several conventional criteria to evaluate the appropriateness of the factor model: factor correlation matrix, Eigenvalues (minimum value 1.00), factor loadings (minimum value

0.40), communalities (minimum value 0.20) and the interpretability of the model (Kim & Mueller 1984). Since dependency between the factors is expected, oblique rotation was conducted. List-wise deletion of missing values was used. This means that those respondents, whose answers to one or more items under consideration were missing, were excluded from the analyses (1 percent of the sample)[6]. Consequently, the final sample was reduced to 1,798 valid cases.

As Table 2.1 shows, the factor structure of the GHQ-28 appeared to be a five-factor solution. Together, these five factors account for a reasonable proportion of variance in the answer of the items (60,3 percent). Items A1 to A7 refer to the first factor, which measures a dimension of somatic complaints. These items have substantial loadings on the first factor, except for item A2 (need a good tonic). This item has a rather low communality value (0.26) and factor loading (0.28). This reflects, as was stated in previous research, the changing usage of the term "good tonic", since this item was formulated in the original GHQ during the seventies (Goldberg & Hillier 1979; Werneke Goldberg Yalcin & Üstün 2000). Moreover, it appeared that item A1 had a cross-loading on the first factor of somatic complaints and on the third factor, which refers to the dimension of social dysfunction. This cross-loading on the somatic dimension as well as on the dimension of social dysfunction, again, was found in previous research (Werneke et al. 2000). Next, the communalities (> 0.32) and the factor loadings (> 0.43) of the seven items that refer to a dimension of social dysfunction (third factor) show substantial values.

Table 2.1 also shows that the items that refer to anxiety (item B4, item B5, item B6 and item B7) and insomnia (item B1 and item B2) cluster together in the fourth factor. These items show factor loadings of at least 0.42, except for item B2 (0.16) and item B5 (0.18). Item B2 (problems with staying asleep) has a substantial loading on the first factor, which refers to somatic complaints, whereas item B5 (getting scared or panicking for no good reason) has a substantial loading on the fifth factor, referring to depressive symptomatology.

With respect to the original items of the GHQ-28 depression subscale, it appeared that items D1 through D4 cluster together in the fifth factor, and item D5, item D6 and item D7 show substantial factor loadings on another distinct factor. Apparently, the latter items which primarily refer to suicidal ideation, include a specific component of depressive symptoms that can be distinguished as (suicidal) depressive symptoms, whereas the content of the other four items reveals that the fifth factor could be distinguished as a dimension of mild depressive symptoms. This distinction of two different types of depressive symptomatology was also addressed in a previous validity study (Epstein Fullerton & Ursano 1994).

We compared these results with previous validation studies (Goldberg & Hillier 1979; Goldberg et al. 1997; Werneke et al. 2000). The first validation study of the GHQ-28 using principal component analyses with varimax rotation, showed a four-factor solution: somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression (Goldberg & Hillier 1979)[7]. More recent validation studies of the GHQ-28, showed factor solutions of three, four, five and even six or seven factors that represent in addition to these four factors, separate sub-dimensions of anxiety and insomnia as well as factors of mild and suicidal depression (Goldberg et al. 1997; Graetz 1991; Hobbs et al. 1984).

Table 2.1 Principal factor analyses with oblique rotation on 28- item General Health Questionnaire (GHQ-28)

		Communalities	**Factor loadings**				
			1	**2**	**3**	**4**	**5**
A1	Felt perfectly well and in good health	.48	.46				
A2	Felt in need of a good tonic	.26	.28				
A3	Felt run down and out of sorts	.58	.47				
A4	Felt ill	.52	.65				
A5	Got pains in your head	.57	.65				
A6	Got tightness or pressure in your head	.64	.65				
A7	Had hot or cold spells	.35	.50				
B1	Lost much sleep through worry	.42				.42	
B2	Had difficulty in staying asleep once you were off	.39	*.35*			*.16*	
B3	Felt constantly under strain	.41				.72	
B4	Got edgy and bad-tempered	.45				.42	
B5	Got scared or panicked for no good reason	.49				*.18*	*.52*
B6	Found everything getting on top of you	.56				.49	
B7	Felt nervous and highly strung all the time	.58				.58	
C1	Managed to keep yourself busy and occupied	.32			.57		
C2	Took more time than normal to do things	.35			.43		
C3	Felt overall that you were doings things well	.46			.68		
C4	Were satisfied with the way you carried out our task	.44			.71		
C5	Felt that you were playing a useful role in things	.37			.65		
C6	Felt incapable of making decisions about things	.33			.55		
C7	Were able to enjoy your normal day-to-day activities	.44			.45		
D1	Felt that you were a worthless person	.55					.66
D2	Felt that life was hopeless	.64					.69
D3	Felt unable to do anything because your nerves were too bad	.53					.60
D4	Felt that life was not worth living	.35					.62
D5	Considered putting an end to your life	.69		.88			
D6	Had thoughts about whishing you were dead	.73		.83			
D7	Had thoughts about taking your own life	.72		.92			
	Eigenvalues		(10.52)	(2.24)	(1.89)	(1.26)	(1.01)
	Explained Variance: 60,3%						

Factor correlation matrix	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Factor 1 (somatic complaints)	1.00				
Factor 2 (suicidal depression)	.30	1.00			
Factor 3 (social dysfunction)	.39	.37	1.00		
Factor 4 (anxiety and insomnia)	.44	.24	.39	1.00	
Factor 5 (mild depression)	.48	.59	.49	.42	1.00

(Data: NHA-2 study; valid cases N= 1,798)

Moreover, remarkably robust evidence appeared from a large-scale validation study of the GHQ-28, based on data from medical care centers completed by 5,278 patients in 15 countries around the world (Werneke et al. 2000). The factor solution of the social dysfunction and depressive symptoms dimension showed rather stable results between centers, whereas the dimensions of the somatic complaints and anxiety and insomnia appeared to be less stable, and showed multiple cross-loadings (Werneke et al. 2000). Although several methods, including principal component analysis, factor analysis, structural equation models, different rotation techniques, i.e., varimax and oblique rotation, as well different types of data have been applied in validation research, our results are quite comparable with previous findings (Epstein et al. 1994; Shek 1993; Werneke et al. 2000). Accordingly, the present study applied principal factor analysis with oblique rotation. The results are comparable and show several cross-loadings that suggest less clear dimensions of somatic complaints and insomnia and anxiety.

With respect to the conceptual distinction between anxiety and depression, the factor correlation matrix of Table 2.1 shows high coefficients between suicidal depressive symptoms, mild depressive symptoms and anxiety symptoms, 0.59, 0.42 and 0.24, respectively. These correlation coefficients suggest that people who suffer from one type of symptoms tend to suffer from another. Anxiety and depressive symptoms are to some extent interrelated as they correlate moderately. However, considering the factor solution, they can be considered as distinct and separate conceptual dimensions of symptomatology. Previous research using latent trait analysis compared a two-factor model with a single-factor model to test the distinction between anxiety and depressive symptoms more profoundly and found no clear evidence for a one-dimensional structure of both types of items (Christensen et al. 1999).

Apparently, these results of principal factor analyses with oblique rotation provide empirical evidence to enables us to conclude that, in general, the various dimensions of symptomatology as built into the GHQ-28 can be reproduced in a sample of the general population. These empirical results support the conclusion that a valid measurement of depressive symptomatology is at best operationalised with specific items, which refer merely to mood/psychological items and not to somatic complaints or insomnia. Based on these empirical results, *conceptual clarity* of a separate dimension of depressive symptomatology is attained *(content validity)*[8].

Severe and less severe depressive symptomatology

This distinct dimension of depressive symptoms, which contain the original seven items of the depression subscale of the GHQ-28, will be further investigated. First, the frequencies of the responses to the different items will be discussed. These frequencies are presented in Table 2.2. It appears that the percentage of people who have not at all experienced these symptoms, varies from 67,8 percent to 91,7 percent. The percentages of people who have experienced these depressive symptoms more than usual and much more than usual vary from 2,6 percent to 8,7 percent. In particular, the respondents who experience considerations to put an end to their lives, thoughts about wishes of death, and thoughts of attempting suicide, ‘rather more’ and ‘much more than usual’ vary between 2,6 percent and 4,0 percent. This pattern of a much larger proportion of low scores and a much smaller proportion of higher scores on these three items is consistent with an interpretation of these items that can be related to a pathological condition of suicidal ideation. One might assume that a much higher proportion of scores on these symptoms would be found in a sample of institutionalised people. These low variances in the present study

indicate that only a slight percentage of the people, i.e., a subgroup of the general population, suffer from thoughts about death and suicide. However, the other four items referring to less severe depressive symptoms, show a relatively broader range of scores in the general population.

Table 2.2 Frequencies of depressive symptoms of the GHQ-28 depression subscale

		Not at all	No more than usual	Rather more than usual	Much more than usual	N
GHQ-28_D1	Feelings of worthlessness	69.9	24.1	4.5	1.4	1798
GHQ-28_D2	Life is hopeless	70.0	23.7	4.9	1.3	1799
GHQ-28_D3	Unable to do anything because nerves were to bad	67.8	23.5	6.9	1.8	1799
GHQ-28_D4	Feelings that life is not worth living	73.4	21.0	4.3	1.3	1798
GHQ-28_D5	Considered putting an end to your life	90.2	6.7	2.8	0.3	1798
GHQ-28_D6	Had thoughts about wishing you were dead	88.3	7.7	3.1	0.9	1799
GHQ-28_D7	Had thoughts about taking your own life	91.7	5.7	2.2	0.4	1798

(Data: NHA-2 study; valid cases N=1,798)

To perform a final test of the dimensional structure of depressive symptoms, a second principal factor analysis with oblique rotation was conducted on the seven items of the depression subscale of the GHQ-28, that are assumed theoretically to be indicative of depressive symptomatology[9]. These results are presented in Table 2.3.

The inter-item correlations of the seven items of the GHQ-28 depression subscale show substantial correlation coefficients (> 0.41). It appeared that the three items that refer to suicidal ideation (item GHQ-28_D5, item GHQ-28_D6 and item GHQ-28_D7) have rather high and homogeneous inter-item correlation coefficients: 0.76, 0.79 and 0.80, respectively. In addition, the four items – item GHQ-28_D1, item GHQ-28_D2, item GHQ-28_D3, and item GHQ-28_D4- show substantial inter-item correlations (> 0.54) and homogeneous coefficients.

Next, the results in Table 2.3 show that two factors with Eigenvalues higher than 1.00 have been extracted. The communalities are sufficient (> 0.20), and the factor loadings have substantial values (> 0.70) (Kim & Mueller 1984). The results of the factor structure in Table 2.3 show a two-factor solution, where the first factor refers to items GHQ-28_D1, item GHQ-28_D2, item GHQ-28_D3, and item GHQ-28_D4, and the second factor includes three items, respectively item GHQ-28_D5, item GHQ-28_D6 and item GHQ-28_D7.

These two dimensions of depressive symptoms proved to be mutually correlated. The correlation between the factors is 0.68. Together, the two factors account for a reasonable proportion of variance in the answers of the items (about 70 percent).

The relatively high and homogeneous inter-item correlation coefficients, the cluster of the items GHQ-28_D5, GHQ-28_D6, and GHQ-28_D7 in the second factor, together with the rather low variance in the scores on these items, provide empirical arguments to exclude these three items from the final measurement scale of depressive symptoms in the present study. A theoretical argument can also be found in the fact that this two dimensional structures in depressive symptoms can be conceptually distinguished. Three symptoms concern attempts at suicide and thoughts about death, which can be defined as rather *severe depressive symptoms*. The remaining four items are aiming at measuring *less severe depressive symptoms*. This conceptual differentiation between less severe and severe depressive symptoms can be found in other studies that use multidimensional scaling techniques (Derogatis et al. 1974; Furer et al. 1995; Graetz 1991; Mirowsky & Ross 1989). This previous research showed a broad range of dimensions such as symptoms that refer to a syndromal depressive affect, a dimension that mirrors milder feelings of sub-syndromal depression, as well as several items that include suicidal ideation (Derogatis et al. 1974; Goldberg & Hillier 1979; Furer et al. 1995).

A fifth aspect with respect to measurement criteria concerns *reliability.* To determine the degree of internal consistency of the items that aim to constitute a reliable scale, item analysis was performed. The inter-item correlation coefficients among these four items as shown in Table 2.3 show sufficient values (> 0.54) and the reliability coefficient suggests a reasonable degree of internal consistency among these four items, i.e., standardised Cronbach's alpha is 0.89 in total sample (standardised Cronbach's alpha for men: 0.86 and women: 0.88). Reliability coefficients of the GHQ-28 depression subscale of the seven items vary between 0.83 and 0.94 (Goldberg & Hillier 1979; Goldberg & Williams 1988; Goldberg et al. 1997). Satisfactory reliability coefficients have been reported by other validation studies since the last review of Goldberg & Williams (1988) (Koeter & Ormel 1991). Nevertheless, reliability coefficients were mostly based on studies using data from institutionalised settings, i.e., patients from general hospitals, or subpopulations i.e., youngsters or the elderly (Banks 1983; Gureje & Obikoya 1990; Hobbs et al. 1984; Winefield Goldney Winefield & Tiggemann 1989). It appeared to be difficult to find comparable studies using the General Health Questionnaire in large-scale data from a sample of the general population with age classes ranging between 18 and 70 years. An exception is a study of Harrison et al. (1999).

To summarise then, the measurement of depressive symptomatology can theoretically and empirically distinguish a conceptual dimension of less severe depressive symptomatology and severe depressive symptomatology. The concept and measurement of *less severe depressive symptomatology* will be used in this study.

Table 2.3 Correlations and principal factor analysis with oblique rotation on items of GHQ-28 depression subscale

	Inter-item correlations						
GHQ-28_D1	1.00						
GHQ-28_D2	.66	1.00					
GHQ-28_D3	.62	.74	1.00				
GHQ-28_D4	.54	.57	.57	1.00			
GHQ-28_D5	.43	.51	.57	.38	1.00		
GHQ-28_D6	.51	.57	.64	.45	.77	1.00	
GHQ-28_D7	.43	.51	.57	.41	.79	.80	1.00

	Factor loadings		**Communalities**
	Factor 1	**Factor 2**	
GHQ-28_D1	**.79**	.05	.51
GHQ-28_D2	**.85**	-.02	.63
GHQ-28_D3	**.73**	-.17	.65
GHQ-28_D4	**.70**	.01	.41
GHQ-28_D5	-.03	**.91**	.68
GHQ-28_D6	.04	**.78**	.73
GHQ-28_D7	-.03	**.92**	.72
Eigenvalues	4.46	1.11	
Explained variance	59,6%	10,3%	

	Factor correlations	
	Factor 1	**Factor 2**
Factor 1	1.00	
Factor 2	.68	1.00

(Data: NHA-2 study; valid cases N=1,798)

2.3.4 Depressive mood

A second conceptual dimension of depressive symptoms is depressive mood. This concept represents more generally formulated items such as feelings of sadness and disappointment. These items are associated with a general dysphoric mood as included in the DSM-IV (APA 1994)*(content validity)*. In general, the content and formulation of these items is comparable to the items of the depressed mood subscale in the Center of Depression Scale (CES-D) (Radloff 1977). It appeared that the CES-D scale has become a standard measurement instrument in sociological and epidemiological research on depressive symptoms and psychological distress in the general population (Beekman et al. 1994; Braam 1999a; Bracke 1998; Mirowsky & Ross 1983, 1989; Ross & Mirowsky 1984). The complete CES-D questionnaire contains 20 items in which respondents are asked how many days during the previous week they experienced specific symptoms. This scale has consistently demonstrated reliable and valid results in large-scale epidemiological studies (Beekman et al. 1994; Braam 1999a; Bracke 1998; Mirowsky & Ross 1983, 1989).

Accordingly, in our study, several items display conceptual similarity to items that refer to depressed mood in the CES-D are distracted from the 30-item version of the General Health Questionnaire (GHQ), a dimensional measurement scale applicable in samples of the general population (Goldberg & Hillier 1979; Goldberg 1996; Goldberg & Williams 1988; Koeter & Ormel 1991).

Consequently, to determine whether these items of the GHQ-30, as compared to the CES-D, are an appropriate measurement to use as a valid and reliable operationalisation of depressive mood in our study, this instrument will be evaluated with regard to several measurement issues as described in section 2.2.3.

One aspect is *severity*. This aspect is accomplished since these items, which refer to a dysphoric mood are included in the DSM-IV (APA 1994). The content of these items appeared to be specific enough to be incorporated as a complex of symptoms built into a dimensional measurement of depressive symptoms whose sum scores indicate a degree of depressive mood which ranges from less severe to considerably severe depressive symptoms.

A second aspect concerns *duration*. As the GHQ-30 in the present study is used to measure depressed mood, the answer categories are not comparable with the original CES-D scale. In the CES-D scale, respondents were asked how they were feeling during the previous week. In the GHQ-30, respondents were asked whether they had experienced certain symptoms during the previous four weeks. However, this difference in the aspect of duration does not pose any problems since both measurements meet the criteria of an episodic period of duration of the previous week to a month at most *(content validity)*.

A third aspect concerns the presence of *positively worded items* in the operationalisation of the measurement of depressed mood. In our study, items that refer to positively formulated symptoms are not included in a measurement of depressed mood, except to reduce the effect of response set in the complete questionnaire. Previous validation studies also support the use of sum scores based on single negatively formulated depressed mood items (Beekman et al. 1994; Schroevers Sanderman van Sonderen & Ranchor 2000). Moreover, the full questionnaire of GHQ-30, from which the items of depressed mood will be distracted, includes several positively formulated items in order to break response set (Goldberg & Williams 1988; Koeter & Ormel 1991).

A fourth aspect concerns *conceptual clarity* of several dimensions of symptomatology *(content validity)*. Previous validity research of the 20-item version of the CES-D scale using multidimensional scaling techniques, showed separate dimensions of positive mood, somatic complaints, interpersonal problems, and depressive mood (Beekman et al. 1994; Braam 1999a; Mirowsky & Ross 1983, 1989; Radloff 1977; Ross & Mirowsky 1984). Despite this convincing empirical evidence of separate conceptual dimensions, most epidemiological research uses a simple total score as an estimate of the degree of depression or psychological distress (Beekman et al. 1994; Mirowsky & Ross 1989; Radloff 1977). However, to assess conceptual clarity in the measurement of this study, items that refer to somatic complaints, interpersonal problems, insomnia, or positive mood are not included in a measurement of depressive mood.

Accordingly, we distracted several items from the 30-item version of the GHQ in order to measure depressive mood. However, it appeared that the GHQ-30 did not contain specific items that refer to depressed feelings, or any item about the consideration that life is a failure. Although the GHQ-30 did not contain items of which the formulation and content exactly resemble the initial CES-D items, specific items of the GHQ-30 have been selected that are conceptually comparable to symptoms of depressed mood included in the CES-D (Radloff 1977).

To summarise then, a second measurement of depressive symptoms is operationalised by several unpleasant symptoms that refer to the conceptual dimension of depressed mood measured by a six-item modification of the CES-D scale based on GHQ-30 items (see also Mirowsky & Ross 1983, 1989; Ross & Mirowsky 1984).

Next, we will test whether the items that are assumed theoretically to be indicative for depressive mood, actually empirically measure this concept. Based on large-scale data from the NHA-2 study (König-Zahn et al. 1999), the empirical results of item analyses, as well as principal factor analyses, will be evaluated. First, frequencies of the responses to this measurement of depressed mood are described. Table 2.4 shows the frequencies of the responses to the items of the GHQ-30 comparable to the items of the CES-D in the NHA-2 study.

Table 2.4 Frequencies of depressive symptoms of the CES-D depressive mood subscale

		Not at all	No more than usual	Rather more than usual	Much more than usual	N
CES-D_D1	Had trouble keeping your mind on what you were doing	19.1	46.0	27.3	6.8	1798
CES-D_D2	Felt you just couldn't get going	29.6	52.0	14.6	3.0	1799
CES-D_D3	Felt that everything was an effort	45.8	37.6	13.1	2.8	1799
CES-D_D4	Felt lonely	27.0	49.4	20.7	2.8	1799
CES-D_D5	Felt you couldn't shake off the blues	35.4	39.1	21.7	3.8	1799
CES-D_D6	Felt sad	42.6	36.0	16.9	3.8	1799

(Data: NHA-2 study; valid cases N=1,798)

The percentages of people who did not experience these symptoms at all, vary from 19,1 percent to 45,8 percent. The percentages of people who experienced these depressive symptoms much more than usual vary from 3,0 percent to 6,8 percent. Item D1 of the CES-D received the most agreement, 34,1 percent of the respondents state that they experienced rather more, and much more than usual 'trouble keeping their mind on what they were doing'. Furthermore, the other five items show comparable ranges of percentages of agreement, i.e., percentages of the answer category 'more than usual' and 'much more than usual', varies between 14,9 percent and 25,4 percent. These percentages of respondents who give answers indicative of a heightened risk of suffering from depressive mood are comparable to studies that use CES-D items (Beekman et al. 1994; Bracke 1998; Braam 1999a; Breslau 1985; Husiani et al. 1980; Mirowsky & Ross 1983; Ross & Mirowsky 1984).

Next, we will test whether the items that are assumed theoretically to be indicative of a certain dimension, namely depressive mood, actually refer to this dimension. Accordingly, inter-item correlation coefficients and principal factor analysis with oblique rotation were conducted on these items and the results are presented in Table 2.5.

Table 2.5 Correlations and principal factor analysis with oblique rotation on items of the (CES-D) depressive mood subscale

	Inter-item correlations					
CES-D_D1	1.00					
CES-D_D2	.51	1.00				
CES-D_D3	.43	.57	1.00			
CES-D_D4	.50	.62	.58	1.00		
CES-D_D5	.52	.62	.58	.62	1.00	
CES-D_D6	.45	.63	.62	.66	.69	1.00

	Factor loadings	**Communalities**
	Factor 1	
CES-D_D1	.78	.54
CES-D_D2	.82	.61
CES-D_D3	.73	.48
CES-D_D4	.79	.55
CES-D_D5	.81	.59
CES-D_D6	.61	.35
Eigenvalues	3.48	
Explained variance	57,9%	

(Data: NHA-2 study; valid cases N=1,798)

The correlation matrix in Table 2.5 shows substantial inter-item correlation coefficients (> 0.43) as well as rather homogeneous correlation coefficients, which suggest that all the six items measure the same underlying construct. Besides that, the results of Table 2.5 show a one-factor solution with a high Eigenvalue of 3.48. Moreover, the communalities show sufficient values (> 0.35) and the factor loadings show substantial values (> 0.61). The one-factor solution accounts for a reasonable proportion of variance in the answers of the items (about 58 percent). Based on these results, these items representing depressive mood appeared to constitute one scale applicable to a sample of the general population.

A fifth aspect of measurement issues concerns *reliability*. Item analyses show strong internal consistency in the six items, which justifies the constitution of one scale to measure depressive mood (standardised Cronbach's alpha 0.86 in total sample, standardised Cronbach's alpha men: 0.85 and women: 0.87) (Cronbach 1951). Comparable results can be found in several studies in the general population and in specific sub populations using the complete CES-D scale (Cronbach's alpha 0.87 in 20-item version) or a modification of it (Cronbach's alpha 0.87 in seven-item version) (Beekman et al. 1994; Bracke 1998; Braam 1999a; Breslau 1985; Husiani et al. 1980; Mirowsky & Ross 1989).

To summarise then, based on these empirical results, there is convincing evidence to demonstrate that these six items are indicative of depressive mood and that these items constitute a valid and reliable measurement scale applicable in a sample of the general population.

It has to be considered that people who have one type of problem, i.e., who suffer from depressive symptoms, tend to have other symptoms that may indicate different types of disorders and that consequently, correlate positively with depressive symptoms. With respect to *convergent validity*, accordingly, these two dimensional measurement scales of depressive symptoms should correlate moderately with each other, as well as with other scales designed to measure aspects of mental disorders. Accordingly, Table 2.6 shows correlation coefficients of these two dimensional measurements of depressive symptoms (GHQ-28_dep, less severe depressive symptomatology and the CES-D depressive mood), with other self-report measurement scales as included in the NHA-2 study (König-Zahn et al. 1999).

The correlation coefficient between both dimensional measurements (GHQ-28_dep and CES-D) shows a substantial correlation of 0.66. However, both types of symptoms represent a sufficient distinctiveness, as can be seen from the results of a principal factor analysis with oblique rotation presented in Appendix A. Therefore, it is most appropriate to use two separate dimensional measurements of depressive symptoms that discriminate theoretically and empirically between depressive dysphoric mood (CES-D) and depressive syndromal symptoms (GHQ-28_dep). The present study aims to choose a dimensional measurement that contains multiple symptoms on which an average level of symptoms severity can be computed that indicates less severe depressive symptoms to severe levels of depressive symptoms. Moreover, the pattern of the correlations between the GHQ-28 scale and the CES-D scale with other scales gives reasonable evidence of *convergent validity*. The highest significant Pearson correlation coefficients appeared between the scales of the total scores based on an index of general mental disorders or general symptomatology like the GHQ-30, the GHQ-28 and the GHQ-12.

As was expected on the basis of conceptual distinction, correlation coefficients of the GHQ-28, with the scales of somatic complaints and anxiety symptoms shows moderate

correlations, 0.57 and 0.53, respectively. However, the correlation coefficient of a subscale of anxiety symptoms with the CES-D turns out to be relatively high (0.87).

Table 2.6 Correlations of the GHQ-28 subscale of less severe depressive symptoms and the CES-D depressive mood scale with other self-report measurements available in the dataset of the NHA-2 study

	GHQ-28 dep	CES-D	Anxiety/ insomnia	Somatic complaints	Social Dys-function	GHQ-30	GHQ-28	GHQ-12
GHQ-28 Dep	1.00							
CES-D	.66	1.00						
Anxiety/ Insomnia	.62	.87	1.00					
Somatic complaints	.57	.65	.69	1.00				
Social dysfunction	.53	.69	.64	.52	1.00			
GHQ-30	.79	.89	.78	.68	.78	1.00		
GHQ-28	.80	.85	.88	.77	.78	.88	1.00	
GHQ-12	.73	.83	.89	.61	.75	.90	.85	1.00

(Data: NHA-2 study; valid cases N=1,798)

2.4 Summary and conclusions

In this study we aimed to choose appropriate items to represent a valid measurement for assessing *depressive symptoms* in the general population, using the rather strong empirical design of large-scale data of the general population. Since the predominant concept in our study is *depressive symptoms,* two conceptual dimensions are theoretically distinguished and operationalised: depressive symptomatology and depressive mood. These two conceptual dimensions of depressive symptoms are used in much contemporary sociological and epidemiological population-based research on mental disorders (Mirowsky & Ross 1989; Wakefield 1999). The concept of *depressive symptomatology* encompasses depressive symptoms of which the features are closely related to core symptoms of the DSM-IV (APA 1994). Actually, the formulations of these items refer to a *syndromal depressive affect* i.e., a complex of rather intense, pervasive, and persistent multiple symptoms such as feelings of worthlessness, hopelessness, diminished ability to think or concentrate, and suicidal ideation.

The concept of *depressive mood* encompasses symptoms of which the features are closely related to a *dysphoric mood* i.e., they actually refer to less intense, rather commonly and negatively formulated items of depressive symptoms such as feeling depressed, blue, sad and experiencing a considerable loss of interest or pleasure in almost all activities. The items that can be associated with a dysphoric mood are formulated in the DSM-IV (APA 1994). In general, it appeared that the latter symptoms resemble the content of a large number of items included in several dimensional measurements that have been frequently applied in large-scale population research (Aneshensel & Phelan 1999; Mirowsky & Ross 1989).

Consequently, the present study uses two types of dimensional measurements containing specific depressive symptoms that theoretically distinguish between items that refer to depressive symptomatology and items that refer to depressive mood. Moreover, based on a review of previous validation studies, several measurement criteria were formulated and as a result, these specific items have been evaluated and validated in an empirical design using large-scale survey data.

With regard to the first aspect of *severity,* based on a number of items, people got a total score on a continuum of both dimensional measurement scales. These continuous scale scores indicate the extent to which people suffering a little from depressive symptoms to suffering considerably from depressive symptoms *(content validity).*

Furthermore, the second and third aspects of content validity are accomplished in both measurement scales. *Positively formulated items* are not included in the measurement and are only used reducing the effect of response set in the complete questionnaire *(content validity)*. The *duration* of the answer categories in the questionnaires incorporate a period of the previous four weeks *(content validity).* With respect to *conceptual clarity,* it appeared that this could be achieved in measurements of depressive symptoms that use only single items whose content refers to core depressive symptoms. In addition, it appeared that, distinct from depressive symptoms, items that refer to suicidal ideation, insomnia, and somatic complaints form separate dimensions, conceptually and empirically. Moreover, for both dimensional scales, inter-item correlations and reliability coefficients showed a reasonable degree of internal consistency of depressive symptomatology, and depressive mood, respectively.

To summarise then, this empirical evaluation of several measurement issues resulted in one scale containing four items, which represent less severe depressive symptomatology according to the original GHQ-28 depression subscale (Goldberg & Hillier 1979; Goldberg & Williams 1988), and one scale that consists of six items representing depressive mood symptoms according to the Center of Depression Scale (Radloff 1977). These two dimensions, however, are similar to measurements used in much contemporary epidemiological and sociological research on aspects of mental disorders (Aneshensel & Phelan 1999; Horwitz & Scheid 1999).

Moreover, for the purpose of this study, the use of these measurements fits more closely than the use of non-specific measurements of psychological distress, mental illness or general demoralisation (Dohrenwend 1982, 1995; Dohrenwend et al. 1980; Mirowsky & Ross 1989). Consequently, a measurement of *depressive symptoms* in this study attains maximum content validity due to the use of specific items. These specific items are related to theoretically distinct dimensions of dysphoric mood and syndromal depressive affect and can be associated with the core components of the DSM-IV (APA 1994).

This multi-method approach of two types of dimensional measurements of depressive symptoms, i.e., less severe depressive symptomatology and depressive mood, makes it possible to compare and evaluate these measurements in one research design. Simultaneous tests of dimensional measurements of two related constructs in one study might enhance the knowledge about social variations of suffering from depressive mood, as well as suffering from less severe depressive symptoms.

Moreover, there is an increasing application and great future potential for a multi-methods approach to the assessment of different kinds of measurements in large-scale research (Aneshensel & Phelan 1999; Horwitz & Scheid 1998). As empirical results support aspects of *content validity* sufficiently, however, the *construct validity* of these two measurements of

depressive symptoms has to be empirically tested. Therefore, a set of hypotheses will be generated about several social factors that should be associated with suffering from depressive symptoms. If these predicted relationships are empirically established, this empirical evidence can be compared to and evaluated with previous studies on social variations of depressive symptoms. This will be done in the chapters that follow, where hypotheses on the effects of people's social positions on depressive symptoms in the general population will be empirically tested using representative large-scale survey data of the general population.

Notes Chapter 2

[1] In this chapter, we focused primarily on relatively recent developments in instruments and measurement techniques of aspects of mental disorders. A review of the evolution of community mental health instruments can be found in Dohrenwend & Dohrenwend (1982) who identified several distinct periods of methodological developments that have grown into what they refer to as 'third generation studies' (see also Furer et al. 1995; Wakefield 1999).

[2] In 1980, as a result of psychiatric and clinical research in previous decennia, the American Psychiatric Association provided a manual with operationalised, theory-neutral, reliable criteria for mental disorders that were converged in the DSM-III. This version was refined in later versions like the DSM-III-R and DSM-IV (see also Dohrenwend & Dohrenwend 1982; Wakefield 1999). In this study, we refer to the latest version of DSM-IV (APA 1994).

[3] This medical model rejects the idea that mental health and illness form a continuum and instead views health and illness as opposites poles that form a dichotomy. In this view, mentally ill people are placed into specific disease categories by the identification of specific symptoms. One either has, or does not have, types of mental disorders such as schizophrenia, depression or anxiety disorders. This dichotomous model stems from biomedical research emphasising organic, biological, genetic and neurological causes of mental disorders (Wakefield 1992a, 1992b, 1999).

[4] Items of the GHQ-28 as included in the self-rating questionnaire applied in the NHA-2 study were asked in a sequence other than the one presented in Appendix A.

[5] Actually, the items of the GHQ-28 are based on a previous version of the DSM, namely DSM-III. However, in the DSM-IV no considerable revisions were made compared to the DSM-II concerning the symptoms and diagnostic criteria of depression (APA 1994; Goldberg & Hillier 1979).

[6] Examination of these missing values showed that 15 respondents had missing values on the total number of items of the GHQ-28. This makes a valid procedure of missing value substitution rather problematic.

[7] Previous research based on general population and patients samples has evaluated the dimensional structure of the GHQ-28 using principal component analysis (Goldberg & Hillier 1979; Goldberg & Williams 1988; Goldberg et al. 1997; Werneke et al. 2000). This does not seem to be the most appropriate method for determining various dimensions of symptomatology. In general, it is rather unusual to perform principal component analysis instead of principal factor analyses since the former scaling technique ignores the unique variance of the items (Kim & Mueller 1984). The variance of each of these items can be distinguished in a part that is explained by an underlying factor, whereas the other part of variance can be explained with measurement errors. Because of this unique variance, principal factor analysis rather than principal component analysis is recommended in research based on large-scale data of the general population (Kim & Mueller 1984). Moreover, previous research applied principal component analysis with varimax rotation although factor solutions showed substantial correlated factors. In addition, based on theoretical arguments, dependency between various dimensions of symptomatology should be assumed. Therefore, oblique rotations would be more appropriate, because this procedure assumes dependency between the various dimensions of symptomatology (Kim & Mueller 1984). Consequently, in this study, we conducted principal factor analysis with oblique rotation, assuming dependence, i.e., correlations between the factors (Kim & Mueller 1984). This methodological approach seems to be most appropriate to establish validity of the particular factorial structure.

Although, this procedure to attain more meaningful and unambiguous understanding of the dimensionality of the General Health Questionnaire (GHQ) is recommended by several researchers, there have been just a few previous studies that used principal factor analysis (Shek 1993; Whittington & Huppert 1998).

[8] The original DSM-IV components of depressive symptoms contain also a component of appetite disturbance and weight problems. However, items that refer to symptoms of appetite disturbance or weight problems are not included in the GHQ-28 (Goldberg & Hillier 1979).

[9] The factor solution of the GHQ-28 showed a cross-loading of item B5 on the factor of anxiety as well as on the factor of depressive symptoms. Consequently, this item was omitted in a second principal factor analysis. This omission makes the content of the remaining items on the depressive symptoms scale more homogeneous. This is in accordance with theoretical arguments of content validity, i.e., selecting specific items whose content refers primarily to depressive symptoms.

3 Depressive symptoms in the Netherlands 1975 - 1996: a longitudinal perspective *

3.1 Introduction

Previous research has suggested that, over the last decades, important temporal changes have occurred in the rates of depressive symptoms. Research in the United States has shown evidence for a continuous increase in the levels of depressive symptoms since the Second World War, a steady increase in the period between 1960 and 1980 for all age classes (i.e., period effect), a higher level of depressive symptoms for people born between 1930 and 1949 (i.e., cohort effect), and a decrease in the age of onset for all birth cohorts (Wickramaratne et al. 1989). In addition, an epidemiological study in Lundby, Sweden, found an over-time increase in the levels of depressive symptoms, during a 25-year period from 1947 to 1972 (Hagnell et al. 1982). Other longitudinal studies in Canada, Great Britain, Finland and New Zealand, showed mixed results of over-time rates of depressive symptoms. Some studies showed a steady increase in depressive symptoms over time, others have reported stable rates in the 1970s, and some research reported short-term fluctuations in the 1980s and 1990s, and some cohort effects: people born between 1930 and 1940 and between 1966 and 1975, have on average, higher rates of depressive symptoms (Joyce et al. 1990; Lehtinen et al. 1991; Klerman & Weissman 1988, 1989; Murphy et al. 2000; Paykel 2000; Sacker & Wiggins 2002). It has been stressed that this evidence of a continuous increase over the last decades, is most persuasive for major depression and that there is some evidence of temporal trends for mild and moderate sub-syndromal depression, i.e., depressive symptoms (Burvill 1995; Klerman & Weissman 1988, 1989).

However, comparing these mixed results of variations over time of depressive symptoms are rather difficult. Results have been based on studies with dissimilar research designs, different methods of data-analyses, distinct concepts and measurements of depressive symptoms, and disparate periods of time (Hagnell et al. 1982; Sacker & Wiggins 2002; Warshaw Klerman & Lavori 1991). Moreover, due to specific sample-based data, such as, patients in mental health institutions, community based samples or samples of particular sub-populations, i.e., specific age categories or birth cohorts, it is rather problematic making a clear identification of a general pattern in variations over time in depressive symptoms in the general and open population (Burvill 1995; Warshaw et al.1991)[1].

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Hence, an appropriate way gaining more general insights into the variations over time in depressive symptoms in the open society, is using a similar measurement of depressive symptoms. This measurement should be applied in repeated cross-sectional and representative samples of the general population, which covers a relatively large period. Fortunately, we found longitudinal data based on representative samples of the national population of the Netherlands, in which depressive symptoms have been recorded over a period of more than two decades, using a similar measurement (surveys of Cultural Changes project 1975-1996; Social and Cultural Planning Office (SCP); Becker 1997). Because in the Netherlands no valid empirical evidence has been presented for the longitudinal development of depressive symptoms (Garssen & Hoeymans 2002; Van den Berg & van der Wulp 1999), these representative large-scale data allows us to fill some gaps in empirical research on the longitudinal trend of depressive symptoms in the general adult population of the Netherlands.

Moreover, since the pioneering work of Brown and Harris (1978) on the social origins of depression, it has been generally acknowledged that suffering from depressive symptoms is related to opportunities and constraints in every day life. Over the last decades, many studies have made major contributions to the relationship between people's social positions and suffering from depressive symptoms (Aneshensel & Phelan 1999; Horwitz & Scheid 1999; Tausig et al. 1999). Studies have reported over-time changes in suffering from depressive symptoms of several social groups, such as divorced people, church members, unemployed people, women and adolescents (Burvill 1995; Hagnell et al. 1982; Kessler & McRae 1981; Klerman 1988; Koenig 1997; Lahelma Arber Rahkonen & Silventoinen 2000; Lehtinen et al. 1991; Murphy 1986, Murphy et al. 2000; Wickramaratne et al.1989). As these social characteristics of people can be considered as levels of economic, social and cultural resources, subsequently, we theoretically elaborate on the association between people's levels of resources and depressive symptoms in general and over time. Based on the theoretical framework of SPF-theory (Ormel et al. 1997, 1999), we will derive several hypotheses on variations over time in social categories and depressive symptoms. Using representative large-scale data sets from repeated cross-national surveys over more than two decades (survey Cultural Changes 1975-1996 (SCP); Becker 1997), we will be able testing these hypotheses systematically. Moreover, incidentally, previous research in the Netherlands has shown that female and male social positions differ fundamentally (Dronkers & Ultee 1995; Van Berkel & de Graaf 1998). Several recent studies have suggested a narrowing of the gender gap in depressive symptoms, among women and men born after the Second World War (Crawford & Prince 1999; Kessler & McRae 1981; Lahelma Martikainen Rahkonen & Silventoinen 1999; Murphy 1986). Accordingly, we will theoretically explore gender differences in levels of resources and depressive symptoms in general and over time.

Furthermore, previous longitudinal research on depressive symptoms suggests that temporal rate changes may be sensitive to fundamental social changes of society. Several scholars have argued that a longitudinal trend of depressive symptoms in the general population may be associated with changes in the economic climate, such as changing unemployment rates, shifts in occupational patterns and growing participation of women in the labour market (Dooley & Catalano 1980; Klerman & Weissman 1989). Others suggest that also demographic developments, such as changes in family structures, growing numbers of single-parent families and increased geographic mobility, together with cultural processes, such as secularisation, increased migration and shifts in normative beliefs and values, might contribute to temporal changes in rates of depressive symptoms (Braam 1999a; Klerman & Weissman 1988, 1989;

Koenig 1997). However, because of a lack of appropriate individual and contextual data, many researchers were unable to give a comprehensive empirical overview of temporal changes in depressive symptoms (Burvill 1995; Kessler & McRae 1981; Klerman & Weissman 1988, 1989; Lahelma et al. 1999). Therefore, several studies have recommended further research on longitudinal developments in mental disorders, related to developments in society (Hagnell et al. 1982; Murphy 1986, 2000; Paykel 2000; Sacker & Wiggins 2002). Unfortunately, until now, little attention has been paid to theoretical implications on the relevance of macro-contextual factors that might explain variations over time in depressive symptoms in the general population in the Netherlands (Garssen & Hoeymans 2002; Van den Berg & van der Wulp 1999).

Consequently, in this study, we aim to elaborate on the association between contextual circumstances at the national level and depressive symptoms. Exposure to conditions of society might evoke feelings of insecurity, dissatisfaction, loneliness, isolation and hopelessness, which might damage people's psychological well-being and induce depressive symptoms (Jacobson 1989; Macintyre et al. 1993). We state that this association between national conditions and depressive symptoms might occur in the period one is living in at the moment (period effect). From this *time-period perspective*, it is expected that macro-contextual circumstances affect suffering from depressive symptoms. Moreover, there can also be an influence from the period one grew up, the formative years (cf. Mannheim 1928/1964). This *cohort perspective* stresses the importance of experiences of the socialisation period that produces distinct experiences and orientations, because of a specific birth year, i.e., cohort membership. The period of young adulthood is considered to be decisive for the acquisition of normative beliefs, values and people's psychological well-being. It might be assumed that people's psychological well-being reflect the climate and macro-contextual circumstances in society during these formative years and produces differences in suffering from depressive symptoms between people who belong to different birth cohorts. To unravel the separate influences of period and cohort, we aim to apply a method of specifying theoretical relevant indicators of period and cohort experiences, using several national-level time series indicating national characteristics (Statistics Netherlands 1994a, 1999).

To summarise then, in this chapter, we aim to elaborate on *a longitudinal perspective on depressive symptoms.* Based on the theoretical framework of SPF-theory (Ormel et al. 1997, 1999) we derive hypotheses on variations over time in people's levels of resources and levels of national resources that may reveal valuable information on how to interpret a longitudinal development in depressive symptoms in the adult population of the Netherlands. Moreover, based on large-scale national and longitudinal data sets from the Social and Cultural Planning Office (survey Cultural changes 1975-1996; Becker 1997) which incorporates indicators of individual characteristics, and based on national-level time series indicating national characteristics, i.e., period and cohort effects (Statistics Netherlands 1994a, 1999), we will be able to test these hypotheses empirically. Accordingly, in this chapter we aim to fill some gaps in the theoretical and empirical research field of longitudinal studies on depressive symptoms. Based on a multifactorial perspective, we aim to test various individual and national characteristics simultaneously, that might show which the decisive social determinants of depressive symptoms in the Netherlands in the period 1975-1996 are.

The following set of research questions in this chapter will be answered:

1) *What has been the longitudinal trend in depressive symptoms over the period 1975-1996 in the Netherlands?*
2) *To what extent do people's levels of resources affect depressive symptoms in the period 1975-1996 in the Netherlands?*
3) *To what extent do effects of people's levels of resources on depressive symptoms differ for men and women in this period?*
4) *To what extent do effects of people's levels of resources on depressive symptoms and gender differences in these effects, change over this period?*
5) *To what extent do levels of national resources, i.e., period and cohort characteristics affect depressive symptoms, in addition to people's levels of resources in the period 1975-1996 in the Netherlands?*

3.2 Theory and hypotheses

3.2.1 Theoretical framework and propositions

This study uses the theoretical framework of Social Production Function Theory (SPF-theory) (Ormel et al. 1997, 1999), as a rather general starting point in a study on depressive symptoms following a multifactorial social approach. This theoretical framework incorporates several previous sociological approaches to mental disorders and is described in the first chapter of this book more extensively. SPF-theory views humans as actively attaining their ultimate goal of 'psychological well-being' using different resources to fulfil instrumental goals and universal needs. Since we consider depressive symptoms to be a lack of psychological well-being, these theoretical notions about the effects of low or lower levels of resources may be a fruitful theoretical approach in a longitudinal perspective on depressive symptoms in the Netherlands. Accordingly, the general proposition we state is: *lower and changing levels of individual and national economic, social and cultural resources induce suffering from depressive symptoms over time.* Subsequently, we systematically elaborated on this rather general proposition by formulating more specific propositions, based on theoretical approaches and previous research findings of mental disorders which can be synthesised into this theoretical framework, as derived from SPF-theory (Ormel et al. 1997, 1999).

