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Depressive symptoms in the Netherlands 1975–1996: a theoretical framework and an empirical analysis of socio-demographic characteristics, gender differences and changes over time

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Abstract   This article examines the longitudinal trend of depressive symptoms in the Netherlands, using large-scale national data recorded over the period 1975–1996. Our analyses showed fluctuations in the overall longitudinal trend. On the basis of a general theoretical framework, we formulated hypotheses concerning which socio-demographic characteristics determine the likelihood of suffering from depressive symptoms and how these associations might have changed over time.

   Our results revealed that people on low incomes, unemployed people, unmarried people and those who had given up their church membership were associated with depressive symptoms. Some associations between socio-demographic categories and depressive symptoms have changed over time. Divorced people have become progressively less likely to suffer from depressive symptoms compared with married people, whereas the reverse holds for those who were never married. People on low incomes have become more likely to suffer from depressive symptoms over time in comparison to people with the highest incomes. Gender differences in these associations were also found: educational level and church attendance were more beneficial to women in protecting them from depressive symptoms than they were to men.

Introduction

Since the pioneering work of Brown and Harris (1978) on the social origins of depression, it has been generally acknowledged that the likelihood of suffering from depression is related to social structural factors. Over the past two decades, sociological studies have confirmed the importance of this social approach to depression and made major contributions to the relationship between the social circumstances people live in and the risk of depressive symptoms (Horwitz and Scheid 1999, Tausig, Michello and Subedi 1999)[1]. Consistent empirical evidence for associations between specific, socio-demographic characteristics (marital status, income, religion, age) and depressive symptoms support this social approach (Beaudet 1996, Tausig et al. 1999). Previous research has also shown a consistent gender effect: women are more likely than men to suffer from depressive symptoms (Culbertson 1997).

Several researchers have found variations over time in the prevalence of depressive symptoms and variations between several social groups, as well as a narrowing of the gender effect (Klerman and Weissman 1988, 1989, Lahelma et al. 1999, Murphy 1986). Unfortunately, most results are limited in generalisation to the wider population due to specific sample-based data such as, for example, patients in mental health institutions, community-based samples or samples of particular subpopulations. Furthermore, comparison is rather difficult because results were often based on studies with dissimilar designs, methods, and measurements of mental illness, or were based on different periods of time (Hagnell et al. 1982, Kessler and MacRae 1981, Tausig et al. 1999). An appropriate way to gain more a general insight into the variations in depressive symptoms over time is to use an analogous measurement of depressive symptoms in representative samples of the general population. 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[2].

Social economic variations in self-reported health, as well as explaining over time changes in health inequalities caused by social structural conditions, have been a frequent subject of study in the last decade (Lahelma et al. 2000, Stronks et al. 1996). Most longitudinal research on mental illness, however, is mainly descriptive, and pays little attention to the theoretical implications of the relevance of (changing) social structural factors to explain variations in depressive symptoms over time (Kessler and McRae 1981, Klerman and Weissman 1989, Tausig et al. 1999). For these reasons, several studies have recommended further research into social structural factors related to changing trends in mental illness (Hagnell et al. 1982, Lahelma et al. 1999, Murphy 1986).

In this study, we set out to make a more systematic elaboration of the relationship between social structural factors and depressive symptoms over time in the general population of the Netherlands. More specifically, we

explore theoretical propositions about differences in the tendency to suffer from depressive symptoms related to socio-demographic characteristics. Incidentally, previous research in the Netherlands has shown that female and male social structural circumstances differ fundamentally and have changed over time (Lippe van der and Doorne-Huiskes 1995). We will therefore explore gender differences in socio-demographic characteristics and depressive symptoms in the general population and also over time.

Using large-scale national and longitudinal data, we tested these propositions in the general Dutch population. The research questions in this study were:

1. What was the longitudinal trend in depressive symptoms over the period 1975–1996 in the Netherlands?
2. Which socio-demographic characteristics determine the likelihood of suffering from depressive symptoms in the period 1975–1996 in the Netherlands?
3. Do the socio-demographic characteristics related to depressive symptoms differ for men and women in this period?
4. Do differences in depressive symptoms between specific socio-demographic categories, as also gender differences, change over this period?