3.2.2 Hypotheses on people's resources

In this section we formulate hypotheses on several socio-demographic categories that can be considered as people's levels of economic, social and cultural resources. Based on the theoretical framework of SPF-theory (Ormel et al. 1997, 1999), we will derive several hypotheses on variations over time in social categories and depressive symptoms.

3.2.2.1 Hypotheses on economic resources and changes over time

We state as a more specific proposition that people with a *lower level of economic resources* suffer more from depressive symptoms than people with a higher level of economic resources. People with a lower level of economic resources have less financial and material possibilities to fulfil instrumental goals such as status attainment and consequently reaching psychological well-

being. In line with research on social stratification and mental disorders, three widely used indicators of economic resources are educational attainment, income, and socio-economic class (Blau & Duncan 1967; Ortega & Corzine 1990). Consequently, we hypothesise that people with a lower educational attainment, people with a lower income, and people dependent on social security or solely on their partner's income (the latter category will furthermore be referred to as housekeepers) suffer more from depressive symptoms than people with a higher educational attainment, people with a higher income and employed people, respectively *(Hypothesis 1)*.

The general socio-economic development of Dutch society between 1975 and 1996 can be characterised by developments in social welfare services, differentiation in occupational relations and an economic boom since the mid-1980s (SCP 2001). In the early 1990s, this economic prosperity has led to, on average, higher income levels. Unfortunately, the difference with those with a lower income, together with those dependent on social security, sharply increased. In addition, the awareness of one's income level became, because of the 'traditional work ethos' and rising economic welfare of Dutch society, an important issue in the economic opportunities among individual people (Middendorp 1994; SCP 2001). Consequently, the people who in spite of this economic prosperity, still have lower levels of economic resources, i.e., still subsist on a lower educational attainment, a lower income or being unemployed, may perceive financial problems and economic insecurity, which cause more damage to psychological well-being than in earlier decades, due to the relatively sharp increase in people with a higher educational attainment, higher incomes and employed people, over this period. We hypothesise that *over time*, the difference in suffering from depressive symptoms between people with a lower educational attainment, people with a lower income or people dependent on social services compared with people with a higher educational attainment, people with a higher income or employed people, has increased *(Hypothesis 2)*.

3.2.2.2 Hypotheses on social resources and changes over time

Levels of social resources depend on people's degree of social integration and the amount of social resources they can derive from their social networks (Turner & Marino 1994). The most powerful indicator of the level of social resources appears to be the presence of an intimate relationship (House Umberson & Landis 1988a; House et al. 1988b; Hughes & Gove 1981). The lack of an intimate relationship, i.e., a lower level of social resources implies less support, advice, security and intimacy, which contributes negatively to instrumental goals such as affection, stimulation and comfort, and will finally induce a lack of psychological well-being, i.e., depressive symptoms. This is also in line with research on social relationships, social support and mental disorders (Aneshensel & Phelan 1999; House et al. 1988a, 1988b; Turner & Marino 1994). Consequently, we hypothesise that people who are divorced, widowed or never married suffer more from depressive symptoms than married people *(Hypothesis 3)*.

Additionally, one might argue that, because of the demographic development in Dutch society, the composition of married people, divorced people and people living alone has changed over time in the Netherlands (SCP 2001). Because the number of divorces in the Netherlands has increased in recent decades, and social networks of divorced people may become more homogeneous, this may provide more options for divorced people to utilise alternative social resources than in earlier decades. Because being divorced or living alone nowadays holds less unfavourable stigmas than in earlier times, these people may be less likely to encounter social disapproval or social isolation. Accordingly, we hypothesise that *over time*, the difference in

suffering from depressive symptoms between unmarried (divorced, widowed, never married) people and married people has decreased *(Hypothesis 4).*

3.2.2.3 Hypotheses on cultural resources and changes over time

Levels of cultural resources can be related to religious involvement. Religious involvement implies participation in a religious community that brings people into contact with others who have similar values and beliefs. Building on Durkheim (1897/1951), we argued that such beliefs give people a feeling of belonging, promote social integration and moreover, offer moral guidance for handling difficulties in life (Braam 1999a; Koenig 1997). These religious beliefs can be considered as *cultural resources*. A higher level of cultural resources may have powerful psychological consequences and protect against suffering from depressive symptoms (Koenig 1997; Ventis 1995). Consequently, people who are less religiously involved, or participate less in a religious community, have a lack or at least a lower level of cultural resources. Previous research in the Netherlands, based on several rather small cross-sectional community samples of elderly Dutch people, has shown that people who give up church membership, i.e., apostates, suffer more from depressive symptoms than those people who remained church members (Braam 1999a). Consequently, we formulate a more general hypothesis that people who left their denomination, i.e., apostates, suffer more from depressive symptoms than people who remained faithful to their church or denomination, and people who attended church to a lesser extent suffer more from depressive symptoms than people who attended church more regularly (*Hypothesis 5).*

There has been a vast secularisation process in Dutch society (Becker & Vink 1994; Te Grotenhuis & Scheepers 2001a). Overall, the number of people who dissociate themselves from religious communities is still growing. Those who left their church in the nineties, i.e., recent apostates, may have more opportunities for using alternative resources than those who left their religious group in the seventies, i.e., early apostates (Te Grotenhuis & Scheepers 2001a). We propose that recent apostates experienced a less severe decline in their levels of cultural resources and were suffering less from depressive symptoms than early apostates. We hypothesise that *over time*, the difference in suffering from depressive symptoms between apostates and people who have remained to be faithful, has decreased *(Hypothesis 6)*.

3.2.2.4 Hypotheses on gender differences and changes over time

Previous research shows a consistent gender difference: women suffer more from depressive symptoms than men (Culbertson 1997). Moreover, some studies have suggested that the over-time gender inequality to suffer from depressive symptoms has narrowed (Kessler & McRae 1981, Lahelma et al. 1999, Murphy 1986). Consequently, we hypothesise that women suffer more from depressive symptoms in the Netherlands, and that this gender effect has changed over time: the difference to suffer from depressive symptoms between men and women has decreased *(Hypothesis 7).* Based on the theoretical framework of SPF-theory, we will elaborate on this gender difference and derive hypotheses about gender differences in the association between levels of resources and depressive symptoms.

With regard to *levels of economic resources*, on average, women used to have lower educational and lower occupational levels than men, i.e., they had fewer economic resources, particularly in the Netherlands (Blossfeld & Hakim 1997). Also, many women were economically dependent on their partner (Van Berkel & de Graaf 1998). Consistent with this theoretical proposition, we state that women with lower economic resources suffer more from

depressive symptoms than men with lower economic resources. Women who had lower educational attainment suffer more from depressive symptoms than men with a lower educational attainment. And non-employed women suffer more from depressive symptoms than employed women, compared with respectively non-employed men who suffer more from depressive symptoms than employed men *(Hypothesis 8)*.

In the Netherlands, studies suggest that the gender inequality in economic resources has been declining over the past decades (Dronkers & Ultee 1995). In addition, there has been an increase in the number of Dutch women with a higher educational attainment and women who have paid employment (Blossfeld & Hakim 1997). This expanding participation of women in the labour market over the last decades, have beneficial effects on women and may increase the level of economic resources. Unfortunately, women who do not have paid employment, generally, may view their socio-economic position nowadays more negatively than in the past. We hypothesise that *over time* the difference in suffering from depressive symptoms between non-employed women and employed women has increased *(Hypothesis 9)*.

Recent studies have shown, regarding *social resources*, that men are more likely to depend on their spouse for social support and participation in social networks, than women are likely to depend on their spouse (Simon 1998). In cases of divorce or widowing, men may have lower levels of social resources and suffer more from depressive symptoms than women in a comparable situation. Therefore, we hypothesise that there will be gender differences in the association between marital status and depressive symptoms: the difference in suffering from depressive symptoms between unmarried and married men, is larger compared than the difference in suffering from depressive symptoms between unmarried and married women *(Hypothesis 10)*. We also expect the difference *over time* in suffering from depressive symptoms between unmarried and married men and women to have decreased *(Hypothesis 11)*.

With respect to the level of cultural resources, we state that - in general - women are more religiously inclined than men (Te Grotenhuis & Scheepers 2001a). Previous studies have suggested that women derive more mental benefit from religious involvement, i.e., women enjoy a higher level of cultural resources (Mirola 1999). Consequently, we hypothesise that women who attend church to a lesser extent, suffer more from depressive symptoms in comparison to men, who attend church less regularly, and that women who left their denomination, i.e., apostates, suffer more from depressive symptoms than male apostates, when compared to men and women who stayed faithful to their denomination *(Hypothesis 12)*.

As stated above, we assume that men and women, who have recently left their church, may experience the negative psychological consequences more severely, than recent male and female apostates. We hypothesise that *over time,* the difference in suffering from depressive symptoms between male apostates and men who remained faithful, and between female apostates and women who remained faithful, has decreased *(Hypothesis 13)*.

3.2.3 Hypotheses on national resources, i.e., period and cohort effects

Based on our theoretical framework, we set out to explore contextual circumstances at the national level in relation to variations over time of depressive symptoms in the Netherlands in the period between 1975 and 1996. In order to derive testable hypotheses, we theoretically elaborate on relevant indicators of particular macro circumstances of society. These national characteristics were indicated by period characteristics (available at the time of the data collection) and by cohort characteristics (available at the time when the respondents were in their formative years)[2].

Since the 1960s, the Dutch society has changed gradually, particularly because of economic developments, and social and cultural processes such as secularisation and individualisation (Becker & Vink 1994; Ester Halman & Moore 1993; SCP 2001; Wilterdink 1995). These particular indicators of levels of contextual national resources might induce depressive symptoms. Following this approach, we derive testable hypotheses from the theoretical framework to test the effects of contextual characteristics that might contribute to explain the longitudinal development of depressive symptoms in the Netherlands.

3.2.3.1 Hypotheses on national economic resources: unemployment

Based on our theoretical perspective and on some previous research about the influence of macro economic conditions on mental disorders, we state that the level of depressive symptoms at a given moment in time might be affected by a lower levels of economic resources of society (Dooley et al. 1988; Tausig & Fenwick 1999). As an indicator of a lower level of national economic resources, we use the level of unemployment in society. Studies have shown that countries and cities with a high unemployment rate have higher rates of ill health and mortality. In addition, previous studies have showed that unemployment levels affect pessimism about the future, fear for financial problems and consequently induce depressive symptoms (Dooley et al. 1988; Tausig & Fenwick 1999; Turner 1995). For these reasons, we can derive the following hypothesis: the higher the level of unemployment in a period, the higher the level of depressive symptoms *(Hypothesis 14a)*.

In addition to these period effects in terms of contemporary economic conditions, we also anticipate that recent changes in these national circumstances may have an additional influence on the longitudinal development of depressive symptoms (Brenner & Mooney 1983; Dooley & Catalano 1980). As based on our general proposition of changing national resources, we state that a rapid change in the unemployment level of society may affect depressive symptoms more strongly, than a constant level of unemployment. Hence, we hypothesise that the larger the (change) (increase) in unemployment, the higher the level of depressive symptoms (*Hypothesis 14b)*.

Furthermore, we assume that similar to the propositions of period effects, cohort effects may operate. Mannheim (1928/1964) described how birth cohorts move into a two-dimensional space of time and age. This makes one cohort's experiences different from those of any other cohort. A general proposition of cohort theory is that certain events or circumstances can produce lasting effects in the attitude and behaviour of cohort members, which remain relatively stable throughout the rest of their lives. If we combine these theoretical notions of Mannheim (1928/1964) with our theoretical framework, we derive that the more economic stress a cohort experienced during its formative years, i.e., the lower the level of national economic resources, the higher the levels of depressive symptoms in that cohort will be. Using the national level of unemployment as an indicator for the economic conditions of a person's formative years (birth cohort), we derive the following hypothesis: the higher the level of unemployment a cohort experienced during its formative years, the higher the level of depressive symptoms *(Hypothesis 14c)*.

3.2.3.2 Hypotheses on national social resources: individualisation

One might expect an influence of the process of individualisation on the long-term development of depressive symptoms in the Netherlands. An important aspect of individualisation is an

increased instability of social relations (Ester et al. 1993; Wilterdink 1995). The change in the nature and composition of households has resulted in a decline of the average size of household members, a rather sharp increase of the number of divorced people, and consequently, a growing proportion of single-person households (SCP 2001; Statistics Netherlands 1994a, 1999). This process might have had negative consequences for individuals and their social environment. The more people live on their own, the more they may experience loss of certainty, lack of group-belongingness, lack of affection and even social isolation. Therefore, we state that individualisation, as an indicator of a lower level of national social resources might induce depressive symptoms. We state that the higher the level of individualisation in some period, the higher the level of depressive symptoms *(Hypothesis 15a)*.

Moreover, if we combine the propositions of cohort theory (Mannheim 1928/1964) with our theoretical propositions on individualisation, we hypothesise that the more individualisation a cohort experienced during its formative years, the higher the level of depressive symptoms *(Hypothesis 15b)*.

3.2.3.3 Hypotheses on national cultural resources: secularisation

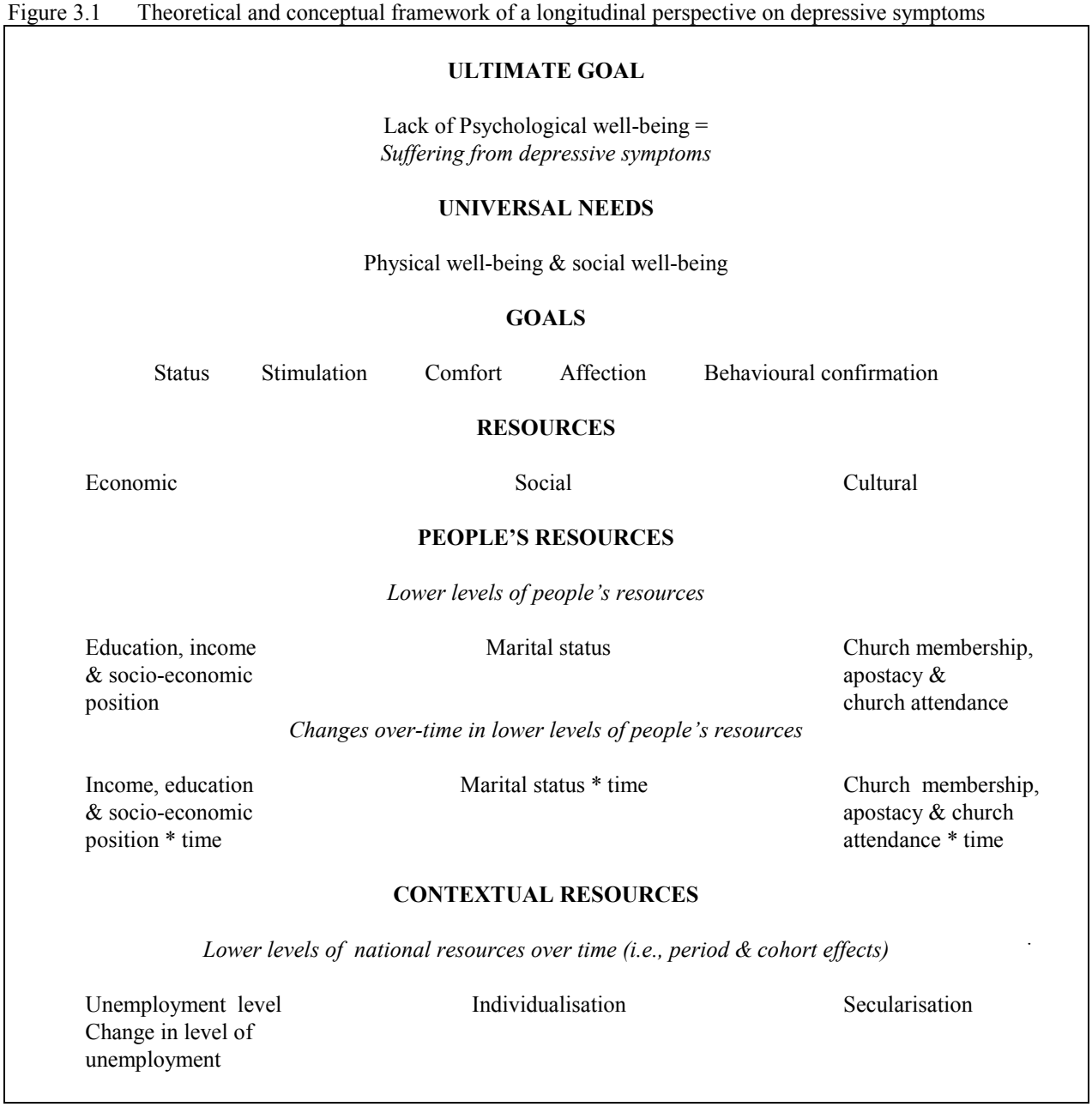
Based on our theoretical framework, we might state that the longitudinal development of depressive symptoms is affected by contextual cultural resources, which can be related to the process of secularisation in society. Because of the process of secularisation, the number of people belonging to religious communities has declined and has made the Netherlands one of the most secular countries in the world (Becker & Vink 1994). Using our theoretical perspective, we state that religiosity may play a significant role related to moral guidance as individuals assign meaning to ordinary life circumstances and potentially problematic events (Koenig 1997). Consequently, secularisation also implies at a societal level less moral guidance, i.e., a lower level of national cultural resources that may induce depressive symptoms (Ellison et al. 1997). The process of secularisation can be used as an indicator of a period effect, to explain the longitudinal development in depressive symptoms. We state that the level of secularisation of society affects the level of depressive symptoms at a given moment in time: the higher the level of secularisation in some period, the higher the level of depressive symptoms *(Hypothesis 16a)*.

Furthermore, if we combine the theoretical notions of cohort theory (Mannheim 1928/1964) with Durkheim's approach of religion (Durkheim 1897/1951), we propose that those who were socialised in times of strong pillarisation of Dutch society, may have stronger religious norms. These religious norms may stay stable throughout the course of life and imply a higher level of cultural resources, which decrease the risk to suffer severely from depressive symptoms. Using the level of secularisation as an indicator of cohort experiences, we derived the following hypothesis: the more secularisation a cohort experienced during its formative years, the higher the level of depressive symptoms *(Hypothesis 16b)*[3].

To summarise then, we formulated several hypotheses on lower and changing levels of people's resources and national resources, i.e. period and cohort effects, which can be synthesised into one theoretical framework as derived from SPF-theory (Ormel et al. 1997, 1999).

Figure 3.1 presents the theoretical framework of SPF-theory, and the theoretical elaborations and extensions as made in this chapter. This figure reflects the conceptual framework and serves as a schematic overview on the hypotheses about specific indicators of levels of resources and the effects on suffering from depressive symptoms.

Figure 3.1 Theoretical and conceptual framework of a longitudinal perspective on depressive symptoms



3.3 Data and methods

3.3.1 Data

In this chapter, we use repeated cross-sectional representative survey data gathered from the national population over more than two decades. The Dutch Social and Cultural Planning Office (SCP) has been collecting this kind of survey data as part of its 'Cultural Changes' project (Becker 1997). These secondary data, i.e., data not collected specifically for our research purposes, contain information on nine national survey samples over the period 1975-1996. All of these surveys employed representative samples of the Dutch adult population and are comparable with respect to various demographic characteristics. Each survey consisted of approximately

1,700 respondents aged between 18 and 75. The samples were drawn in a random way by selecting municipalities in the Netherlands based on the level of urbanisation.

Since the samples were drawn in a random way and there were enough number of respondents each year, we consider the samples broadly representative of the national Dutch population as far as gender, age and degree of urbanisation in the year of survey, are concerned (Becker 1997).

3.3.2 Depressive symptoms

A similar questionnaire on depressive symptoms has been administered to nine samples of respondents in the Netherlands in the period between 1975 and 1996. The items of this questionnaire were initially proposed by Gadourek (1963), as a measurement of lack of psychological well-being. People were asked whether they had feelings of loneliness, pointlessness, and depressiveness and felt worried. The formulation of these items resembles items that appeared in measurements and questionnaires developed at a later date such as the Self Rating Depression Scale (SDS; Zung 1965) and the Center for Epidemiological Studies of Depression Scale (CES-D; Radloff 1977). These items in our secondary data resemble symptoms of a depressive mood. As such, these symptoms incorporate a complex of symptoms, that can be used as a dimensional measurement of depressive symptoms, applicable in the general population (APA 1994; Horwath et al. 1992; Mirowsky & Ross 1983; Radloff 1977; Ross & Mirowsky 1984). Details about these types of items are discussed more extensively in Chapter 2.

Next, we computed a scale by adding up the scores of the response categories: the higher the score, the more severely a person suffers from depressive symptoms. The reliability of the scale is sufficient (standardised Cronbach's alpha 0.64) (Cronbach 1951). Descriptive information of the dependent variable is presented in Appendix B, Table B.1.

3.3.3 Individual characteristics

Educational attainment was measured as the highest level attained by the respondent, ranging from primary education to a university degree. Income was measured as the gross household income, divided into several categories. Over the years, the number of categories and the ranges changed considerably. In order to achieve a measurement that was comparable over two decades, we recoded the variable into four standardised categories: lowest income (more than one standard deviation below the mean), low income (up to one standard deviation below the mean), high income (up to one standard deviation above the mean) and highest income (more than one standard deviation above the mean)[4]. The number of missing answers on the income variable in the data set, was relatively large (20 percent). To avoid a small effective sample size, we treated this missing data as a separate category in the analyses. Socio-economic position was measured by asking the respondents about their most important daily activities. People who were not active in the labour market were classified as pensioners, people dependent on social security, students of full-time housekeepers.

The indicator for the levels of social resources was measured with a direct question about the marital status of the respondent. Four answer categories were available: married or cohabiting with a partner, divorced, widowed and never married[5].

The indicators for the levels of cultural resources were church attendance and whether people considered themselves being member of the church. Church attendance was measured by asking how often the respondent had attended church over the past six months. The answer

categories were: never going to church, going to church less than once a month, going monthly to church, going once a week to church and going more than once a week to church. Church membership and apostacy were ascertained by combining three questions. First, a question on whether the respondent had been brought up in a religious way. Secondly, a question on whether (s) he still considered him/herself to be a church member. Thirdly, a question about the denomination to which the respondent felt (s) he belonged or which (s) he had left: Roman Catholic, Dutch Reformed, and Dutch Re-reformed[6]. We distinguished between people who had never been member of a church, people who were still church member and apostates. For example, respondents who said they were born into a Catholic family, but no longer considered themselves to belong to the Catholic denomination, were classified as apostates of the Catholic Church. The categories for gender were 'man' and 'woman'. We included size of the respondent's municipality as a control variable. Size of the municipality ranged from less than 5,000 inhabitants to more than 400,000 inhabitants.

The literature suggests conflicting findings of the effects of age on depressive symptoms (see a review of Ernst & Angst 1995). Some found a decrease in depressive symptoms among the elderly; others have showed no age effect or an increase in depressive symptoms. Moreover, several studies tested the hypothesis that the prevalence of depressive symptoms in the general population declines with age (Christensen et al. 1999; Henderson et al. 1998). These studies have presented models in which age-effects on depressive symptoms were separately controlled for several risk factors such as life events, social support, physical impairment and neuroticism. These findings support the hypothesis that the mean scores of depressive symptoms decline with age. However, these studies have failed to control for risk factors simultaneously by way of including a wide range of risk factors related to people's social positions. In addition, other studies have suggested a U-shape relation between age and depressive symptoms, as well as variations across the life course, due to economic positions (Miech & Shanahan 2000; Mirowsky & Ross 1992, 2001). Others have stressed the specific interaction between age and gender on depressive symptoms (Bebbington et al. 1998; Mirowsky 1996). Moreover, studies in America showed age, cohort and period effects on depressive symptoms (Wickramaratne et al. 1989).

However, in order to test the life-course perspective on depressive symptoms profoundly, panel data from the general population are needed. Moreover, previous research fails to apply a systematic approach of age on depressive symptoms, including several indicators of social, economic and cultural resources, simultaneously. In order to contribute to some assumptions of possible effects of the life course on depressive symptoms, we will include effects of birth cohorts in our models. We are aware of the fact that we hereby ignore age effects (Te Grotenhuis Lammers Pelzer & Scheepers 1998). We distinguished birth cohorts to test whether people differ in suffering from depressive symptoms, due to different socialisation periods. Birth cohorts were constructed by subtracting a respondent's age from the year in which the survey was held. According to Becker's distinction of birth cohorts (Becker 1991), we distinguish five birth cohorts: people born before 1929, people born between 1930 and 1940, between 1941 and 1955, people born between 1956 and 1966 and people born between 1967 and 1978.

3.3.4 National characteristics

Contemporary levels of national economic resources (period characteristics) were measured by the level of unemployment derived from national-level time series from the Dutch Office of Statistics (CBS) (Statistics Netherlands 1994a, 1999). Level of unemployment is measured as the

number of unemployed people as a percentage of the labour force. Because these percentages of unemployment strongly differ between educational categories, we applied distinct unemployment figures for four educational levels (Statistics Netherlands 1994a, 1999). For period characteristics, each respondent is assigned the percentage concerning the year the interview was conducted. If data were missing for some measurement points, the intermediary values were calculated by means of interpolation. Changes in the unemployment level were measured by recoding the volume mutation of the percentage of unemployment compared with the percentage of unemployment in the previous year. A residual change score has been used as suggested by Bohrnstedt (1969). These change scores reflect the change of unemployment percentages in a specific time period, for example between 1980 and 1981, compared to the population wide pattern of change in unemployment percentages, in the time period between 1975 and 1996.

Levels of national economic resources during the formative years, i.e., cohort characteristics, were calculated by the unemployment percentages, based on the same procedure of creating time series in accordance with data from publications of the Dutch Office of Statistics (CBS) (Statistic Netherlands 1994a, 1999). Each respondent is assigned the average percentages of unemployment, in the period when the respondent was between 16 and 20 years old, i.e., the average age class at which many respondents might enter the labour market and may experience feelings of economic insecurity or face financial problems (cf. Coenders & Scheepers 1998).

Current levels of national social resources were assessed with two measures, i.e. time series of percentages of people living alone and the percentages of divorces in the Netherlands (Statistics Netherlands 1994a, 1997a, 1999). Not surprisingly, we observed a high degree of correlations among these measures. To avoid the multi-collinearity problem that would result from analysing these measures simultaneously in a multivariate model, we followed a procedure that is recommended by Land et al. (1990) and has been applied in other studies to measure indicators of several contextual circumstances (Caughy O'Campo & Patterson 2001; Silver et al. 2002). We factor analysed both indicators of level of individualisation. A principal factor analysis with varimax rotation revealed a single factor solution that explains 90 percent of the variance of the various time-series (period: Eigenvalue 1.80, factor-correlation 0.89; cohort: Eigenvalue 1.50, factor-correlation 0.69). The loadings for each factor were used to compute an individualisation level factor score as an indicator for period macro-circumstances. In addition, factor loadings assigned to respondent's birth year were used as an indicator for cohort circumstances (after reverse scoring the negative signs). Consequently, for the period characteristics, each respondent is assigned a factor score that indicates the level of individualisation before the year of measurement. For cohort characteristics, each respondent is assigned a factor score of the level of individualisation, in the period when the respondent was at the age of 20, i.e., the average age at which many respondents might start stable relationships, cohabiting or getting married.

The indicator for levels of national cultural resources, i.e., the level of secularisation, was measured with different related time series. For the period effect, we used data on the percentage of people who considered themselves not a member of a church per province, based on the two stage question of membership of a denomination, derived from data from the Social and Cultural Planning Office. For the cohort effect, we added older data derived from publications of the Dutch Office of Statistics (Statistics Netherlands 1994a) and from Faber et al. (1970) (c.f. Te Grotenhuis & Scheepers 2001a). The percentage of non-church members per province was attributed to each respondent at the time (s) he was 12 years old, i.e., the average age when respondent's awareness about values and norms begins. For both the period and the cohort effect,

we would like to argue that the level of secularisation of the province in which one has grown up, is a direct and valid formative circumstance. Detailed information on the descriptive statistics for all the individual and contextual variables are presented in Appendix B.

3.3.5 Methods

To give an answer to our first research question on the longitudinal trend in depressive symptoms in the period 1975-1996 in the Netherlands, the following procedure was applied. We performed one-way analyses of variance and computed the mean scores of depressive symptoms per year. We standardised the scores by transforming the mean scale scores in such a way, that the general mean over time was 500 and the standard deviation 100; scale scores ranged from 400 to 800. The higher the mean score, the higher the level of depressive symptoms. See also the descriptive statistics of the dependent variable in Appendix B.

To answer our second research question about people's levels of resources indicated with socio-demographic characteristics, we aim to test differences between socio-demographic categories that might account for the average level of depressive symptoms over a time span of 21 years. To answer this question we combined the nine cross-sectional samples into one pooled data set containing 16,190 respondents. List wise deletion was performed on missing values of some measurements of the independent variables. This reduced the final pooled data set only slightly (missing rate of 2,8 percent).

We performed ordinary least square (OLS)-regression analysis to ascertain mutually adjusted effects of differences between socio-demographic categories and suffering from depressive symptoms. The depressive symptoms scale showed a significant positively skewed distribution that can produce heteroscedasticity in regression analysis, i.e., inflating the standard errors of coefficients, which in turn may reduce the power of significance tests. Consequently, a log transformation was employed of the depressive symptom scale score (Ln (Depsym) * 100)[7].

Since most of our socio-demographic categories were nominal variables, we employed the procedure proposed by Hardy (1993), using categorical variables as dummy variables in the (OLS)-regression analysis. The estimated parameters are non-standardised regression coefficients that have to be compared to the reference category, in order to interpret whether a specific category suffers more or less from depressive symptoms[8]. In accordance to our theoretical propositions, people with a higher level of resources were considered as the reference category[9].

To answer our third research question about gender differences, we specified (OLS)-regression analyses by gender. Separate regression analyses to unravel gender effects are equivalent to the approach of adding product terms with gender, to specify interaction effects. However, specifying such an amount of nominal variables with gender in our model leads to multi-collinearity that makes the results of statistical analyses unreliable. Therefore, we performed separate subgroup regressions using a procedure that deals with the assumption of homoscedasticity (i.e., equality of normal distribution of the mean residual sum of squares in the two subgroups) (see Hardy 1993, p. 53)[10]. In this procedure, we were able to test statistical significance of subgroup differences between men and women, regarding effects of socio-demographic categories and depressive symptoms, computing t-values.

To answer our fourth research question about (linear) trends within specific categories of socio-demographic variables, we computed interactions with year (for example low income * year) and performed OLS-regression analyses, in which these linear interaction terms were included (Firebaugh 1997).

Moreover, in order to answer our fifth research question, about the influence of national characteristics, we included period and cohort characteristics in (OLS)-regression analyses, in addition to individual characteristics[11].

3.4 Results

3.4.1 Longitudinal trend in depressive symptoms

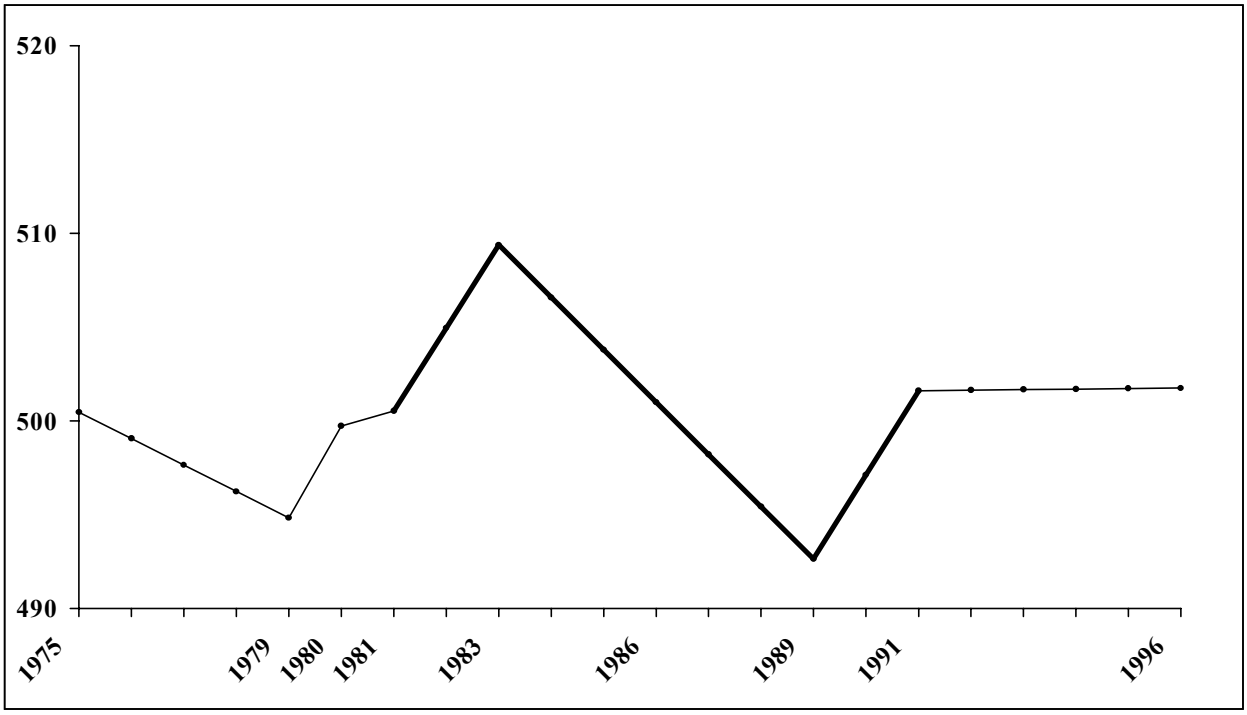
Figure 3.2 below presents the general trend in depressive symptoms in the Netherlands over the period 1975 to 1996. Significant differences in the mean scores of depressive symptoms are presented in bold lines.

As this figure shows, the average level of depressive symptoms decreased from 1975 to 1979. It increased from 1979 to 1983 and increased significantly between 1981 and 1983 (bold line in Figure 3.2). From 1983 to 1989, the level of depressive symptoms decreased significantly, whereas between 1989 and 1991 it increased significantly. Between 1991 and 1996, the level increased slightly, but not significantly. Summing up these developments: the longitudinal course of depressive symptoms in the general population of the Netherlands has fluctuated and it has shown particularly strong variations during the eighties.

Consistent empirical results have shown that suffering from depressive symptoms is a high risk factor for committing suicide (Blair-West et al. 1999; Malone et al.1995). Therefore, we compare the results of our analyses with the longitudinal development of committed suicides in the Netherlands in the similar period between 1975 and 1996. Figure 3.2 presents the percentages of suicides per 100,000 adult inhabitants (aged 18 and older) in the Dutch society over the period between 1975 and 1996 (Statistics Netherlands 1999).

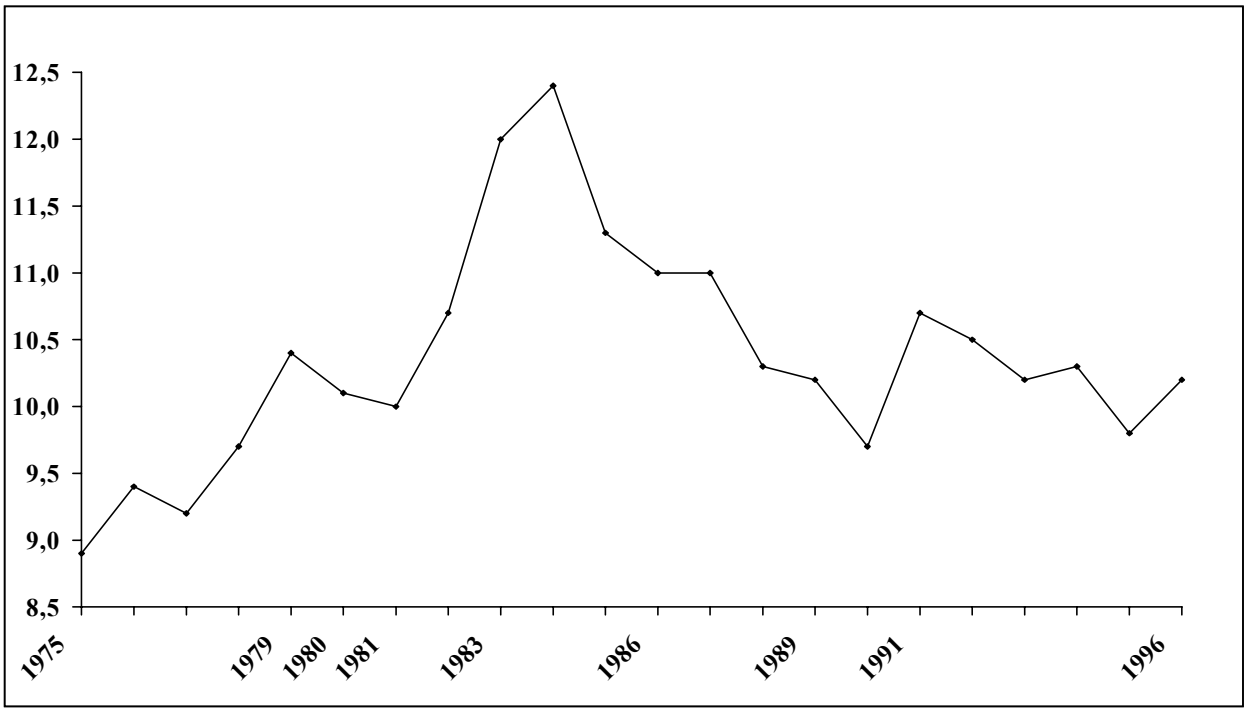
Both figures show a comparable pattern of the longitudinal developments in depressive symptoms and in committing suicides in the Dutch adult population. The percentage of suicides shows a steady increase until the mid 1980s, with the highest rate in 1983 and 1984, then a steady decline until the late 1980s, whereas after an increase between 1989 and 1991, the number of suicides stayed rather stable until 1996. These similarities in the longitudinal developments as reported here, indicate that the level of depressive symptoms in Dutch society, has not continuously increased between 1975 and 1996, but shows particular strong variations during the 1980s.

Figure 3.2 General trend in depressive symptoms in the Netherlands 1975 - 1996



(Bold lines: significant differences in mean scores of depressive symptoms between years of measurement; $t>1.96$; $p<0.05$. Standardised mean scores for depressive symptoms)

Figure 3.3 General trend in committed suicides in the Netherlands 1975 - 1996



(Percentage of committed suicides per 100.000 adult people aged 18 and older. Data derived from Statistics Netherlands (1999) (www.cbs.nl/statline))

3.4.2 Regression analyses on individual characteristics and changes over time

In separate models, the results of (OLS)-regression analysis are presented and reveal the differences between social categories and suffering from depressive symptoms. In accordance with the order of our hypotheses on economic, social and cultural resources, we present the empirical results in the order in which they were introduced above.

Model 1 in Table 3.1 shows a positive, but not significant estimated coefficient of educational level. The non-standardised regression coefficients of the different income levels are positive and significant[12]. This indicates that people with a lower income suffer more from depressive symptoms than people with a higher income, i.e., the reference category. More specifically, we found that the lower the income, the more likely it was to have depressive symptoms. The coefficients of the subcategories of socio-economic position, show positive and significant estimates for housekeepers, and people who depend on social security: they suffer more from depressive symptoms than employed people. These results on indicators of levels of economic resources partially confirm Hypothesis 1.

Model 2 in Table 3.1 shows linear interaction effects over time, within specific socio-demographic categories. Most of the coefficients of the indicators for economic resources (education, income and socio-economic position) are positive, but do not reach significance[13]. Only the category of people with the lowest income level has a positive and significant parameter. This implies that over time, the difference to suffer from depressive symptoms between people with the lowest income level and people with a higher income level has increased, a partial support for Hypothesis 2.

Model 1 in Table 3.1 shows that all the non-standardised coefficients of the different categories of marital status were positive and significant. People who are divorced, widowed or never married suffer more from depressive symptoms, than people who are married. This finding supports Hypothesis 3.

Model 2 in Table 3.1 shows that the linear interaction effect of the divorced category is negative and significant. This implies that over the years, the difference in suffering from depressive symptoms between being divorced compared to being married has decreased. In contrast to our hypothesis, the category of never married people shows a significant and positive linear interaction effect: over time, the difference in suffering from depressive symptoms between people who were never married compared to married people, has increased. Overall, these findings imply partial support for Hypothesis 4.

The positive parameters of church membership and apostacy in Model 1 from Table 3.1 demonstrate that apostates of the Catholic and Dutch Reformed Church suffer more from depressive symptoms than people who considered themselves as Church members. In general, these results show that people who left their religious community, i.e., apostates, suffer more from depressive symptoms than people who have remained faithful to their denomination[14].
Church attendance has a significant negative effect: people who went to church less often suffer more from depressive symptoms than people who went to church more regularly, this supports Hypothesis 5.

We also hypothesise that in the 1970s, apostates suffer more from depressive symptoms than apostates in the 1990s. These coefficients of Model 2 in Table 3.1, are as expected, all negative, though not significant. There are no significant linear interaction effects over time in apostates, in suffering from depressive symptoms.

Table 3.1 Multiple regression analyses to ascertain differences between social categories in depressive symptoms (Model 1) and linear trends within socio-demographic categories over time (Model 2)

	Model 1		**Model 2**
	b	**SE**	**Trend (Interaction With year (b))**
(Constant)	*(612.01)***	*(0.77)*	
Educational attainment	0.17	0.09	-0.05
Income			
Lowest	**5.98****	0.56	**0.24***
Below mean	**2.82****	0.48	0.08
Above mean	**1.16****	0.43	-0.01
Missing	**1.53***	0.48	0.00
(Highest=ref.)			
Socio-economic position			
Dependent on social security	**6.77****	0.51	0.14
Pensioned off	-0.64	0.59	0.02
Student	-0.15	0.72	0.01
Housekeeper	**1.29****	0.44	0.07
(Employed=ref.)			
Marital Status			
Divorced	**12.43****	0.69	**-0.38***
Widowed	**7.96****	0.64	0.01
Never married	**3.18****	0.45	**0.11***
(Married=ref.)			
Church membership & apostacy			
Never church member	0.02	0.40	0.03
Apostates from Catholic Church	**1.93***	0.48	-0.09
Apostates from Dutch Reformed Church	**2.13***	0.98	-0.08
Apostates from Dutch Re-Reformed Church	0.58	0.58	-0.03
(Church member=ref.)			
Church attendance	**-0.72****	0.11	0.02
Cohort			
Born between 1901-1929	-0.63	0.47	
(Born between 1930-1940=ref.)			
Born between 1941-1955	**-1.10***	0.42	
Born between 1956 -1966	**-2.68***	0.51	
Born between 1967- 1978	**-2.54***	0.79	
Gender Women *(Men=ref.)*	**3.62****	0.37	-0.05
Degree of Urbanisation	**0.67***	0.09	
Year			-0.04
Adjusted R square	*10,3%*		*11,2%*

(Bold=significant (** p <0.01; * p <0.05; ~p <0.10) (Data: Cultural Changes; N=16,190; author's calculations)

These findings do not support Hypothesis 6.With respect to control variables, the results of Table 3.1 reveal that people who live in large cities, suffer more from depressive symptoms than people living in rural areas. This is consistent with previous empirical findings (Stern Smith & Joon Jang 1999). The four birth cohorts showed negative parameters compared to the reference category. The coefficients of the cohorts 1941-1955, 1956-1966 and 1967-1978 reached significance. In general, we can state that people born between 1901-1929, 1941-1955 and 1956-1966 and people born after 1966 suffer less from depressive symptoms than people born between 1930 and 1940. Similar findings of previous research showed also a cohort effect of depressive symptoms in people who were socialized during the Second World War (Klerman & Weissman 1988, 1989; Wickramaratne et al. 1989).

3.4.3 Regression analyses on gender differences and changes over time

As can be seen from the gender effect in the Model 1 of Table 3.1, women suffer significantly more from depressive symptoms than men. This is consistent with a large quantity of empirical findings (Culbertson 1997). The linear interaction effect of gender was negative, though not significant (see Model 2 of Table 3.1). This result implies a partial refutation of Hypothesis 7.

In Model 1 of Table 3.2, we specified indicators of levels of economic, social and cultural resources by gender. These results indicate that the effect of educational attainment in men is positive and significant. In women, the coefficient for educational attainment is negative and not significant. According to the significant t-value in Model 3, these findings indicate that the association between educational attainment and depressive symptoms differs between men and women: women with a higher educational attainment suffer less from depressive symptoms than men with a higher educational attainment. Socio-economic positions specified by gender show that women dependent on social security and homemakers suffer more from depressive symptoms than employed women, i.e., the reference category. Men dependent on social security also differ significantly from employed men: they suffer more from depressive symptoms. There are no significant differences in depressive symptoms between men and women according to their socio-economic position[15]. These results partially confirm Hypothesis 8. It also appeared that, over time, the difference to suffer from depressive symptoms between non-employed women and employed women has not increased. Hypothesis 9 is not refuted. Categories of marital status specified by gender show that both unmarried men and women, i.e., men and women who were divorced, widowed or never married, suffer more from depressive symptoms than married men and women. These effects do not differ between men and women, Hypothesis 10 is not confirmed.

Model two in Table 3.2 shows that the linear interaction effect of the divorced categories was negative and significant in both women and men. This implies that, over time, the difference in suffering from depressive symptoms between the divorced and the married, for both men and women, has decreased. Hypothesis 11 is not confirmed.

Both men and women who attend church frequently suffer less from depressive symptoms (Model 1). Moreover, female churchgoers suffer even less from depressive symptoms than males, according to the significant t-value in Model 3. With respect to church membership and apostacy as specified by gender, the results showed positive parameters for women and men who had never been religiously involved, as well as for female and male apostates. However, not all the parameters reach significance. Female and male apostates from the Catholic Church and male apostates from the Re-reformed Church, have a significant positive parameter.

Table 3.2 Multiple regression analyses to ascertain gender differences between social categories in depressive symptoms (Model 1); linear trends within social categories over time by gender (Model 2) and differences between men and women within social categories (Model 3)

	Model 1 Men		**Model 2 Trend ***	**Model 1 Women**		**Model 2 Trend ***	**Model 3 Difference**
	b	**SE**	**b**	**b**	**SE**	**b**	**t-value ***
(Constant)	*(610.52)*	*(0.99)*		*(617.36)*	*(1.21)*		
Educational attainment	**0.35***	0.11		-0.08	0.14		**2.36**
Income *(Highest=ref.)*							
Lowest	**5.22****	0.78	**0.20***	**6.22****	0.82	**0.24***	
Below mean	**2.21****	0.63		**3.29****	0.72		
Above mean	**1.44****	0.54		0.93	0.66		
Missing	**1.72***	0.65		**1.35***	0.70		
Socio-economic position							
Dependent on social security	**7.63****	0.60		**6.01****	0.92		
Pensioned off	-0.15	0.69		-0.59	1.33		
Student	-0.20	0.87		-0.05	1.19		
Housekeeper	-1.01	2.64		**0.99***	0.55		
(Employed =ref.)							
Marital Status							
Divorced	**11.07****	1.09	**-.51***	**13.00****	0.92	**-0.31***	
Widowed	**8.70****	1.26		**7.54****	0.80		
Never married	**3.65****	0.58		**2.88***	0.71		
(Married=ref.)							
Church membership & apostacy							
Never church member	0.38	0.53		-0.31	0.58		
Apostates from Catholic Church	**1.73***	0.64		**2.17***	0.71		
Apostates from Dutch Reformed Church	**3.80***	1.30		0.48	1.45		
Apostates from Dutch Re-Reformed Church	0.17	0.78		0.89	0.84		
(Church member=ref.)							
Church attendance	**-0.52****	0.15		**-0.91****	0.16		**1.71**
Cohort							
Born between 1901-1929	-0.58	0.66		-0.83	0.68		
(Born between 1930-1940=ref.)							
Born between 1941-1955	-0.37	0.58		**-1.63***	0.61		
Born between 1956 - 1966	**-3.00***	0.72		**-2.35***	0.73		
Born between 1967 - 1978	**-2.91***	1.06		**-2.25***	1.17		
Degree of Urbanisation	**0.66***	0.12		**0.66***	0.13		
Year			-0.09			-0.11	

(Bold=significant ** p <0.01; * p <0.05; ~p <0.10). (Data: Cultural Changes; N= 7,288 (Men) N=8, 450 (Women); author's calculations) (* Only significant effects presented)

In general, these findings imply that there are no differences between men and women who had left their church and suffering from depressive symptoms. Hypothesis 12 is partly confirmed. There are no significant linear interaction effects over time in male and female apostates implying that Hypothesis 13 is refuted.

With respect to *control variables* of degree of urbanisation and birth cohort, the results either for men or women do not differ: either men or women who live in urban settings, suffer more from depressive symptoms. In addition, men and women who were born after 1941 suffer less from depressive symptoms than men and women who were born before the Second World War.

3.4.4 Regression analyses on national characteristics, i.e., period and cohort effects

Now, let us turn to our fifth research question on the effects of national characteristics, i.e., period and cohort effects, in terms of national economic, social and cultural resources that may contribute to the explanation of the variations over time in depressive symptoms in the Netherlands. Therefore, we turn to Table 3.3.

From this table we derive the effects of period and cohort characteristics, in addition to the effects of individual characteristic, i.e., people's levels of resources indicated with social categories. The results regarding people's levels of resources are highly similar to the results presented and described in Table 3.1. It turns out that people with a lower income suffer more from depressive symptoms than people with a higher income. Also, people who are dependent on social security, full-time housekeepers, divorced people, widowers, people living alone and women show significant estimated parameters and thus, suffer more from depressive symptoms compared to their respective reference categories. With regard to the coefficients of apostacy and church attendance, it turns out that frequent churchgoers suffer less from depressive symptoms and that apostates, i.e., people who left their Catholic and Reformed Church suffer more from depressive symptoms than those who are still church member. Let us now turn to the results of period and cohort effects as presented in Table 3.3. In Hypotheses 14a and 14b we proposed to test whether levels of depressive symptoms are affected by the contemporary national level of unemployment and a recent change in the national level of unemployment. It appears in Table 3.3 that the period effect of unemployment amounts to 1.51, meaning that the more one is exposed to unemployment at the time when the survey was conducted, the higher the levels of depressive symptoms. This estimated parameter reached significance and consequently Hypothesis 14a is supported: the higher the level of unemployment in a period, the higher the rate of depressive symptoms. In addition, the effect of a change in the level of unemployment took the direction hypothesised and is significant: the larger the increase (change) in unemployment, the higher the level of depressive symptoms. This result supports Hypothesis 14b.

Next, we turn to the estimated effects of the national economic circumstances during the respondent's formative years. In Hypothesis 14c we stated that suffering from depressive symptoms is higher among birth cohorts that experienced a higher level of unemployment during their socialisation period. However, the parameter in Table 3.3 indicates that the level of unemployment during one's formative years has a negative sign and does not significantly affect suffering from depressive symptoms. This finding refutes Hypotheses 14c.

Table 3.3 Multiple regression analysis on pooled data matrix to ascertain contextual effects of period and cohort characteristics and individual characteristics on depressive symptoms

	b	SE
(Constant)	*(610.21)*	*(1.27)*
National characteristics		
Period		
Unemployment	**1.51****	0.08
Change in unemployment	**0.35***	0.17
Individualisation	-0.28	0.21
Secularisation	0.02	0.19
Cohort		
Unemployment	-0.04	0.07
Individualisation	**-0.59***	0.34
Secularisation	-0.01	0.02
Individual characteristics		
Educational attainment	0.37	0.29
Income		
Lowest	**5.75****	0.56
Below mean	**2.66****	0.48
Above mean	**1.11****	0.43
Missing	**1.53***	0.48
(Highest=ref.)		
Socio-economic position		
Dependent on social security	**6.95****	0.51
Pensioned off	-0.34	0.62
Student	-0.15	0.72
Housekeeper	**1.37****	0.44
(Employed=ref.)		
Marital Status		
Divorced	**12.63****	0.69
Widowed	**8.04***	0.65
Never married	**2.81***	0.45
(Married=ref.)		
Church membership & apostacy		
Never church member	-0.02	0.40
Apostates from Catholic Church	**1.93***	0.48
Apostates from Dutch Reformed Church	**2.08***	0.98
Apostates from Dutch Re-Reformed Church	0.65	0.58
(Church member=ref.)		
Church attendance	**-0.68***	0.11
Age	0.02	0.21
Gender Women *(Men=ref.)*	**3.56****	0.37
Degree of urbanisation	**0.64***	0.09
Adjusted R square	*12,0 %*	

(Bold=significant (** p <0.01; * p <0.05; ~p <0.10). (Data: Cultural Changes; N=16,190; author's calculations)

With respect to the effects of individualisation, the following results appeared. The period effect of individualisation shows a non-significant negative parameter. However, the cohort effect showed a negative and significant estimated parameter. In contrast with our expectations, it appeared that the higher the levels of individualisation during one's socialisation period, i.e., higher levels of people living alone and people who are divorced, the lower the level of depressive symptoms. Possibly, experiences of aspects of individualisation such as a higher level of divorces and a greater amount of people living on their own, during people's formative years, slightly modifies the effects on people's psychological well-being and presumably gives enhancement of possibilities, feelings of freedom which hampered the damage on psychological well-being, i.e., suffering from depressive symptoms. Consequently, Hypotheses 15a and 15b are not supported.

According to the effect of secularisation, we proposed to test a period and cohort effect. The results of Table 3.3 shows that the provincial level of secularisation at the time of the survey, shows a positive though not significant effect. The provincial level of secularisation during one's formative years, do not significantly affect the levels of depressive symptoms. Both findings refute Hypotheses 16a and 16b.

3.5 Conclusions and discussion

In this chapter, we have examined the longitudinal development in depressive symptoms in the Netherlands during the period from 1975 to 1996, using large-scale national and longitudinal data. To answer the first research question of this chapter, we can state that in the Netherlands the longitudinal course of depressive symptoms in the general population, shows a rather fluctuated pattern: in the early 1980s there was an increase in the level of depressive symptoms, whereas in the late 1980s the level of depressive symptoms decreased and in the first part of the 1990s the level depressive symptoms became rather stable. We compared these results to the longitudinal development in committed suicides in the Netherlands and to results of other longitudinal studies abroad. Consequently, we have to state that the longitudinal development of depressive symptoms in the Netherlands in the period between 1975 and 1996 shows temporal variations, although no continuous increase. Dutch client registry studies, however, suggest that the use of community care services has increased, although this might depend on specific registration methods (Ten Have & Bijl 1998). Based on these service use figures, one might expect an increase in the rates of depressive symptoms over the last decades (Oldenhinkel 1998; Pijl Kluiter & Wiersma 2000). However, other factors such as changes in professional attitudes, psychotherapeutic practice, and psychiatric treatment, as well as developments in descriptive behaviour and pharmaceutical practice, together with behavioural changes in service use in recent years, might contribute to these considerations about an expected increase of the number of people suffering from depressive symptoms (Ormel 1985; Paykel 2000; Schnabel Bijl & Hutschemaekers 1991). An increase in the level of depressive symptoms might also be evoked by a greater professional and public interest in several aspects of mental health and illness, as by a risen awareness of depressive symptoms in the population in recent years, due to a proto-professionalisation (Furer 2001; Paykel 2000; Warshaw et al. 1991). These particular aspects might have contributed to the assumption that depressive symptoms are a "disease of modernisation" and that we have entered an "age of melancholy" (Elsevier 1999; Hagnell et al. 1982; Klerman & Weissman 1988, 1989; Sartorius 1993). Nevertheless, if we consider the longitudinal trend of committed suicides and depressive symptoms in the national population of

the Netherlands, the results of our analyses indicate that in the Netherlands, in the investigated period between 1975 and 1996, no 'age of depressive symptoms' has occurred.

Our second research question concerned the extent to which people's levels of resources affect depressive symptoms. From the theoretical framework of SPF-theory (Ormel et al. 1997, 1999), we derived several hypotheses on differences in suffering from depressive symptoms between specific social positions. We can state, that people with *lower levels of economic resources,* suffer more from depressive symptoms than people with higher levels of economic resources. People with a lower income, people dependent on social security or their partner's income (housekeepers), suffer more from depressive symptoms than people with a higher income or employed people. Previous research into the relationship between socio-economic position and depressive symptoms has shown similar results (Fryers et al. 2003; Nordenmark & Strandh 1999). According to the level of economic resources, we found a non-significant effect of educational attainment. Hence, based on these results, the hypothesis that people with lower educational attainment suffer more from depressive symptoms, than people with a higher educational attainment, was refuted.

With respect to social resources, we found a positive relationship between *lower levels of social resources* and suffering from depressive symptoms. People who were divorced, widowed or never married suffer more from depressive symptoms than married people. These empirical findings are consistent with other studies in which the absence of a confiding relationship showed a negative effect on psychological well-being (House et al. 1988a, 1988b; Hughes & Gove 1981).

Our analyses also showed that *lower levels of cultural resources* increased the suffering from depressive symptoms: people who did not go to church regularly and people who had abandoned their religion, i.e., apostates, suffer more from depressive symptoms than regular church goers and faithful church members. These findings are consistent with research into the relation between religiosity and mental disorders that showed a positive association between giving up church membership and depressive symptoms (Braam 1999a; Koenig 1997; Ventis 1995).

Our third research question was about differences between men and women in the relationships between levels of resources and depressive symptoms. With respect to *levels of economic resources*, we can conclude that housewives and women depending on social security suffer more from depressive symptoms than employed women. This is in line with recent research into the beneficial mental health effects of women working outside the home (Glass & Fujimoto 1994). Men depending on social security suffer also more from depressive symptoms when compared to employed men. We found a significant gender difference in the effect of educational attainment. When educational attainment was specified with gender, our results showed that women derived more mental benefit from a higher educational attainment than men. With respect to our results about *levels of social resources* we can conclude that either men or women with a lower level of social resources, i.e., women and men who were divorced, widowed or never married, suffer more from depressive symptoms than married men and women. There were no differences between men and women in the association between marital status and depressive symptoms. This is in line with a former study (Umberson et al. 1996). Regarding *the levels of cultural resources,* we can conclude that women who attend church regularly derive more mental benefit than men: they suffer less from depressive symptoms than men. This was also previously shown (Mirola 1999). No differences were observed between men and women in the association between apostacy and depressive symptoms.

With regard to these results, we can conclude that, except for the level of education and church attendance, the association between lower levels of resources and suffering from depressive symptoms is similar in both men and women. Although we made gender differences in suffering from depressive symptoms among several indicators of levels of resources more explicit in our analyses, a significant main effect of gender persisted. Other studies made gender differences more explicit by unravelling the distinct responses of men and women to social support, perceived distress, performance of specific roles, the interaction between family and working conditions, and changes occurring in these relationships (Bartley 1999; Hirsch & Rapkin 1986; Simon 1997). However, other factors may also be responsible for the difference in depressive symptoms between men and women like biological and alternative disorder explanations (Nazroo Edwards & Brown 1998). Unfortunately, these issues could not be tested, because our secondary data did not contain information on factors such as social support, household composition, measurement of various types of mental disorders, perceptions of distress and performing different social roles. Some of these aspects will be examined in the next chapters.

Our fourth research question concerned over-time changes in the effects of specific social categories on depressive symptoms and over time changes in gender differences of these effects. Our analyses showed that the difference in suffering from depressive symptoms decreased over time between divorced and married people. This pattern is comparable to a study abroad that found a narrowed gape in suicide rates of divorced and married people in the period 1959-1980 (Stack 1990). Furthermore, it appeared, that over time, suffering from depressive symptoms of people who were never married, i.e., living unmarried alone compared to married people has increased. This finding suggests a damaging effect on psychological well-being when people are living alone and have never had a relationship compared to having ever lived together with a partner like the divorced and widowed people.

Our results also indicate a tendency that over the years suffering from depressive symptoms increases among people who living alone and people who have the lowest incomes. These results contribute to the discussion about growing social and economic inequality, that might lead to increasing mental health inequalities in society (Mackenbach 1992). These developments may become especially relevant in the debate on service use and mental health issues in the Netherlands now and in the future (Schabel et al. 1991; Ten Have te Grotenhuis Meertens Scheepers Beekman & Vollebergh 2003).

With respect to gender differences in the effects of over time changes of social categories on depressive symptoms, our results did not show significant differences between men and women in these over time effects. We found that for both men and women, the effect of being divorced compared to being married, on depressive symptoms increased and the effects of having a low income compared to a high income increased.

The fifth research question was about macro conditions at the society level that affect the longitudinal development of depressive symptoms. We included theoretically relevant indicators for period and cohort effects. The results showed no significant cohort effects regarding the level of unemployment and secularisation on the levels of depressive symptoms. In contrast with previous research (Faupel et al. 1987; Pescosolido 1990), it turned out that there is no effect of the level of secularisation on the average level of depressive symptoms. However, it appeared that a current national level of unemployment, together with a recent change (increase) in the national level of unemployment have positive effects on the levels of depressive symptoms: the higher change (the increase) level of unemployment, the higher the levels of depressive

symptoms. These results were also found in several studies that examined the impact of economic change, economic recession and unemployment on various aspects of mental disorders (Brenner & Mooney 1983; Dooley et al. 1988; Tausig & Fenwick 1999).

An unexpected cohort effect of individualisation on depressive symptoms appeared: a higher level of individualisation during one's socialisation period induces lower levels of depressive symptoms. Although individualisation is associated with poor mental health outcomes, we found that this societal development of individualisation leads to lower levels of depressive symptoms. Possibly, due to the individualisation process, that has been going on since the 1960s, people who were socialised in these societal circumstances, may become acquainted to the features of individualisation, and this presumably gives enhancement of possibilities, experiences of autonomy, and feelings of freedom which consequently leads to less suffering from depressive symptoms. Changes in the legislation of divorces and social services in the late 1960s and early 1970s might have contributed to these developments (Dronkers & Ultee 1995). Since the proportion of people living alone, increased consistently during the 1980s and the 1990s (Statistics Netherlands 1999) and it is estimated that there will be a further increase in these numbers by the year 2030 (De Jong & van Huis 2003), the impact of these demographic and social developments on depressive symptoms of the population requires further attention.

A final remark concens the use of national characteristics as indicators for period and cohort effects. In this study, the identification problem of cohort, period and age effects was solved through the specification and measurements of theoretical relevant indicators of period and cohort. However, it should be noted that these conclusions are only valid, when all the appropriate characteristics of period and cohort effects are identified. One possible improvement of this study would be the inclusion of more national-level time series to represent historical and societal developments. This is a rather difficult task because some developments in society such as proto professionalisation, help seeking and receiving behaviour, and health or labour market policies, which may also affect the average level of depressive symptoms, are difficult to measure. Moreover, expanding the number of available time series, probably will give rise to another methodological problem, since time series often measure similar features of a common process and are therefore highly correlated.

In conclusion, we state that this study fills a gap in sociological and social epidemiological research on longitudinal trends in depressive symptoms in the general and national population of the Netherlands.

Notes Chapter 3

[1] Moreover, identifying longitudinal developments in the prevalence of depressive symptoms belongs to the research field of epidemiology, the discipline that is predominantly concerned with estimating rates of disorders in defined populations and examining variations in these rates by characteristics of individuals, places or periods. Prevalence rates are in general estimated as the proportion of the population with a particular disorder at a given time, or within a period of time, usually a year or a month, i.e., point prevalence. Most population based studies applied symptom scales and define the point prevalence of the population by using cutoff scores to obtain accurate estimates and detect changes in the estimate of prevalence of depressive symptoms. However, these estimates of prevalence rates may include misclassified subjects or disregard information of people suffering from depressive symptoms less severely (Van Hemert Heyer Vorstenbosch & Bolk 1995; Wakefield 1992b, 1999).

[2] This theoretical elaboration on relevant and concrete indicators of period and cohort effects is a theory-guided approach to avoid the A(ge)-P(eriod)-C(ohort) identification problem (Te Grotenhuis Lammers Pelzer & Scheepers 1998). This procedure was initially suggested by Menard (1991). This methodological problem of APC-identification (Glenn 1977) evokes once, age, period and cohort effects are include in a statistical model simultaneously, based on repeated cross-sectional research. The crucial problem is that the effects of birth cohort, period and age are linearly dependent and cannot be identified separately. In other words, when age and year of measurement are given, birth cohort cannot vary, because birth year=measurement year-age. An elegant solution to the A(ge) P(eriod) C(ohort) identification problem lies in the specification and direct measurement of theoretical characteristics for which age, period and cohort are only indirect indicators (De Graaf 1999; Te Grotenhuis & Scheepers 2001a; Te Grotenhuis et al. 1998). The problem has shifted from a methodological to a theoretical matter, since now we need to examine whether these theoretically relevant social structural characteristics really do serve as substitutes for the period and/or cohort effects. This approach of a theoretical elaboration on indicators of period and cohort effects has been successfully applied in previous research (cf. Coenders & Scheepers 1998; Scheepers te Grotenhuis & Bosch 1999). See for a general discussion on the APC-problem: Te Grotenhuis et al. (1998) and de Graaf (1999).

[3] In addition to the expected gender differences in the association between lower levels of individual resources and suffering from depressive symptoms, we could propose that the effects of contextual circumstances may differ either for men or women. Previous studies have showed different effects of societal unemployment on mental health for employed men and women, and housewives (Kessler & McRae 1981; Novo Hammarström & Janlert 2001; Lahelma et al. 1999, 2000; Murphy 1986). Also, the individualisation process may have mixed consequences for suffering from depressive symptoms of men and women who are divorced or living alone, due to differences between cohorts as a result of changes in the legislation of divorces (Dronkers & Ultee 1995; Wilterdink 1995). The same could be hold for differences in secularisation effects on religious men and women (Braam 1999b; Koenig 1997; Mirola 1999). However, such an great amount of interaction effects of contextual macro circumstances, i.e., period and cohort effects, with individual circumstances, i.e., socio-demographic characteristics, could not be tested with the available data. It turned out that models in which interaction terms between time-series and socio-demographic categories were included, had an undesirable high amount of collinearity.

[4] This variable was constructed as follows: first, the ordinal categories of the original variable were given the numerical values 1,2, and so forth. Second, for each year we calculated the mean (m) and standard deviation (s) of these values, and (m-s) and (m+s). Third, for each year, we recoded the original variable into four ordinal categories which has boundaries the rounded values of respectively (m-s) and (m+s). In most of the years of measurement, the

acquired income variable was more or less normally distributed. In other cases, one original category was subsumed within an adjacent category in order to achieve a more normal distribution. In this manner we constructed an income variable that is comparable through time with respect to its content.

[5] Unfortunately, these secondary data, i.e., data not exclusively collected for our research purpose, did not contain any information on household composition. Therefore, no mutually exclusive categories like people who were not married but living with others could be distinguished. However, it appeared that this category occur very marginal in the Dutch population, especially in the 1990s (SCP 2001).

[6] There is a growing number of non-Christian religions in the Netherlands. For example, the Islamic tradition is increasing in the Netherlands, because of large-scale immigration, especially from Indonesia, Morocco and Turkey (Te Grotenhuis & Scheepers 2001a). However, there is only a small representation of theses traditions in the Netherlands, especially in the 1970s when data were collected. Because of these marginal representations of non-Christian religious in this time-span, we will leave these denominations out of the analyses.

[7] Many measurements of mental disorders used in large-scale data showed positively skewed distributions. This skewed distribution of scale scores can produce homoscedasticity in regression analysis, i.e., inflating the standard errors of coefficients that in turn reduce the power of significant tests. Consequently, in this study, a log transformation was employed to fulfill more closely to normality assumption of multivariate regression analysis and increase the power of significant tests.

[8] Because we use the standardised log transformation of our dependent variable (Ln (DepSym) * 100), the interpretation of an unstandardised regression coefficient (b) differs compared with an ordinal scale of summed up Likert scores. Therefore it is necessary to use the inverse of the logarithmic function (i.e., the exponential or antilog function) in order to interpret the exact change in scores of an independent (dummy) variable on the scale of the dependent variable.

[9] Although these data able us to study depressive symptoms over time, it does not offer possibilities to untangle over time processes of causation or selection of depressive symptoms. Nevertheless, there is a firm discussion of selection and causation processes on mental disorders (Dohrenwend 1992). Some assume that people are “selected” for poor mental health, i.e., they suffer more from depressive symptoms than others. However, previous research has shown that processes of selection may be more important in the origin of severe mental disorders, such as schizophrenia, whereas social causation may be play a more important role in the development of less severe mental disorders such as depressive symptoms (Dohrenwend 1992; Fox 1990; Miech et al. 1999; Ritsher et al. 2001). Presumably, in this study, selection effects were only marginal.

[10] At first, we estimated the regression model for each subgroup separately (men and women) and obtained the residual sum of squares (RSS subgroup) from the separate regressions. We then also estimated the regression model for the pooled sample and obtained the residual sum of squares (RSS total) of the pooled regressions. Furthermore, as the two subgroups may be of different size (women N= 8,450 and men N=7,288), this pooled estimate must be weighted for each subgroup estimate by appropriate degrees of freedom (Hardy 1993, p 53). Assuming equality of group variances, i.e., homogeneity of variance, the formula for the pooled estimate of the total residual mean square is:

$$\text{RSS pooled} = \frac{(n1 - k1 - 1) * RSS1 + (n2 - k2 - 1) * RSS2}{(N - (k1 + k2 + 2))}$$

(n= the number of cases in the subgroups, k=the number of independent variables included in each subgroup regressions and RSS= the mean residual sum of squares from their respective subgroup regression).

Subsequently, it is possible to compute t-values which correct for subgroup differences in variances between the two gender specified models. We estimated the t-test for the difference in coefficients from separate subgroup regression using the formula:

$$t = \frac{(b\ (\text{women}) - b\ (\text{men}))}{\text{RSS pooled} * \left[\frac{\text{SE b women}}{\text{RSS women}} + \frac{\text{SE b men}}{\text{RSS men}} \right]^{½}}$$

[11] In all the different models of multiple regression analyses, we paid special attention to the assumption from which linear regression starts. Especially, we took matters related to multi-collinearity into account that are known to be one of the major methodological problems related to specifying period, cohort and age effects (Te Grotenhuis et al. 1998). Measures like condition index and variation inflation factors were inspected. The variance inflation factor (VIF) indicates the degree to which the standard deviation (SE) of and independent variable's regression coefficient is inflated due to multicollinearity. Methodologists suggest that serious collinearity problems do not occur when the VIF's are less than 10. (Bollen & Jackman 1985). Serious collinearity occurs if the condition index shows values that vary between 30 and 100. In our models, both controls do not indicate some degree of inefficiently in our estimations (maximum value of condition index is 28 and the VIF do not exceed 10 for any of our models). Moreover, the correlations coefficients between the independent variables show acceptual values.

[12] We also performed (OLS)-regression analysis using educational categories as dummy variables, however, none of the categories reached significance.

[13] If a linear interaction variable does not reach significance, this does not imply that there may be other than linear trends in the data, but these are extremely difficult to unravel.

[14] In this study we did not expect a distinction in suffering from depressive symptoms, between religious denominations among those people who are currently church member as compared with non-church members. However, empirical research based on several community samples among the elderly, has shown substantial differences among denominations and the risk to suffer from depressive symptoms (Braam 1999a). As in the Netherlands a trend was observed toward more individualism in moral issues among Catholics and Protestants (Ester et al. 1993), one might expect that church members of these denominations would suffer less from depressive symptoms, compared with Dutch Re-Reformed apostates who still heavily impose on restrictive and conservative normative standards and traditional values. However, multivariate analyses including subcategories of people belonging to specific denominations (results not shown here), did no show any significant differences between denominations and suffering from depressive symptoms in the general adult population aged between 18 and 75, of the Netherlands. The results showed that in general, church membership is more important than belonging to a

particular denomination, to protect from suffering from depressive symptoms, compared with people who are not church member. So, religiosity has a protective influence on people's suffering from depressive symptoms.

[15] Unfortunately, income as and indicator of the level of economic resources was measured only as the gross household income. Therefore gender differences in the association between income and suffering from depressive symptoms will be marginal in case of people living together with a partner.

4 Depressive symptoms in the general population: a static and a dynamic perspective

4.1 Introduction

Research on social variations in depressive symptoms has been strongly influenced by the pioneering work on the social origins of depression of Brown and Harris (1978). This study has empirically demonstrated that depressive symptoms notably depend on people's positions in society, i.e., related to the opportunities and constraints in every day life. This elementary work on the social etiology of depressive symptoms moved many researchers to investigate associations between people's positions and depressive symptoms. Over the last few decades, many studies have shown that people's socio-economic class, marital status or religious denomination induce depressive symptoms (Aneshensel & Phelan 1999; Horwitz & Scheid 1999; Koenig 1998; Mirowsky & Ross 1989).

Each of these separate research traditions has generated a number of insights into the relationships between particular social positions and depressive symptoms. However, some social factors have not been systematically investigated and controlled for. Therefore, we state that it is necessary to apply *a multifactorial social approach on depressive symptoms*. In such approach, a synthesis of several research traditions that theoretically elaborate on associations between several aspects of people's positions and depressive symptoms can be established and empirically tested. As these characteristics of people can be considered as levels of economic, social and cultural resources, subsequently, we theoretically elaborate on the association between people's levels of resources and suffering from depressive symptoms. Subsequently, based on Social Production Function Theory (SPF-theory) (Ormel 1997, 1999), we derive several hypotheses on people's socio-demographic categories and depressive symptoms.

An empirical test of people's characteristics requires an appropriate research design. Data based on specific samples of sub-populations or institutionalised individuals, have as a drawback that they contain rather limited information on a number of characteristics or are selective with respect to a certain feature such as the unemployed, the elderly or women (Braam 1999a; Bracke 1998; Fokkema & Dykstra 2001; Ruiter et al. 1998; Van Ekkel 2000). Based on large-scale representative data from the general adult population instead of specific samples, it is possible to test a multifactorial social approach on depressive symptoms more profoundly. Applying several techniques of multivariate analyses might show which particular positions affect depressive symptoms more strongly and are decisive determinants of depressive symptoms, if we are able to control systematically for a number of other social indicators.

Accordingly, in this study, we use large-scale representative data of the general adult population aged 18-75 years derived from the cross-sectional survey of the NHA-2 study (König-Zahn et al. 1999). These data contain various indicators of people's levels of resources that allow unravelling effects of specific social categories on depressive symptoms. Consequently, the first research question reads:

1) *To what extent do people's lower levels of resources affect depressive symptoms?*

Answering this research question on a number of indicators of people's levels of resources might broaden the insights regarding which specific disadvantaged positions induce depressive symptoms. However, this is a rather static perspective, since we focus on static levels of resources. Another rather important sociological question has to be considered: to what extent do changes in people's positions affect their psychological well-being negatively, i.e., induce depressive symptoms (George 1993). Elaboration on such *a static and a dynamic perspective on depressive symptoms* may be imperative for a systematic theoretical elaboration on lower levels and decreasing levels of resources that induce depressive symptoms in the general population (Aneshensel & Phelan 1999; Mirowsky & Ross 1989). As the NHA-2 study contains information on changes in people's positions, several hypotheses on lower and decreasing levels of resources will be tested simultaneously, in order to test for the decisive determinants of particular disadvantaged positions and changes into disadvantaged positions on depressive symptoms. The second research question of this chapter reads:

2) *To what extent do people's decreasing levels of resources, in addition to people's lower levels of resources, affect depressive symptoms?*

Previous research has shown a persistent gender difference: women suffer more from depressive symptoms than men (Culbertson 1997; Nolen-Hoeksema 1987). Moreover, research has shown that female's and male's positions may differ fundamentally (Chatab et al. 1987). No previous Dutch studies, however, investigated gender differences in depressive symptoms using a multi-factorial social approach, i.e., testing various indicators of levels of resources simultaneously. In this chapter, we will empirically explore on gender differences regarding suffering from depressive symptoms due to differences in people's levels of resources. The third research question of this chapter reads:

3) *To what extent do the effects of people's lower levels of resources and decreasing levels of resources on depressive symptoms, differ for men and women?*

In this chapter, we aim to fill gaps in sociological research on depressive symptoms in the Netherlands using a dynamic perspective. First, by building on a theoretical framework we will formulate general propositions about lower and decreasing levels of resources and suffering from depressive symptoms. Based on these propositions, we will derive testable hypotheses on various static and dynamic characteristics. Second, according to our multifactorial social approach, we will empirically and simultaneously test these hypotheses in the general population, using a cross-sectional and large-scale regional data set from the adult population aged 18-75 years (NHA-2 study; König-Zahn et al. 1999).

In this chapter, we will also pay some attention to aspects of social selection and social causation on depressive symptoms. The large-scale data set used in this chapter, contains some indicators on which 'indirect' social selection can be empirically tested. In addition to previous research, we aim to examine the extent to which unfavourable childhood circumstances, socio-economic parental background, and familial psychopathology can explain social variations in depressive symptoms (Amato & Sobolewski 2001; Lundberg 1991; Miech et al. 1999; Van der Mheen et al. 1997).

4.2 Theory and hypotheses

4.2.1 Theoretical framework and propositions

As was described before, in this study we use the theoretical framework of SPF-theory (Ormel et al. 1997, 1999) as a rather general starting point in research on depressive symptoms that follows a multifactorial social approach. These theoretical notions about the effects of resources seem to be a fruitful theoretical approach for explaining differences in people's positions and suffering from depressive symptoms. As was presented in Chapter 1, we state as a first general proposition: *lower levels of economic, social, and cultural resources induce suffering from depressive symptoms.*

Depressive symptoms may also be associated with changes in people's positions, i.e., decreasing levels of resources (George 1993; Lin & Ensel 1989). The importance of a dynamic perspective on depressive symptoms has already been shown in previous research on life change events and distress that mark a transition in people's positions (Brown et al. 1973; Holmes & Masuda 1974; Paykel 1978; Rabkin & Streuning 1976). However, a clear and systematic theoretical elaboration on life change events and depressive symptoms has received little attention in sociological research (Mirowsky & Ross 1989; Ross & Mirowsky 1979; Tausig 1982; Thoits 1983). More recently in the literature, the distinction between random stressors and systematic stressors has been frequently made (Pearlin et al. 1981; Pearlin 1989; Thoits 1995). This conceptual reorientation of life change events is relevant when trying to understand the 'social etiology' of depressive symptoms. Moreover, the period of negative life change events in people's positions appeared to be important (George 1993; Thoits 1983, 1995). In previous research, little attention has been paid to the episode of life change events and the time lag between the occurrence of events and their consequences. A process of adaptation for a certain period might lower the distressing effect of life change events on depressive symptoms, compared to acute life change events (Holmes & Masuda 1974). Accordingly, in this chapter, we will present an extension of the theoretical framework of SPF- theory by elaboration on *a dynamic perspective on depressive symptoms*. Based on SPF-theory, we theoretically elaborate on the dynamic impact of recent and less recent systematic social stressors. In theoretical terms, we consider systematic social stressors that imply transitions to worse positions as decreasing levels of resources (Dohrenwend 1973; Dohrenwend & Shrout 1985). So, the general proposition as described in Chapter 1 reads as follows: *decreasing levels of economic, social and cultural resources induce suffering from depressive symptoms, where a recent decrease induces suffering from depressive symptoms more severely than a less recent decrease.*

4.2.2 Hypotheses on lower levels of resources

According to the first general proposition, we derive hypotheses on suffering from depressive symptoms among people with a *lower level of economic, social, and cultural resources.* Just as in Chapter 3, we use educational attainment and income as indicators of the level of economic resources. In addition, we hypothesise on people's socio-economic class, including people's economic position (e.g., the unemployed, the employed, housekeepers, students), and additional information on the occupational status of people who are currently employed. Consequently, we hypothesise that people with a lower educational attainment, people with lower income, and people belonging to a lower socio-economic class suffer more from depressive symptoms compared to people with a higher educational attainment, a higher income, and belonging to a higher socio-economic class respectively *(Hypothesis 1)*. As in Chapter 3, we hypothesise on lower levels of social resources. In addition to people's marital status, we include information on people's household composition. We hypothesise that people who live alone suffer more from depressive symptoms than people who live with a partner and with children *(Hypothesis 2).* With respect to cultural resources, as in chapter three, we hypothesise that people who are not a member of a church suffer more from depressive symptoms compared to people who are church members *(Hypothesis 3a),* and that people who do not attend church regularly suffer more from depressive symptoms compared to people who attend church more frequently *(Hypothesis 3b).*

4.2.3 Hypotheses on decreasing levels of resources

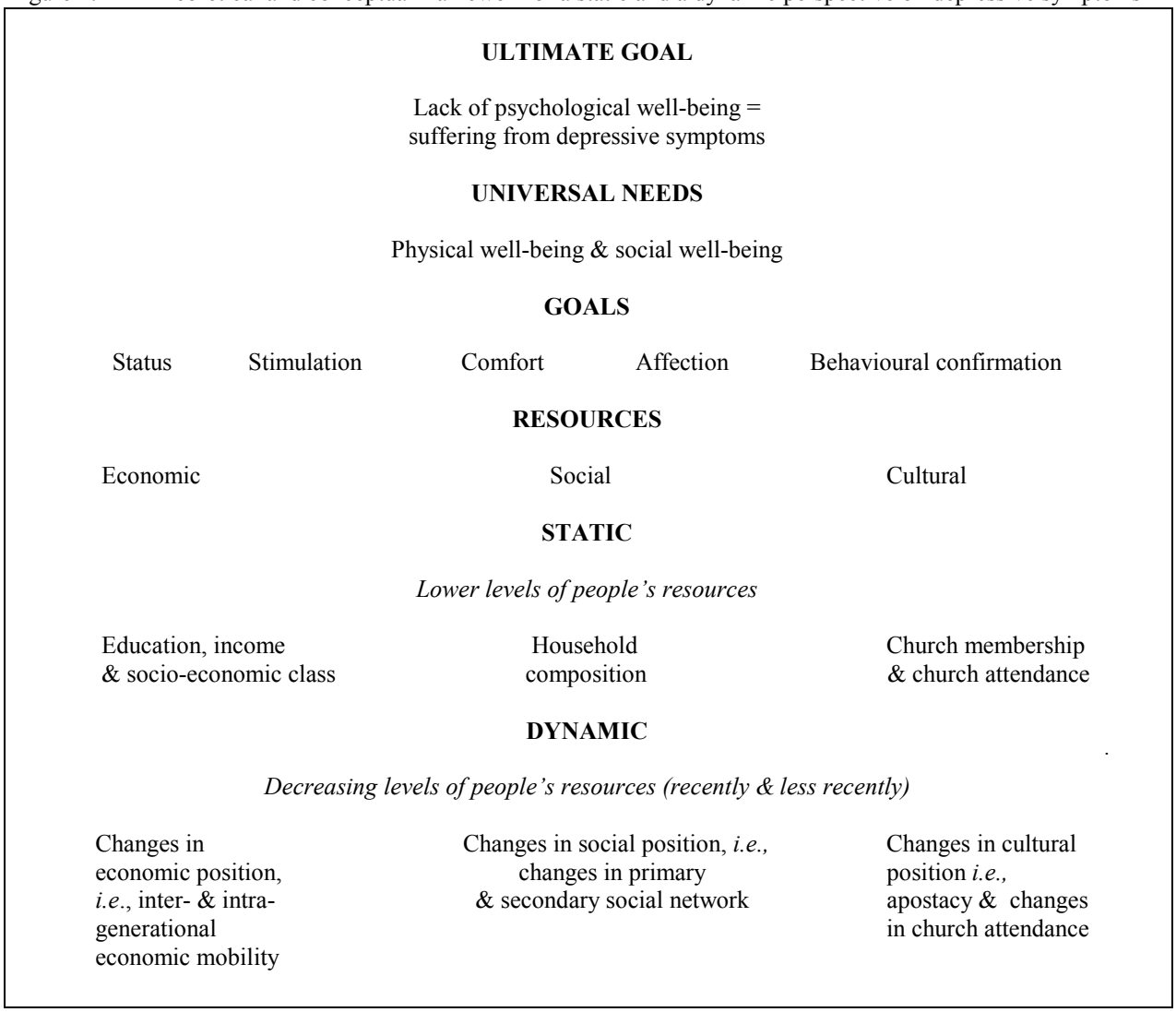
With regard to the second general proposition of this chapter, we elaborate on *decreasing levels of economic resources*. In addition, we state that a disturbance, or change of the socio-economic position, induces suffering from depressive symptoms. Changes in the socio-economic position that took place during the course of the respondent's life, can be related to *intra*-generational economic mobility (Dronkers & Ultee 1995; de Graaf 1989). Consequently, we hypothesise that people who recently came into financial difficulties or became jobless, suffer more from depressive symptoms than people who experienced a change in their socio-economic position less recently or not at all *(Hypothesis 4).* In addition, *inter*-generational economic mobility may occur that is a change in people's occupational status compared to the occupational status of their parents (de Graaf 1989). People with a lower occupational status, i.e., lower levels of economic resources, compared to their parent's occupational status experience downward economic mobility, which may act as structural distress itself, and may induce suffering from depressive symptoms (Aneshensel 1992; Dressler 1988; House & Harkins 1975). We hypothesise that people who have attained a lower occupational status compared to their parents' occupational status (i.e., who experienced downward inter-generational economic mobility), suffer more from depressive symptoms compared to people who attained a higher (or equal) occupational status compared to their parents (i.e., upward (or equal) inter-generational economic mobility) *(Hypothesis 5)*.

Decreasing levels of social resources due to problems in the primary and secondary social network (i.e., a divorce, the break up of a relationship, children leaving the home, or problems with friends, family or neighbours) might have severe consequences for a person's psychological well-being. Divorced people might become socially isolated, due to a lack of social approval or supportive relationships. In addition, the loss of an intimate relationship implies a loss of trust, security, and affection, which consequently might induce depressive symptoms (House et al. 1988b). Research has shown that people whose children leave home may experience feelings of

abandonment, i.e., empty nest syndrome (Harkins 1978). In addition to changes in the primary network, also changes in the secondary social network may lead to decreasing levels of social resources and consequently induce depressive symptoms Problems with friends, extended family members and neighbours, may induce depressive symptoms (Due Holstein Lund Modvig & Avlund 1999). However, the time lag related to these decreasing levels of resources may be important. People who experienced decreasing levels of social resources less recently, might have replaced these decreasing social resources by starting a new relationship, remarrying or gaining new friends. Consequently, we hypothesise that: people who recently experienced problems in their primary and secondary social network suffer more from depressive symptoms compared to people who experienced a change in their social network less recently or not at all *(Hypothesis 6)*.
Many Dutch people have given up their church membership, have stopped attending church, or have fallen from their Christian faith (Te Grotenhuis & Scheepers 2001a). The mental health consequences of leaving church may depend on the period when this occurred. In the previous periods, people who left church were considered as a 'deviant' group, which may have had negative effects on psychological well-being due to lower cultural resources. However, if one leaves church today, this may have less devastating effects on psychological well-being because of the wider range of possibilities to employ alternative resources in today's rather secular society (Braam 1999a, Te Grotenhuis & Scheepers 2001a). In line with our theoretical proposition, we propose that people who recently disassociated themselves from the church, i.e., recent apostates, may have developed more possibilities in using alternative cultural resources than those who left their denomination less recently. Accordingly, we hypothesise that people who have recently left their church suffer less from depressive symptoms than people who left their church less recently, compared to those who remained church members *(Hypothesis 7a)*. Also, we hypothesise that those who attend church less frequently, as compared to their formative years, will suffer more from depressive symptoms compared to people who attend church more frequently, or just as often nowadays *(Hypothesis 7b)*.

Figure 4.1 includes specific indicators of static and dynamic levels of resources that might induce suffering from depressive symptoms. A less detailed version of this framework was also presented in Chapter 1. This figure illustrates the theoretical elaborations and extensions of a static and a dynamic perspective on depressive symptoms as outlined in this chapter.