Theory and hypotheses

This study initially used the theoretical framework of the Social Production Function Theory (Ormel *et al.* 1997, 1999) as a general starting point in the social approach to mental illness. This theoretical framework incorporates several previous sociological approaches to mental illness. The Social Production Function (SPF) Theory views humans as actively attaining their ultimate goal of 'psychological wellbeing', using different resources to fulfil instrumental goals and universal needs. SPF 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 pleasant living environment) 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. If we consider depressive symptoms to result from a lack of psychological wellbeing, these theoretical notions about the effects of (lower levels of) resources may be a fruitful theoretical approach to explain differences in socio-demographic categories and the likelihood of suffering from depressive symptoms also changes over time. Accordingly, we started with a general proposition that a lower level of resources might induce depressive symptoms. Subsequently, we systematically elaborated on this rather general proposition by formulating more specific propositions. These were based on previous research findings and theoretical approaches to mental illness,

which could be synthesised into this general theoretical model derived from SPF-theory (Ormel *et al*. 1997, 1999).

Economic resources and changes over time

On the basis of our general theoretical proposition, we suggest as a more specific proposition that people with a *lower level of economic resources* are more likely to suffer from depressive symptoms than people with a higher level. People with a lower level of economic resources have fewer financial and material resources with which to fulfil instrumental goals such as status attainment, and consequently less likelihood of achieving psychological wellbeing. In line with research on social stratification and mental illness, three widely-used indicators of economic resources are income, education and socio-economic position (Ortega and Corzine 1990). Consequently, we hypothesised that people with low levels of income or education, and people who depend on social security or solely on their partner's income (the latter category will subsequently be referred to as homemakers) were more likely to suffer from depressive symptoms than people with a high income, a high level of education, and employed people, respectively *(Hypothesis 1)*.

The general socio-economic development of Dutch society between 1975 and 1996 is characterised by an economic boom starting in the mid-1980s (Social and Cultural Planning Office (SCP) 2001). Consequently, people who, in spite of this economic prosperity, still have lower economic resources, *i.e.* still subsist on a low income or who are unemployed, may be subject to greater economic deprivation than in earlier decades, due to the relatively sharp increase in people with higher incomes over this period. We hypothesised that *over time*, the difference in the likelihood of suffering from depressive symptoms between people with a lower income or who depended on social security compared to those with a higher income, or who are employed, has increased *(Hypothesis 2)*.

Social resources and changes over time

The level of social resources available to people depends on their degree of social integration (Turner and Marino 1994). The most powerful indicator of the level of social resources appears to be the presence of an intimate relationship (Hughes and Gove 1981). The lack of this implies a lower level of social resources such as less access to support, advice, security and intimacy. This contributes negatively to instrumental goals such as affection, stimulation and mental comfort, and consequently leads to a lack of psychological wellbeing, *i.e.* depressive symptoms. This is also in line with research on social relationships, social support and illness (Aneshensel and Phelan 1999, House, Umberson and Landis 1988). Consequently, we hypothesised that people who were divorced, widowed or never married were more likely to suffer from depressive symptoms than married people *(Hypothesis 3)*.

One might argue that the composition of married and unmarried (*i.e.* never married, divorced, widowed) people has changed over time in the

Netherlands (SCP 2001). This may provide more options for these people to utilise alternative social resources than in earlier decades. As being divorced or living alone nowadays holds fewer unfavourable stigmas than in earlier times, these people are less likely to encounter social disapproval. Accordingly, we hypothesised that *over time*, the difference in the likelihood of suffering from depressive symptoms between unmarried and married people has decreased *(Hypothesis 4)*.