Figure 4.1 Theoretical and conceptual framework of a static and a dynamic perspective on depressive symptoms



4.3 Gender differences

In previous research, consistent empirical evidence has shown a gender difference with regard to depressive symptoms: women suffer more from depressive symptoms than men (Culbertson 1997; Nolen-Hoeksema 1987). Based on sampled subpopulations or specific subgroups like divorced or unemployed men and women, studies were mostly restricted to single determinants of gender differences and depressive symptoms (Bracke 1998; Fokkema & Dijkstra 2001; Van Ekkel 2000). However, a systematic investigation of the relationship between gender differences in various socio-demographic categories and depressive symptoms in the general population requires a multifactorial approach. Therefore, in this chapter, we intend to test, in a rather explorative manner, the extent to which the effects of lower and decreasing levels of resources on depressive symptoms differ between men and women, and what the decisive social determinants of women and men in suffering from depressive symptoms are.

4.4 Social selection and social causation

We aim to examine the extent to which social selection processes affect social variations in depressive symptoms. Social selection processes refer to the fact that people may drift into lower positions because of previous depressive symptoms (Dohrenwend 1992; Fox 1990). In these cases, an inverse relationship would be exist between current lower levels of resources and depressive symptoms, and it would be incorrect to suggest that lower levels of resources are a causal factor in the production of depressive symptoms. A panel design would appear to be the most appropriate manner for testing this hypothesis most stringently.

In this study, however, we use a cross-sectional data set in which no information is available on previous periods of depressive symptoms. So strictly speaking, social selection processes cannot be empirically tested. Nevertheless, in recent studies, models have been employed in which unfavourable childhood circumstances are included as sources of 'indirect' social selection. These procedures have become a topic for discussion in social selection and social causation research on physical and mental health differences (Amato & Sobolewski 2001; Lundberg 1991; Miech et al. 1999; Van der Mheen et al. 1997). In addition to previous periods of depressive symptoms, unfavourable childhood circumstances may also cause people to drift into lower positions, which in turn affect adult levels of depressive symptoms. Parental divorce may influence present marital status and have an indirect effect on depressive symptoms (Amato & Sobolewski 2001; Moors et al. 1998). Parents' occupational class and educational attainment may also play an important role: because of lower levels of parental economic resources, people may drift into lower economic positions and consequently suffer from depressive symptoms (Miech et al. 1999, Ritscher et al. 2001).

In the cross-sectional data set of the NHA-2 study, some information is available concerning familial psychopathology, parental socio-economic status, and unfavourable childhood circumstances. These indicators make it possible to examine the extent to what 'indirect' social selection contributes to variations in people's current positions and the extent of suffering from depressive symptoms (Amato & Sobolewski 2001; Blau & Duncan 1967; Fox 1990; Poulton et al. 2002; Ritsher et al. 2001). The hypothesis we propose to test in our study reads as follows: *due to unfavourable childhood circumstances, lower parental socio-economic status, and familial psychopathology, some people may have been hampered in the past in attaining higher levels of resources, and as a result, they are currently suffering more from depressive symptoms.*

4.5 Data and methods

4.5.1 Data

In this chapter we used the data from the Nijmegen Health Area study (NHA-2 study; König-Zahn et al. 1999). This large-scale data set is based on a multi-stage stratified random sample of people aged 18 to 75. The final number of interviewed people was 1,813 persons in total (response rate 51 %). The survey sample has been proven to be an accurate reflection of the general population according to gender and age. Detailed information on the NHA-2 study was presented in Chapter 2, Appendix A, and has been extensively described in König-Zahn et al. (1999).

4.5.2 Depressive symptoms

In this chapter, we will use two scales of depressive symptoms. We assessed depressive symptoms in relation to depressive symptomatology and depressive mood. These two conceptual and empirical dimensions were also used in much contemporary sociological and epidemiological research on aspects of mental disorders (Horwitz & Scheid 1999, Mirowsky & Ross 1989, Tausig et al. 1999). In Chapter 2, detailed information was presented on the operationalisation procedure, the scale construction and aspects of validity and reliability of these two conceptual dimensions of depressive symptoms. These two measurements embrace a scale that contains, respectively, four items that represent depressive symptomatology according to the original General Health Questionnaire (GHQ-28) depression subscale (Goldberg & Hillier 1979), and a scale that consists of six items that represent depressive mood according to the Centre of Depression Scale (CES-D) (Radloff 1977).

Item scores of both measurements were added up; a higher score indicates suffering more from depressive symptoms. The reliability of both measurement scales is sufficient (standardized Cronbach's alpha's (Cronbach 1951); GHQ-28_dep 0.89; CES-D_dep 0.86), and is comparable to previous studies (Bracke 1998; Braam 1999a; Goldberg & Hillier 1979; Goldberg 1988; Husiani et al. 1980; Mirowsky & Ross 1983, 1989; Radloff 1977; Ross & Mirowsky 1984). The frequency distribution of both dimensional scales of depressive symptoms showed a positively skewed distribution. Consequently, a log transformation was employed to both depressive symptom scale scores[1].

4.5.3 Static characteristics

Indicators for people's levels of resources were derived from several questions on people's socio-demographic characteristics. Indicators for levels of economic resources were income, educational attainment and socio-economic class. Educational attainment was measured using a question regarding the highest educational level the respondent had attained and complicated with an official certificate: categories ranged from no education to university degree. Income was measured using the net monthly income of the household to which the respondent belongs. Categories range from less than 1,000 Dutch guilders to 6,000 Dutch guilders or more per month (missing values 5,3%). Current socio-economic position was constructed using the EGP-classification (Erikson Goldthorpe & Portocarero 1983). This class typology considers both occupational function and employment status. A five-fold version of the EGP-class typology seems to be most appropriate in this study; 1) higher professionals, 2) lower professionals 3) routine non-manuals 4) self-employed (with/without employees), and 5) manual workers (skilled/unskilled). People who were not employed at the time of completing the questionnaire were categorised as retired persons, full-time housekeepers, full-time students or people dependent on social security or a disability pension.

Levels of social resources were indicated using categories of household composition. Information was derived from a question on marital status, and a question regarding whether a respondent has children (living at home) or not. The following categories were distinguished: living with a partner without children, i.e., family without children, living with a partner and children, i.e., family with children, and living without a partner with children, i.e., leading single-parent family. For people who where living alone without children the following categories were distinguished: living alone (never had a relationship), living divorced alone and living widowed alone.

Indicators of levels of cultural resources were church membership and church attendance. Church membership was measured using the question regarding whether a respondent considers him/herself to belong to a church (yes, no)[2]. Church attendance was measured in four categories ranging from never attending church to attending church once a week.

4.5.4 Dynamic characteristics

Decreasing levels of economic resources were measured using indexes that indicate whether a respondent had experienced a change in his/her economic position or not. Changes in economic position i.e., *intra*-generational economic mobility, were measured using questions regarding whether respondents had faced financial problems, had been dismissed from their job, or had been looking for a job without success. Moreover, in order to elaborate the dynamic element in these changes more profoundly, we distinguished between recent and less recent changes. Since we asked respondents to indicate the timing of the economic changes, we constructed a variable 'changes in economic position' that indicates whether a respondent experienced no decrease, a recent decrease (i.e., less than three years) or a less recent decrease (i.e., three years or more) in economic resources.

The second indicator of a change in the economic position was constructed using an index on *inter*-generational economic mobility. We compared the occupational status of respondent's current job with the father's occupational status at the time that the respondent was fifteen years old (EGP-classification; Erikson et al. 1983). Next, we distinguished three categories; 1) respondent experienced downward economic mobility compared to father's occupational status; 2) respondent experienced upward economic mobility compared to father's occupational status and 3) respondent's occupational status is comparable with father's occupational status, i.e., equal economic mobility.

Decreasing levels of social resources were measured using an index that indicates changes in the primary and secondary social network. This index included information based on questions regarding whether the respondent had experienced a divorce, the termination of a relationship, children leaving the home, problems with family, friends or neighbours. Also, respondents were asked to specify the period in which the change or changes took place, i.e., whether these changes had happened in the previous three years or longer ago than this. Consequently, the variable change in social position consists of three categories; 'no change', 'recent change' and 'less recent change'.

With respect to decreasing levels of cultural resources, we constructed two indicators of a change in cultural position. Change in church attendance was measured using a question regarding the extent of church attendance when the respondent was 15 years of age, and with a question on the current extent of church attendance. Both answer categories were compared and an index was constructed where a higher score implies relatively more change in church attendance, i.e., less church attendance compared to the socialisation period. The second indicator of changes in cultural resources was based on a question about previous church membership, a question about leaving the church, i.e., apostasy, and a question on respondent's age at the time of leaving the church. In order to distinguish between recent and less recent apostates, we corrected for the respondents' age deviation from 21, i.e., the average age of leaving church in the Netherlands (Te Grotenhuis & Scheepers 2001a, 2001b). This indicator on changes in cultural position has three categories; 'never left church/never been a church member', 'recent apostates', and 'less recent apostates'. The categories for gender are 'men' and 'women'.

4.5.5 Control variables

The literature suggests conflicting findings regarding effects of age on depressive symptoms (see for example, a review of Ernst & Angst 1995). In this study however, we aim to contribute to some assumptions of possible effects of the life course on depressive symptoms. We will include effects of birth cohorts in our models to test whether people differ in suffering from depressive symptoms due to different socialisation periods. We are aware of the fact that we hereby ignore age effects (Te Grotenhuis et al. 1998). According to Becker's distinction of birth cohorts (Becker 1991), we distinguished five birth cohorts: people born between 1923 and 1929, people born between 1930 and 1940, between 1941 and 1955, between 1956 and 1966, and people born between 1967 and 1980. We included degree of urbanisation in our analyses. Degree of urbanisation was assessed using information from the Dutch Office of Statistics municipality index, based on postal codes (Statistics Netherlands 1997).

Another control variable concerns an indicator of random stressors, i.e., life change events. Based on the predictive value of random stressors for depressive symptoms, we control whether a respondent had been seriously ill or had suffered the death of a partner, of children, or of family and friends (Pearlin et al. 1981; Pearlin 1989; Tausig 1982). The categories are; 'no random stressor', 'recently experienced random stressor' and 'less recently experienced random stressor'. Moreover, we test, controlled for several social aspects, whether a chronic disease affects suffering from depressive symptoms, as previous research on co-morbidity between mental and physical health problems has frequently suggested (De Jong et al. 1999; Vilhjalamsson 1998). Subsequently, information regarding whether the respondent was suffering from one or more chronic physical diseases at the time of completing the questionnaire was used as a control variable[3].

The NHA-2 study (König-Zahn et al. 1999) contains some indicators to test indirect social selection processes on depressive symptoms like familial psychopathology, family background, and some indicators of the respondent's socialisation period. We used information about the respondent's economic family background, family psychopathology and unfavourable childhood circumstances gathered with retrospective questions. Unfavourable childhood circumstances were measured with a dummy variable, whether the parents of the respondent divorced before he or she was sixteen years old, whether the respondent lived in foster homes, or ran away frequently. Economic family background was measured using educational attainment of father and mother, and the father's occupational status at the time the respondent was fifteen years old. Familial psychopathology was measured regarding whether parents had ever suffered from psychological problems. Further descriptive information on all dependent, independent, and control variables are presented in Appendix C.

4.5.6 Methods

To give an answer to the first research question of this chapter about people's levels of resources and suffering from depressive symptoms we performed Ordinary Least Square (OLS)- regression analysis to ascertain differences between socio-demographic categories and suffering from depressive symptoms. To investigate a multifactorial social approach on depressive symptoms more profoundly, and to test differences in indicators of levels of economic, social and cultural resources on depressive symptoms simultaneously, the estimated parameters were mutually adjusted.

Since the majority of the socio-demographic characteristics were nominal variables, we employed the procedure proposed by Hardy (1993) using categorical variables as dummy variables in the OLS-regression analysis. The estimated parameters were non-standardised regression coefficients, which have to be compared to the reference category in order to determine whether a specific category suffers more or less from depressive symptoms. Consistent with our theoretical propositions, people with higher levels of resources were the reference category[4].

To give an answer to the second research question on a dynamic aspect of people's positions, indicators of decreasing levels of economic, social, and cultural resources were tested simultaneously in one model, in addition to indicators of static levels of economic, social, and cultural resources. The sub-categories of several dynamic positions that indicate a recent or a less recent change were also included as categorical dummy variables (Hardy 1993). People who had never experienced a change, were the reference category.

To answer the third research question about gender differences, we specified OLS-regression analyses by gender. Just as in the procedure followed in chapter three, we performed separate subgroup regressions using a procedure which deals with the assumption of homoscedasticity, i.e., equality of normal distribution of the mean residual sum of squares in the two subgroups (see Hardy 1993, p. 53 and Note 10 in Chapter 3 of this dissertation). Using this procedure, we were able to test statistical significance of subgroup differences computing t-values.

4.6 Results

4.6.1 Regression analyses on social selection and social causation

Before we discuss the results of the effects of static and dynamic characteristics on depressive symptoms, we will pay some attention to social selection processes. In this study, we have the ability to empirically include measures of economic family background such as father's occupational status and parents' educational attainment, and of parental psychological problems and respondent's unfavourable childhood circumstances, i.e., some measures for social family background. These measurements allow us to empirically test 'indirect' social selection: to what extent do unfavourable childhood circumstances, lower parental socio-economic status, and familial psychopathology affect current levels of resources and, consequently, suffering more from depressive symptoms.

First, we built on status attainment models (Blau & Duncan 1967), and examined the extent to which economic family background, unfavourable childhood circumstances, and familial psychopathology have affected the current socio-economic class of the respondent, i.e., educational attainment and occupational status.

Second, we tested whether the association between respondent's socio-economic class, (e.g., education, occupational class, and income) and depressive symptoms (GHQ-28_dep) was affected by socio-economic background of the parents, familial psychopathology, and unfavourable childhood circumstances. We tested socio-economic status attainment models using OLS-regression analysis. The results are presented in Table 4.1.

Table 4.1 Socio-economic status attainment models with controls for social selection processes (Ordinary Least Square (OLS)- regression analysis, models adjusted for age and gender)

	Model 1				**Model 2**				**Model 3**			
	Educational level Respondent				**Occupational Status Respondent**				**Depressive symptoms**			
	b	**Beta**	**b**	**Beta**	**b**	**Beta**	**b**	**Beta**	**b**	**Beta**	**b**	**Beta**
Economic family background												
Educational level father	**.28****	**.26****	**.28****	**.26****	.01	.01	. 01	.01	.29	.02	.21	.01
Educational level mother	**.24****	**.16****	**.24****	**.16****	-.03	-.02	-.02	-.02	.22	.01	.05	.01
Occupational status father	**.21****	**.16****	**.21****	**.15****	**.09***	**.08***	**.08***	**.09***	-.62	-.03	-.56	-.03
Economic resources respondent												
Educational level					**.38****	**.52****	**.38****	**.51****	**-1.99****	**-.14****	**-1.97****	**-.14****
Occupational status									.10	.01	.11	.01
Income									**-2.46****	**-.15****	**-2.38****	**-.15****
Social family background												
Familial psychopathology *(no=ref.)*			**.44***	**.05***			.04	.01			**7.36***	**.05***
Unfavourable childhood circumstances *(no=ref.)*			**-.71***	**- .07***			-.18	-.02			4.00	.04
Adjusted R square	23,7%		24,7%		30,4%		30,4%		5,3%		5,6%	

(Bold coefficients ** p < 0.01; * p < 0.05) (Data: NHA-2 Study; N=1,798; author's calculations)

Table 4.2 Marital status attained with controls for social selection processes (Logistic Regression Analysis Model 1 and Model 2 and OLS-regression analysis Model 3, models adjusted for age and gender)

	Model 1		**Model 2**		**Model 3**			
	Ever experienced a divorce/break-up of a relationship (yes/no)		**Current marital status (alone/not alone)**		**Depressive symptoms**			
	b	**EXP (B)**	**b**	**EXP (B)**	**b**	**Beta**	**b**	**Beta**
Social resources respondent								
Ever experienced divorce/break-up of a relationship *(no=ref.)*			**1.89****	**6.61***	**4.46***	**.05***	3.86	.06
Current marital status *(not alone=ref.)*					**4.79***	**.06****	**4.51***	**.05***
Social family background								
Familial psychopathology *(no=ref.)*	**.44****	**1.65****	.21	1.23			2.98	.03
Unfavourable childhood circumstances *(no=ref.)*	**1.20***	**2.74***	.35	1.42			**3.93***	**.05***
	R square (Nagelkerke) .036		*R square (Nagelkerke) .271*		*Adjusted R square 2,0%*		*Adjusted R square 2,9%*	

(Bold coefficients ** p < 0.01; * p < 0.05) (Data: NHA-2 Study; N=1,798; author's calculations)

As these results demonstrate, the estimates of Model 1 and Model 2 in Table 4.1 show very small effects (Beta's) of the indicators for social selection processes (familial psychopathology and unfavourable childhood circumstances) on the respondent's current socio-economic class. On both the respondent's educational attainment and occupational status, parental economic resources (father's educational level and father's occupational status) show the strongest effects. The positive significant effect of familial psychopathology on the respondent's educational attainment is striking: people raised in a family with psychological problems attained a higher educational level[5]. In addition, in Model 2, the effects of familial psychopathology and unfavourable childhood circumstances on the respondent's occupational status no longer attain significance. Moreover, the results in the third model indicate that the association between the respondent's socio-economic class and depressive symptoms do not disappear after economic family background, familial psychopathology, and unfavourable childhood circumstances have been controlled for. However, a significant positive effect of family psychopathology suggests some evidence for a genetic influence. Although, parameters that indicate levels of economic resources, i.e., income level and educational attainment, seems to be the most decisive economic determinants for suffering from depressive symptoms in the general population. The results reported here indicate that in the general population, depressive symptoms are significantly and predominantly associated with the current socio-economic class of the respondent and only very slightly with family psychopathology and unfavourable childhood circumstances. These reported findings support a social causation process on depressive symptoms in the general population, and are in line with previous findings on social selection and social causation processes on socio-economic class (Poulton et al. 2002; Ritsher et al. 2001).

Next, in line with a procedure applied in previous studies (Amato & Sobolewski 2001; Hughes & Gove 1981) we performed Logistic Regression Analysis to test whether respondents' current marital status was affected by previous relational problems, unfavourable childhood circumstances, and familial psychopathology. The results in Model 1 of Table 4.2 show that the likelihood of having experienced a divorce or the break-up of a relationship is significantly affected by respondents' unfavourable childhood circumstances and parents' psychological problems. However, in the Model 2, these effects no longer reach significance. Probably, these aspects have a marginal influence on the current marital status (direct effect of previous relational problems) and an indirect influence of social family background (familial psychopathology and unfavourable childhood circumstances). The results of Model 3 show that current levels of social resources, i.e., living alone affect depressive symptoms significant. In addition, it appears that unfavourable childhood circumstances affect suffering from depressive symptoms significantly. Since unfavourable childhood circumstances include parental divorce, it seems that these circumstances have a lasting indirect effect on the risk of suffering from depressive symptoms in adulthood among people living alone. These results were in line with some previous research findings on social selection and social causation of parental divorce, current marital status, and depressive symptoms (Amato & Sobolewski 2001; Aseltine 1996).

Although these measurements should be viewed only as rough indicators of features of the socialisation period of the respondent, the results reported here do not indicate a strong evidence of indirect social selection processes of social family background. Furthermore, only 7 percent and 12 percent of the general population, respectively, experienced unfavourable childhood circumstances or had parents with psychological problems (numbers presented in Appendix C). We conclude that in these cross-sectional data, 'indirect' social selection processes play a minor

role and cannot completely explain differences between social categories in suffering from depressive symptoms. This is in line with previous research, which has shown robust empirical support for the social causation hypothesis (Miech et al. 1999; Ritsher et al. 2001)[6].

4.6.2 Regression analyses on static and dynamic characteristics

In the following section, we discuss the results of OLS-regression analyses of indicators of lower and decreasing levels of economic, social and cultural resources on depressive symptoms. First, we will discuss Table 4.3, which presents the results of multivariate regression analysis on the GHQ-28_dep subscale of depressive symptomatology.

Table 4.3 Multiple regression analysis to ascertain associations of static (Model 1) and dynamic (Model 2) characteristics on depressive symptoms (GHQ-28_dep depressive symptomatology)

	Model 1		**Model 2**	
	b	**SE**	**b**	**SE**
Static characteristics				
Educational attainment	**-1.82****	**(0.44)**	**-1.89****	**(0.45)**
Income	**-2.00****	**(0.52)**	**-1.85****	**(0.52)**
Socio-economic class *(Higher professionals= ref.)*				
- Lower professionals	0.22	(3.01)	0.23	(3.07)
- Routine non-manuals	1.52	(3.31)	0.92	(3.42)
- Self-employed (with/without employees)	-0.01	(4.14)	-0.01	(4.10)
- Manual workers (skilled/unskilled)	-0.69	(3.39)	-0.68	(3.93)
- Dependent on a disability pension	**25.35****	**(4.77)**	**24.22****	**(5.16)**
- Dependent on social security	**11.19***	**(5.82)**	8.84	(6.24)
- Retired	2.89	(4.27)	2.58	(4.63)
- Student	-1.89	(4.19)	-2.32	(4.57)
- Housekeeper	3.37	(3.72)	3.48	(4.17)
Household composition *(Living together with partner and children= ref.)*				
- Leading a single-parent family	**11.23***	**(4.39)**	**9.37***	**(4.39)**
- Living with partner without children	**4.90***	**(1.98)**	**4.55***	**(1.99)**
- Living alone (never had a relationship)	**6.28***	**(2.93)**	**5.62~**	**(2.93)**
- Living alone (divorced)	0.70	(4.64)	-1.02	(4.73)
- Living alone (widowed)	3.11	(4.60)	4.45	(4.73)
Church attendance	**-2.49***	**(1.03)**	-1.85	(1.25)
No church member *(Member=ref.)*	-0.77	(1.97)	-0.41	(2.77)
Gender Women *(Men=ref.)*	**4.11***	**(1.76)**	**3.97***	**(1.77)**
Cohort				
- 1923-1929 *(1930-1940 =ref.)*	2.92	(3.61)	4.15	(3.63)
- 1941-1955	**8.18***	**(2.91)**	**7.23***	**(2.91)**
- 1956-1966	1.47	(3.13)	1.72	(3.22)
- 1967-1980	-5.06	(3.54)	-3.97	(3.78)
Degree of urbanisation	0.92	(0.61)	0.75	(0.61)

Table 4.3 continued	Model 1 b	Model 1 SE	Model 2 b	Model 2 SE
Dynamic characteristics				
Economic position				
Intra-generational economic mobility				
(No change=ref.)				
- Recent change			**5.82***	**(2.99)**
- Less recent change			0.28	(2.14)
Inter-generational economic mobility				
(Equal=ref.)				
- Downward economic mobility			0.20	(2.82)
- Upward economic mobility			0.64	(2.66)
Social position *(No change=ref.)*				
- Recent change			**6.76***	**(2.57)**
- Less recent change			**3.45***	**(1.79)**
Cultural position *(Church member=ref.)*				
- Recent apostates			-3.63	(2.91)
- Less recent apostates			0.83	(3.18)
Change in church attendance			0.59	(0.85)
Experienced random stressor				
- Recently			2.04	(2.44)
- Less recently			-2.55	(2.09)
Chronic illness *(no=ref.)*			2.62	(1.99)
Constant	*178.91***	*(6.46)*	*174.76***	*(7.41)*
Adjusted R square	*11,1%*		*12,5%*	

(Bold coefficients ** p < 0.01; * p <0.05; ~ p <0.10) (Data: NHA-2 Study, N=1,813; author's calculations)

With regard to indicators of economic resources, we propose to test whether people with lower levels of economic resources suffer more from depressive symptoms than people with higher levels of economic resources. As the results in Model 1 of Table 4.3 show, the estimated parameter of educational attainment is negative and significant. People with lower educational attainment suffer more from depressive symptoms than people with higher educational attainment. The effect of income is also negative and significant. This indicates that people with a lower income suffer more from depressive symptoms, compared to people with a higher income. The findings regarding people's socio-economic class, show positive and significant coefficients of people dependent on social security and people who receive a disability pension: they suffer more from depressive symptoms than people in the highest socio-economic class, i.e., higher professionals.

Lower levels of social resources were indicated by household composition. The categories of people who live alone and who had never had a relationship, people who lead a single parent family, and people who live together with a partner and without children showed significant estimates. Compared to people who have a partner and children, i.e., the reference category, these categories suffer more from depressive symptoms.

With regard to cultural resources, the results of Model 1 show that church attendance has a significant negative effect: people who attend church regularly, suffer less from depressive symptoms than people who attend church less often. The category of non-church members shows a negative and non-significant parameter.

To Model 1 in Table 4.3, we added indicators of decreasing levels of economic, social and cultural resources in order to examine whether changes (recent or less recent) affect suffering from depressive symptoms. In general, compared to Model 1, the results of the static characteristics in Model 2 show similar estimates. Compared to Model 1, the coefficient of church attendance and the coefficient of the category of people who depend on social security, no longer attain significance in Model 2. With respect to dynamic characteristics, several categories show positive and significant parameters. The results in Model 2 show a significant and positive coefficient of a recent change in economic position. This means that people who recently experienced a negative change in their economic position indicated by losing a job, getting into financial problems, or not being able to find a job suffer more from depressive symptoms than people who did not experience a change in their economic position. In addition, the categories of changes in people's social position showed both significant and positive parameters. People who experienced a recent and less recent change in their social position, i.e., decreasing levels of social resources suffer more from depressive symptoms. Changes in people's cultural position indicated by recent and less recent apostacy as well as indicated by a change in the frequency of church attendance, show no significant estimates. The gender effects in the first and second models were significant; women suffer more from depressive symptoms than men. Degree of urbanisation shows no significant effect on depressive symptoms. With respect to birth cohorts, the results of Table 4.3 show a positive and significant parameter for people who were born between 1941 and 1955. Compared to the reference category i.e., people who were born between 1930 and 1940, people born between 1941 and 1955 suffer more from depressive symptoms than people socialised in the Second World War. A recent or less recent experience of random stressors shows no significant estimates. This is consistent with previous research that showed relatively small effects from random stressors (i.e., life events) on depressive symptoms, after controlling for several other social determinants (Ross & Mirowsky 1979; Tausig 1982). The coefficient of chronic illness is positive though not significant.

Table 4.4 shows estimates of multivariate OLS-regression analyses on depressive symptoms assessed the CES-D subscale of depressive mood.

Table 4.4 Multiple regression analysis to ascertain associations of static (Model 1) and dynamic (Model 2) characteristics on depressive symptoms (CES-D depressive mood)

	Model 1		**Model 2**	
	b	**SE**	**b**	**SE**
Static characteristics				
Educational attainment	-0.02	(0.45)	-0.16	(0.46)
Income	**-1.89****	**(0.54)**	**-1.74****	**(0.54)**
Socio-economic class *(Higher professionals= ref.)*				
- Lower professionals	-0.05	(3.01)	-2.32	(3.16)
- Routine non-manuals	4.74	(3.13)	2.04	(3.42)
- Self-employed (with/without employees)	-0.57	(4.29)	-0.21	(4.10)
- Manual workers (skilled/unskilled)	-0.06	(3.53)	-0.97	(3.93)
- Dependent on a disability pension	**16.52****	**(4.95)**	**17.24****	**(5.16)**
- Dependent on social security	9.18	(6.04)	8.64	(6.24)
- Retired	-4.30	(4.44)	-2.17	(4.63)
- Student	-5.42	(4.36)	-3.56	(4.57)
- Housekeeper	0.08	(3.86)	2.73	(4.29)

Table 4.4 continued	Model 1 b	Model 1 SE	Model 2 b	Model 2 SE
Household composition				
(Living together with a partner and children= ref.)				
- Leading a single-parent family	**8.69***	**(4.35)**	6.33	(4.39)
- Living with partner without children	2.78	(2.05)	2.24	(2.05)
- Living alone (never had a relationship)	2.48	(3.04)	1.03	(2.93)
- Living alone (divorced)	-3.38	(4.82)	-4.27	(4.73)
- Living alone (widowed)	-5.09	(4.78)	-3.38	(4.87)
Church attendance	**-2.48***	**(1.07)**	-1.81	(1.29)
No church member *(Member=ref.)*	-1.63	(2.05)	-3.03	(2.77)
Gender Women *(Men=ref.)*	**4.63***	**(1.83)**	**4.43***	**(1.82)**
Cohort				
- 1923-1929	2.57	(3.61)	4.69	(3.63)
(1*930-1940 =ref.)*				
- 1941-1955	**9.88***	**(3.02)**	**8.34***	**(2.91)**
- 1956-1966	**6.72***	**(3.25)**	**6.67***	**(3.22)**
- 1967-1980	3.84	(3.67)	4.88	(3.78)
Degree of urbanisation	**1.24~**	**(0.63)**	0.79	(0.61)
Dynamic characteristics				
Economic position				
Intra-generational economic mobility *(No change=ref.)*				
- Recent change			**6.59***	**(2.99)**
- Less recent change			2.52	(2.19)
Inter-generation economic mobility *(Equal=ref.)*				
- Downward economic mobility			**6.56***	**(2.90)**
- Upward economic mobility			**5.69***	**(2.74)**
Social position *(No change=ref.)*				
- Recent change			**11.26***	**(2.64)**
- Less recent change			**4.42***	**(1.85)**
Cultural position *(Church member=ref.)*				
- Recent apostates			1.39	(2.91)
- Less recent apostates			4.94	(3.18)
Change in church attendance			0.71	(0.85)
Experienced random stressor				
- Recently			3.80	(2.44)
- Less recently			-3.86	(2.09)
Chronic illness *(No=ref.)*			**4.45***	**(2.00)**
Constant	*243.71***	*(6.71)*	*236.32***	*(7.64)*
Adjusted R square	*6,3%*		*7,5%*	

(Bold coefficients ** p <0.01; * p <0.05; ~ p <0.10) (Data: NHA-2 Study, N=1,813; author's calculations)

Model 1 in Table 4.4 shows the results of static characteristics, i.e., lower levels of economic, social and cultural resources. The estimated parameter of educational attainment is negative but does not reach significance. The coefficient of income is negative and significant: people with lower income levels suffer more from depressive symptoms. According to socio-economic class, a significant parameter appears for people dependent on a disability pension: they suffer more from depressive symptoms than people in the highest socio-economic class, i.e., higher professionals.

The results of Model 1 in Table 4.4 show a significant parameter only for the category of people who lead a single-parent family. Compared to people living with a spouse and children, i.e., the reference category, single parents suffer more from depressive symptoms. The estimates of people who live alone, and people who live together with a partner and children, are also positive, but did not reach significance.

In addition, the results of Model 1 show that the estimated parameter of church attendance is negative and significant; people who attend church regularly suffer less from depressive symptoms than people who attend church less regularly. However, the results show no significant effect of none church membership.

Various dynamic characteristics were included in Model 2 of Table 4.4. In general, compared to Model 1, the results of the static characteristics in Model 2 are similar. Only the significant parameters in Model 1 of single-parent family and church attendance no longer reach significance in Model 2. With regard to changes in economic position, the significant estimate of the indicators of intra-generational economic mobility indicates that people who recently experienced a negative change in their socio-economic position suffer more from depressive symptoms than people who did not experience a change in their socio-economic position. Furthermore, the significant positive coefficients of inter-generational economic mobility indicates that people whose occupational status is lower or higher compared to their father's occupational status, suffer more from depressive symptoms, compared to the reference category, i.e., equal occupational status compared to their father's occupational status. In addition, it appears that the sub categories of changes in social position show both significant and positive parameters. People who experienced recent and less recent decreasing social resources, suffer more from depressive symptoms compared to people who did not experience a decrease in their social resources. Indicators of a change in the cultural position show positive, but not significant, estimates. With respect to the included control variables, it appears that degree of urbanisation has a slightly significant effect on depressive symptoms in Model 1, but this effect becomes insignificant in Model 2. With respect to birth cohorts, we find positive and significant parameters for people born between 1941 and 1955, and people born between 1956 and 1966. People born in one of these two birth cohorts suffer more from depressive symptoms compared to people born between 1930 and 1940. The coefficients of the subcategories of random stressor, i.e., experience stressful life events recently or less recently, show no significant parameters. The indicator of chronic illness shows a positive and significant coefficient: people with a chronic illness suffer more from depressive symptoms than people without a chronic illness.

If the results from Table 4.3 and Table 4.4 on static characteristics (Model 1) are compared, we can summarise as follows. It appeared that people with a lower income and people dependent on a disability pension showed significant effects in both tables: they suffer more from depressive symptoms than people with a higher income and higher professionals, respectively. The similar effects of educational attainment and people depending on a social security, although not significant in Table 4.4, suggest that we, in general, can conclude that people with lower levels of economic resources suffer more from depressive symptoms. With regard to social resources, the results of both tables showed that people who lead a single- parent family suffer significantly more from depressive symptoms, compared to people who live together with a partner and children. People who live alone and people who live together with a partner without children show positive and significant coefficients in Table 4.3, although they do not reach significance in Table 4.4. In general, we might state that people with lower social resources suffer

more from depressive symptoms compared to people with higher levels of social resources. The two indicators of cultural resources, i.e., church attendance and church membership, show negative estimated parameters in Table 4.3 and 4.4. Church attendance appeared to reach significance only in the first models of both tables. A comparison of the results of the second models in Table 4.3 and Table 4.4 show both a significant effect of recent intra-generational economic mobility. This implies that people who experienced a recent change in their socio-economic position suffer more from depressive symptoms. In addition, both categories of inter-generational economic mobility show positive estimates that also reach significance in Table 4.4. Both tables show positive and significant effects of a recent and a less recent change in people's social position. This indicates that recent and less recent decreasing levels of social resources induce depressive symptoms. With regard to changes in cultural resources, both tables show non-significant results of changes in church attendance and recent and less recent apostacy.

To summarise then, these empirical findings suggest similar associations between several indicators of lower levels and decreasing levels of resources, and the two measurements on depressive symptoms, i.e., depressive symptomatology and depressive mood in the general population.

4.6.3 Regression analyses on gender differences

The results of Table 4.5 and 4.6 present the findings of the simultaneous tests of gender differences in static and dynamic characteristics on depressive symptoms. We specified OLS-regression analyses by gender and computed t-values to test whether there were significant differences between men and women in the particular socio-demographic categories. First, we will discuss the findings as displayed in Model 1 from Table 4.5. These results present the findings of the simultaneous analyses on depressive symptoms based on a scale of depressive symptomatology. The estimated parameter of educational attainment shows a negative and significant coefficient for women whereas for men the coefficient was negative though not significant. The significant t-value indicates that women with higher educational attainment suffer less from depressive symptoms compared to higher educated men. The estimated parameters for income of both men and women are negative and significant[7]. Furthermore, it turns out that both men and women who are dependent on a social disability pension have positive and significant parameters: they suffer more from depressive symptoms compared to men and women who are higher professionals. In addition, the parameter of women who are dependent on social security is positive and significant; these unemployed women suffer more from depressive symptoms compared to women who are higher professionals.

Estimates of subgroup categories of household composition show that men who live alone, men who live together with a partner and without children, and men who live without a partner and with children, i.e., leading a single-parent family suffer more from depressive symptoms than men who live together with a partner and with children. Women who lead a single-parent family, suffer more from depressive symptoms, compared to women living together with a partner and children. The effects of the subcategory of living alone on depressive symptoms differ significantly between men and women. Men who live alone suffer more from depressive symptoms than women who live alone, compared to men and women who live with a partner and children. Parameters of church attendance are slightly significant only for men, and suggest that men who attend church more often suffer less from depressive symptoms compared

to men who attend church to a lesser extent. Coefficient of none church membership on suffering from depressive symptoms is not significant for either men or women.

The findings in Model 2 from Table 4.5 show a significant and positive estimate for a recent change in intra-economic mobility of men. Men who experienced a recent change in their economic position suffer more from depressive symptoms than men who did not experience a change in their socio-economic position. The effect of intra-generational economic mobility of women shows no significant effect, and no significant effects for either men or women of inter-generational economic mobility on suffering from depressive symptoms. For women, both types of changes in their social position affected suffering from depressive symptoms significantly. These results differ significantly between men and women: women who experience decreasing levels social resources recently, suffer more from depressive symptoms compared to men who experience a recent decrease in their levels of social resources. The parameters of both indicators of changes in cultural position, i.e., apostacy and changed church attendance, show no significant estimates for either men or women.

Table 4.5 Multiple regression analysis to ascertain gender differences in the associations of static (Model 1) and dynamic (Model 2) characteristics on depressive symptoms (GHQ-28_dep scale)

	Model 1			**Model 2**		
	b	**b**	**t**	**b**	**b**	**t**
Static characteristics	**Men**	**Women**		**Men**	**Women**	
Educational attainment	-0.75	**-2.91***	***2.36***	-0.87	**-2.88***	***2.14***
Income	**-1.80***	**-2.11****	.36	**-1.68***	**-1.90****	.29
Socio-economic class *(Higher professionals=ref.)*						
- Lower professionals	0.22	0.86	-.19	-0.22	1.31	-.22
- Routine non-manuals	1.09	1.43	-.03	0.51	1.35	-.10
- Self-employed (with/without employees)	-0.60	2.15	-.18	-0.6	3.45	-.32
- Manual workers (skilled/unskilled)	-2.25	4.02	-.77	-2.16	4.57	-.68
- Dependent on a disability pension	**23.36****	**31.09****	-.48	**21.57 ****	**31.50****	-.60
- Dependent on social security	6.87	**17.99***	-.99	1.30	**17.64~**	-1.21
- Retired	8.37	-4.89	1.53	7.66	-2.79	1.24
- Student	1.77	-3.95	.65	2.65	-2.39	.59
- Housekeeper	1.46	3.45	-.14	-1.69	3.60	-.20
Household composition *(Living together with partner and children=ref.)*						
- Leading a single-parent family	**12.01***	**10.60***	-.79	9.06	5.57	-.53
- Living together with partner without children	**6.53***	4.14	.11	**6.43***	3.87	.21
- Living alone (never had a relationship)	**10.12***	2.74	***1.94***	**11.95***	-0.36	***1.68***
- Living alone (divorced)	-5.73	5.43	-.47	-5.15	1.44	-.55
- Living alone (widowed)	2.91	3.46	-.40	3.61	4.34	-.40
Church attendance	**-2.40~**	**-2.41~**	-.11	-0.66	-2.39	.76
No church member *(Church member =ref.)*	1.73	-2.84	1.20	1.94	-0.31	.95
Cohort						
- 1923-1929 *(1930-1940 =ref)*	-1.25	5.01	-.88	-0.85	4.60	-1.03
- 1941-1955	**7.50***	**9.91***	-.52	**7.09***	**8.39***	-.28
- 1956-1966	-2.15	5.43	-1.21	-1.52	3.82	-.58
- 1967-1980	**-9.82***	-1.15	-1.19	-6.56	-3.47	-.40
Degree of urbanisation	0.60	1.30	-.52	0.72	1.29	-.26

Table 4.5 continued	Model 1 b	Model 1 b	t	Model 2 b	Model 2 b	t
Dynamic characteristics	**Men**	**Women**		**Men**	**Women**	
Economic position						
Intra-generational economic mobility						
(No change=ref.)						
- Recent change				**8.90***	4.93	.69
- Less recent change				0.59	0.65	-.03
Inter-generational economic mobility						
(Equal=ref.)						
- Downward economic mobility				-1.37	1.91	-.56
- Upward economic mobility				-0.08	2.79	-.51
Social position *(No change=ref.)*						
- Recent change				-8.74	**14.62****	***-2.83***
- Less recent change				1.54	2.47	-.75
Cultural position *(Church member=ref.)*						
- Recent apostates				-1.15	-6.31	.28
- Less recent apostates				3.79	-2.75	-.80
Change in church attendance				1.66	-0.35	1.28
Experienced random stressor						
- Recently				-1.19	4.67	.12
- Less recently				-0.84	-2.19	-1.17
Chronic illness *(No=ref.)*				2.55	2.36	-.02
Constant	*171.92**	*185.43**		*165.46**	*185.52**	
Adjusted R square	*9,09%*	*9,60%*		*10,10%*	*10,60%*	
F (model 1) = .8651; F (model 2) =.8775						

(Bold coefficients ** p < 0.01; * p < 0.05; p ~ <0.10) (Data: NHA-2 Study; Women N=1,003; Men= 810; author's calculations)

With respect to the included control variables, degree of urbanisation shows no significant results on depressive symptoms for either men or women. The effects of birth cohorts show Model 1 and in Model 2 that men and women who were born between 1941-1955, differ significantly from men and women who were born between 1930 and 1940: they suffer more from depressive symptoms. For men, the estimates in Model 1 also show a significant negative coefficient for men born between 1967-1978; they suffer less from depressive symptoms compared to the reference category. However, this effect no longer attains significance in the Model 2. Moreover, the estimates of random stressor and chronic illness do not show any significant results for women and for men[8].

Finally, we describe gender differences on depressive symptoms based on the CES-D scale of depressive mood as presented in Table 4.6. For educational attainment, the parameter for women shows a negative though not significant coefficient; while for men it is positive but also not significant. The estimated parameters of income show for both men and women a negative and significant effect, men and women with a lower income suffer more from depressive symptoms compared to men and women with a higher level of income. Furthermore, based on the significant estimates of socio-economic class, it turns out that both men and women who are dependent on a social disability pension, suffer more from depressive symptoms compared to men and women who are employed as higher professionals. With respect to household position, it

appears that men who had never had a relationship, and women who lead a single-parent family suffer more from depressive symptoms compared to their respective reference categories, i.e., men and women who live together with a partner and children. With respect to cultural resources, only the estimated parameter of church attendance shows a negative and significant coefficient for men: men who attend church regularly suffer less from depressive symptoms compared to men who attend church less often. These results on differences in various static characteristics between men and women, do not reveal any significant t-values, i.e., there are no differences between men and women in the effects of lower levels of economic, social, and cultural resources on suffering from depressive symptoms.

Table 4.6 Multiple regression analysis to ascertain gender differences in the associations of static (Model 1) and dynamic (Model 2) characteristics on depressive symptoms (CES-D depressive mood)

	Model 1			**Model 2**		
	b	**b**	**t**	**b**	**b**	**t**
Static characteristics	**Men**	**Women**		**Men**	**Women**	
Educational attainment	0.58	-0.54	.67	0.25	-0.64	.58
Income	**-1.36~**	**-2.31***	.49	-1.14	**-2.14***	.52
Socio-economic class *(Higher professionals=ref.)*						
- Lower professionals	-1.11	2.20	-.37	-3.43	2.43	-.33
- Routine non-manuals	4.64	6.61	-.91	1.10	6.25	-.57
- Self-employed (with/without employees)	-3.33	7.43	.84	-4.66	10.19	.76
- Manual workers (skilled/unskilled)	0.12	3.67	.70	0.15	6.21	.43
- Dependent on a disability pension	**14.46***	**22.86***	1.19	**14.27***	**26.58***	-1.58
- Dependent on social security	9.31	11..31	-.15	6.00	14.84	.64
- Retired	-2.33	-3.79	-.80	-2.06	1.88	.90
- Student	-1.72	-4.76	.32	1.64	-0.08	-.26
- Housekeeper	-38.95	1.77	-1.48	-41.09	7.31	-1.09
Household composition *(Living together with partner and with children=ref.)*						
- Leading a single-parent family	6.39	**9.03***	-.33	5.04	4.28	.23
- Living together with partner without children	2.84	3.77	-.41	1.84	3.47	.14
- Living alone (never had a relationship)	**8.28***	-1.91	1.10	**6.26~**	-4.73	1.05
- Living alone (divorced)	-4.04	-1.27	-1.00	-6.64	-4.83	.58
- Living alone (widowed)	-5.71	-6.01	-.97	-2.31	-5.23	.98
Church attendance	**-2.91***	-1.87	-.66	-1.46	-1.95	-.72
No church member *(Member=ref.)*	-0.66	-2.20	.65	-2.65	-3.35	1.13
Cohort						
1923-1929	-3.18	2.72	-.73	-1.33	2.09	-1.16
1930-1940 (=ref.)						
1941-1955	**7.29~**	**12.86***	***-2.08***	6.75	**11.08***	***-1.73***
1956-1966	1.41	**12.36***	***-2.07***	1.76	**11.05***	***-1.64***
1967-1980	-6.01	**11.37***	***-2.87***	-3.10	**10.19***	***-1.95***
Degree of urbanisation	0.83	**1.65***	1.06	0.63	**1.46~**	-1.00

Table 4.6 continued	Model 1 b	Model 1 b	t	Model 2 b	Model 2 b	t
Dynamic characteristics	**Men**	**Women**		**Men**	**Women**	
Economic position						
Intra-generational economic mobility						
(No change=ref.)						
- Recent change				**9.43***	5.29	.60
- Less recent change				4.67	1.09	.32
Inter-generation economic mobility						
(Equal=ref.)						
- Downward economic mobility				**8.48***	4.00	***-1.65***
- Upward economic mobility				5.82	7.16	.23
Social position *(No change=ref.)*						
- Recent change				3.05	**12.17***	***-1.69***
- Less recent change				1.86	5.13	-.25
Cultural position *(Church member=ref.)*						
- Recent apostates				1.52	0.89	.87
- Less recent apostates				5.84	2.90	-1.45
Change in church attendance				1.38	-024	
Experienced random stressor						
- Recently				4.74	3.45	.42
- Less recently				-3.23	-2.52	.27
Chronic illness *(No=ref.)*				3.86	**5.23***	-.65
Constant	*241.59**	*245.19**		*234.99**	*240.80**	
Adjusted R square	*4,10%*	*4,30%*		*5,20%*	*5,30%*	
F (model 1) = .8651 F (model 2) = .8775						

(Bold coefficients ** p < 0. 01; * p <0.05; p ~ <0.10) (Data: NHA-2 Study; Women N=1,003; Men= 810; author's calculations)

The results presented in the Model 2 of Table 4.6 indicate that, for women, none of the estimates of intra-generational and inter-generational economic mobility reach significance. For men, it appears that those men who experienced a recent change in their economic position suffer more from depressive symptoms compared to men who did not experience a change in their economic position. Also, the positive and significant estimated parameter of downward inter-generational economic mobility implies that men who have experienced downward mobility, i.e., a lower occupational status compared to the occupational status of their father, suffer more from depressive symptoms compared to men who have an equal occupational status compared to their father's occupational status.

The significant t-value reveals that this effect of downward inter-generational economic mobility on suffering from depressive symptoms differs significantly between men and women. Moreover, from Model 2 of Table 4.6 it appears that women who experienced a recent change in their social position suffer more from depressive symptoms compared to women, who did not experience a change in their social position. This effect differs significantly from the effect of a recent change in social position of men on suffering from depressive symptoms. None of the sub-categories of changes in cultural position for either men or women show significant coefficients.

With respect to the effects of the included control variables, exposure to a random stressor showed the same, though non-significant parameters, for both men and women. Furthermore, it

appeared that chronic illness had a significant positive effect for women: women who are chronically ill suffer more from depressive symptoms than women who are not chronically ill. However, these effects did not differ between men and women. According to degree of urbanisation, the results of Table 4.6 showed a significant effect for women. It appears that women living in urban settings suffer more from depressive symptoms compared to women living in a rural environment.

The results demonstrate that women born after 1941 suffer more from depressive symptoms compared to women born between 1930 and 1940. Moreover, the significant t-tests show that a gender difference exists between men and women born in different birth cohorts compared to the reference category.

These results presented in Table 4.5 and Table 4.6 suggest that women and men differ in suffering from depressive symptoms according to educational attainment, living alone, downward inter-generational economic mobility, recent changes in the social network and being born in a specific birth cohort.

4.6 Conclusions and discussion

In this chapter, using a large-scale regional data set, several hypotheses derived from a theoretical framework (SPF-theory) were tested simultaneously using multivariate (OLS)-regression analysis. As an answer to the first research question of this chapter, we can state that we found empirical evidence to indicate that various indicators of people's lower levels of resources affect suffering from depressive symptoms in the general population. With respect to lower levels of economic resources, we find that people with a lower income, a lower educational attainment, people who are dependent on social security or a disability pension suffer more from depressive symptoms than people with a higher income, higher educational attainment or people belonging to a higher socio-economic class (Hypothesis 1 is supported). We emphasise that our results do not show significant differences between depressive symptoms of people who belong to a lower occupational class compared to higher professionals. However, this is in line with previous research that has shown that occupational class is a less consistent indicator of levels of economic resources that affect depressive symptoms, compared to income, education, and employment status (see a review of Fryers et al. 2003).

Our results show that different indicators of lower levels of social resources affect suffering from depressive symptoms. The results demonstrate that people who never have had a partner and people leading single-parent families suffer more from depressive symptoms than people who do live together with a partner and children. These empirical findings are consistent with other studies, which have shown that the absence of an intimate relationship affects people's psychological well-being negatively (House et al. 1988a, 1988b; Hughes & Gove 1981; Turner & Marino 1994) (Hypothesis 2 is supported). It appeared that people who live together with a partner but without children, suffer more from depressive symptoms compared to people who live together with a partner and with children. Apparently, having both a partner and children is more beneficial to people's level of social resources than being single and childless. People with a partner and without children might therefore suffer more from depressive symptoms than people with a partner and children. This was also suggested in previous research on the positive health outcomes of family and social relationships (Ross Reynolds & Goldsteen 1990). Moreover, when gender differences of household composition on depressive symptoms were tested, it appeared

that men who live alone and men who live with a partner but without children suffer more from depressive symptoms (Simon 1997, 1998). These findings stress the importance of using characteristics of people's household composition, in addition to information on marital status as specific indicators of the levels of social resources to show the relationships with depressive symptoms.

Furthermore, we find that lower levels of cultural resources affect suffering from depressive symptoms: people who attend church to a lesser extent suffer more from depressive symptoms than people who attend church more often (Hypothesis 3a is supported). However, whether people were a member of the church or not, showed no significant effects in our analyses (Hypothesis 3b is not supported). The findings reported here suggest that it is not whether people consider themselves as belonging to a church that affects suffering from depressive symptoms, but rather the *extent* of church attendance. As church attendance might be considered as active participation in a religious community, this might provide feelings of belonging and moral guidance, and consequently protects against suffering from depressive symptoms. This finding is consistent with previous research on the impact of religiosity and moral guidance on mental disorders (Braam 1999a: Koenig 1997).

The second research question of this chapter concerned the extent to which decreasing levels of economic, social, and cultural resources affect depressive symptoms. The results reported in this chapter indicate that, in general, people who experienced a recent change in their economic and social position, i.e., decreasing levels of economic and social resources, suffer more from depressive symptoms (Hypotheses 4,5, and 6 are supported). With respect to social position, the results indicate that less recent changes in the primary and secondary social network have a lasting effect on suffering from depressive symptoms. A striking finding was the significant effect of upward inter-generational economic mobility. Respondents whose occupational statuses were higher compared to their father's occupational statuses suffer more from depressive symptoms. One might assume that people who face upward economic mobility might have lower social and economic resources due to their family background (Dronkers & Ultee 1995). Consequently, the fulfilment of instrumental goals such as status and behavioural confirmation in the current occupational status might be difficult because of inexperience or desintegration at the occupational environment due to lower social and economic resources, which may induce depressive symptoms (Dressler 1988; House & Harkins 1975). Dynamic changes in cultural position appeared to have no substantial effects on suffering from depressive symptoms in the general population (Hypothesis 7a and Hypothesis 7b are refuted). These results contrast with the findings of Braam (1999a) on the effects of apostacy on depressive symptoms among the elderly. Probably, people who had left church in times when this was considered as a deviant action, suffered negative effects on psychological well-being, due to lower cultural resources and fewer alternative possibilities in a rather homogenous religious environment. Leaving church nowadays may have less devastating effects on psychological well-being, because of a more heterogeneous secularised environment (Te Grotenhuis & Scheepers 2001a). However, these associations between mental disorders, church attendance, church membership, and religiosity in the general population require further theoretical and empirical study. As an answer to the second research question then, the results we reported in this chapter indicate that dynamic changes in economic and social positions induce depressive symptoms.

Our third research question concerned about gender differences in the effects of lower and decreasing levels of resources on depressive symptoms. Regarding gender differences in levels of

economic resources, it turns out that -compared to men-, women have receive beneficial mental health effects from a higher educational attainment, adjusted for their socio-economic class and level of income. This is comparable with the results on gender differences as presented in the Chapter 3, and in line with research on the beneficial mental health effects of educational attainment, such as intellectual growth, and economic independence especially for women (Glass & Fujimoto 1994). According to indicators of levels of social resources, the results showed that men who live alone suffer more from depressive symptoms compared to women who live alone. Moreover, it appeared that men and women differ in the effects of decreasing economic resources, i.e., inter-generational economic mobility on depressive symptoms. Women who did experience decreasing social resources, i.e., recent change in the primary social network, suffer more from depressive symptoms compared to men. These findings are consistent with some previous studies, which showed that men's psychological well-being is more strongly influenced by levels of economic resources such as exposure to job related stress, financial strains and downward economic mobility. On the other hand, it appeared that the level of depressive symptoms among women is more strongly influenced by exposure to negative changes within the social network, i.e., decreasing levels of social resources (Conger Lorenz Elder & Simons 1993; Fuhrer Stansfield Chemali & Shipley 1999; Timms 1998).

In this chapter, we also paid some attention to social selection and social causation. We can conclude that 'indirect' social selection explains only minor variations in the effects of people's current levels of resources on suffering from depressive symptoms. The empirical results reported here show that, the relations between social and economic positions and depressive symptoms could be considered as substantial results to support social causation processes (Amato & Sobolewski 2001; Aseltine 1996; Dohrenwend 1992, Fox 1990, Miech et al. 1999, Ritsher et al. 2001, Van der Mheen et al. 1997).

With respect to the two dimensional measurements scales of depressive symptoms, as used in this chapter, we conclude that, in general, similar associations between several static and dynamic characteristics and depressive symptoms appeared in both dimensional measurements. No substantial differences were found between socio-demographic categories on both types of measurements representing a syndromal depressive affect and a dysphoric mood, respectively. However, the differences in explained variance of the different models suggest that the GHQ-28_dep scale of depressive symptomatology is more sensitive to several indicators of lower and decreasing levels of resources tested in a multifactorial social approach in the general population. With respect to birth cohort, there were some striking differences between the two measurements as demonstrated by our analyses. Apparently, symptoms of depressive mood were manifest equally in all birth cohorts, independent of people's socialisation period, whereas depressive symptoms showed that, in particular, people who were born between 1941 and 1955, i.e., socialised after the Second World War, appeared to suffer more from depressive symptoms. Further elaboration may be needed on effects of age and birth cohorts on depressive symptoms in the general population as well as on differences in the association with age and birth cohorts applying two types of measurements (Christensen et al. 1999; Ernst & Angst 1995).

Notes Chapter 4

[1] Many measurements of mental disorders used in large-scale data show a positively skewed distribution. This skewness of scale scores can produce heteroscedasticity in regression analysis, thereby inflating the standard errors of coefficients that in turn reduce the power of significant tests. Consequently, we employed a natural log transformation of the scale scores, which is an elegant solution to fulfil more closely to normality assumption of multivariate regression analysis, and to increase the power of significant tests (cf. Mirowsky & Ross 1989; Ross 2000).

[2] Because of the rather homogenous religious tradition of the Catholic Church in the Nijmegen Health Area, no specific information on denominations was available in the NHA-2 study (Te Grotenhuis & Scheepers 2001b; König-Zahn et al. 1999).

[3] In this study, we paid no attention to the distinction between indigenous and non-indigenous people. There are, however, just a small number of people from non-indigenous groups in the sample of the NHA-2 study. Among the inhabitants of the Nijmegen Health Area, ethnic minorities are slightly under-represented compared to other regional areas of the Netherlands (Statistics Netherlands 1997). Since data of national-level time series showed that non-indigenous people, in general, have a lower educational attainment and are rather over-represented among the long-term unemployed, we could, in general, expect that non-indigenous people suffer more from depressive symptoms compared to indigenous Dutch people, due to lower levels of economic resources (Roelandt et al. 1993). However, with respect to social and cultural resources, we did not have any theoretical assumptions, and because of the marginal number of indigenous people, as well as an absence of any specific distinction between ethnic minorities, i.e., Turkish, Moroccans, Surinamese, etc., in the NHA-2 data, we did not test any differences in suffering from depressive symptoms between indigenous and non-indigenous people.

[4] Since, we use the log transformation of our dependent variables: Ln (GHQ-28_dep * 100) and (Ln (CES-D_dep) * 100), the interpretation of an unstandardised regression coefficient (b) differs compared to an ordinal scale of summed Likert scores. Therefore, it is necessary to use the inverse of the logarithmic function (i.e., the exponential or antilog function) in order to interpret the exact change in scores of an independent (dummy) variable on the scale of the dependent variable.

[5] This has probably to do with the fact that the question for familial psychopathology was not asked in a time specific way. The question was: have your father/mother *ever* had psychological problems. So, parent's psychological problems that occurred after the respondent's final attainment of educational level were not relevant in these models.

[6] These findings are in line with previous research, mostly based on specific sub-samples or studies with a panel design. These studies have shown overriding evidence that social causation processes play an important role in the development of less severe mental disorders like depressive symptoms, whereas 'direct' social selection was confirmed in the origins of severe mental disorders, like schizophrenia (Dohrenwend 1992; Fox 1990). In addition, a study on socio-economic inequalities of physical health showed that selection effects only marginally exist in data representing a general population. Moreover, it appeared that selection processes contribute no more than approximately ten per cent to socio-economic inequalities in health (Van der Mheen et al. 1997).

[7] In the NHA-2 study, income was measured as the net household income. Probably, gender differences in the effects of income on depressive symptoms will be marginal in the case of people living together with a partner.

[8] In order to test for selection effects on our final models, we performed OLS-regression analyses including familial psychopathology and unfavourable childhood circumstances to control whether these variables modified our results of static and dynamic characteristics (results not shown here). It appeared that the familial psychopathology has a marginal significant positive effect on depressive symptoms. In neither the pooled sample, nor the gender specified samples, unfavourable childhood circumstances show any significant effects in either models. Including these controls did not alter our original results of the effects of static and dynamic characteristics on depressive symptoms.

5 Depressive symptoms in the general population: a contextual and an explanatory perspective

5.1 Introduction

Recently, a number of studies has shown geographical variations in self-reported health, medicine use, depressive symptoms, and suicide rates between cities, areas, boroughs, and neighbourhoods (Aneshensel & Succoff 1996; Ellison et al. 1997; Faupel et al. 1987; Groenewegen Leufkens Schreewenberg, & Worm 1999; Reijneveld & Schene 1998; Ross 2000; Verdonk 1979). This research suggests variations in the risk of suffering from depressive symptoms due to living in different social contexts. This research is actually influenced by Faris's and Dunham's (1939) pioneering work on mental disorders and Shaw & McKay's (1942) initial study on delinquent behaviour in urban areas. This type of research can be related to the application of the 'places matter' position, and contributes to an ecological approach to mental disorders (Curtis & Jones 1998; Macintyre et al. 1993).

Based on this approach, a lot of research emphasised associations between socio-economic features of the social context and several aspects of mental disorders and physical illness (Dooley et al. 1988; Pickett & Pearl 2001). Moreover, based on Durkheim (1897/1951), a number of studies have focused on the religious climate of the social context and its relation to suicide rates and depressive symptoms (Braam 1999b; Ellison et al. 1997; Faupel et al. 1987; Pescosolido 1990). More recently, social capital as a contextual characteristic has been regarded as playing an important role in health differences between places and social groups (Kawachi et al. 1999; McKenzie et al. 2002).

The social context in which people live can be indicated using various types of social surroundings like the society, a geographic area, the city, the neighbourhood, or even the street. Previous research has shown that people are likely to be affected by their daily experiences and the facing of disadvantaged neighbourhood conditions that have an influence on their psychological well-being and, consequently, induce depressive symptoms. Therefore, in this study we focus on the neighbourhood as a valid indicator of the social context.

In addition to current features of the neighbourhood, changes in these features also appeared to induce depressive symptoms (Jacobson 1989; George 1993). Delinquency research has reflected the impact of changes in social organisation, urbanisation, and socio-economic circumstances of neighbourhoods on criminal behaviour (Bursik & Webb 1982; Taylor & Covington 1988). Epidemiological research has suggested that changes in contextual characteristics of the neighbourhood, such as an increase in unemployment or social isolation induce mental disorders or physical health problems (Boyle et al. 2001; Brenner & Mooney 1983; Ross & Reynolds 2000; Tausig & Fenwick 1999). Based on these empirical findings, we further investigate and hypothesise that current and changing contextual conditions in the neighbourhood are associated with suffering from depressive symptoms in the general population.

However, in most studies it is not clear which particular aspects of the social context are decisive determinants for suffering from depressive symptoms. Moreover, recent reviews of 'places matter' (Macintyre Maciver & Sooman 1993; Picket & Pearl 2001) have suggested that there is a lack of explicit theoretical considerations concerning the various mechanisms which link features of the social context with depressive symptoms. This lack of clarity might also be caused by a selective focus on particular contextual features such as some indicators of socio-economic conditions, or single aspects of social cohesion (Braam et al. 1999b; Ellison et al. 1997; Pickett & Pearl 2001; Robert 1999). This lack of cross-references, i.e., taking no advantage of theoretical components or empirical evidence of studies which have emphasised various contextual features that might induce depressive symptoms, has certain consequences. First, this implies that several studies have failed to control systematically for a number of specific contextual factors and second, this focus on single factors makes it difficult to draw conclusions on decisive determinants of the social context that induce depressive symptoms. Until now, just a few studies based on several theoretical traditions have attempted to systematically derive hypotheses on various features of the social context that might induce depressive symptoms (Ross 2000; Silver et al. 2002).

In addition, we state that further research might be enhanced by a theoretical explication of the impact of various features the neighbourhood on depressive symptoms. Research might be improved by a theoretical development that synthesises different contextual factors, changes in these factors and their impact on suffering from depressive symptoms. Consequently, one of the challenges in this chapter will be to make theoretical progress by elaborating and enhancing previous research using *a multifactorial social approach* on contextual factors representing with the neighbourhood that have a substantial effect on depressive symptoms. Based on SPF-theory we will hypothesise on different aspects of the neighbourhood and their impact on suffering from depressive symptoms, in addition to people's positions. Elaboration on the social context might produce more understanding about the effects of people's positions and contextual conditions on suffering from depressive symptoms.

A fundamental difficulty of research on social contexts is the kind of data that have to be used to test hypotheses on contextual factors appropriately. Previous studies based their results on aggregated characteristics of people living in particular areas, i.e., measures of 'social composition', rather than using 'contextual characteristics' of the places people live in (Macintyre Ellaway & Cummins 2002). Although these studies have provided valuable information on the variations between different social contexts, i.e., neighbourhoods and depressive symptoms, they have neglected compositional differences between these contextual areas, which might have overestimated the related effects, since individual-level data were not included. Accordingly, as was recommended by several studies, further research into the effects of social contexts on depressive symptoms requires operational definitions and valid measures of indicators of social contexts that are not based exclusively on aggregated characteristics of individuals (Buckner 1988; Caughy et al. 2001; Macintyre et al. 1993, 2002). Furthermore, in recent years, a number of studies made use of the methodological advantages of performing multilevel analysis (Braam et al. 1999b; Malmström Sundquist & Johansson 1999; Pickett & Pearl 2001; Ross 2000). This method offers possibilities for examining more appropriately the effects of contextual characteristics on aspects of mental disorders adjusted for individual characteristics (Bryk & Raudenbusch 1992; Snijders & Bosker 1999, p.13-15). In this chapter, therefore, we aim to make empirical progress, to extend upon previous research by taking into

account simultaneously both individual-level characteristics and contextual-level characteristics of the neighbourhood in one research design using multilevel analysis.

Another aspect that we investigate in this chapter are the mechanisms behind the association between individual and contextual characteristics and depressive symptoms (Sooman & Macintyre 1995; Mirowsky & Ross 1999). As was described in Chapter 1, it might be necessary to propose specific subjective perceptions that people attach to their social positions as well as to their social contexts (Frohlich et al. 2003; Sooman & Macintyre 1995). Subjective perceptions reflect people's experiences, meanings, and expectations, depending on social references. As was previously suggested, we state that people's positions as well as neighbourhood conditions may evoke subjective perceptions of distress, which contribute to the explanation of suffering from depressive symptoms among specific social categories in the general population (Aneshensel & Sucoff 1996; Cohen et al. 1982; Frohlich et al. 2003, Mirowsky & Ross 1999; Pearlin et al. 1981; Ross 1993; Sooman & Macintyre 1995, Thoits 1999). Accordingly, in this chapter, we will theoretically elaborate on particular subjective perceptions of people's positions and people's social context that might induce depressive symptoms.

To summarise then, in this chapter we introduce *a contextual perspective and an explanatory perspective on depressive symptoms*. We propose that specific aspects of the social context representing with the neighbourhood, have a substantial effect on depressive symptoms. We focus on a number of contextual conditions of the neighbourhood that may be associated with depressive symptoms, in addition to people's individual positions. Based on SPF-theory, hypotheses are derived about lower levels of people's resources and levels of neighbourhood's resources and suffering from depressive symptoms. Moreover, we also hypothesise on decreasing levels of resources in the neighbourhood and suffering from depressive symptoms. We used individual-level data from the regional-based survey (NHA-2 study, König-Zahn et al. 1999), and as contextual-level data, we used characteristics of neighbourhoods based on the postal codes of sample of the NHA-2 study (Statistical Netherlands 1994b, 1997b; Wegener 2001)[1]. These 'nested' data, i.e., individuals within neighbourhoods, permitted the application of multilevel analysis, i.e., a method that offers the possibility of testing several hypotheses on individual and contextual characteristics simultaneously. Using these individual and contextual data, we are able to answer the following two research questions of this chapter:

1) *To what extent do lower levels of neighbourhood's resources and decreasing levels of neighbourhood's resources affect depressive symptoms, in addition to people's lower and decreasing levels of resources?*

2) *To what extent can the relationships between people's lower and decreasing levels of resources and depressive symptoms and the relationships between lower and decreasing levels of neighbourhood's resources and depressive symptoms, be explained by particular subjective perceptions of distress?*

5.2 Theory and hypotheses

5.2.1 Theoretical framework and propositions

The theoretical framework of Social Production Function Theory (Ormel et al. 1997, 1999) was described in detail in previous chapters. We briefly recapitulate the two rather general propositions on a static and dynamic perspective of levels of resources: *lower levels of economic, social, and cultural resources induce suffering from depressive symptoms*, and, *decreasing levels of economic, social, and cultural resources induce suffering from depressive symptoms, where a recent decrease induces suffering from depressive symptoms more severely than a less recent decrease.*

In this chapter, we expand on *a contextual perspective on depressive symptoms* using previous empirical findings and theoretical traditions that elaborate on the resources approach, as included in SPF-theory. Previous studies have shown that conditions of the local social environment, i.e., the neighbourhood, can be related to depressive symptoms (Aneshensel & Succof 1996, Macintyre & Sooman 1993, Silver et al. 2002, Ross 2000). In line with our theoretical framework of SPF-theory, we state that the neighbourhood contains resources that might contribute to their residents' psychological well-being. Equally, disadvantageous contextual conditions in the neighbourhood may induce feelings of insecurity, dissatisfaction, and hopelessness which in turn might reduce their resident's psychological well-being, and subsequently provoke depressive symptoms (Silver et al. 2002). Consequently, our third general theoretical proposition is: *lower levels of economic, social, and cultural resources of the neighbourhood induce suffering from depressive symptoms.*

In addition, we propose that changes in the level of contextual resources in the neighbourhood may also provoke suffering from depressive symptoms (George 1993; Jacobson 1989). Deterioration in the social environment due to decreasing levels of contextual resources might increase feelings of insecurity, anomie, hopelessness, and distress, and subsequently induce depressive symptoms (Boyle et al. 2001; Brenner & Mooney 1983; Cohen et al. 1982; Taylor & Covington 1988). Consequently, our fourth general theoretical proposition is: *decreasing levels of economic, social, and cultural resources of the neighbourhood induce suffering from depressive symptoms.*

Another aspect we elaborate on in this chapter concerns *an explanatory perspective on depressive symptoms.* We assume that people differ from each other in their levels of objective individual and contextual resources. However, it might be argued that subjective perceptions of people's positions and their social contexts are aspects which differ between social groups, due to social stratification in society (Aneshensel et al. 1991). Subjective perceptions, experiences, and evaluations of the individual position and of the contextual environment might reinforce suffering from depressive symptoms, and might in fact be considered as factors of distress (Aneshensel et al 1991; Frohlich et al. 2003; Sooman & Macintyre 1995; Turner Lloyd 1999). In line with SPF-theory (Ormel et al. 1997, 1999), Aneshensel et al. (1991) stated that the discrepancy between people's situation and people's needs, wants and goals might evoke distress. This distress is determined by people's subjective perceptions and evaluations of their situation, i.e., the level of resources and possibilities on the one hand, and the goals one has to fulfil, on the other hand. If a person feels unable to fulfil instrumental goals, this may lead to feelings of threat, despair, strain and, ultimately, to perception of distress that induces suffering from depressive symptoms.

Accordingly, our fifth proposition is: *subjective perceptions of distress induce suffering from depressive symptoms.*

5.2.2 Hypotheses on people's resources

Just as in the previous chapters, we hypothesise on several indicators of people's levels of economic, social, and cultural resources. Consequently, we expect that people with a lower educational attainment, a lower income, and belonging to lower socio-economic classes suffer more from depressive symptoms compared to people with, respectively, a higher educational attainment, a higher income and belonging to higher socio-economic classes *(Hypothesis 1);* people who live alone suffer more from depressive symptoms than people who live with a partner and children *(Hypothesis 2);* people who are not church members suffer more from depressive symptoms compared to people who consider themselves to be church members *(Hypothesis 3a),* and people who attend church less regularly suffer more from depressive symptoms, compared to people who attend church more often *(Hypothesis 3b).*

Related to the second general proposition on decreasing levels of resources, we consequently hypothesise that people who recently experienced a change in their economic position suffer more from depressive symptoms than people who experienced a change in their socio-economic position less recently or not at all *(Hypothesis 4).* Also, we expect that: people who experienced problems in their primary and secondary social network recently, suffer more from depressive symptoms compared to people who experienced a change in their social network less recently, or not at all *(Hypothesis 5).* Finally, we expect that people who have recently left their church suffer less from depressive symptoms than people who left their church less recently, i.e., long term apostates compared to those who remained church members *(Hypothesis 6a).* Those who attend church to a lesser extent as compared to their formative years will suffer more from depressive symptoms compared to people who attend church more (or equally) nowadays *(Hypothesis 6b).*

5.2.3 Hypotheses on neighbourhood's resources

Based on a theoretical perspective and on previous research concerning the influence of contextual economic conditions on mental disorders (Dooley et al. 1988; Robert 1999), we state that the current socio-economic conditions in the neighbourhood have an influence on depressive symptoms. Lower levels of economic resources in the neighbourhood such as high levels of unemployment and financial strain, may produce feelings of insecurity, anomie, hopelessness, confusion, and despair to their residents, and possibly provoke depressive symptoms at the individual level. Previous research has shown that living in an economically deprived area may induce depressive symptoms at the individual level (Pickett & Pearl 2002; Reijneveld et al. 1998; Robert 1999; Turner 1995). We use the economic neighbourhood conditions as indicators of the levels of economic resources of the neighbourhood. We hypothesise that the higher the economic neighbourhood disadvantage, the higher the suffering from depressive symptoms at the individual level *(Hypothesis 7).*

Demographic changes affected the composition of households in the Netherlands (SCP 2001) and nowadays, the numbers of single-person and single-parent households in a neighbourhood are rather substantial (SCP 2001; Statistics Netherlands 1997b). The more people live on their own in a neighbourhood, the more they may experience autonomy, freedom, and an enhancement of possibilities, but also lack of affection, instability of social relations, lack of

group belongingness and even social isolation (Gove & Hughes 1980; Durkheim 1897/1951; Wilterdink 1995). Moreover, previous research found that neighbourhoods with a high degree of single-person households were positively associated with a higher risk of mental disorders (Gove & Hughes 1980; Kawachi & Berkman 2001; van Os et al. 2000). We hypothesise that the higher the proportion of single-person households in a neighbourhood, the higher the suffering from depressive symptoms at the individual level *(Hypothesis 8)*.

As was previously described, religiosity may play a significant role related to moral guidance, whereby individuals assign meaning to ordinary life circumstances and potentially problematic events (Koenig 1997). With regard to the social context, we state that a religious climate reflects shared values and norms in the local community, based on the local religious traditions. Religious communities often shape local institutions (i.e., clubs, schools, churches), which link residents across generations and social classes. This local community might shape a local culture with cultural resources such as shared world views, shared beliefs and values, and moral guidance, which consequently reduces the risk of suffering from depressive symptoms (Faupel et al. 1997; Pescosolido 1990). By contrast, as result of the present level of secularisation, the actual number of people belonging to a religious community is relatively small, and areas containing less coherent religiously homogeneous settings have risen up on a large scale (Te Grotenhuis & Scheepers 2001a, 2001b). Consequently, this might imply that at a contextual level, less moral guidance prevails, i.e., lower levels of cultural resources of the neighbourhood which may induce depressive symptoms at the individual level. Previous research in the Netherlands based on several community samples of the elderly has shown that living in a secularised environment induces depressive symptoms (Braam 1999b). For these reasons, we hypothesise: the lower the level of religious affiliation in a neighbourhood, the higher the suffering from depressive symptoms at the individual level *(Hypothesis 9)*.

In addition to these hypotheses on the static aspects of levels of resources of the neighbourhood, we also anticipate that changes in the neighbourhood may have an additional influence on depressive symptoms. In accordance with this dynamic aspect of a contextual perspective, previous research has shown that a decline in economic conditions of society increased the level of economic deprivation in a neighbourhood and consequently induces suffering from depressive symptoms at the individual level (Boyle et al. 2001, Tausig & Fenwick 1999). We hypothesise that an increase in economic neighbourhood disadvantage induces suffering from depressive symptoms at the individual level more strongly than a stable level of economic neighbourhood disadvantage (*Hypothesis 10)*.

Social ties among neighbours are important factors affecting the subjective quality of life (Kawachi & Berkman 2001). A community feature that has deleterious consequences for the level of social integration in a neighbourhood or local community is high residential turnover that restricts the ability of individuals to develop social ties and friendship with other residents of their neighbourhood (Durkheim 1897/1951; Ross & Joon Jang 2000; Ross & Reynolds 2000). According to social disorganisation theory, high residential mobility in a neighbourhood leads to the breakdown of social ties and social control that are preconditions for crime and various social pathologies (Bursik & Webb 1982; Ross 1993; Ross & Reynolds 2000; Taylor & Covington 1988)[2]. Consequently, we hypothesise that the higher the residential mobility in a neighbourhood, the more depressive symptoms at the individual level *(Hypothesis 11a)*. In addition, we hypothesise that an increase in disadvantaged social conditions in a neighbourhood (i.e., an increase of proportion single-person households) induces the suffering from depressive symptoms

of individuals more strongly than a stable level of disadvantaged social conditions in a neighbourhood *(Hypothesis 11b).*

In accordance with our dynamic perspective on cultural resources of the neighbourhood, we hypothesise that a decrease in the level of religious affiliation in a neighbourhood induces suffering from depressive symptoms at the individual level more strongly than a stable or increasing level of religious affiliation in the neighbourhood *(Hypothesis 12).*

5.2.4 Hypotheses on subjective perceptions of distress

We have already proposed that people differ from each other in their levels of individual and contextual resources, and therefore in their likelihood to suffer from depressive symptoms. We also state that people's positions as well as people's environment may evoke subjective perceptions of distress (Frohlich et al. 2003; Sooman & Macintyre 1995). People might perceive distress or dissatisfaction, financial strain or social isolation, which may induce depressive symptoms. Furthermore, subjective perceptions of economic distress and social isolation are assumed to be more strongly prevalent among people in the lower segments of society. Empirical research has shown that people with a lower socio-economic status perceive more feelings of economic deprivation than people with a higher socio-economic status (Pearlin 1989; Turner & Marino 1994). It has also been convincingly shown that people who live alone perceive more feelings of social isolation compared to people with dense social networks (Aneshensel et al. 1991; House et al. 1988a, Ross et al. 1990; Turner & Marino 1994). This mechanism of subjective perceptions of distress (partially) explain differences between socio-demographic categories and depressive symptoms, since certain categories, (i.e., people with lower levels of economic, social, and cultural resources), may perceive relatively more economic distress or social isolation. Accordingly, we hypothesise that people with lower and decreasing levels of resources suffer more from depressive symptoms because of subjective perceptions of economic distress and social isolation *(Hypothesis 13).*

Besides these subjective perceptions of people' positions, subjective perceptions of the social context might also partially explain the association between neighbourhood's resources and depressive symptoms. People with lower levels of resources, might depend more on the resources of their neighbourhood than might people with higher levels of resources (Sooman & Macintyre 1995). Disadvantaged contextual conditions such as high levels of unemployment, impoverishment, social disorganisation and lack of social integration may increase feelings of insecurity, anomie, and hopelessness in their residents (Cohen et al. 1982; Sooman & Macintyre 1995). People with a lower level of resources perceive and experience these neighbourhood features as threatening conditions and stressors (Aneshensel & Sucoff 1996; Sooman & Macintyre 1995). These perceptions could be referred to as 'neighbourhood disadvantage' or 'perceived neighbourhood disorder' (c.f. Taylor 1996; Mirowsky & Ross 1999; Ross & Joon Jang 2000; Ross 2000) and were found to provoke depressive symptoms at the individual level. Consequently, we hypothesise that people with lower and decreasing levels of resources and lower resources of the neighbourhood suffer more from depressive symptoms, because of perceived neighbourhood disadvantage *(Hypothesis 14).*

Figure 5.1 Theoretical and conceptual framework of a contextual and an explanatory perspective on depressive symptoms

ULTIMATE GOAL

Lack of psychological well-being =
suffering from depressive symptoms

SUBJECTIVE PERCEPTIONS OF DISTRESS

Perceived economic distress
Perceived neighbourhood disadvantage
Perceived social isolation

RESOURCES

Economic	Social	Cultural

PEOPLE'S RESOURCES

STATIC

Lower levels of people's resources

Income, education socio-economic position	Household composition	Church memberschip & church attendance

DYNAMIC

Decreasing levels of people's resources (recently & less recently)

Intra-generational economic mobility	Changes in primary & secondary social networks	Apostacy & change in church attendance

CONTEXTUAL RESOURCES

STATIC

Lower levels of neighbourhood's resources

Disadvantaged economic conditions, *i.e,* level of income, unemployed	Disadvantaged social conditions, *i.e.,* level of single-person households	Disadvantaged cultural conditions, *i.e.,* level of non-religious affiliated

DYNAMIC

Decreasing levels of neighbourhood's resources

Disadvantaged economic conditions increased/ decreased	Residential mobility & disadvantaged social conditions increased/decreased	Level of non-religious affiliation increased/ decreased

In the previous section, we systematically elaborated on five rather general propositions and formulated more specific hypotheses on people's levels of resources and neighbourhood's levels of resources, as well as subjective perceptions of distress, which may induce depressive symptoms. These specific hypotheses can be based on previous theoretical approaches and research findings on mental disorders, which can be synthesised into this theoretical framework as derived from SPF-theory (Ormel et al. 1997, 1999). As with the figures presented in the previous chapters, Figure 5.1 displays a schematic outline of the theoretical and conceptual framework of SPF-theory and reflects the elaboration of a contextual and an explanatory perspective on depressive symptoms as made in this chapter. This figure illustrates the specific indicators of people's and contextual resources and subjective perceptions of distress.

5.3 Data and methods

5.3.1 Data

In this chapter, we used large-scale data from the regional survey of the NHA-2 study (König-Zahn et al. 1999) as individual level data. These data contain several indicators of static and dynamic characteristics. Detailed information on these data was described in the second and fourth chapters of this book and in König-Zahn et al. (1999).

Furthermore, a distinction between individual and neighbourhood characteristics requires appropriate contextual data, which makes a reliable empirical test possible. Moreover, data necessary for such an analysis are most appropriate if indicators of contextual conditions were collected in the same period in which the individual level data were collected. Fortunately, we were able to make use of information of several neighbourhood characteristics based on four-digit postal codes published by the Dutch Office of Statistics (CBS) (Kerncijfers Postcode Gebieden 1997; Statistics Netherlands 1997b) and collected in the same period in which the NHA-2 study was conducted (König-Zahn et al. 1999). Although postal code sectors are somewhat larger units, they are the next best approximation to neighbourhoods. The average population size of postal code sectors varies to a lesser extent and, in general, more information on these units is available (Knol 1998; Statistics Netherlands 1997b)[3]. A number of studies on multilevel analysis used postal code sectors as equivalents for local communities and neighbourhoods (Knol 1998; Robert 1999; Ross 2000). Accordingly, Reijneveld et al. (2000) found equally significant effects on variations in mental and physical symptoms using three distinct geographical categorisations, i.e., neighbourhoods, postal code sectors, and districts of a large city in the Netherlands.

Consequently, in this chapter we used data form the NHA-2 study based on 1,654 respondents and 54 neighbourhoods (mean numbers of individuals per neighbourhood, n=30). Individuals as well as postal codes with missing data were excluded from the study population (n=154; 8,1 percent). For most of the neighbourhood characteristics, we used valid statistics indicative for the year in which the individual data were collected and drawn from the statistical publications of the Dutch Office of Statistics (CBS) (Statistics Netherlands 1997b), and figures derived from a marketing research office (Wegener 2001).

5.3.2 Depressive symptoms

In this chapter, we use a dimensional measurement based on continuous scales scores of four items that refer to depressive symptomatology. The operationalisation of this concept is based on a modified version of the depression subscale of the General Health Questionnaire, 28-item version (GHQ-28) (Goldberg & Hillier 1979; Goldberg 1988; Koeter & Ormel 1991). Item scores were added up, as higher scores indicate suffering more from depressive symptoms. This continuous scale has a positively skewed distribution and therefore a log transformation was employed to fulfil more closely to the normality assumption of multivariate regression analyses, and to increase the power of significance. Internal reliability is sufficient (standardised Cronbach's alpha: 0.89) (Cronbach 1951). Specific details on the operationalisation and scale construction of depressive symptomatology based on the General Health Questionnaire can be found in the Chapter 2 of this book[4].

5.3.3 Individual characteristics

Operationalisations of several indicators of people's levels of resources were extensively described in the previous chapter. In this section, we briefly summarise these measurements. Categories of educational attainment were measured as the highest level attained by the respondent and ranged from no education to a university degree. Income was measured as the gross household income per month divided into several categories ranging from lower to higher income. Information on respondent's socio-economic position were classified as employment, full-time housekeepers (female or male), students, pensioners or people dependent on social security or a disability pension. Household composition contained information on people's marital status and whether people were living together with children or not. Church membership was measured as a dichotomy (yes, no) and church attendance ranged from never attending church to more than once a week.

The variable 'changes in economic position' indicated whether a respondent experienced 'no change', 'a recent change' or 'a less recent change' in levels of economic resources due to intra-generational economic mobility. Changes in levels of social resources were measured using an index that indicates changes in the primary and secondary social networks. The variable 'changes in social position' consists of three categories: 'no change', 'recent change' and 'less recent change'. With respect to changes in levels of cultural resources, we constructed two indicators for a 'change in cultural position'. The first indicator, change in church attendance, was constructed with an index that compared the level of church attendance when the respondent was fifteen years old with the current level of church attendance. A higher score implied more change in church attendance. The second indicator of changes in cultural resources was based on questions about apostacy. This indicator has three categories; 'never left church/never been a member', 'recent apostates' and 'less recent apostates'.

In this chapter we included gender as a control variable. The categories for *gender* were 0 'man' and 1 'woman'[5]. Another control variable concerns birth cohort. According to Becker's distinction of birth cohorts (Becker 1991), we distinguished five birth cohorts: people born between 1923 and 1929, people born between 1930 and 1940, people born between 1941 and 1955, born between 1956 and 1966 and born between 1967 and 1978. We are aware of the fact that we hereby ignore age effects (Te Grotenhuis et al. 1998). Descriptives of static and dynamic individual characteristics were presented in Appendix D[6].

5.3.4 Neighbourhood characteristics

Levels of economic resources of the neighbourhood were measured with an index comparable to the procedure that measures the level of economic neighbourhood deprivation (Knol 1998; van Eijk 1998). This index represents indicators of economic characteristics based on data from over 2,000 neighbourhoods in the Netherlands derived from statistical publications of the Dutch Office of Statistics (CBS) (Statistics Netherlands 1997b; van Eijk 1998). These indicators were the proportion of people reporting an income at the Dutch social minimum or below, percentage of people aged 16-65 who were unemployed, and average household income per income recipient. These indicators clustered into one principal component derived from factor analyses and conceptualised as disadvantaged economic neighbourhood conditions. Subsequently, to indicate the level of economic neighbourhood conditions, we used factor scores that range from less (-1.90) to higher (2.40) scores. A higher score implies more disadvantaged economic neighbourhood conditions.

Levels of social resources of the neighbourhood were measured using the proportion of people living alone, i.e., percentage of single-person households based on four-digit postal codes (Statistics Netherlands 1997b). The percentages ranged from 8 to 70 percent.

The indicator of cultural resources of the neighbourhood was based on percentages of religious affiliation in neighbourhoods. We aggregated data based on six-digit postal codes to four digit zip codes (Wegener 2001). We recoded categories that range from highly religiously affiliated neighbourhoods (score 1) to less than averagely religiously affiliated (score 8) neighbourhoods.

In order to empirically test a dynamic and contextual perspective on depressive symptoms, we measured changes in contextual features over a period of five years. This period seemed to be suitable and reliable for indicating changes in a neighbourhood's levels of resources, since it is unlikely that during this period under consideration neighbourhood conditions remained constant (Knol 1998). We used appropriate measurements of neighbourhood characteristics that permit studying changes in the period between 1994 and 1998.

Since the emphasis in this study is on the dynamic aspects of neighbourhood change, a reliable operationalisation of dynamic changes is of crucial importance. One possible approach is the creation of relative change scores, that is, the ratio of change during five years to the initial level of the indicator at time t, thus creating a measure of proportional change. However, such raw change scores have the unfortunate drawback of being dependent on the initial levels of the neighbourhood score and are undefined when the change during the period is zero. In this study, instead of a relative change measure, a residual change score has been used as suggested by Bohrnstedt (1969) and previously used in many studies on neighbourhood changes (Bursik & Webb 1982; Taylor & Covington 1988; Van Wilsem Wittenbrood & de Graaf 2003). These residual change scores are equal to the residual of a regression analysis in which the initial levels of an indicator of a contextual variable are used to predict levels at a later point in time (Bohrnstedt 1969). The equation is then used to predict the level for each neighbourhood at time t. This score is subtracted from the observed level at time t resulting in the residual change score. These change scores reflect the population change that a neighbourhood experiences above and beyond the regional-wide pattern of neighbourhood change[7]. This procedure was used to compute residual change scores for each of the indicators of conditions in neighbourhoods during the 5-year period between 1994 and 1998.

Dynamic economic neighbourhood resources were operationalised with residual change scores across the three indicators of the index for disadvantaged economic neighbourhood conditions during the period 1994-1998. A summary index of economic neighbourhood change was computed based on residual change scores of the proportion of people reporting an income at the level of the Dutch social minimum or below, proportion of people aged 16-65 who were unemployed, and average household income per income recipient. Subsequently, these scores were weighted with factor loadings (scores range from –3.68 to +2.35). Higher scores on this index imply an increase in disadvantaged economic neighbourhood conditions, i.e., a decline of the neighbourhood, lower values point towards a decrease in disadvantaged economic neighbourhood conditions, i.e., neighbourhood improvement. These scores were recoded into categories in order to interpret whether a neighbourhood had experienced an improvement, a decline, or stable disadvantaged economic neighbourhood conditions. If the values were at least one standard deviation higher than the mean, neighbourhoods were coded into score 1 (increase), neighbourhoods with scores at least one standard deviation below the mean were coded as 2 (decrease), and scores that range in between a standard deviation from the mean level were coded as stable 0 (stable). Consequently, three categories of this indicator of dynamic economic neighbourhood characteristics could be distinguished: 'stable disadvantaged economic neighbourhood conditions', 'disadvantaged economic neighbourhood conditions increased, i.e., neighbourhood decline', and 'disadvantaged socio-economic neighbourhood conditions decreased, i.e., neighbourhood improvement'.

Dynamic social neighbourhood resources were measured using residual change scores of the proportion of single-person households in a neighbourhood during the period 1994-1998. Residual change scores ranged from -3.25 to +2.79: a higher score implies an increase in disadvantaged social neighbourhood conditions, i.e., a decline of the neighbourhood. The same categorisations of these scores were made as applies for dynamic economic contextual characteristics. Three categories were distinguished based on scores that differed one standard deviation below or above the mean: 'stable disadvantaged social neighbourhood conditions', 'disadvantaged social neighbourhood conditions increased, i.e., a decline of the neighbourhood' and 'disadvantaged social neighbourhood conditions decreased, i.e., an improvement of the neighbourhood'.

Residential mobility as another indicator of dynamic social resources in the neighbourhood was measured with data of people who had lived in the same house for the previous five years (Wegener 2001). This indicator of residential mobility based on six-digit postal codes, was aggregated to a measurement based on four-digit postal codes. This variable was recoded into dichotomous categories: 'neighbourhood experienced residential stability' and 'neighbourhood experienced residential mobility in the past five years'.

Unfortunately, for 1994 no data on religious affiliation of neighbourhoods were available. Even other types of data that could indicate cultural resources of the neighbourhood in a former period were, as far as we know, unavailable. Consequently, we were not able to empirically test the hypothesis on dynamic changes in cultural resources of a neighbourhood and depressive symptoms.

Descriptives and correlations of these static and dynamic neighbourhood characteristics are displayed in Appendix D, Table D.2 and Table D.4.

5.3.5 Subjective perceptions of distress

Four items were used to measure respondent's subjectively perceived economic distress, and two items as a measure of subjectively perceived neighbourhood disadvantage. Formulations and frequencies of these items are presented in Appendix D. The specific content of these items reflects respondent's perceived situation of the neighbourhood in general, and the respondent's current socio-economic situation. Principal factor analysis on these six items showed a clear two-dimensional structure: one dimension refers to subjective perception of neighbourhood disadvantage (Jacobs & Willits 1994; Mirowsky & Ross 1999), and another dimension refers to perceived distress of the individual socio-economic situation. Additional reliability analysis revealed that Cronbach's alphas were satisfactory, with standardized alphas of 0.68 and 0.81, respectively (Cronbach 1951).

Furthermore, six items measured the perception of social isolation. These items are extracted from a subscale of the loneliness and social isolation scale (Gierveld & Kamphuis 1985). Formulations and frequencies of these items are presented in Appendix D. These items present the subjective perception, experience and evaluation of respondent's level of social isolation and severe loneliness. These items proved to be a valid and reliable measurement of subjectively perceived social isolation as shown in several studies (Van Tilburg & de Leeuw 1991). Based on the large-scale data of the present study, reliability analysis showed a consistent scale, and the reliability test was satisfactory (Cronbach's alpha: 0.84)

5.3.6 Methods

We used multilevel analysis to estimate the effects individual and neighbourhood characteristics on depressive symptoms. Multilevel modelling allows simultaneous estimation of individual-level and neighbourhood-level effects (Bryk & Raudenbusch 1992; Snijders & Bosker 1999). These analyses allowed us to identify which part of the variance in the dependent variable is explained with neighbourhood level effects and which part of the variance individual level effects explain. As the structure of the data is such that individuals are nested within neighbourhoods (individuals are level 1 units and neighbourhoods are level 2 units in the analysis), neglecting the error terms at level 2 would underestimate standard errors of the regression coefficients. This in turn could lead to incorrect confirmation of hypotheses. Correct standard errors will be estimated only if variation at the neighbourhood level (as well as variation at the individual level) is allowed in the analysis. Multilevel modelling provides an efficient way of doing this (Snijders & Bosker 1999). To estimate multilevel models we used the software program MlwiN version 1.1 (Goldstein 1995).

We estimated a set of successive models to determine the fit of different models to explain suffering from depressive symptoms. The results of the modelling procedure are displayed in Table 5.1. We started by estimating a null model. In this model, no predictors are taken into account. It is therefore referred to as the null model, empty model or baseline model. The model produces estimates for the intercept, the mean score of our dependent variable and allows for variation at the individual level only. The -2*log likelihood statistic of this empty model is 16291.500 for the depressive symptoms scale (GHQ-28_dep).

Table 5.1 The estimation of different multilevel models to explain static and dynamic individual and contextual effects on depressive symptoms (GHQ-28_dep depressive symptomatology)

	Depressive symptoms		
Model	**-2* log likelihood**	**Δ -2* log likelihood**	**Δ df**
Model 0 intercept	16219.500	-	-
Model 1 + random variation at neighbourhood level	16214.920	4.58	1
Model 2 + static individual characteristics	16043.170	171.22	18
Model 3 + dynamic individual characteristics	16022.720	20.45	7
Model 4 + static neighbourhood characteristics	16009.530	13.19	3
Model 5 + dynamic neighbourhood characteristics	15998.880	10.65	5
Model 6 + subjective perceptions	15674.670	324.21	3

(Data: NHA-2 study; N=1,645, author's calculations)

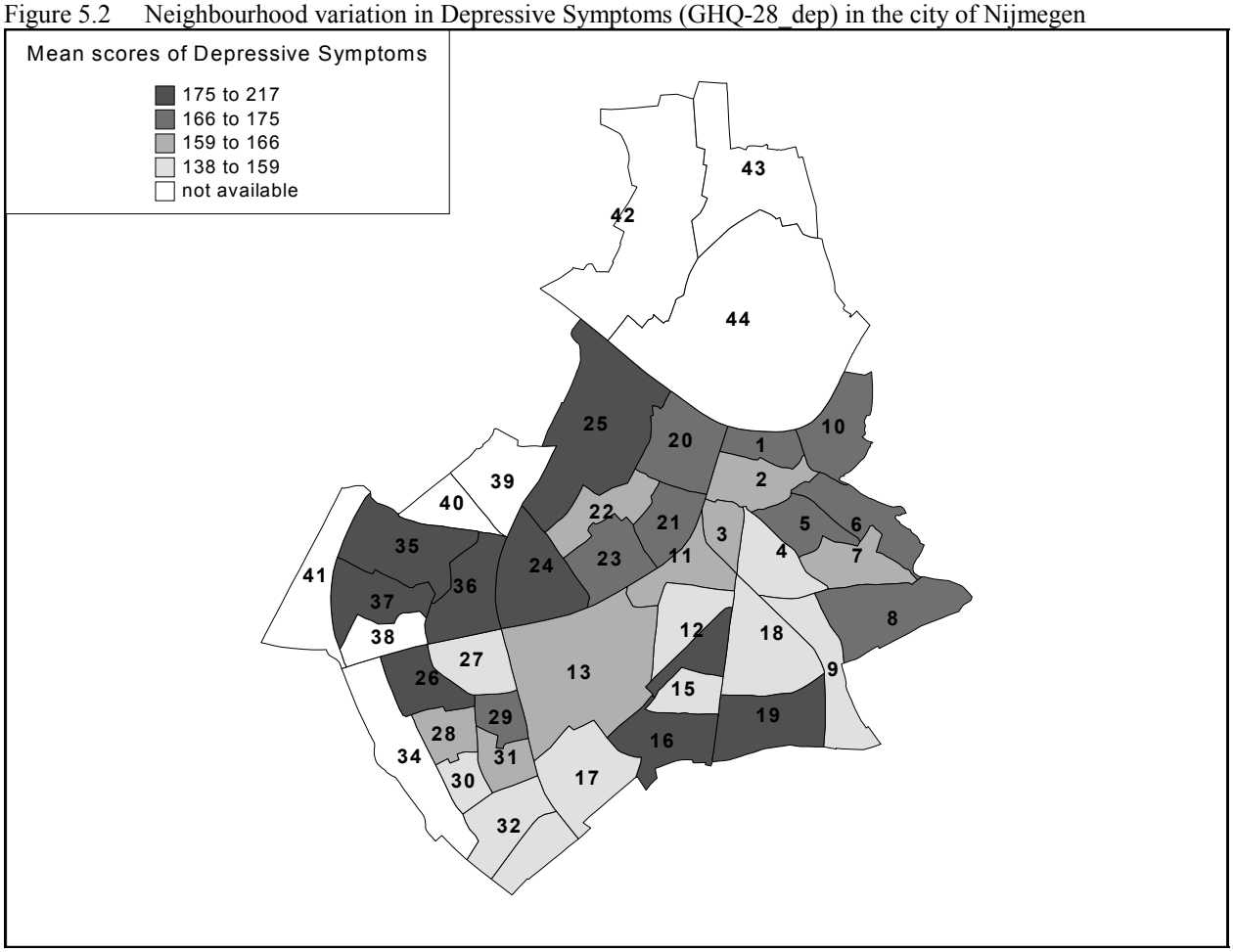
Next, we allowed the intercept to vary between neighbourhoods (Model 1). The -2* log likelihood statistic indicates the goodness of fit of this model. This statistic indicates lack of fit, since the lower the log likelihood, the better the fit. In fact, to determine whether there is an improvement in model fit, we have to compare it with the previous model, as indicated by the difference in -2* log likelihood that follows a Chi-square distribution with degrees of freedoms equal to the number of parameters to be estimated. With respect to the first model of Table 5.1, we see that allowing the intercept to vary leads to an improvement in the model fit for the dependent variable. Compared to the null model, the decrease in the -2* log likelihood for the depressive symptomatology scale is 4.58. This is a significant improvement of the model fit, indicating that there are significant differences between neighbourhoods in the mean score on depressive symptoms. This is also illustrated in Figure 5.2. This figure shows the mean scores of depressive symptoms of the neighbourhoods of the city of Nijmegen, one of the communities of the Nijmegen Health Area.

Since we are interested in the effects of static individual characteristics on depressive symptoms, we added these characteristics in the next model. Introducing these variables is expected to reduce the variance at the individual level. We see that this change leads to a large improvement in the model fit. This is indicated by a decrease in the log likelihood statistic of 171.22 with 18 degrees of freedom. This implies that static individual characteristics are important determinants of depressive symptoms.

Next, in Model 3 we added the dynamic individual characteristics. We see a decrease of 20.45 in the log likelihood statistic with 7 degrees of freedom. We can state that inclusion of indicators of dynamic individual characteristics leads to a significant improvement in the model fit. Moreover, we hypothesised that suffering from depressive symptoms is induced by certain static and dynamic neighbourhood characteristics. Therefore, we first added static contextual characteristics in Model 4. This again improved the model's goodness of fit significantly (a change of 13.19 in the -2* log likelihood statistic), implying that at least some of these static neighbourhood characteristics had significant effects on depressive symptoms. In the Model 5, we added dynamic neighbourhood characteristics. As displayed in Table 5.1, inclusion of these dynamic neighbourhood characteristics leads to a slight but significant improvement of model fit (deviance 10.65; df=5).

In a final step, more individual-level characteristics were added. These are individual-level subjective perceptions with which we try to explain why certain social categories suffer more from depressive symptoms. In a final model (Model 6), we added the perceptions of economic distress and social isolation as well as neighbourhood disadvantage. These final additions of variables to our model improved the model's goodness of fit significantly (a change of 324.21 in the -2* log likelihood statistic).

Figure 5.2 Neighbourhood variation in Depressive Symptoms (GHQ-28_dep) in the city of Nijmegen



(Data: CBS Buurt- & Wijkkaart 1997 (Statistics Netherlands 1997b) and data of NHA-2 study)

Neighbourhoods derived from Dutch Office of Statistics (CBS) (Statistics Netherlands 1997)

1	Benedenstad	13	Goffert	25	Haventerrein	37	't Broek
2	Centrum	14	St. Anna	26	Tolhuis	38	’t Bos n.a.
3	Bottendaal	15	Hatertse Hei	27	Zwanenveld	39	Westkanaaldijk n.a.
4	Galgenveld	16	Grootstal	28	Meijhorst	40	Neerbosch-West n.a.
5	Altrade	17	Hatert	29	Lankforst	41	Bijsterhuizen n.a.
6	Hunnerberg	18	Heyendaal	30	Aldenhof	42	Nijmegen-Oosterhout n.a.
7	Hengstdal	19	Brakkenstein	31	Malvert	43	Ressen n.a.
8	Kwakkenberg	20	Biezen	32	Weezenhof	44	Lent n.a.
9	Groenewoud	21	Wolfskuil	33	Vogelzang		
10	Ooijse Schependom	22	Hees	34	Staddijk n.a.		
11	Nije Veld	23	Heseveld	35	't Acker		
12	Hazenkamp	24	Neerbosch	36	De Kamp		

5.4 Results of multi-level analyses

The results of the multilevel modelling procedure to explain suffering from depressive symptoms are presented in Table 5.2. This table contains unstandardised parameter estimates. Since most of the independent variables specified in our hypotheses were nominal variables, we used the procedure proposed by Hardy (1993), using categorical variables as dummy variables. Multilevel modelling is, to some extent, comparable with conventional multiple regression analysis. Additionally, the estimated parameters are unstandardised regression coefficients and can be compared to the reference category in order to interpret whether a specific category suffers more or less from depressive symptoms[8]. At the bottom of the table, we present variance components both at the individual and at the neighbourhood level. Reduction of variances between different models is related to the explanatory power of the models we estimated. We also calculated the amounts of explained variance (cf. Snijders & Bosker 1999).

First, turning to the results of Model 2 in Table 5.2 that shows the effects of various indicators of static individual characteristics, we can state that the estimates reported here are similar to the results presented in Table 4.3 of Chapter 4. Significant estimates were found for educational attainment, income, people who are dependent on social security or a disability benefit, people leading single-parent families, people living with a partner and without children, people who frequently attend church, women, and people born between 1941 and 1955; these social categories suffer more from depressive symptoms compared to their respective reference categories. As we compare the variance components of Model 1 and Model 2, it appears that the inclusion of indicators of static individual characteristics leads to a reduction of the initial variance at the individual level from 1047.92 to 958.37, i.e., 8,5 percent explained variance. Moreover, effects of static individual characteristics also explain some of the variance at the neighbourhood level, since the variance at neighbourhood level decreases from 15.53 to 9.06, i.e., about 41,7 percent explained variance. This indicates that differences in the neighbourhood's composition are relevant to the explanation of the mean level of depressive symptoms across neighbourhoods (Snijders & Bosker 1999, p. 218).

In Model 3 of Table 5.2, we add indicators of people's decreasing levels of economic, social, and cultural resources. The results reported here are similar to those of Chapter 4 and show positive and significant parameters of the sub-categories of a recent change in socio-economic position, as well as a recent and less recent change in social position. As we compare the variance components of Model 1 and Model 3, we see that the inclusion of dynamic individual characteristics leads to a reduction of the initial variance at the individual level from 1047.92 to 950.49 i.e., 9,3 percent explained variance. The variance at the neighbourhood level does not change compared with Model 1.

Furthermore, in Model 4 we take into account that all these people live in quite different social contexts, i.e., neighbourhoods, different with respect to static neighbourhood characteristics. We find a rather strong significant effect of the current levels of economic resources of the neighbourhood: the more disadvantageous the economic neighbourhood conditions are, the more people suffer from depressive symptoms. This indicates that the economic context is rather important in understanding differentiation in depressive symptoms. Inclusion of contextual characteristics in the model hardly changed the effects of individual characteristics, except for the effect of a recent change in individual economic position, which turns non-significant in Model 4.

Table 5.2 Parameter estimates from multilevel models on depressive symptoms (GHQ-28_dep) in 54 neighbourhoods (standard errors between brackets)

Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Intercept	*164.07 (1.86)*	*157.95 (3.28)*	*159.35 (2.03)*	*154.01 (4.83)*	*152.19 (5.15)*	*108.72 (6.24)*
Static individual characteristics						
Educational attainment		**-1.57 (0.39)****	**-1.62 (0.39)**	**-1.61 (0.40)****	**-1.58 (0.41)****	**-1.32 (0.37)****
Income		**-2.16 (0.53)****	**-2.04 (0.53)**	**-2.05 (0.53)****	**-1.95 (0.53)****	**-1.18 (0.49)****
Socio-economic position *(Employed =ref.)*						
- Dependent on social welfare		**19.35 (3.40)****	**17.82 (3.41)****	**17.86 (3.44)****	**18.03 (3.43)****	**6.31 (3.18)****
- Student		-1.13 (3.39)	-1.92 (3.36)	-1.77 (3.38)	-1.88 (3.38)	-1.24 (3.06)
- Pensioned		2.72 (3.63)	2.21 (3.59)	2.74 (3.63)	2.66 (3.63)	0.16 (3.29)
- Housekeepers		2.85 (2.69)	2.77 (2.66)	2.88 (2.68)	2.74 (2.67)	0.43 (2.44)
Household composition *(Living together with a partner and with children=ref.)*						
- Leading a single-parent family		**10.29 (4.78)****	**8.27 (4.76)~**	**7.31 (4.78)~**	**7.28 (4.79)~**	1.20 (4.35)
- Living together with partner without children		**4.02 (2.00)***	**3.83 (1.98)***	**3.69 (2.00)~**	**3.86 (2.01)~**	**3.68 (1.82)***
- Living alone (never relationship)		*4.15 (2.93)~*	3.21 (2.91)	2.76 (2.93)	3.40 (2.94)	2.21 (2.69)
- Living alone divorced		0.47 (4.68)	-0.99 (4.69)	-1.32 (4.67)	-0.93 (4.72)	**-9.89 (4.32)***
- Living alone widowed		-0.58 (4.98)	-0.84 (4.84)	-1.57 (4.48)	-1.73 (4.86)	-5.88 (4.42)
Church attendance		**-2.76 (1.05)****	**-2.53 (1.04)****	**-2.62 (1.26)***	**-2.46 (1.04)***	-1.09 (1.15)
Church membership (*Member=ref.)*						
- Not a member		-0.35 (1.97)	-0.04 (2.54)	-0.56 (2.79)	-0.68 (2.56)	-0.56 (2.36)
Gender *(Men=ref.)*						
- Women		**4.72 (1.72)****	**4.36 (1.71)****	**4.14 (1.72)***	**4.33 (1.72)***	2.30 (1.57)
Birth cohort						
- 1923-1929 *(1930-1940= ref.)*		3.26 (3.70)	4.14 (3.68)	4.16 (3.71)	4.22 (3.70)	4.46 (3.38)
- 1941-1955		**6.32 (2.93)***	**5.24 (2.92)***	**5.27 (2.93)***	**5.42 (2.93)***	4.55 (2.66)
- 1956-1966		0.62 (3.26)	0.88 (3.19)	0.73 (3.24)	1.13 (3.21)	0.67 (2.93)
- 1967-1980		**-6.56 (3.52)~**	-5.66 (3.65)	-5.79 (3.75)	-5.27 (3.67)	-3.07 (3.34)

Table 5.2 continued

Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dynamic individual characteristics						
Economic position *(No change=ref.)*						
-Recent change			**4.22 (2.36)~**	3.79 (2.88)	3.48 (2.88)	1.75 (2.62)
-Less recent change			-0.76 (2.13)	-.085 (2.92)	-1.06 (2.14)	**-3.81 (1.94)***
Social position *(No change=ref.)*						
-Recent change			**8.21 (2.58)****	**8.08 (2.58)****	**8.30 (2.58)****	**4.64 (2.35)***
-Less recent change			**3.26 (1.79)~**	**3.42 (1.79)~**	**3.42 (1.87)~**	1.95 (1.62)
Cultural Position *(No change=ref.)*						
-Recent apostates			-3.89 (2.92)	-3.88 (2.92)	-3.98 (2.72)	-2.29 (2.65)
-Less recent apostates			2.77 (3.20)	2.63 (3.19)	2.70 (3.06)	2.61 (2.91)
Change in church attendance			0.33 (0.88)	0.06 (0.86)	0.28 (0.86)	-0.02 (0.79)
Static neighbourhood characteristics						
Disadvantaged economic conditions				**4.45 (1.39)****	**4.08 (1.36)****	**3.62 (1.34)****
Disadvantaged social conditions				3.17 (2.37)	2.78 (2.37)	0.01 (2.31)
Disadvantaged cultural conditions				0.70 (0.67)	0.66 (0.67)	0.65 (0.66)
Dynamic neighbourhood characteristics						
Disadvantaged economic conditions *(Stable=ref.)*						
- Increased					-2.59 (2.38)	-2.68 (2.27)
- Decreased					**-10.43 (3.38)****	**-7.69 (3.19)***
Disadvantaged social conditions *(Stable=ref.)*						
- Increased					2.18 (2.14)	**4.66(2.11)***
- Decreased					0.38 (2.49)	1.18 (2.44)
Residential mobility *(Stable=ref.)*						
- Increase/decrease					5.08 (9.96)	6.35 (9.53)
Subjective Perceptions						
Economic distress						**2.21 (0.39)****
Social isolation						**5.10 (0.32)****
Neighbourhood disadvantage						-0.65 (1.13)
Variance components						
Individual (% explained compared to Model 1)	1047.92	958.37 (8,5%)	950.49 (9,30 %)	950.20 (9,3%)	948.39 (9,5%)	778.19 (25,7%)
Neighbourhood (% explained compared to Model 1)	15.53	9.06 (41,7%)	9.03 (41,7%)	2.25 (85,5%)	0.72 (95,5%)	3.33 (78,5%)

(Data: NHA-2 study, N=1,654; author's calculations)

The effects of disadvantaged social and cultural contextual conditions show no significant parameters. By including static neighbourhood characteristics, the variance at the neighbourhood level changed from initial 15.53 to 2.25. This indicates that almost 85,5 percent of the initial variance at neighbourhood level is explained.

In Model 5, dynamic neighbourhood characteristics are included. The results show that a decrease in disadvantaged economic conditions in a neighbourhood, i.e., an improvement of the neighbourhood, has a negative and significant effect. People living in economically disadvantaged neighbourhoods and who experienced an improvement in their economic neighbourhood conditions suffer less from depressive symptoms, compared with people living in neighbourhoods with stable economic conditions compared to five years ago. With respect to a change in the proportion of single-person households, and residential mobility, which indicate dynamic changes in the social conditions of the neighbourhood, these variables show positive, though non-significant, estimates. Including these dynamic neighbourhood characteristics leads to a change in variance at the neighbourhood level from initial 15.53 to 0.72. This indicates that 95,5 percent of the initial variance at neighbourhood level is explained.

Finally, in Model 6 subjective perceptions of economic distress, social isolation and neighbourhood disadvantage are added to the model as presented in Model 5. Since these subjective perceptions were expected to explain the effects of static and dynamic individual and neighbourhood characteristics, the initial parameters in the previous models (Model 5) are expected to decrease when including subjective perceptions of distress. That might lead to the conclusion that the differences in suffering from depressive symptoms are partly or completely explained by effects of subjective perceptions, which is in line with conventional path analysis (cf. Bryk & Raudenbusch 1992). The results of Model 6 show that perceived economic distress and social isolation have significant and positive effects. The more people perceive economic distress and social isolation, the more people suffer from depressive symptoms. The effect of perceived neighbourhood disadvantage is negative and non-significant. Moreover, it appears that some effects of individual static and dynamic characteristics decreased and turned insignificant. In Model 6, we find that the subjective perception of economic distress and social isolation can explain why people who lead single-parent families suffer more from depressive symptoms, as the parameter of single-parent families decreases from 10.291 to 1.202 and turned non-significant. In addition, the effect of church attendance decreases substantially and was no longer significant in Model 6. Next, the effect of a less recent change in social position no longer reaches significance in Model 6. Moreover, these findings show that women, and people born between 1941 and 1955 suffer more from depressive symptoms compared with men and people born between 1930 and 1940 respectively, due to subjective perceptions of economic distress and social isolation. The estimated parameter of the category of people who are dependent on social security decreases tremendously (from 18.307 to 6.313). Moreover, a contradictory effect appeared with respect to the sub-category of household composition. Compared to Model 5, the negative parameter of people living alone divorced, strongly increased, became positive, and turned significant in Model 6, implying that these people suffer less from depressive symptoms compared to people living together with a partner and children, after controlling for subjective perceptions of social isolation and economic distress.

Furthermore, it appears that some of the effects of dynamic individual characteristics declined and turned non-significant. Thus, the original relationship between decreasing levels of resources and depressive symptoms is largely explained by perceived distress: individuals who

experienced a recent decrease in their social and economic position suffer more from depressive symptoms, due to stronger perception of social isolation and economic distress. The negative effect of a less recent change in economic position becomes significant when controlling for subjective perceptions.

With regard to static and dynamic neighbourhood characteristics, the effects of most neighbourhood characteristics are smaller than in the previous model, but they remained significant. By contrast, the effect of an increase in social neighbourhood conditions is stronger and its effect turns significant compared to the previous model. People living in a neighbourhood with an increase in proportion of single-person households, and where a decline in the social conditions of the neighbourhood is observed, suffer more from depressive symptoms compared to living in a neighbourhood with a stable level of percentage of single-person households. This is due to perception of social isolation and economic distress. Apparently, in neighbourhoods with a higher proportion of single-person households, the average score on depressive symptoms was higher than one would expect, given the average score on perceived social isolation and economic distress. In other words, the effect of dynamic levels of contextual social resources on depressive symptoms was partly modified by the level of subjective perceived distress.

To summarise then, subjectively perceived economic distress and social isolation are both strong determinants of suffering from depressive symptoms. Our final model explains variance at both the individual and at the neighbourhood level. Of the inter-individuals variance (265.24/1047.92*100=) about 25,3 percent is explained. Consequently, the explained variance at the individual level, compared to Model 5, increased from 9,49 percent to 25,73 percent, due to the subjective perception variables. At the neighbourhood level, the variance eventually fell from an initial 15.53 to 3.33. However, the explained variance at the neighbourhood level did not increase, and even decreased slightly in Model 6, compared to the previous model, from 95,5 percent (Model 5) to 78,5 percent (Model 6)[9].

An alternative interpretation of the effects of subjective perceptions of distress would be that perceptions of economic distress, social isolation, and neighbourhood disadvantage would reflect underlying mental states. Thus, people who suffer more from depressive symptoms would be more susceptible to perceived economic distress and social isolation. In this case, these effects should be identified as selection effects. We examined this assumption and from several analyses (not shown here), the following appeared. First, we performed factor analyses with oblique rotation, which shows that the dependent variable of depressive symptoms and the subjective perceptions of distress can be considered as theoretically and empirically distinct aspects. The factor solution shows a clear four-dimensional structure of the items of depressive symptoms, economic distress, social isolation and neighbourhood disadvantage. These four dimensions represent the distinct underlying concepts (Eigenvalues 3.64, 2.09, 1.77, 1.08; factor correlations < 0.32). These results suggest that subjective perceptions of distress represent no underlying mental states of people who suffer more from depressive symptoms. Second, we performed multivariate analyses on the variables of subjective perceptions of distress. These findings (not shown here) indicate no convincing empirical evidence that suffering from depressive symptoms is a significant predictor of subjective perceptions of economic distress, social isolation and neighbourhood disadvantage, when several individual and contextual characteristics are controlled for. Neither of the two types of analyses supports the assumption of selection effects of depressive symptoms on subjective perceptions of distress. This is in line with previous research which supports the social causation hypothesis: subjective perceptions might lead to poorer

mental health, rather than a reverse relationship (Sooman & Macintyre 1995; Frohlich et al. 2003).

5.5 Conclusions and discussion

Based on the findings reported in this chapter we can summarise that people with *lower levels of economic resources* (lower income, lower educational attainment, dependent on social security) suffer more from depressive symptoms than people with higher levels of economic resources (Hypothesis 1 is supported*).* We also found that *people's lower levels of social resources* determine suffering from depressive symptoms. The results showed that people leading a single-parent family and people living together with a partner and without children suffer more from depressive symptoms than people who live with a partner and children (Hypothesis 2 is supported). Next, we found that *people's lower levels of cultural resources* induces suffering from depressive symptoms: people who attend church to a lesser extent suffer more from depressive symptoms than people who attend church more often (Hypothesis 3a is supported). Church membership showed no significant effect (Hypothesis 3b is not supported). With respect to *decreasing levels of people's resources,* we can conclude that a recent change in one's economic and social position induces depressive symptoms (Hypotheses 4 & 5 are supported). With respect to dynamic change in people's levels of cultural resources, we found no significant effects (Hypotheses 6a and 6b are not supported).

One of the main concerns of this chapter was the elaboration of *a contextual perspective on depressive symptoms.* With respect to current levels of neighbourhood 's resources, i.e., static neighbourhood characteristics, we can conclude that the more disadvantaged the economic neighbourhood conditions are, the higher the level of depressive symptoms (Hypothesis 7 is supported). This is in line with previous research on the impact of socio-economic contexts on mental and physical health outcomes (Pickett & Pearl 2001). However, our results revealed no significant effects of levels of social and cultural resources in the neighbourhood on depressive symptoms at the individual level (Hypotheses 8 and 9 are not supported).

With respect to decreasing levels of resources in the neighbourhood, i.e., dynamic neighbourhood characteristics, our findings show that living in a neighbourhood with improved economic conditions decreases the suffering from depressive symptoms, compared to living in a rather stable neighbourhood with respect to disadvantageous socio-economic conditions (Hypothesis 10 is partially confirmed). Moreover, it appeared that an increase in disadvantaged social conditions, i.e., an increase in the proportion single-person households in a neighbourhood, has an influence on depressive symptoms (Hypothesis 11b is supported). In this study, no significant effect of residential mobility on depressive symptoms was found (Hypothesis 11a is not supported). We have to emphasise that the difference in the amount of explained variance at the individual and the neighbourhood level was substantial. Some of the apparent effects of the neighbourhood context on depressive symptoms are due to the composition of individual socio-demographic characteristics of residents, however significant effects of economic, and social contextual conditions remained. Thus, neighbourhood differences in depressive symptoms are not simply a result of neighbourhood variation in socio-demographic characteristics.

Another focus of attention in this chapter has been the elaboration on *an explanatory perspective on depressive symptoms*. The results of the analyses presented in this chapter show that subjective perceptions of economic distress and social isolation were powerful determinants of depressive symptoms. These subjective perceptions explain to some extent the association between

indicators of levels of economic, social and cultural resources and depressive symptoms. We find that people with lower income, people dependent on social security, people leading single-parent families, people who attend church less often, and women, suffer more from depressive symptoms due to stronger subjective perception of economic distress and social isolation (Hypothesis 13 is confirmed). These findings are in line with previous research, which tried to disentangle mechanisms through which individual positions and environmental conditions might induce suffering from depressive symptoms (Aneshensel & Succoff 1996; Ellaway & Macintyre 2001; Frohlich et al. 2003; Mirowsky & Ross 1999; Ross 2000; Silver et al. 2002; Sooman & Macintyre 1995).

This study contributes to research on subjective perceptions of the social context, i.e., neighbourhood. We aimed to investigate whether people's perceptions of neighbourhood disadvantage affect suffering from depressive symptoms. Although this hypothesis was not supported (Hypothesis 14), the measurement of neighbourhood disadvantage was rather crude in the data used here. As we were limited to information available in these secondary data, i.e., data collected not specifically for this research purpose, we were compelled to use this indicator of neighbourhood disadvantage, which actually refers to economic aspects of subjectively perceived neighbourhood disadvantage. In fact, perceived neighbourhood disadvantage may also incorporate concepts of social disorder like social isolation, lack of social control, lack of social institutions, lack of confidence in neighbours, neighbourhood problems, and fear of crime (Jacobs & Willits 1994; Mirowsky & Ross 1999). Moreover, there has recently also been a growing recognition that objective physical characteristics of a neighbourhood, such as type of housing, type of amenities, presence of graffiti, garbage and abandoned or vacant buildings can be associated with subjective perceptions of neighbourhood disadvantage (Macintyre et al. 2002; Silver et al. 2002; Sooman & Macintyre 1995). Loss of confidence in the neighbourhood, fear of crime, perception of a decline in informal social controls, may lead to a higher risk of mental disorders (McKenzie et al. 2002; Perkins Meeks & Taylor 1992). However, further research should be encouraged by our findings to disentangle the mechanisms through which individual and contextual circumstances induce mental disorders. Moreover, a clear theoretical elaboration of the specific mechanisms and aspects of perceptions of distress is beneficial for further understanding of the impact of subjective perceptions of the social context on suffering from depressive symptoms. Therefore, we recommend further neighbourhood research on mental disorders and, consequently, more elaboration on indicators of subjective perceived neighbourhood disadvantage as well as the use of improved measurements to research neighbourhood perceptions and depressive symptoms in the Netherlands (Cohen et al. 1982; Caughy et al. 2001; Mirowsky & Ross 1999; Sooman & Macintyre 1995, Taylor 1996).

In conclusion, as an answer to the two research questions in this chapter, we can state that lower levels of economic resources of the neighbourhood and increasing levels of these economic neighbourhood resources have an impact on the extent of suffering from depressive symptoms of all residents, irrespective of people's levels of resources. Furthermore, subjective perceptions of economic distress and social isolation appeared to explain some associations between lower and decreasing levels of people's resources and depressive symptoms.

Notes Chapter 5

[1] In this chapter the concept of neighbourhood is used as an indicator of the social context people live in, as neighbourhoods were considered as rather socio-culturally homogenous areas reflecting 'real' communities (Reijneveld et al. 2000; Ross 2000; Sooman & Macintryre 1995).

[2] A different interpretation of residential stability has emerged among those who consider neighbourhood stability as negative when it means being trapped in a disadvantaged neighbourhood (Ross 2000). This means that stability is especially damaging for residents of socio-economic disadvantaged neighbourhoods. However, in this chapter, we keep the concept of residential mobility distinct from other meanings of neighbourhood stability. Residential mobility refers only to the in- and outflow of people, regardless of their socio-economic characteristics.

[3] In fact, neighbourhoods can be distinguished from postal code sectors due to a more similar type of building, often delineated by natural boundaries, and being more socially and culturally homogenous. Unfortunately, in contrast to communities based on postal codes, the mean number of individuals in a neighbourhood varies a great deal. In addition, postal code sectors are somewhat larger units but the next best approximation to neighbourhoods. Moreover, to achieve an adequate sub sample size, i.e., enough people within a neighbourhood, we used postal code sectors instead of neighbourhoods in the research models of this study. Otherwise, the combination of a relatively small sample size of the first level (individuals) and a relatively large sample size of the second level would lead to increased measurement errors and biased estimates, due to a non- sufficient sample size and consequently rather low statistical power (cf. Maas & Hox 2001; Snijders & Bosker 1993).

[4] As was expected, it appeared that the mean level of depressive symptoms based on the GHQ-28 dep scale of depressive symptomatology varies between neighbourhoods. ANOVA-analyses showed significant F-statistics in mean depressive symptoms scores across neighbourhoods (GHQ-28_dep F= 1.441* ($p < 0.05$), Eta 0.21). However, the mean level of depressive symptoms based on a modified version of the CES-D scale, showed no sufficient variance across neighbourhoods (CES-D F= 1.073 ($p=0.34$), Eta 0.04). Consequently, the second dimensional measurement of depressive symptoms based on the CES-D scale (CES-D_dep) as presented in this study, was not included in the empirical analyses of this chapter.

[5] Due to the number of individual cases, as well as the number of neighbourhoods, we are not able to test separate models on gender in multi-level analyses. Such a non-sufficient sample size and rather low statistical power would lead to increased measurement errors and biased estimates (cf. Maas & Hox 2001; Snijders & Bosker 1993). Moreover, a multifactorial approach as applied in this study would require inclusion of interactions of gender with all static, dynamic individual and neighbourhood characteristics in the research models. However, the inclusion of such a number of interaction terms in the analyses would - due to the complexity of the models, as well as the risk of multi-collinearity - make the interpretation of the results impossible and, consequently, would make it impossible to empirically test appropriate gender effects on depressive symptoms.

[6] In contrast to the previous chapter, we did not use information of respondent's occupational class and inter-generational economic mobility as indicators of people's static and dynamic economic positions. Because it appeared that both variables had no significant effects on the dependent variable (see Chapter 4), consequently we left them out in the empirical analyses of the present chapter.

[7] This procedure to determine neighbourhood dynamics has its advantages because residual change scores are independent of a neighbourhood's initial level compared to relative change scores and raw differences (Borhnstedt 1969). Therefore, they represent the change in neighbourhood conditions that is not expected because of the initial level alone. This is an important advantage in ecological research since it statistically controls for the increase or decrease in level of contextual resources that can be attributed to an ongoing pattern in the community, or what Shaw & Mckay (1942) referred to as the "character of the community". Another advantage of residual change scores compared to other types of change scores is that these measurements prevent identification problems in regression models. Because one cannot include both neighbourhood characteristics at time t0, neighbourhood characteristics at time t1, as well as a characteristic that indicates the amount of change between the two of them. Thus change scores that are independent of the specific neighbourhood's status position of origin (in this case 1994) are the most likely ones to yield regression estimates that reflect the independent effect of neighbourhood change on depressive symptoms (and not the effect of position of origin).

[8] As already was described, we use a standardised log transformation of the scale scores of the dependent variable. Consequently, it is necessary to use the inverse of the logarithmic function in order to interpret the exact change in scores of an independent (dummy) variable on the scale of the dependent variable.

[9] Previous research using multilevel modelling suggests that cross-level interactions may operate. However, in this study no individual-level or cross-level interaction hypotheses were formulated or empirically tested. On theoretical grounds, we have no expectations for assuming which specific individual and neighbourhood characteristics would interact and which interactions would presumably induce suffering from depressive symptoms. In addition, there is evidence that the number of people with lower levels of resources living in neighbourhoods with higher levels of resources are marginal compared to the substantial number of people with lower levels of resources living in a neighbourhood with lower levels of resources (Knol 1998; van Eijk 1998). Moreover, the empirical argument would be that a multifactorial social approach on depressive symptoms as applied in this study, requires a simultaneous estimation of all possible cross-level interaction effects. However, including such a number of interactions in the research models as presented here would not allow a reliable interpretation of the parameters.

6 Conclusions & discussion

6.1 Recapitulation of the research problem

In this study we examined the relationships between people's levels of resources and depressive symptoms in the general population using a multifactorial social approach. Previous studies encouraged a scientific challenge to further extend on a 'social etiology' of depressive symptoms. Epidemiological studies have shown that compared to other aspects of mental disorders, depressive symptoms have a relative high prevalence in the general population. Furthermore, research based on sociological traditions of social stratification and social integration propose the influence of particular positions of people on these prevalence rates, and showed consistent findings on the relationships between people's disadvantaged positions and depressive symptoms in the general population (Aneshensel & Phelan 1999; Brown & Harris 1978; Durkheim 1897/1951; Horwitz & Scheid 1999; Mirowsky & Ross 1989). These separate research traditions have generated a number of insights into the relationships between people's specific positions and depressive symptoms. However, in the course of this study, we discovered lacunas in previous research of explicit and systematic theoretical elaboration on these associations between people's positions and depressive symptoms. In general, no cross-references between these research traditions have been systematically made. Therefore, in this study we aimed to improve upon previous research by producing a synthesis of various theoretical traditions on mental disorders which would allow a more systematic theoretical elaboration of propositions and hypotheses. Consequently, we applied *a multifactorial social approach* on depressive symptoms. In such a approach, we theoretically clarified people's specific positions that might induce depressive symptoms. A multifactorial social approach seemed to be crucial to attain *theoretical progress* in sociological research on depressive symptoms in the general population.

We elaborated on Social Production Function Theory (SPF-theory) (Ormel et al. 1997, 1999), as this theoretical framework makes it possible to systematically derive propositions and hypotheses on the association between people's positions and depressive symptoms. This theoretical framework offers possibilities to systematically elaborate on the association between differences in specific people's positions and psychological well-being (or a lack of it), i.e., suffering from depressive symptoms. As people's positions can be considered as levels of economic, social and cultural resources, subsequently, we elaborate on the association between people's levels of resources and depressive symptoms. We hypothesise on people's specific positions and conditions that may account for differences in suffering from depressive symptoms in the general population. SPF-theory assumes the existence of a hierarchical structure in reaching the ultimate goal of psychological well-being, using different resources to fulfil instrumental goals and universal needs. SPF-theory states that if important goals are not met, due to lower levels of resources, people are not able to adequately fulfil goals such as status

attainment, behavioural confirmation, comfort, and affection and will therefore attain less social well-being, which eventually reduces people's psychological well-being. We considered depressive symptoms to be a lack of psychological well-being, and these theoretical notions about the effects of resources seem to offer a fruitful theoretical approach for explain differences in people's levels of resources and suffering depressive symptoms. We have focused on a broad range of levels of resources, such as economic resources (socio-economic class, income, education), social resources (marital status, household composition, social network), and cultural resources (religious denomination, church membership, church attendance). Accordingly, our first general proposition was: lower levels of economic, social, and cultural resources induce suffering from depressive symptoms. Subsequently, in this study we elaborated on this rather general theoretical proposition, and developed a theoretical and conceptual framework based on previous theoretical approaches and empirical findings, which explicitly accounts for various indicators of levels of resources that induce depressive symptoms.

It appeared that in the Netherlands, the majority of previous studies on depressive symptoms had focused on sampled data of specific sub-populations, such as the elderly, the unemployed, the divorced, women, and adolescents, as well as on data from institutionalised patients and primary care settings. A restriction regarding these studies that did not used society-wide samples from the population, is the limited generalisation of research findings to the general society. These types of data contain limited information on various aspects of people's positions. Moreover, a few Dutch studies that employed representative samples of the general population were rather descriptive, and focused mainly on prevalence rates and co-morbidity numbers, to detect several types of mental disorders, and specific needs for treatment among particular subgroups (Bijl et al. 1998a, 1998b; Hodiamont 1986). This lack of appropriate data of the general population has, until now, hindered a more systematic and simultaneous empirical test of various types of resources to identify what the decisive determinants of depressive symptoms in the general population are. A multifactorial social approach on depressive symptoms requires a simultaneous test of hypotheses based on large-scale data of the general population. In this study, we employed cross-sectional samples of the general population of the Netherlands. In spite of the fact that these large-scale surveys had not been collected exclusively for the research purpose of this study, these secondary data contained many indicators of people' levels of resources thereby allowing us to make an appropriate empirical test of a multifactorial social approach on depressive symptoms, and consequently to attain *theoretical and empirical progress.*

A shortcoming in sociological research on depressive symptoms concerned research on the longitudinal trend in depressive symptoms in the Netherlands. Previous research abroad has suggested that, over the last decades, important temporal changes have occurred in the rates of depressive symptoms. These longitudinal empirical studies showed mixed results on over-time variations, although -more in general-, they suggest a tendency towards an increase in depressive symptoms (Joyce et al. 1990; Lehtinen et al. 1991; Murphy et al. 2000; Paykel 2000; Sacker & Wiggins 2002). In addition, these previous studies assumed that temporal changes in depressive symptoms might be sensitive to developments in society, such as changes in the economic climate, demographic developments as well as processes of secularisation, increased migration, and individualisation.

However, less attention was paid to theoretical considerations and empirical research on the relevance of individual and national social factors to explain variations in depressive symptoms over time. In the Netherlands too, no convincing empirical evidence was presented for

the longitudinal trend of depressive symptoms and the impact of macro contextual circumstances (Van den Berg & van der Wulp 1999; Garssen & Hoeymans 2002). This is why, in this study, we examined *a longitudinal perspective on depressive symptoms*. Based on the theoretical framework of SPF-theory, we theoretically specified a second general proposition: *lower and changing levels of individual and national economic, social and cultural resources induce suffering from depressive symptoms over time.* Based on this proposition, we systematically derived testable hypotheses on people's resources and national resources that might explain over-time variations in depressive symptoms. We tested these hypotheses using longitudinal data based on representative samples of the national adult population of the Netherlands, in which depressive symptoms have been recorded over a period of more than two decades using a similar measurement (survey Cultural Changes 1975-1996; Social and Cultural Planning Office; Becker 1997). Also, we used national-level time-series that indicate macro contextual conditions represented by period and cohort effects (Statistics Netherlands 1994a, 1999). These kinds of data offered a possibility to fill lacunas in theoretical and empirical research on the longitudinal development of depressive symptoms in the general population of the Netherlands.

Another aspect of previous research on mental disorders that deserved extensive elaboration were the mechanisms that relate changes in people's resources with depressive symptoms. A lot of research into life change events has failed to systematically theorise the significance of specific subsets of negative life change events on depressive symptoms (Dohrenwend 1973; Thoits 1983). Recently, however, sociological research has produced some theoretical elaboration on the relevance of particular life change events that lead to lower positions and affect suffering from mental disorders, i.e., depressive symptoms (Pearlin et al. 1991; Pearlin 1989; Thoits 1995). In addition, the distinction between random and systematic social stressors was made that recognises the homogeneity and heterogeneity of particular life change events and their relations with mental disorders. In this study, we theoretically elaborated on specific subsets of life change events that indicate people's changes in levels of resources. Also, we elaborated on the episode of a life change event. It appeared that the episode between the occurrence of a life change event and its consequences is rather important when trying to understand differences in suffering from depressive symptoms (George 1993). Accordingly, in this study we applied *a dynamic perspective on depressive symptoms* and proposed that undesirable negative life change events represent transitions to lower positions, i.e., decreasing levels of resources and have an influence on suffering from depressive symptoms. Based on SPF-theory, our third proposition was that *decreasing levels of economic, social, and cultural resources induce suffering from depressive symptoms, where a recent decrease induces suffering depressive symptoms more severely than a less recent decrease.*

A rather important aspect in sociological research concerns the influence of the social context in which people live. The study of the impact of neighbourhoods, areas, cities or other contextual levels on depressive symptoms has become a major subject of sociological and social-epidemiological research. Therefore, in this study, we elaborated on the social context in relation to suffering from depressive symptoms. This suggests variations in the risk of suffering from depressive symptoms due to living in different social contexts. Disadvantaged conditions of people's environment such as lack of social order, social isolation and poverty may produce depressive symptoms. This type of research can be related to the application of 'places matter' and seemed to be useful advancing the understanding of the extent of depressive symptoms among people living in different types of contextual circumstances. (Curtis & Jones 1998;

Macintyre et al. 1993). However, much of previous research has focused on only a specific characteristic of the social context such as socio-economic conditions, or aspects of social cohesion (Braam 1999b; Ellison et al. 1997; Picket & Pearl 2001; Robert 1999). Because of this limited focus, it is not clear which particular aspects of he social context are decisive determinants for depressive symptoms. Moreover, recent reviews of contextual health research have suggested that there is a lack of explicit theoretical considerations about the mechanisms which link features of the social context with depressive symptoms (Frohlich et al. 2003; Macintyre et al. 1993, 2002; Picket & Pearl 2001).

Examining this *contextual perspective on depressive symptoms* might produce more understanding concerning the specific contextual circumstances of people suffering from depressive symptoms. The social context in which people live can be indicated using various types of social surroundings like the society, a geographic area, the city, the neighbourhood, or even the street. Previous research has shown that people are likely to be affected by their daily experiences and the facing of threatening or disadvantaged neighbourhood conditions that have an influence on their psychological well-being and, consequently, induce depressive symptoms. Therefore, most studies have focused on the neighbourhood as a valid indicator of the social context. Various characteristics of the neighbourhood can contribute to understanding the influence of the social context on depressive symptoms. Accordingly, based on SPF-theory, our fourth general proposition was: *lower levels of economic, social and cultural resources of the neighbourhood induce depressive symptoms.* We also elaborated on a dynamic aspect of contextual resources, which is in line with some previous findings. Our fifth general proposition was: *decreasing levels of economic, social and cultural resources of the neighbourhood induce suffering from depressive symptoms.*

A final aspect on which we focused was the explanatory mechanism behind the association between people's and neighbourhood's levels of resources and suffering from depressive symptoms (Frohlich et al. 2003; Sooman & Macintyre 1995; Ross 2000). Previous research has focused on cognitive and personal aspects such as locus of control and coping mechanisms that might explain why some particular people suffer from depressive symptoms (Cohen & Wills 1985; Landau 1995). However, in this study we extended a sociological research tradition that studies explanatory mechanisms that account for the unequal distribution of people's levels of resources. One might expect that people's and neighbourhood's levels of resources could evoke subjective perceptions of distress that induce depressive symptoms. These subjective perceptions of distress contain aspects of experiences, meanings, and references that people subjectively perceive based on their individual positions and based on their environment (Cohen et al. 1983; Frohlich et al. 2003; Macintyre et al. 2002; Sooman & Macintyre 1995). These subjective perceptions might contribute to the explanation of differences between specific resources and depressive symptoms in the general population. People with lower levels of resources might experience their social situations as distressing, as previous research has shown (Aneshensel & Sucoff 1996; Cohen et al. 1982; Frohlich et al. 2003; Mirowsky & Ross 1989; Pearlin et al. 1981: Ross & Reynolds 2000; Sooman & Macintyre 1995; Thoits 1999). Until now, in the Netherlands, this *explanatory perspective on depressive symptoms* of subjective perceptions, has not received much attention in relation to depressive symptoms. Consequently, in this study, we made progress in this research field and elaborated on particular subjective perceptions of people's and neighbourhood's levels of resources. Based on SPF-theory, our sixth

general proposition was: particular subjective perceptions of distress induce suffering from depressive symptoms.

In the Chapters 3, 4, and 5 of this book, a theoretical and empirical investigation was reported on these six theoretical propositions. From a theoretical and conceptual framework based on SPF-theory, we derived and tested hypotheses on several indicators of economic, social, and cultural resources. Hereby, we focused on indicators of people's resources and contextual resources, i.e., national and neighbourhood's resources, as well as on indicators of static and dynamic resources, i.e., lower and decreasing levels of people and neighbourhood resources. These characteristics were derived from large-scale cross-sectional data sets from the national population of the Netherlands (survey Cultural Changes 1975-1996 several years; Becker 1997). And we used a large-scale cross-sectional data set of the general population derived from a survey conducted in the eastern part of the Netherlands (Nijmegen Health Area project (NHA-2 study) König-Zahn et al. 1999).

In this study, we also contributed to previous research on the association between gender differences in depressive symptoms as well as gender differences in several indicators of levels of resources. Our aim was to gain insights that were more complete and systematic towards gender differences in the effects of levels of resources on depressive symptoms in the general population.

Furthermore, we addressed aspects of social selection and social causation, as these considerations appeared to be important in a research approach of a 'social etiology' of depressive symptoms. We aimed to show to extent to which 'indirect' social selection explains some of the variations in people's levels of resources and depressive symptoms. We examined whether unfavourable childhood circumstances, parental economic resources and family psychopathology may have led to currently lower levels of resources that indirectly affect people's suffering from depressive symptoms.

6.2 Answering the research questions

6.2.1 Conceptual and measurement issues of depressive symptoms

A central issue that needs explication is the choice we made in this study for the predominant concept of depressive symptoms as a sub aspect of mental disorders. A multifactorial social approach requires a concept and measurement of mental disorders that is a valid and sensitive psychological barometer for the consequences of people's positions (Mirowsky & Ross 1989, 1999; Pearlin et al. 1981, 1989; Wakefield 1999). For the purpose of this study, and with respect to comparability with previous research, we used the concept and measurement of depressive symptoms rather than measurements that capture less specific concepts such as psychological distress, mental illness, or general demoralisation. Consequently, we intended to assess depressive symptoms with a valid and reliable dimensional measurement applicable in large-scale survey-based research.

Accordingly, in Chapter 2, we discussed various conceptual issues and measurement scales of depressive symptoms. We reviewed the epidemiological literature and the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (APA 1994) to assess several aspects of conceptual clarity. We also extensively described the survey-based data of the Nijmegen Health Area Study (NHA-2 study) (König-Zahn et al. 1999). Because of particular measurement scales available in this data set, we were compelled to use specific sets of items. These specific items appeared to contain a degree of equivalence with respect to content and formulation. Due to face

validity, these items were initially considered to be suitable to represent a measurement of depressive symptoms. Subsequently, several validity criteria derived from the research literature were evaluated in an empirical research design related to content and construct validity, and reliability.

Two conceptual dimensions were distinguished: depressive symptomatology and depressive mood. The concept of depressive symptomatology contains symptoms whose features can be associated with the core components of depressive symptoms as formulated in the DSM-IV (APA 1994). These items refer to a syndromal depressive affect, i.e., a complex of rather intense, pervasive, and persistent symptoms such as feelings of worthlessness, hopelessness, diminished ability to think or concentrate, and suicidal ideation. These items were included in a scale that contains four items that represent less severe depressive symptomatology according to the original General Health Questionnaire 28 items (GHQ-28) depression subscale (Goldberg & Hillier 1979; Goldberg & Williams 1988; Graetz 1991).

The concept of depressive mood contains symptoms whose features are closely related to a dysphoric mood, i.e., less intense, rather commonly formulated symptoms such as feeling depressed, blue, sad, and a experiencing a considerable loss of interest or pleasure in nearly all activities. These items can be associated with a dysphoric mood as formulated in the DSM-IV (APA 1994). These types of items were derived from a scale that consists of six items representing depressive mood symptoms according to a modified version of the Centre of Depression Scale (CES-D) (Mirowsky & Ross 1983, 1989; Radloff 1977; Ross & Mirowsky 1984) and were operationalised with conceptually comparable items of the General Health Questionnaire, 30-item version (GHQ-30) (Goldberg & Williams 1988).

In addition, based on a review of previous validation studies, we described a number of validity and reliability criteria that a dimensional measurement of depressive symptoms has to fulfil, in general, as well as more specifically, on the content of the items. These aspects concerned severity, duration, item formulation, conceptual clarity, and reliability. Subsequently, these criteria were tested towards both dimensional measurement scales in an empirical design. Based on the large-scale data of the NHA-2 study, we conducted several statistical analyses such as principal factor analysis and Likert analysis. Consequently, following a critical review of the research literature and these empirical results, we presented and evaluated the construction and scale validation of two valid and reliable measurements to assess depressive symptoms in the general population.

With respect to severity, on both scales people score on a number of items whose total score indicates, on a continuum, the extent of severity in suffering from depressive symptoms. The scale scores ranged from less severe depressive symptoms to more severe depressive symptoms. Furthermore, the items of both dimensional scales were formulated in such a way as to refer to symptoms whose specific content is formulated in a negative way. These negatively formulated items were mixed together with positively formulated items only to reduce or prevent the possible effect of response set in the complete questionnaire. With regard to duration, the answer categories incorporate a period of the four weeks prior to completing the questionnaire, which is a sufficient time period for measuring suffering from depressive symptoms in a valid manner. With respect to conceptual clarity, this aspect was examined with confirmatory factor analyses with oblimin rotation. The results reported in Chapter 2 showed that a conceptual and empirical distinction could be made in several dimensions of mental symptomatology. It appeared that the specific content of items refers to several conceptual dimensions that could be

theoretically and empirically distinguished. Results showed that in addition to a dimension of depressive symptoms, items refer to somatic complaints, anxiety, social dysfunction and suicidal ideation.

Moreover, inter-item correlations and reliability coefficients of both dimensional measurements of depressive symptomatology and depressive mood showed a reasonable degree of internal consistency between the items. Also, correlations between both dimensional scales and other measurements of mental disorders indicated reasonable evidence of convergent validity.

6.2.2 A longitudinal perspective

In Chapter 3, we addressed a longitudinal perspective on depressive symptoms. The first research question that we addressed in this chapter reads:

> *1a) What has been the longitudinal trend in depressive symptoms over the period 1975 - 1996 in the Netherlands?*

We performed analyses based on nine cross-sectional data sets conducted between 1975 and 1996 in the Netherlands (survey Cultural Changes; Social and Cultural Planning Office (SCP) (Becker 1997)). The total number of respondents was 16,190. These large-scale national and longitudinal data contain a similar measurement of depressive symptoms over a time span of more than two decades. This dimensional measurement included items that indicated depressive mood (Gadourek 1963; Radloff 1977). In answer to the first research question, we concluded that in the Netherlands the longitudinal course of depressive symptoms in the general population showed a rather fluctuating pattern. In the early 1980s, there was a steady increase in the level of depressive symptoms, whereas in the late 1980s the level of depressive symptoms decreased, and in the first part of the 1990s the level of depressive symptoms became rather stable. We compared these results with the longitudinal development of suicides committed in the Netherlands, with results of other longitudinal studies abroad, and with research on people's use of mental health service. Although longitudinal research abroad and statistics on help-seeking have suggested a continuous increase in depressive symptoms, the findings presented here imply that the longitudinal development of depressive symptoms in the Netherlands in the time period between 1975 and 1996 showed temporal variations, but no tendency to continuously increase. These results based on population samples, however, contrasted with an expected increase in depressive symptoms suggested by both, changes in professional attitudes of therapeutic and clinical practice, and as indicated by client registry figures of Dutch mental health care services (Oldenhinkel 1998; Pijl Kluiter & Wiersma 2000; Ten Have & Bijl 1998). However, processes like proto-professionalisation and pharmacological developments might have also led to changes in mental health care and help-seeking behaviour among specific subgroups, and these aspects have consequently contributed to the assumption that rates of depressive symptoms have shown a tendency to increase in general society in the last decades (Furer 2001; Klerman & Weissman 1989; Ormel 1985; Paykel 2000).

The second research question posed in Chapter 3 was answered with an empirical test of various indicators of people's levels of resources:

1b) To what extent do people's levels of resources affect depressive symptoms in the period 1975-1996 in the Netherlands?

The nine cross-sectional samples of the national population contained information on several indicators of people's levels of economic, social and cultural resources. Wit respect to economic resources, we concluded that people with a lower income, people who are dependent on social security, or people who are housekeepers suffer more from depressive symptoms than people with a higher income or employed people. With respect to social resources indicated by marital status, we found that people who had been divorced, widowed or had never been married suffer more from depressive symptoms than married people. With respect to cultural resources, we found that people who did not go to church regularly, and people who had abandoned their religion, i.e., apostates, suffer more from depressive symptoms than regular churchgoers and loyal church members. Also, we found that women suffer more from depressive symptoms. People who were socialised after the Second World War suffer less from depressive symptoms compared with those who were socialised during the Second World War.

The third research question in Chapter 3 concerned gender differences in specific levels of resources:

1c) To what extent do effects of people's levels of resources on depressive symptoms differ for men and women in this period?

In general, we concluded that effects of gender differences on depressive symptoms appeared with regard to educational attainment and church attendance. These findings showed that women with higher levels of economic and cultural resources suffer less from depressive symptoms compared to men.

The fourth research question in Chapter 3 concerned over-time changes in people's levels of resources and depressive symptoms.

1d) To what extent do effects of people's levels of resources on depressive symptoms and gender differences in these effects, change over this period?

The main findings were that the difference in suffering from depressive symptoms decreased over time between divorced and married people, it increased between people who had never been married compared to married people and additionally, the findings showed that over the years, depressive symptoms increased in the lowest income category compared to the higher income category. Based on these findings, in general, we concluded that there were some over time changes in the relationship between lower levels of social and economic resources and depressive symptoms. We found no gender differences in these over-time changes: for both men and women, the difference in suffering from depressive symptoms decreased between divorced and

married people, and it increased between people who had never been married compared to married people.

In both the scientific and the public debate, it has often been suggested that depressive symptoms are affected by societal circumstances such as individualisation or secularisation. However, these contextual propositions have seldom been put to the test: neither by means of large-scale longitudinal data sets, nor by means of multivariate analyses, where effects have been adjusted for the effects of other relevant macro contextual characteristics. In this study, we gathered additional data at the society level and tested the effects of these national characteristics, i.e., period and cohort effects, in multivariate analyses simultaneously. Accordingly, the final research question in Chapter 3 concerned contextual national levels of resources that might affect the longitudinal development of depressive symptoms:

1e) To what extent do levels of national resources, i.e., period and cohort characteristics affect depressive symptoms, in addition to people's levels of resources in the period 1975-1996 in the Netherlands?

We found a period effect of national economic resources. Higher levels of unemployment as well as a change (increase) in the level of unemployment affect depressive symptoms. Also, in contrast to our expectations, a cohort effect of individualisation on depressive symptoms was shown: the higher the level of individualisation during people's socialisation period, the lower the level of depressive symptoms. These findings suggest that levels of national social resources indicated with a process of individualisation decreases levels of depressive symptoms. Possibly, people who had been socialised in these societal circumstances of individualisation presumably experience an enhancement of possibilities and autonomy that consequently prevents suffering from depressive symptoms. This might also be caused by changes in the legislation concerning divorce that took place in the 1960s and led to the perception of enhanced possibilities and fewer social pressures in the case of divorce. This was also suggested by the finding that over time, divorced people suffer less from depressive symptoms compared to married people. Possibilities since 1965- to receive social security for women who became divorced-, might also contribute to an interpretation of this cohort effect. We found no significant cohort effects related to the level of unemployment and secularisation on the levels of depressive symptoms. We found also no significant effect of the national cultural resources indicated with the level of secularisation at any moment in time on the average level of depressive symptoms.

6.2.3 A static and a dynamic perspective

In Chapter 4, we elaborated on a static and a dynamic perspective on depressive symptoms. The research questions of this chapter were:

2a) To what extent do people's lower levels of resources affect depressive symptoms?

2b) To what extent do people's decreasing levels of resources, in addition to people's lower levels of resources, affect depressive symptoms?

Based on the theoretical framework of SPF-theory, we derived hypotheses and tested them empirically. We used the cross-sectional data of the NHA-2 study (König-Zahn et al. 1999). This data set was based on a multi-stage stratified sample of people aged between 18 and 75 years. The final number of people interviewed was 1,813. The survey sample has proven to be a good reflection of the general population with respect to age, gender, and medicine use. These data contain several indicators of people's levels of resources and dynamic aspects of these resources. To test a multifactorial social perspective on depressive symptoms profoundly, we conducted multivariate regression analyses and included all these indicators simultaneously in the analyses.

With respect to indicators of people's levels of economic resources, we concluded that people with a lower income, a lower educational attainment, and people who are dependent on social security or a disability pension suffer more from depressive symptoms. With respect to lower levels of social resources, we found that people who had never had a partner, people living without a partner and with children, i.e., leading a single-parent family and people living with a partner and without children, suffer more from depressive symptoms than people who do live with a partner and children. Regarding lower levels of cultural resources, we found that people who attend church to a lesser extent suffer more from depressive symptoms than people who attend church more often.

According to decreasing levels of people's resources on depressive symptoms, we concluded that, in general, people who experienced a recent change in their economic and social position, i.e., decreasing levels of economic and social resources suffer more from depressive symptoms. We found a significant effect of upward inter-generational economic mobility: respondents whose occupational status was higher compared to their father's occupational status suffer more from depressive symptoms. We found no significant results of decreasing levels of cultural resources on depressive symptoms, indicated by apostasy and a decrease of church attendance. People who have given up their church membership as well as people who are going to church less frequently compared to their socialisation period, showed no significant effect on depressive symptoms compared to people who remained church members or who went to church just as frequently as before or even more frequently compared to the past.

In Chapter 4, we also addressed a research question on gender differences. In a rather explorative manner we examined:

> *2c) To what extent do the effects of people's lower levels of resources and decreasing levels of resources on depressive symptoms, differ for men and women?*

For men and women, we tested separate models with multivariate regression analyses in which several indicators of lower and decreasing levels of resources were included simultaneously. The results reported in Chapter 4 showed that the effects for men and women differ in suffering from depressive symptoms as far as educational attainment, and leading single-person households were concerned. We found that women with a higher educational attainment suffer less from depressive symptoms compared to men with a higher educational attainment. Men who live alone suffer more from depressive symptoms compared to women who live alone.

With respect to indicators of decreasing levels of resources, we found that men and women differ in suffering from depressive symptoms when inter-generational economic mobility and a recent change in the primary and secondary social networks were involved. This implies

that men who experienced downward economic mobility, and women who experienced a recent decrease in their levels of social resources that they derive from their primary and secondary social networks, suffer more from depressive symptoms compared to women and men who experience comparable changes in their social and economic positions.

Additionally, in Chapter 4 we presented empirical results according to 'indirect' social selection and social causation processes on suffering from depressive symptoms. Following on from this, we proposed to test the following hypothesis: *due to unfavourable childhood circumstances, lower parental socio-economic status, and familial psychopathology, some people may have been hampered in the past from attaining higher levels of resources and as a result they are currently suffering more from depressive symptoms.* We employed status attainment models on socio-economic status and marital status, controlled for social and economic family background and familial psychopathology. In line with previous findings it appears that social variations in depressive symptoms are predominantly associated with social causation processes and only slightly with social selection processes, due to unfavourable childhood circumstances and familial psychopathology (Amato Sobolewski 2001; Aseltine 1996; Dohrenwend 1992; Fox 1990; Miech et al. 1999; Ritsher et al. 2001; Van der Mheen et al. 1997).

With respect to both dimensional measurements scales of depressive symptoms, i.e., a syndromal depressive affect and a dysphoric mood, we concluded that in this study, in general, similar patterns appeared related to the associations between several indicators of lower and decreasing levels of resources and depressive symptoms. A considerable difference, however, was found between both types of measurements of depressive symptoms and educational attainment. In contrast with the negative and significant effect of educational attainment on the scale of depressive symptomatology, educational attainment showed no significant effect on the depressive mood scale as presented in the Chapters 3 and 4. In addition, the scale on depressive mood showed significant relations with inter-generational economic mobility, in contrast to the scale on depressive symptomatology. However, the differences in explained variance between the empirical models of Chapter 4 using different measurements showed that the scale of depressive symptomatology was more sensitive to effects of several indicators of static and dynamic resources. It was only with respect to the control variable of birth cohort that it appeared that depressive symptoms measured with the depressive mood scale showed comparable estimates in all the distinguished birth cohorts. However, the averages on the scale of depressive symptomatology showed that, in particular, people born between 1941 and 1955 suffer more from depressive symptoms.

6.2.4 A contextual perspective

In Chapter 5, we addressed a contextual perspective on depressive symptoms and addressed the following research question:

> 3) *To what extent do lower levels of neighbourhood's resources and decreasing levels of neighbourhood's resources affect depressive symptoms, in addition to people's lower and decreasing levels of resources?*

Relatively speaking, few studies in the Netherlands have tried to distinguish various indicators of resources of the neighbourhood and their relevance for depressive symptoms (Braam 1999b;

Reijneveld & Schene 1998; van Os et al. 2002). In this chapter, we employed individual-level data based on the NHA-2 study (König-Zahn et al. 1999), as well as contextual-level data of neighbourhoods based on four-digit postal codes. For the majority of the neighbourhood characteristics we used valid statistics indicative for the year in which the individual data were collected. We have drawn these neighbourhood data from the statistical publications of the Dutch Office of Statistics (CBS) and an official marketing office (Statistic Netherlands 1994b, 1997b; Wegener 2001). After we had excluded some missing cases, the final data set contained data on 1,654 respondents and data on 54 neighbourhoods (mean numbers of individuals per neighbourhood, n=30). The dependent variable in this chapter was based on the measurement of depressive symptomatology. We found significant differences between neighbourhoods in the mean scores of depressive symptoms. This was also illustrated in Figure 5.2 of Chapter 5. The scale of depressive mood showed no significant differences between neighbourhoods.

Based on SPF-theory, we derived hypotheses on lower and decreasing resources of people and neighbourhoods affecting depressive symptoms. The hypotheses were tested by means of multi-level analyses, in which the effects of individual and contextual variables were simultaneously estimated.

As the effect of each contextual characteristic was adjusted for all other contextual-level, and individual-level effects, these findings revealed empirical support for the hypotheses on the effects on depressive symptoms of neighbourhood conditions. We can summarise the findings that say that the more disadvantageous economic neighbourhood conditions, the higher the level of depressive symptoms. We found no significant effects of disadvantaged social and cultural neighbourhood conditions.

With respect to decreasing levels of neighbourhood's resources, it appears that living in a neighbourhood with improved socio-economic neighbourhood conditions reduces suffering from depressive symptoms, compared to living in a rather stable neighbourhood with disadvantaged socio-economic conditions. No significant effects of decreasing social conditions indicated with a change in the level of proportion single-person households and residential mobility were found.

According to the number of explained variances at the individual and the neighbourhood level in the different models as presented in Chapter 5, we emphasise that none of the apparent effects of neighbourhood characteristics on depressive symptoms were due to the composition of individual characteristics of their residents. Thus, neighbourhood differences in depressive symptoms were not simply a result of neighbourhood variation in individual characteristics, but due to independent significant effects of neighbourhood characteristics. These findings suggest that living in an economic disadvantaged neighbourhood has a decisive influence on depressive symptoms and that in addition a change in these disadvantaged economic neighbourhood conditions has a crucial impact on suffering from depressive symptoms.

6.2.5 An explanatory perspective

In Chapter 5, we also tested hypotheses on the explanatory power of particular subjective perceptions of distress in the effects of people's levels and neighbourhood's levels of resources on depressive symptoms. In fact, the theoretical and framework of SPF-theory was systematically tested by deriving and testing hypotheses regarding independent individual variables, intervening individual variables and independent contextual variables. The final research question, therefore, addressed the extent to which the observed differences in depressive symptoms between

individual characteristics and neighbourhood characteristics could be explained by means of intervening variables at the individual level. The research question was:

4) *To what extent can the relationships between people's lower and decreasing levels of resources and depressive symptoms and the relationships between lower and decreasing levels of neighbourhood's resources and depressive symptoms, be explained by particular subjective perceptions of distress?*

We conducted multi-level analyses and in these models we included simultaneously several indicators of subjective perceptions of distress such as perceived economic distress, social isolation, and neighbourhood disadvantage, and indicators of people's resources and neighbourhood's levels of resources. We found that subjective perceptions of economic distress and social isolation affect depressive symptoms positively. These subjective perceptions explain the association between some indicators of people's levels of economic, social, and cultural resources, and depressive symptoms. Our results revealed that people with lower income, people dependent on social security, people leading single-parent families, people who attend church less often, and women suffer more from depressive symptoms compared to their respective reference categories, due to a stronger perception of economic distress and social isolation. In addition, we found a significant effect of increased disadvantaged social conditions on depressive symptoms when perception of social isolation was included. This implied that effects of disadvantaged social conditions in the neighbourhood on depressive symptoms are suppressed by perceptions of social isolation, due to people with higher levels of perception of social isolation living in these neighbourhoods. We also made a preliminary contribution to the effects of perceptions of living in particular contexts, i.e., neighbourhoods. However, we found no significant relation between subjective perceptions of neighbourhood disadvantage and depressive symptoms.

6.3 General conclusions

Now that the research questions of this study have been recapitulated and answered, we will discuss the main findings of this study. We systematically reviewed the findings presented in Chapter, 3,4, and 5 of this book. Comparing these empirical results based on multiple analyses in which all indicators were included and tested simultaneously, leads to overarching conclusions regarding the decisive social determinants of depressive symptoms in the general population. These results also stressed the robustness of the relationships between levels of resources and depressive symptoms in the general population, as the empirical results were derived from large-scale samples of the national and regional population on which a profound test of a multi-factorial social approach of depressive symptoms was applied.

6.3.1 Economic resources

Economic resources were indicated with educational attainment, income, occupational class and socio-economic position. It appeared that income and dependence on social security or a disability pension are strong predictors of depressive symptoms. Educational attainment appeared to be a less consistent determinant of depressive symptoms. People with lower educational attainment suffer more from depressive symptoms on the scale of depressive symptomatology, whereas on the scale that represents depressive mood no significant effects are shown, as reported in the Chapter 3 and 4. It is possible that educational attainment is a less important predictor of

suffering from depressive symptoms when a depressive mood is concerned. With respect to occupational class, we found no differences in suffering from depressive symptoms between different occupational classes based on the EGP-classification. Apparently, occupational class is not an appropriate indicator of levels of economic resources in relation to depressive symptoms, compared to education, income, and employment status (see also Fryers et al. 2003). In many studies on socio-economic health inequalities, measurements of socio-economic position are often based only on the working population.

In these particular studies, features of working conditions in specific occupational classes that might have an impact on depressive symptoms are investigated, such as less demand of control, lack of authority, high time pressure, and work overload (see for example Link Lennon & Dohrenwend & 1993). The findings of this study, however, show that we can not draw conclusions merely on differences between occupational classes and suffering from depressive symptoms. The results reported in this study indicate that being active in the labour market is more important than the type of occupational class people are working in. The effects of lower levels of economic resources on suffering from depressive symptoms are caused by the fact that people who are economically inactive and dependent on social welfare or a disability pension: they suffer more from depressive symptoms compared to employed people in higher occupational classes. We can conclude that a status of unemployment and dependence on social welfare affect depressive symptoms most severely.

With respect to decreasing levels of economic resources, it appears that recent downward intra-generational economic mobility, i.e., financial problems, becoming unemployed or not being able to find a new job, are important factors that induce depressive symptoms. Moreover, our findings showed that with respect to duration, a less recent decrease in economic resources affects depressive symptom most severely. It appears that over time, people who have lower incomes compared to people with higher income levels suffer more from depressive symptoms. This suggests that lower and decreasing levels of economic resources are important determinants of depressive symptoms. These findings can be related to the mental health implications of Dutch policy that aims to prevent people being entitled to disability pension or social welfare, and to stimulate participation in the labour market.

When levels of contextual economic resources were indicated at the national level and at the neighbourhood level using unemployment rates, it appears that a higher level of unemployment is a strong determinant of depressive symptoms. Moreover, as decreasing contextual economic resources were concerned, we can state that a rise in the national unemployment rate and changes in disadvantaged economic conditions in the neighbourhood were also important determinants of depressive symptoms. Contextual economic conditions have a potential impact on all residents, irrespective of individual characteristics. These findings are in agreement with results of previous research on mental disorders in economically deprived areas, countries, and cities, and the effects of recession at the national level on depressive symptoms (Brenner & Mooney 1983; Malmström et al. 1999; Pickett & Pearl 2001; Tausig & Fenwick 1999). To summarise then, using comparable indicators of economic resources at both the individual level as well as at the contextual level, the consistent results presented in this book show that lower socio-economic positions indicated by lower household income, being dependent on social benefits, and lower socio-economic conditions indicated by higher unemployment levels in society and the neighbourhood, have decisive influences on suffering from depressive symptoms.

6.3.2 Social resources

One of the indicators of social resources was marital status. The results in this study show convincingly that people who live alone and who have never had a relationship suffer more from depressive symptoms than people who were married. Also, the differences between having no relationship and living alone compared to married people in suffering from depressive symptoms have increased over time. In general, we can state that these results are similar to previous research findings on the impact of living alone on depressive symptoms (Hughes & Gove 1981). Moreover, people who have been divorced suffer more from depressive symptoms compared to married people, although these decreases over time. This narrowing effect of the categories of marital status was also found in a trend study on the impact of divorce on suicide (Stack 1990).

Furthermore, we included information on household composition as indicators for people's levels of social resources. With respect to parenthood, the results were mixed: although we found an impact on depressive symptoms of being childless in the case of having a partner, people who have children but no partner, i.e., leading a single-parent family, also suffer more from depressive symptoms than parents with children. Previous studies on parenthood have shown that having children in general does not increase psychological well-being. However, it was suggested that one should look at whether children still live at home, what the features of the marriage are with respect to economic strain, whether there is emotional support among the spouses, and the average age of the children (Ross et al. 1990). Unfortunately, our secondary data did not contain specific information on the ages of the children. However, in contrast to previous studies, our findings stress the importance of using characteristics of people's household composition, in addition to marital status as specific indicators of people's levels of social resources. This is also supported by the fact that we, in contrast to other studies, found no significant effect of being divorced on depressive symptoms in Chapter 4. However, single-parent families, i.e., people who are divorced or widowed but living together with children at home, suffer significantly more from depressive symptoms. Apparently, the combination of being divorced and living together with children is an important determinant of suffering from depressive symptoms. These results stress the importance of focusing on household composition in addition to people's marital status. Previous studies have mainly emphasised the current marital status of respondents, without controlling for the current household composition and the effect of having children or not (Simon 1998). Nevertheless, these effects of household composition require further attention and should be tested in other data sets and countries to obtain more general results.

With respect to levels of social resources at the national level, the process of individualisation showed a positive cohort effect on depressive symptoms. Adjusted for secularisation and unemployment, higher levels of individualisation during people's socialisation period appear to have a preventive effect on suffering from depressive symptoms. At the neighbourhood level, the proportion of single-person households appears not to have a significant effect on depressive symptoms when other contextual economic and cultural resources are controlled for. However, a change in neighbourhood's social resources appears to be an important determinant of depressive symptoms, when subjective perceptions of distress are included. Presumably, perceived social isolation on the individual level suppresses the impact of an increase in the proportion of single-person households on depressive symptoms.

To summarise then, living alone and leading a single-parent family are important determinants of depressive symptoms. Also, lower levels of social resources in the neighbourhood appear to induce depressive symptoms at the individual level.

6.3.3 Cultural resources

People's lower and decreasing levels of cultural resources were indicated with church attendance, church membership, changes in church attendance and apostasy. As presented in the Chapters 3, 4, and 5, these results show that church attendance has a positive and significant effect on depressive symptoms. People who attend church more regularly suffer less from depressive symptoms compared to people who attend church less often. These consistent findings suggest that church attendance is a solid indicator of the level of cultural resources that affect depressive symptoms. This was also found in other studies on the effects of different aspects of religiosity and mental illness (Ellison et al. 1997; Koenig 1997). In Chapter 3, we outlined some effects of leaving the Catholic Church and the Dutch Reformed Church on depressive symptoms. These effects indicate that decreasing levels of cultural resources affect suffering from depressive symptoms positively. However, with respect to a dynamic perspective of cultural resources, presented in Chapter 4, we found no conclusive effects of apostasy and changes in church attendance on depressive symptoms in the general population, when other indicators of people's levels of social and economic resources were controlled for. Presumably, low statistical power due to a rather low number of respondents in the regional data set compared to the national data sets account for these non-significant results.

At the contextual level, it appears that when the extent of secularisation at the national level and at the neighbourhood level is taken into account in a multifactorial research approach of depressive symptoms, these indicators appear to have no convincing effects. By contrast, a Dutch study based on several community samples (2,817 individuals across 11 contexts represented by municipalities) of the elderly showed that living in a highly secularised environment affects suffering from depressive symptoms positively irrespective of individual religious involvement (Braam et al. 1999b). In this study, however, contextual cultural resources were indicated with proxies for the religious climate based on the percentage of votes for parties with a Christian orientation in the national elections within each municipality. This study failed to control systematically for other municipality-level characteristics indicative of contextual social or economic resources. Apparently, leaving church nowadays may have less devastating effects on psychological well-being, i.e., depressive symptoms, in the adult general population of the Netherlands. Due to a more heterogeneous secularised environment and a more secularised society in general, people's mental disorders are not seriously affected by these conditions. Contextual economic and social conditions appear to be decisive determinants of depressive symptoms.

6.3.4 Subjective perceptions of distress

Previous epidemiological and psychological research on mental disorders in general and, more specifically, on depressive symptoms, has been dominated by the theoretical assumptions of stress theory (Aneshensel 1992, 1999). In this study, we synthesised the assumptions of stress theory into a theoretical framework of depressive symptoms. We related the proposition that states that people's perceptions of distress affect depressive symptoms, with the core proposition that people's and neighbourhood's lower levels of resources induces depressive symptoms related

to social inequalities and social disintegrations in society. We showed that subjective perceptions of economic distress and social isolation are important determinants of depressive symptoms and explain some of the associations between people's levels of resources and depressive symptoms. The findings presented here are in line with previous research that has tried to clarify mechanisms through which individual and environmental conditions might induce depressive symptoms (Aneshensel & Succoff 1996; Frohlich et al. 2003; Silver et al. 2002; Ross 2000; Sooman & Macintyre 1995).

6.3.5 Gender differences

This study aimed to provide insights into a more general and systematic pattern of gender differences in the effects of levels of resources on depressive symptoms. The most important finding was that the effects of educational attainment on suffering from depressive symptoms differ between men and women. A higher educational attainment is more beneficial to women than it is to men in providing protection against suffering from depressive symptoms. Also, it appeared that men's depressive symptoms are affected negatively by the experiences of downward inter-generational economic mobility compared to women. Additionally, living alone is more detrimental to men's suffering from depressive symptoms compared to being married: single men suffer more from depressive symptoms compared to women. This is in line with the evidence that living alone in general damages psychological well-being, i.e., induce depressive symptoms and that men who live alone suffer more from depressive symptoms than women who live alone (Ross et al. 1990). On the other hand, negative changes in the primary and secondary social networks of women have long-lasting effects on suffering from depressive symptoms compared with men.

With regard to cultural resources, the most important indicator of cultural resources on gender differences in depressive symptoms appeared to be church attendance. Women suffer less from depressive symptoms than men in cases of a higher level of church attendance. This is in line with the beneficial effects of religiosity on depressive symptoms and the higher religious involvement of women on average (Mirola 1999). After disentangling gender differences on the effects of several indicators of levels of resources on depressive symptoms more profoundly, a persistent gender effect on depressive symptoms remained. In this study, comparable to a great number of empirical studies, we still found a major effect of gender: women suffer more from depressive symptoms than men. In Chapter 5, however, we disentangled gender differences in depressive symptoms including subjective perceptions of distress. The elaboration on subjective perceptions of distress in this study appears to be an important contribution to research on gender differences in depressive symptoms, as we found that subjective perceptions explain why women suffer more from depressive symptoms than men. The main effect of gender on depressive symptoms became non-significant after including particular subjective perceptions of distress in addition to other individual and neighbourhood characteristics. Although this factor has been was suggested in previous research, it was not convincingly and systematically tested in the general population (Ellaway & Macintyre 2001). In further research, these aspects of subjective perceptions of distress should be taken into account with respect to subjective perceptions of social roles, quality of marriage, working conditions, and neighbourhood conditions. These aspects might contribute to relevant explanations of gender differences in depressive symptoms using a multifactorial social approach.

6.4 Theoretical and empirical progress

In this study, we aimed to advance research on the relationships between people's positions and contextual conditions and depressive symptoms by addressing questions regarding how people vary with respect to depressive symptoms depending on their levels of resources, as well as on the resources of their social context. We made a theoretical clarification and conducted an empirical test by explicitly applying several sociological perspectives. An extension or improvement upon previous research concerns the introduction of a longitudinal perspective, a static and a dynamic perspective, a contextual perspective and an explanatory perspective on depressive symptoms. Elaborations on these perspectives, in combination with the application of a multi-factorial empirical test, have led to a more systematic and severe test of hypotheses showing what the decisive social determinants of depressive symptoms are.

With respect to a longitudinal perspective, this study provides important information on a longitudinal trend in depressive symptoms in the national population of the Netherlands. We made progress in epidemiological and sociological research since the assumption of an expected tendency for depressive symptoms to increase had, up till now, not been able to be supported. We made the longitudinal development of depressive symptoms in society empirically feasible using data from the national population of the Netherlands. Moreover, as far as we know, this is the first study that examined the impact of over-time changes on depressive symptoms in the effects of specific positions, as well as testing period and cohort effects of national conditions of society.

The static and dynamic perspective led to new hypotheses about life change events. It seemed very fruitful to look at changes in people's positions that incorporate decreasing levels of resources and their effects on depressive symptoms. Moreover, it seemed to be even more useful to include a dynamic aspect that distinguishes between a recent and a less recent decrease in levels of resources. The application of research models in which particular types of changes and the timing of these changes in people's positions are simultaneously included, improves the understanding of the decisive influence of life change events on depressive symptoms. The results of this study clearly indicate that the distinction of recent and less recent social and economic changes, as well as inter-generational and intra-generational economic mobility, form an essential approach for understanding the effects of particular dynamic effects on depressive symptoms. This approach is theoretically and empirically more specific than testing solely a combined effect of one or more life change events on depressive symptoms, as done in previous research.

The elaboration of a contextual perspective on depressive symptoms, in combination with a dynamic perspective is an enhancement on 'places matters' research on depressive symptoms. The theoretical specification of various neighbourhood characteristics and the empirical test using multi-level analyses offered new possibilities for testing a contextual influence on mental disorders in general and depressive symptoms specifically, more extensively. Moreover, the dynamic aspect of neighbourhoods appeared to be relevant, as we demonstrated that socio-economic improvements of neighbourhoods decrease depressive symptoms. The reducing or preventing effects on depressive symptoms as a result of redevelopments of neighbourhoods, support the efforts of local policies to stimulate programs on neighbourhood improvement. From a public health perspective, these investments seem to be worthwhile, given the expected effectiveness of prevention and intervention programmes of health care policies in the local community.

Finally, examining an explanatory perspective on depressive symptoms produced hypotheses on the extent to which specific subjective perceptions of distress explain the effects of resources on depressive symptoms. This application of including particular subjective perceptions of distress in addition to indicators of people's levels of resources simultaneously, provided strong evidence that these subjective perceptions can to some extent explain suffering from depressive symptoms among specific subgroups. Subsequently, in this study, we were able to specify the conditions under which the mechanisms of subjective perceptions of distress are intensified. This explanatory perspective appears to be a theoretical constructive factor in sociological research on depressive symptoms. Moreover, we assessed empirically the effects of particular perceptions of distress on depressive symptoms, which in many studies remained an implicit theoretical factor. Studying the role of intervening factors of subjective perspectives is an important factor that leads to theoretical and empirical progress in sociological research on depressive symptoms.

6.5 Remaining concerns and further research

In the course of this study a number of ideas and new questions arose that could not be tested appropriately since we were restricted to the information available in the secondary data sets. A recommendation for further research would be a search for more detailed information of neighbourhood characteristics. For example, information on numbers of clubs, local facilities, participation in clubs or service institutions, voluntary work, and contacts with neighbours could serve as indicators of the extent of stable and durable social relationships in neighbourhoods. A possibility would be the use of data on local governments that have to collect these data to get insights into their demographic and public health situation of their city (Sociale Atlas Nijmegen 2003). Such information on local social cohesion might contribute to a better test of more direct indicators of the levels of contextual social resources that might induce or prevent from suffering from depressive symptoms (Buckner 1988; Kawachi & Berkman 2001; McKenzie et al. 2001).

Related to this recommendation of using more specific data of contextual characteristics, is a recommendation on the collection of particular aspects of perceived neighbourhood disadvantage. Because of our secondary data, we were compelled to use information that actually refers to subjective perceptions of economic details in the neighbourhood. The findings presented in this book however, suggest an interesting path for further research on the mechanisms through which perceptions of the neighbourhood affect depressive symptoms. Therefore, we recommend further neighbourhood research in the Netherlands that provides more details on subjective perceptions of neighbourhood disadvantage. These factors should incorporate concepts of subjective perceived social disorder such as a perceived lack of social control, lack of trust among neighbours, or fear of crime (Cohen et al. 1982; Caughy et al. 2001; Mirowsky & Ross 1999; Sooman & Macintyre 1995). Especially with respect to the general concern of the government about crime rates in specific neighbourhoods and feelings of fear among their residents, this type of research could also feature some policy implications.

An interesting path for further research would be the elaboration on the decisiveness of the type of social context that induces depressive symptoms. This study has demonstrated that both conditions at the national level, and at the neighbourhood level have a potential impact on residents' extent of suffering from depressive symptoms, irrespective of people's individual positions. It would be a challenge to test what the decisive contextual influence is, whether it are the characteristics of society, or of the neighbourhood or maybe even of the city (Malmström et al. 1999; Pickett & Pearl 2001; Tausig & Fenwick 2001). A recommendation would be to

perform multilevel analysis using three levels: individuals (level 1) nested within neighbourhoods (level 2) and nested within cities (level 3). Such a strategy would provide possibilities to a more severe test of what the decisive context is that affect depressive symptoms. However, for this research purpose a sample is needed that includes a sufficient number of observations at each of these levels. Also, appropriate and detailed information on people, neighbourhoods and cities are necessary to serve as valid and comparable indicators of specific contextual resources. Data that might be appropriate for such a research purpose could be derived from population monitoring research that is periodically conducted by the local governments in several large cities in the Netherlands (for example Social Atlas Nijmegen 2003). As information on several aspects of people's mental illness could be included in these questionnaires, an interesting research question concerning what the decisive context is that induce depressive symptoms, can be answered.

Another point that may need more explication in future research is the relation of religious affiliation - or the lack of it - and depressive symptoms. The underlying assumptions about religiosity can be related to feelings of belonging and moral guidance, which are assumed to protect against depressive symptoms. However, due to restrictions of the data, these aspects could not be tested directly. Data on particular aspects of subjective perceptions of religiosity or moral guidance, such as content of belief, (religious) attitudes toward life style choices, and support may be relevant to include as intervening variables in models in addition to church attendance, church membership, and religious denominations. These subjective perceptions would contribute to the interpretation of the relationships between church membership and apostasy and depressive symptoms more profoundly (Braam 1999a; Koenig 1997). Because a rather high number of Dutch inhabitants do not consider themselves to be a church member, the associations between religiosity, or a lack of it and depressive symptoms in the general population, needs further theoretical considerations and empirical tests. In addition, finding more detailed information in a specific period on religious affiliation at the neighbourhood level, would be worthwhile. Such specific indicators of dynamic aspects of cultural resources in the neighbourhood might be a better way of gaining advance understanding and interpretation of whether processes of a breakdown in moral guidance are a decisive contextual feature that determines depressive symptoms.

To summarise then, this study applied a multifactorial social approach taking into account several perspectives on suffering from depressive symptoms in the general population. We would like to conclude by underlining the benefit of using such a multifactorial social approach, which enhances the understanding of 'a social etiology' of depressive symptoms in the general population. We have demonstrated the impact on depressive symptoms of a more complete and more systematic range of people's positions and conditions related to their economic, social, and cultural, static and dynamic, and individual and contextual levels of resources. This study broadens the perspectives on social determinants of mental disorders. We would like to conclude that the importance of this study is related to the application of a multifactorial social approach that revealed important insights in the impact on depressive symptoms of the dynamics in inequality and disintegration in the Dutch society.

APPENDICES

Appendices

Appendix A

Table A.1 Age and sex distributions (in percentages) of the sample of the NHA-2 study and the population

	Sample	**Population**	**Chi-square**
Age			
18-19	1.4	3.2	
20-24	5.2	10.0	
25-29	8.3	11.9	
30-34	11.8	12.0	
35-39	14.1	11.3	
40-44	11.6	10.7	
45-49	11.4	10.6	
50-54	10.4	7.9	
55-59	8.2	6.8	
60-64	6.8	6.1	
65-69	6.0	5.2	
70-75	4.9	4.3	42,5 (<.001)
Sexe			
females	55.3	49.9	
males	44.7	50.1	19,8 (<.001)
Total (N =)	1,813	325 ,666	

This table shows that the age distribution of the sample deviates substantially in the age classes of 20-24, 25-29 and 50-54 years. However, the distribution of the other age classes in the sample show slight deviations from the age distribution of the population of the Nijmegen Health Area (Statistics Netherlands 1997b). However, this deviation of specific age classes shows a significant but marginal value (CHI-square = 42.5, p<. 001). Table A.1 also shows that female respondents are slightly over-represented in the sample compared to the gender distribution of the population of the Nijmegen Health Area (55,3 and 44,7 percent respectively). This deviation is marginally significant (CHI-square= 19.8, p <. 001) (see further König-Zahn et al. 1999, p. 25-26)

Table A.2 28- item General Health Questionnaire (GHQ-28) (Goldberg & Hillier 1979)

We should like to know if you have any medical complaints, and how your health has been in general over the past four weeks. Please answer all the questions simply by underlining the answer that you think most nearly, applies to you. Please note that we want to know about present and recent complaints, not those you had in the past.

A1	Felt perfectly well and in good health
A2	Felt in need of a good tonic
A3	Felt rundown and out of sorts
A4	Felt ill
A5	Got pains in your head
A6	Got tightness or pressure in your head
A7	Had hot or cold spells
B1	Lost much sleep through worry
B2	Had difficulty in staying asleep once your were off
B3	Felt constantly under strain
B4	Got edgy and bad-tempered
B5	Got scared or panicked for no good reason
B6	Found everything getting on top of you
B7	Felt nervous and highly strung all the time
C1	Managed to keep yourself busy and occupied
C2	Took more time than normal to do things
C3	Felt overall that you were doing things well
C4	Were satisfied with the way you carried out your task
C5	Felt that you were playing a useful role in things
C6	Felt incapable of making decisions about things
C7	Were able to enjoy your normal day-to-day activities
D1	Felt that you were a worthless person *
D2	Felt that life was hopeless *
D3	Felt unable to do anything because your nerves were too bad *
D4	Felt that life is not worth living *
D5	Considered putting an end to your life *
D6	Had thoughts about wishing you were dead *
D7	Had thoughts about taking your own life *

** Items measure depressive symptoms GHQ-28_dep*

Answer categories: not at all, no more than usual, rather more than usual, much more than usual

(Data: NHA-2 study; valid cases N=1,798)

Table A.3 Correlations and principal factor analysis with oblique rotation on items of GHQ-28 depression subscale and CES-D-items

Inter-item correlations										
GHQ-28_D1	1.00									
GHQ-28_D2	.66	1.00								
GHQ-28_D3	.62	.74	1.00							
GHQ-28_D4	.54	.57	.57	1.00						
CES-D1	.28	.29	.28	.31	1.00					
CES-D2	.25	.27	.25	.30	.59	1.00				
CES-D3	.23	.21	.20	.23	.37	.51	1.00			
CES-D4	.45	.42	.40	.44	.43	.43	.57	1.00		
CES-D5	.50	.51	.48	.49	.45	.49	.62	.58	1.00	
CES-D6	.38	.38	.36	.39	.41	.52	.62	.57	.62	1.00

	Factor loadings		**Communalities**
	Factor 1	**Factor 2**	
GHQ-28_D1	**.71**	.05	.52
GHQ-28_D2	**.77**	-.02	.63
GHQ-28_D3	**.78**	-.16	.65
GHQ-28_D4	**.67**	.01	.45
CES-D_D1	-.05	**.67**	.44
CES-D_D2	-.05	**.59**	.38
CES-D_D3	-.06	**.56**	.29
CES-D_D4	.06	**.69**	.47
CES-D_D5	.13	**.73**	.52
CES-D_D6	.03	**.66**	.39
Eigenvalues	5.8	1.9	**Factor correlations**
Explained Variance	41,7%	11,9%	

	Factor 1	**Factor 2**
Factor 1	. 1.00	
Factor 2	.44	1.00

(Data: NHA-2 study; valid cases N=1,798)

Appendix B

Table B.1 Measurements of Depressive Symptoms

Initial items as proposed to measure depressive symptoms scale (Gadourek 1963)	Items of the Centre for Epidemiological Studies (CES-D; Radloff 1977)
Interviewer: The following aspects are about your mood during the past week?	*Interviewer: Please tell me how often you felt this way during the past week?*
1 Are you very worried?	1 I was worried by things that usually don't worry me
2 Is something bothering or depressing you?	2 I felt depressed
3 Do you feel life is pointless sometimes?	3 I thought my life had been a failure
4 Do you feel lonely sometimes?	4 I felt lonely
Answer categories 1 yes 2 no	*Answer categories 1 none of the times, 2 sometimes, 3 occasionally and 4 most of the time*
Reliability: Standardised Cronbach's alpha 0.64 (Cronbach 1951)	Standardised Cronbach's alpha 0.87 (original scale of 20 items)

(Data: Cultural Changes, Social and Cultural Planning Office (SCP)

Table B.2 Descriptive statistics of depressive symptons in the Netherlands (1975-1996)

	Correlations			
	D1	**D2**	**D3**	**D4**
D1 Are you very worried?	1.00			
D2 Is something bothering or depressing you?	.41**	1.00		
D3 Do you feel life is pointless sometimes?	.25**	.27**	1.00	
D4 Do you feel lonely sometimes?	.26**	.30**	.38**	1.00

Year	**Mean**	**SD**	**N**
1975	500	102	1739
1979	495	99	1779
1980	499	100	1775
1981	501	99	1804
1983	510	106	1708
1986	501	102	1788
1989	493	95	1741
1991	501	100	1675
1996	502	100	2181

(Data: Cultural Changes, Social and Cultural Planning Office (SCP), author's calculations)

Table B.3 Descriptive statistics of dependent variable, individual and national characteristics

	Min.	Max.	Mean	SD
Dependent variable				
Depressive symptoms (Ln (Depsym) * 100)	606.36	669.01	619.75	20.56
Individual characteristics				
Educational attainment	1	7	3.42	1.89
Income	1	5	3.08	1.32
Church attendance	1	5	2.17	1.57
Gender	0	1	0.55	0.50
Age	18	74	42.56	15.66
Size of municipality	0	7	3.61	1.66
National characteristics				
Period characteristics				
Unemployment level (%)	2.80	16.90	7.46	3.12
Change in unemployment level	1.29	3.55	2.06	0.85
Secularisation (%)	14.80	77.60	50.75	15.04
Individualisation	1.92	4.76	2.91	1.06
Cohort characteristics				
Unemployment level (%)	0.52	9.98	3.37	2.75
Secularisation (%)	0.44	76.00	21.13	14.21
Individualisation	1.01	5.51	3.09	1.25

Proportions of total sample in various categories

Educational level		**Marital Status**	
Primary education	15.0	Married	68.1
Lower vocational training	29.0	Divorced	4.5
Secondary Modern School	11.0	Widowed	6.1
Middle secondary	17.2	Never married	21.2
Higher-level secondary Education	8.9	**Denominations**	
Secondary scientific training/ higher vocational training	10.2	Non-religious	22.3
Academic/University	8.8	Apostates from Catholic Church	12.7
		Apostates from Dutch Reformed	8.2
		Apostates from Dutch Re-reformed	3.1
Income		Apostates from other religion	1.7
Lowest category	14.2	Church member (any denomination)	42.3
Below mean category	20.8		
Above mean category	27.8	**Church attendance**	
Highest Category	17.3	Never	55.4
Missing	19.9	Less than once a month	14.3
		Monthly	6.3
Socio-economic position		Once in two weeks	5.4
Participating in labour market	42.4	Once a week or more often	18.7
Dependent on social security	9.1		
Pupils, students	5.3	**Cohort**	
Housewives/househusbands	32.1	Born between 1901-1929	25.6
Retired	8.5	Born between 1930-1940	16.3
		Born between 1941-1955	34.2
		Born between 1956-1966	18.7
		Born between 1967-1978	5.3

(Data: Cultural Changes, Social and Cultural Planning Office (SCP), author's calculations)

Table B.4 Correlations of dependent variable and national characteristics

	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**
a Depressive Symptoms (Ln (dep_sym) * 100)	1.00							
b Unemployment (period)	.05*	1.00						
c Unemployment (cohort)	.02*	.09**	1.00					
d Change unemployment (period)	.03*	.27**	-0.00	1.00				
e Secularisation (period)	.05*	-.03*	.05*	-.15**	1.00			
f Secularisation (cohort)	.03*	-.14**	.16**	-.13**	.75**	1.00		
g Individualisation (period)	.01	.17**	.15**	-.14**	.38**	.19**	1.00	
h Individualisation (cohort)	-.03*	.19**	.07**	-.18**	.13**	.43**	.34**	1.00

** p < 0.01, * p < 0.05, ~ p <0.10

Appendix C

Table C.1 Descriptive statistics of the dependent and independent variables

	N	Min.	Max.	Mean	SD
GHQ-LOG (Ln (GHQ-28_dep) * 100) Depressive symptomatology	1798	138.63	277.26	164.23	32.69
CESD-LOG (Ln (CES-D_dep) * 100) Depressive mood	1796	179.18	317.81	239.68	33.04
Educational attainment	1811	1	9	5.08	2.28
Income (5,3% missing)	1718	1	9	6.06	2.00
Current church attendance	1813	1	4	2.06	0.95
Previous church attendance	1813	1	4	3.27	1.12
Age	1813	18	75	45.63	13.96
Urbanisation	1811	1	5	3.69	1.42

(Data: NHA-2 study; valid cases N=1,798)

Table C.2 Descriptive statistics of dynamic characteristics

Intra-generational economic mobility			Inter-generational economic mobility		
	N	Percentage		N	Percentage
No change	1373	75.7	Equal occupational class as father	276	15.2
Recently	147	8.1	Downward economic mobility	312	17.2
Less recently	293	16.2	Upward economic mobility	508	28.0
			Not employed	717	39.5
Total	1813	100.0	Total	1813	100.0

(Data: NHA-2 study; valid cases N=1,798)

Social Position			Cultural position		
	N	Percentage		N	Percentage
No change	1366	75.3	Church member	929	51.3
Recently	219	12.1	Recent apostates	395	21.8
Less recently	228	12.6	Less recent apostates	489	26.9
Total	1813	100.0		1813	100.0

(Data: NHA-2 study; valid cases N=1,798)

Table C.3 Control variables

Familial Psychopathology			**Unfavourable childhood circumstances**		**Chronic Illness**		**Random Stressor**		
	N	**Percent**	**N**	**Percent**	**N**	**Percent**		**N**	**Percent**
No	1592	87.8	1691	93.3	1433	79.1	Never	1244	68.6
Yes	221	12.2	122	6.7	378	20.9	Recently	214	11.8
							Less recently	355	19.6
Total	1813	100.0	1813	100.0	1813	100.0		1813	100.0

(Data: NHA-2 study; valid cases N=1,798)

Appendix D

Table D.1.1 Descriptive statistics of the dependent and independent variables

	N	Min.	Max.	Mean	SD
GHQ-LOG (Ln (GHQ-28_dep) * 100) Depressive symptomatology	1654	138.63	272.26	164.01	32.56
Educational attainment	1654	1	9	5.13	2.30
Income	1654	1	9	6.05	2.01
Current church attendance	1654	1	4	2.04	.96
Previous church attendance	1654	1	4	3.02	.98
Gender	1654	0	1	.55	.50
Age	1654	18	75	45.63	13.95

(Data: NHA-2 study; valid cases N=1,654)

Table D.1.2 Descriptive statistics of dynamic individual characteristics

Change in economic position			Change in social position		Change in cultural position		
	N	Percent	N	Percent		N	Percent
No change	1239	74.9	818	49.5	No change	1171	70.8
Recent change	142	8.6	188	11.4	Recent apostates	188	11.4
Less recent change	273	16.5	648	39.2	Less recent apostates	648	12.5
Total	1654	100.0	1654	100.0		1654	100.0

(Data: NHA-2 study; valid cases N=1,654)

Table D.2 Descriptive statistics of static and dynamic neighbourhood characteristics

Static neighbourhood characteristics				Disadvantaged economic neighbourhood conditions		Disadvantaged social neighbourhood conditions	
	Min.	Max.	Mean		N	Percent	N	Percent
Index disadvantaged economic conditions	-1.90	2.40	.12	Stable	1262	76.3	1110	67.1
Proportion of single-person households	8.00	70.00	27.57	Decrease	135	8.2	232	14.0
Level of non-religious affiliation	1.00	8.00	5.00	Increase	257	15.5	312	18.9
Residential mobility	.00	1.00	.76	Total	1654	100.0	1654	100.0

Table D.3.1 Descriptive statistics of subjectively perceived economic distress

	Percentages			Correlations			
	Never	**Some times**	**Often**	**1**	**2**	**3**	**4**
1 Do you fear economic disadvantage in the near future?	61.7	31.0	7.3	1.00			
2 Do you fear that you can afford less luxury?	56.5	36.9	6.6	.61**	1.00		
3 Does the total household income allow you to cover your expenses in a satisfactory way?	62.8	31.3	5.9	.56**	.64**	1.00	
4 Are you afraid that you might have to change your current lifestyle?	70.6	25.8	3.7	.48**	.46**	.46**	1.00
Cronbach's alpha 0.81				** p < 0.01			

(Data: NHA-2 study; valid cases N=1,654)

Table D.3.2 Descriptive statistics of subjectively perceived neighbourhood disadvantage

	Percentages			Correlations	
	Never	**Some times**	**Often**	**1**	**2**
1 Are you worried about possible residential mobility of people with lower SES to your neighbourhood	92.6	6.0	1.5	1.00	
2 Are you worried about socio-economic decay in your neighbourhood?	87.5	10.2	2.3	.52**	1.00
Cronbach's alpha 0.68				** p < 0.01	

(Data: NHA-2 study; valid cases N=1,654)

Table D.3.3 Descriptive statistics of subjectively perceived social isolation

	Percentages			Correlations					
	Never	**Some times**	**Often**	**1**	**2**	**3**	**4**	**5**	**6**
1 I wish I had a really close friend	83.8	7.8	8.4	1.00					
2 I experience a sense of emptiness around me	83.6	10.1	6.4	.47**	1.00				
3 I feel I am a prisoner in my own home	84.6	10.1	5.3	.42**	.63**	1.00			
4 I feel my circle of friends and acquaintances is too limited	81.4	10.3	8.3	.38**	.37**	.42**	1.00		
5 I miss having people around me	85.7	7.4	6.8	.44**	.56**	.65**	.48**	1.00	
6 I often feel rejected	87.9	8.1	4.2	.42**	.56**	.50**	.38**	.49**	1.00
Cronbach's alpha 0.84				** p < 0.01					

Table D.4 Correlations of individual, contextual and intervening variables

	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**
a Depressive symptoms (Ln (GHQ-28_dep) * 100)	1.00									
b Index disadvantaged economic neighbourhood conditions	.12**	1.00								
c Proportion of single-person households	.01	.51**	1.00							
d Level of non-religious affiliation	-.06~	.26**	-.28**	1.00						
e Change in economic neighbourhood conditions	.07*	-.38**	-.23**	.18**	1.00					
f Change in proportion of single-person households	.05~	.14**	.17**	.22**	.01	1.00				
g Residential mobility	-.03	.19**	.26**	-.06*	-.19**	-.09**	1.00			
h Perception of economic distress	.26**	.12**	.01	.08*	.01	.05~	-.04	1.00		
i Perception of social isolation	.33**	.02	.08*	.04*	.04	-.01	.01	.18**	1.00	
j Perception of neighbour-hood disadvantage	.12**	.05*	.03	.05*	.06*	.01	.06*	.20**	.15**	1.00

(Data: NHA-2 study; valid cases N=1,654)

Samenvatting

(Summary in Dutch)

Inleiding

Epidemiologisch onderzoek heeft veelvuldig aangetoond dat depressieve symptomen relatief hoge prevalenties hebben in de algemene populatie. Daarnaast heeft onderzoek gebaseerd op sociologische onderzoekstradities zoals stratificatie en cohesie, consistente bevindingen laten zien van de verbanden tussen sociale factoren en depressieve symptomen in de algemene bevolking (Aneshensel & Phelan 1999; Brown & Harris 1978; Durkheim 1897/1951; Horwitz & Scheid 1999; Mirowsky & Ross 1989). Een lacune in deze studies wordt gevormd door een gebrek aan expliciete en systematische theorievorming over de verbanden tussen diverse sociale factoren en depressieve symptomen. In deze studie, beogen we een verbetering c.q. systematische uitbreiding van eerder onderzoek, door een theoretische synthese aan te brengen in de relatie tussen sociale factoren en depressieve symptomen. Dit is gedaan aan de hand van de theorie van Sociale Productie Functies (SPF-theorie) (Ormel et al. 1997, 1999). Deze theorie vormt een geschikt theoretisch model om op een systematische manier theoretische proposities te formuleren en hypothesen af te leiden over de verbanden tussen diverse sociale factoren en de mate van depressieve symptomen in de algemene bevolking. SPF-theorie stelt dat mensen streven naar het bereiken van psychologisch welbevinden. Dit wordt nagestreefd met diverse hulpbronnen waarover mensen beschikken en die ze inzetten om instrumentele doelen te verwezenlijken en behoeften te bevredigen. De sociale posities die mensen innemen in de samenleving beschouwen we als diverse type hulpbronnen zoals economische, sociale en culturele hulpbronnen, welke nodig zijn om het uiteindelijke doel van psychologisch welbevinden te bereiken. SPF-theorie stelt dat indien men bepaalde instrumentele doelen niet kan bereiken of niet naar behoren kan verwezenlijken door een gebrek aan of een lager niveau van hulpbronnen, mensen een verminderd psychologisch welbevinden ervaren. In deze studie beschouwen we depressieve symptomen als een gebrek aan psychologisch welbevinden.

Deze theoretische uiteenzetting van de effecten van hulpbronnen op depressieve symptomen is een geschikt theoretisch kader om verschillen in het niveau van hulpbronnen, alsook diverse type hulpbronnen waar mensen over beschikken, te onderscheiden. Vervolgens trachten we met verschillen in het niveau van hulpbronnen de mate van depressieve symptomen te verklaren. In deze studie onderscheiden we diverse hulpbronnen zoals economische hulpbronnen (sociaal-economische positie, inkomen, opleidingsniveau), sociale hulpbronnen (burgerlijke staat, huishoudsamenstelling, sociaal netwerk) en culturele hulpbronnen (religiositeit, kerklidmaatschap en kerkgang). De centrale en algemene theoretische propositie in deze studie is: *een lager niveau van economische, sociale en culturele hulpbronnen is bepalend voor depressieve symptomen.*

Deze algemene propositie is verder uitgewerkt aan de hand van diverse perspectieven en empirische bevindingen. Dit heeft ertoe geleid dat we in dit boek een theoretisch en conceptueel kader hebben ontworpen, waarvan hypothesen over verschillende indicatoren voor diverse hulpbronnen zijn afgeleid. De verschillende perspectieven zijn: een longitudinaal perspectief, een statisch en dynamisch perspectief, een contextueel perspectief en een verklarend perspectief. In hoofdstuk 1 zijn deze perspectieven geïntroduceerd en theoretisch uitgewerkt met eerdere bevindingen en de eerder genoemde centrale en algemene theoretische propositie.

Een tekortkoming in empirisch onderzoek naar de relatie tussen sociale factoren en depressieve symptomen met name in Nederland, is het gebrek aan studies die gebruik maken van grootschalige data die representatief zijn voor de algemene populatie. Eerder onderzoek is vooral gedaan onder specifieke subpopulaties zoals ouderen, werkelozen, vrouwen, gescheiden vrouwen, maar ook onder patiënten en cliënten van zorginstellingen en huisartspraktijken. Een tekortkoming van deze studies die geen gebruik maken van populatiebrede steekproeven, is een beperkte generaliseerbaarheid van empirische bevindingen naar de gehele samenleving. Daarnaast zijn er wel studies die gebruik maken van representatieve steekproeven, maar zich voornamelijk richten op prevalentie- en co-morbiditeits cijfers van specifieke psychische stoornissen waaronder depressieve symptomen, om op deze manier de zorgbehoefte en het zorggebruik van de populatie in kaart te brengen (Bijl et al. 1998a, 1998b; Hodiamont 1986). Een gebrek aan geschikte gegevens uit de algemene populatie, heeft tot nu toe een meer systematische onderzoek naar de relaties tussen sociale factoren en depressieve symptomen beperkt.

Grootschalig empirisch onderzoek van diverse indicatoren van economische, sociale en culturele hulpbronnen kan bijdragen aan het aantonen van de sociale determinanten van depressieve symptomen in de algemene bevolking. In dit boek hebben we dan ook gebruik gemaakt van cross-sectionele steekproeven van de algemene volwassen bevolking van Nederland. Ondanks dat deze data niet expliciet verzameld zijn voor de doelen van deze studie, bevatten ze gegevens over diverse indicatoren voor economische, sociale en culturele hulpbronnen welke een multifactoriële sociale benadering mogelijk maakt. In hoofdstuk 3 is gebruik gemaakt van grootschalige nationale data uit de periode 1975 tot 1996, van het Sociaal Cultureel Planbureau. Het gaat om bestanden verzameld in diverse jaren in het kader van het project 'Culturele Veranderingen in Nederland'. Ook gebruiken we diverse tijdsreeksen van het Centraal Bureau van de Statistiek. Deze data zijn gebruikt als indicatoren voor sociale processen op nationaal niveau zoals secularisering, werkeloosheid en individualisering. In hoofdstuk 2 en 4 is gebruik gemaakt van een regionaal databestand verzameld door de afdeling Sociale Geneeskunde van het UMC St. Radboud te Nijmegen in het kader van het 'Regioproject Nijmegen: psychiatrische morbiditeit in de regio, deel 2' (König-Zahn et al. 1999). Dit cross-sectionele survey is gehouden in 1998 onder een steekproef van ongeveer 1800 personen in de leeftijd tussen 18 en 75 jaar wonend in diverse gemeentes in de regio Nijmegen. Daarnaast hebben we in hoofdstuk 5 gebruik gemaakt van deze dataset aangevuld met data van diverse buurtkenmerken van gemeentes in de regio Nijmegen, afkomstig van het Centraal Bureau van de Statistiek.

In hoofdstuk 2 is de conceptualisering en operationalisering van depressieve symptomen in eerdere studies beschreven en bediscussieerd. We geven een theoretische en empirische verantwoording met behulp van de epidemiologische en klinische literatuur voor de keuze van het specifieke concept van depressieve symptomen in dit boek. Ook formuleren we diverse criteria waaraan een dimensionaal instrument van depressieve symptomen toepasbaar in de

algemene populatie, dient te voldoen. Deze criteria (conceptuele afbakening, validiteit en betrouwbaarheid) toetsen we vervolgens empirisch met diverse analyses zoals principale factor analyses en betrouwbaarheidsanalyses.

Gebaseerd op de evaluatie van deze criteria kiezen we in deze studie voor twee metrische schalen van depressieve symptomen. Een meetinstrument gebaseerd op de General Health Questionnaire (GHQ) (Goldberg & Hillier 1979), vormt een operationalisering van depressieve symptomatologie en refereert aan een depressief syndroom: een complex van intense symptomen zoals gevoelens van waardeloosheid, hopeloosheid, concentratieproblemen en problemen in het dagelijks functioneren. Een tweede meetinstrument in deze studie is gerelateerd aan een depressieve stemming en vergelijkbaar met de veelvuldig gebruikte en gevalideerde meetschaal van de Centre of Depression Scale. (CES-D) (Radloff 1977; Mirowsky & Ross 1983, 1989). Hierbij gaat het om symptomen zoals zich depressief voelen, somberheid, verdrietig zijn, neerslachtig zijn en een gebrekkige beleving van interesse en plezier aan dagelijkse dingen.

Een longitudinaal perspectief

In hoofdstuk 3 bestuderen we vanuit een longitudinaal perspectief de mate van depressieve symptomen in Nederland. Eerdere buitenlandse onderzoeken in diverse landen laten longitudinale veranderingen zien in de mate van depressieve symptomen in de algemene populatie. Sommige landen laten een toename zien van depressieve symptomen, anderen fluctuaties over de tijd, terwijl sommigen landen ook periode- en cohort effecten hebben aangetoond, gerelateerd aan sociaal-culturele ontwikkelingen in de samenleving.

In Nederland is echter nog maar weinig onderzoek gedaan naar het longitudinaal verloop van depressieve symptomen in de samenleving. Dit heeft geleid tot de eerste onderzoeksvraag van deze studie: *Wat is de longitudinale trend van depressieve symptomen in de periode van 1975 tot 1996 in Nederland?*

Uit de analyses van circa 16.000 respondenten blijkt dat het longitudinaal verloop van depressieve symptomen in Nederland een sterk fluctuerend beeld laat zien, met name in de jaren tachtig. Dit patroon is vergelijkbaar met cijfers over zelfmoord in de Nederlandse samenleving over dezelfde periode. Ondanks het feit dat men een continue toename van depressieve symptomen veronderstelt, veelal gebaseerd op cijfers van zorginstellingen en de publieke opinie, worden deze veronderstellingen niet met de bevindingen van deze studie ondersteund.

Verder onderzoeken we in hoofdstuk 3 welke sociale factoren met depressieve symptomen samenhangen, of deze verbanden over de tijd heen veranderen en of er sprake is van man-vrouw verschillen in deze verbanden. De tweede onderzoeksvraag luidt: *In welke mate hebben economische, sociale en culturele hulpbronnen effecten op de mate van depressieve symptomen in de periode 1975-1996, veranderen deze effecten over de tijd en welke verschillen tussen mannen en vrouwen doen zich in deze effecten voor?*

De empirische resultaten laten zien dat mensen met een laag inkomen, mensen afhankelijk van sociale zekerheid, en mensen die enkel een huishouden voeren, in sterkere mate depressieve symptomen vertonen vergeleken met mensen met een hoger inkomen en mensen die betaalde arbeid verrichten. De analyses laten eveneens zien, dat over de tijd heen, de mate van depressieve symptomen onder mensen met een lager inkomen is toegenomen vergeleken met mensen met een hoger inkomen.

Daarnaast blijkt dat mensen die gescheiden of verweduwd zijn, of nooit getrouwd geweest zijn (alleenstaanden), in sterkere mate depressieve symptomen te vertonen. Ook blijkt dat over de

tijd heen, de mate van depressieve symptomen onder mensen die gescheiden zijn is afgenomen vergeleken met gehuwde mensen. Eveneens is gebleken dat over de tijd heen, de mate van depressieve symptomen onder mensen die alleenstaand zijn is toegenomen vergeleken met gehuwde mensen.

Met betrekking tot religiositeit en kerkgang blijkt dat mensen die zelden naar de kerk gaan en mensen die zichzelf niet langer als kerkelijk beschouwen, c.q. kerkverlaters, in sterkere mate depressieve symptomen vertonen dan mensen die vaker naar de kerk gaan en respectievelijk kerkleden. Ook blijkt dat vrouwen in sterkere mate depressieve symptomen vertonen dan mannen, en dat kerkgang en een hoger opleidingsniveau vrouwen meer beschermen tegen depressieve symptomen vergeleken met mannen.

Een laatste onderzoeksvraag welke in hoofdstuk 3 aan de orde komt betreft de effecten die ontwikkelingen in de samenleving zoals werkeloosheid, secularisering en individualisering hebben op de mate van depressieve symptomen. Deze macro kenmerken zijn nog maar zelden met grootschalige longitudinale databestanden simultaan getoetst. Aan de hand van aanvullende tijdreeksen van het Centraal Bureau van de Statistiek was het mogelijk om periode en cohort effecten van nationale omstandigheden empirisch te toetsen. De onderzoeksvraag luidt: *In welke mate hebben hulpbronnen op nationaal niveau (periode en cohort kenmerken), effecten op depressieve symptomen in de periode 1975-1996 in Nederland?*

Uit de analyses blijkt een significant periode-effect van werkeloosheid en een significant periode-effect van een sterke verandering (toename) in werkeloosheid op de mate van depressieve symptomen in Nederland. Ook blijkt een significant cohort effect van individualisering, hetgeen betekent dat een grotere mate van individualisering in de socialisatieperiode resulteert in een mindere mate van depressieve symptomen in het latere leven.

Een statisch en een dynamisch perspectief

In hoofdstuk 4 hebben we depressieve symptomen in de algemene bevolking onderzocht vanuit een statisch en een dynamisch perspectief. Bestaand onderzoek naar levensgebeurtenissen en depressieve symptomen laat een beperkte theoretische uitwerking zien van diverse type levensgebeurtenissen gerelateerd aan sociale factoren. In dit hoofdstuk gaan we uit van specifieke levensgebeurtenissen gerelateerd aan negatieve sociale veranderingen die in termen van een afnemend niveau van hulpbronnen, effecten hebben op de mate van depressieve symptomen. Hierbij veronderstellen we eveneens dat de termijn een rol speelt waarbinnen deze veranderingen hebben plaatsgevonden. De centrale onderzoeksvraag in dit hoofdstuk luidt: *In welke mate heeft een afnemende niveau van hulpbronnen effecten op depressieve symptomen, naast een lager niveau van hulpbronnen?*

Uit de multi-variate regressie analyses waarin alle indicatoren van statische en dynamische economische, sociale en culturele hulpbronnen simultaan zijn getoetst, is gebleken dat mensen welke een recente negatieve verandering in hun economische situatie hebben meegemaakt (*intra*-generationele economische mobiliteit zoals het verliezen van hun baan, geen geschikte baan vinden en financiële problemen), in sterkere mate depressieve symptomen vertonen dan mensen die niet of niet recent zulke verandering hebben meegemaakt. Ook is gebleken dat een afname van sociale hulpbronnen, zoals problemen in het sociale netwerk welke recentelijk hebben plaatsgevonden, de mate van depressieve symptomen beïnvloedt.

Daarnaast besteden we in dit hoofdstuk aandacht aan de vraag of deze effecten van statische en dynamische aspecten van hulpbronnen voor mannen en vrouwen verschillen. Uit de

analyses is gebleken dat mannen die negatieve *inter*-generationele economische mobiliteit meemaken (mensen met een lagere beroepsstatus vergeleken met hun vader), vergeleken met vrouwen, in sterkere mate depressieve symptomen vertonen. Ook blijkt dat vrouwen die negatieve veranderingen in hun sociale netwerk ervaren, een sterkere mate van depressieve symptomen vertonen, vergeleken met mannen.

Ook presenteren we in hoofdstuk 4 empirische bevindingen omtrent processen van sociale selectie en sociale causatie. Aan de hand van statusverwervings-modellen toetsen we in hoeverre moeilijke omstandigheden in de jeugd van de respondent, psychische problemen van de ouders van de respondent, alsook het niveau van sociale en economische hulpbronnen van de ouders, een effect hebben op het huidige niveau van hulpbronnen van de respondent en vervolgens op de mate van depressieve symptomen. Overeenkomstig met eerder onderzoek, wijzen de empirische bevindingen in het algemeen in de richting van sociale causatie processen van depressieve symptomen en minder in de richting van processen van sociale selectie.

Een contextueel perspectief

De invloed van de sociale context zoals kenmerken van wijken, buurten, steden en landen op depressieve symptomen is een belangrijk onderwerp in sociologisch en epidemiologisch onderzoek. Dit onderzoek is gefundeerd in de benadering van 'places matter' en blijkt cruciaal in het verklaren waarom de mate van depressieve symptomen verschillen tussen mensen die wonen in specifieke contextuele omstandigheden. Omdat men zich in eerder onderzoek op afzonderlijke aspecten van de sociale context richtte, zijn in deze studie diverse aspecten van de sociale context in één theoretisch model geïntegreerd en aan de hand van diverse hypothesen empirisch getoetst.

In dit boek is de buurt als indicator voor de sociale context bestudeerd. Naast de statische kenmerken van het niveau van hulpbronnen in een buurt, is ook aandacht besteed aan dynamische buurtkenmerken, de veranderingen die een buurt over een periode van 5 jaar ondergaan heeft in termen van economische, sociale en culturele hulpbronnen. De centrale onderzoeksvraag in hoofdstuk 5 luidt: *In welke mate heeft een lager niveau van hulpbronnen in de buurt en een afnemend niveau van hulpbronnen in de buur effecten op depressieve symptomen, naast individuele statische en dynamische hulpbronnen?*

De statistische analyses zijn gedaan met behulp van multi-niveau analyse gebaseerd op 1.654 respondenten (niveau 1) en 54 buurten (niveau 2). De resultaten van de simultane schattingen van effecten van alle individuele en contextuele kenmerken samen, laten een sterk significant effect zien van het niveau van economische hulpbronnen in een buurt op de mate van depressieve symptomen. Hoe lager de sociaal-economische positie in een buurt, hoe sterker de mate van depressieve symptomen. Daarnaast is gebleken dat in buurten waar de sociaal-economische positie verbeterd is, de mate van depressieve symptomen lager is vergeleken met buurten die geen verandering in hun sociaal-economische positie hebben ondergaan. De analyses laten geen significante effecten zien van sociale en culturele hulpbronnen in de buurt op de mate van depressieve symptomen. Uit de verklaarde varianties van de diverse modellen, kan men afleiden dat deze effecten van buurtkenmerken geen resultaat zijn van de compositie van bewoners van de buurt, maar dat het onafhankelijke directe buurteffecten op de mate van depressieve symptomen betreft.

Een verklarend perspectief

Tot slot behandelen we in hoofdstuk 5 een verklarend perspectief van depressieve symptomen. Er is getoetst in hoeverre subjectieve percepties van stress, de samenhang tussen economische, sociale en culturele hulpbronnen en de mate van depressieve symptomen kunnen verklaren. Deze subjectieve percepties van stress omvatten ervaringen, referenties en attitudes welke mensen op basis van hun individuele posities maar ook op basis van hun sociale omgeving percipiëren. Deze ervaringen kunnen bijdragen aan de verklaring van verschillen in het niveau van hulpbronnen en de mate van depressieve symptomen. Mensen met een lager niveau aan individuele hulpbronnen, maar ook een lager niveau aan hulpbronnen in de buurt, zullen deze posities en situaties als stresserend percipiëren, hetgeen een sterke mate van depressieve symptomen met zich meebrengt. De laatste onderzoeksvraag van dit boek luidt: *In welke mate kunnen de verbanden tussen een lager en afnemend niveau van hulpbronnen en depressieve symptomen, alsook de verbanden tussen een lager niveau en een afnemend niveau van hulpbronnen in de buurt, verklaard worden door subjectieve percepties van stress?*

In multi-niveau analyses zijn naast individuele en contextuele kenmerken diverse indicatoren van subjectieve percepties van stress opgenomen, zoals percepties van economische nood, sociale isolatie en verval in de buurt. De resultaten laten zien dat percepties van economische nood en sociale isolatie een significant positief effect hebben op de mate van depressieve symptomen. Daarnaast is gebleken dat mensen die afhankelijk zijn van sociale zekerheid, mensen met een laag inkomen, mensen die een eenoudergezin leiden, mensen die zelden naar de kerk gaan, en vrouwen, in sterkere mate depressieve symptomen te vertonen vanwege een sterke perceptie van economische nood en sociale isolatie.

Conclusies en discussie

In hoofdstuk 6 van dit boek hebben we de antwoorden op de onderzoeksvragen samengevat en de empirische bevindingen systematisch geëvalueerd. Hierbij worden de resultaten van de diverse indicatoren van statische en dynamische economische, sociale en culturele hulpbronnen op individueel-, buurt- en nationaal niveau vergeleken en beschreven om algemene conclusies te trekken omtrent de beslissende sociale factoren die de mate van depressieve symptomen in de algemene populatie in Nederland bepalen. Wat betreft economische hulpbronnen, concluderen we op basis van vergelijkbare indicatoren op individueel en contextueel niveau, dat de resultaten laten zien dat een lager inkomen, afhankelijkheid van sociale zekerheid, alsook een grote mate van werkeloosheid op nationaal niveau en buurtniveau, een sterke invloed hebben op de mate van depressieve symptomen in de algemene bevolking. Ook intra-generationele economische mobiliteit speelt een belangrijke rol in de mate van depressieve symptomen. Met betrekking tot sociale hulpbronnen concluderen we dat het niet hebben van een partner en het leiden van een éénoudergezin belangrijke sociale determinanten zijn van depressieve symptomen. Ook problemen in het sociale netwerk spelen een belangrijke rol in de mate van depressieve symptomen, met name voor vrouwen. Met betrekking tot culturele hulpbronnen blijkt dat met name kerkgang een belangrijke determinant van depressieve symptomen is. Kerklidmaatschap en kerkverlating laten minder eenduidige resultaten zien indien men de bevindingen van hoofdstuk 3 en 4 vergelijkt. Een relatief gering aantal respondenten zou hiermee te maken kunnen hebben. Voorzichtig kan men concluderen dat kerkverlating positief verband houdt met depressieve symptomen.

Een andere belangrijke conclusie van dit boek is de bevinding dat subjectieve percepties van stress de verschillen tussen bepaalde sociale groepen en de mate van depressieve symptomen verklaren. Een interessante bevinding is eveneens het feit dat deze percepties de verschillen tussen mannen en vrouwen in depressieve symptomen verklaren. Deze subjectieve percepties leveren een relevante bijdrage in het theoretisch en empirisch sociaal-wetenschappelijk onderzoek van depressieve symptomen. In eerder onderzoek bleven percepties vaak een impliciete theoretische factor. Hieraan gerelateerd is echter de beperking van de beschikbare informatie in deze studie omtrent de diverse indicatoren voor subjectieve percepties. Bij perceptie van buurtverval ging het bijvoorbeeld met name om economische factoren in de buurt. In toekomstig onderzoek kan men uitwerken hoe subjectieve percepties op diverse terreinen relevante verklaringen bieden voor verschillen tussen diverse sociale hulpbronnen en depressieve symptomen. Men kan hierbij denken aan de percepties van diverse sociale relaties in de buurt zoals onveiligheidsgevoelens en gebrek aan vertrouwen, maar ook percepties van fysieke kenmerken van de leefomgeving.

Ook op het gebied van inhoudelijke aspecten van religiositeit en de relatie met depressieve symptomen is meer theoretische uitwerking en empirisch onderzoek wenselijk. Aspecten als morele kaders, inhoud van het geloof, zingeving, en sociale steun in moeilijke levensomstandigheden spelen hier mogelijk een rol welke het verband met depressieve symptomen inzichtelijk kunnen maken. Een mogelijkheid, waarmee in dit boek reeds een aanvang is gemaakt, zijn subjectieve percepties van (een gebrek aan) zingevingeskaders welke de relatie tussen kerkelijkheid en kerkgang enerzijds, en depressieve symptomen anderzijds zouden kunnen verklaren. Juist vanwege een voortgaand proces van secularisering in de Nederlandse samenleving lijkt onderzoek naar deze culturele factor van de geestelijke volksgezondheid interessant.

De bevinding in deze studie dat een verbetering in sociaal-economische buurtomstandigheden bepalend is voor de mate van depressieve symptomen, ondersteunen de inspanningen en ontwikkelingen van lokale overheden in het uitvoeren van buurtprogramma's. Vanuit het perspectief van de volksgezondheid lijken deze investeringen lonend op het gebied van preventieve en curatieve maatregelen in de sociale en fysieke leefomgeving en vervolgens op het gebied van gevoelens van leefbaarheid, veiligheidsgevoelens en psychologisch welbevinden van buurt en/of wijkbewoners. Hierin ligt eveneens een aanbeveling voor verder onderzoek om buurtprogramma's systematisch te evalueren met grootschalige gegevens. Het verzamelen van geschikte data en gedetailleerde informatie door gemeentes en zorginstellingen omtrent leefbaarheidaspecten, zoals betrokkenheid en beoordeling van de kwaliteit van de fysieke en sociale leefomgeving door bewoners, alsook demografische en gezondheidssituaties op buurt- of wijkniveau, kunnen hieraan een bijdrage leveren. Bijkomend voordeel zou kunnen zijn dat zulke gegevens gebruikt kunnen worden voor wetenschappelijk onderzoek naar de sociale mechanismen verantwoordelijk voor het psychologisch welbevinden of juist een gebrek hieraan bij bewoners in verschillende typen buurten of wijken.

Samengevat, in dit boek is een multifactoriële sociale benadering gehanteerd om depressieve symptomen in de algemene populatie te bestuderen. Aan de hand van diverse theoretisch uitgewerkte perspectieven, hiervan afgeleide hypothesen en empirische analyses gebaseerd op nationale en regionale data, is gebleken dat deze benadering een vruchtbare exercitie is geweest om de kennis omtrent de invloed van sociale factoren op depressieve symptomen inzichtelijk te maken en uit te breiden. Door op een meer complete en systematische

manier de mate van depressieve symptomen te relateren aan statische en dynamische aspecten van individuele en contextuele economische, sociale, en culturele hulpbronnen, alsook de percepties hiervan, kan men concluderen dat deze studie heeft bijgedragen aan theoretische en empirische vooruitgang in sociaal-wetenschappelijk onderzoek op het gebied van depressieve symptomen in de algemene bevolking.

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Curriculum Vitae

Vivian Meertens was born in Kerkrade, the Netherlands on September 30, 1973. She studied Sociology at the University of Nijmegen, where she received her master's degree in 1998. In September 1998, she started her PhD project at the Interuniversity Centre for Social Science Theory and Methodology (ICS) at the department of Sociology and at the department of Social Medicine, University of Nijmegen. In the autumn of 2001, she participated as a guest researcher in a research project on the 'Use of Community Mental Health Care' at the Netherlands Institute of Mental Health and Addiction (Trimbos-Instituut), Utrecht. In December 2003, she completed this book.

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