Cultural resources and changes over time

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 argue that such beliefs give people a feeling of belonging, promote social integration and moreover, offer moral guidance for handling difficulties in life (Koenig 1998). These religious beliefs can be deemed *cultural resources*. A higher level of cultural resources may have powerful psychological consequences and may protect against depressive symptoms (Ventis 1995). People who are less religiously involved or who participate less in a religious community lack or at least have a lower level of cultural resources. Previous research in the Netherlands, based on several rather small cross-sectional (Dutch) community samples of elderly people, has shown that people who give up church membership, *i.e.* apostates, were more likely to suffer from depressive symptoms than those who remained church members (Braam 1999). Consequently, we formulated a more general hypothesis that apostates were more likely to suffer from depressive symptoms than people who remained faithful to their church or denomination, and people who attended church to a lesser extent were more likely to suffer from depressive symptoms than more regular church attenders *(Hypothesis 5)*.

There has been a vast secularisation process in Dutch society (Grotenhuis te and Scheepers 2001). Overall, the number of people who dissociate themselves from religious communities is growing. Those who left their church in the 1990s, *i.e.* recent apostates, may have more opportunities for using alternative resources than those who left their religious group in the 1970s, *i.e.* early apostates (Grotenhuis te and Scheepers 2001). We proposed that recent apostates experienced a less severe decline in cultural resources and were less likely to suffer from depressive symptoms than early apostates. We hypothesised that *over time*, the difference in the likelihood of suffering from depressive symptoms between apostates and people who have remained church attenders has decreased *(Hypothesis 6)*.

Gender differences in economic, social and cultural resources, and changes over time

Previous research shows a consistent gender difference: women suffer more from depression than men (Culbertson 1997). Moreover, some studies have suggested that longitudinal gender inequality in the likelihood of suffering

from depressive symptoms has narrowed because of changes in social and economic conditions (Lahelma *et al*. 1999, Murphy 1986). However, no previous Dutch studies have investigated the longitudinal trend in gender differences in depressive symptoms or the association with (changing) social structural factors. Consequently, we hypothesised that women were more likely to suffer from depressive symptoms in the Netherlands and that this gender effect has changed over time: the difference in the likelihood of suffering from depressive symptoms between men and women has decreased *(Hypothesis 7)*. Based on our theoretical framework we have elaborated on this gender difference, proposing hypotheses about gender differences in the association between (changes in) levels of resources and depressive symptoms.

With regard to *economic resources*, on average, women have traditionally experienced lower educational and occupational levels than men, *i.e.* they had fewer economic resources, particularly in the Netherlands (Blossfeld and Hakim 1997). Also, women are more likely to be economically dependent on their partner (Van Berkel and De Graaf 1998). Consistent with our theoretical propositions we suggest that women with lower economic resources are more likely to suffer from depressive symptoms than men with lower economic resources. Similarly, women with a lower educational level are more likely to suffer from depressive symptoms than their male counterparts. And non-employed women are more likely to suffer from depressive symptoms than employed women, compared respectively to non-employed men who are more likely to suffer 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 (Lippe van der and Doorne-Huiskes 1995). In addition, there has been an increase in the number of Dutch women with a higher level of education and in women who are in paid employment (Blossfeld and Hakim 1997). Working outside the home may have beneficial effects on increasing the level of economic resources. Nowadays, women not in paid employment may view their socio-economic position more negatively than in the past. We hypothesised, therefore, that *over time* the difference in the likelihood of suffering from depressive symptoms between non-employed women and employed women has increased *(Hypothesis 9)*.

Regarding *social resources*, recent studies have shown 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 widowhood, men may have lower levels of social resources and are more likely to experience depressive symptoms than women in a comparable situation. Therefore, we hypothesised that there would be gender differences in the association between marital status and depressive symptoms: the difference in the likelihood of suffering from depressive symptoms between unmarried and married men would be greater compared with the difference between unmarried and married women

(Hypothesis 10). We also expected the difference *over time* between unmarried and married men and women to have decreased *(Hypothesis 11)*.

Regarding the level of cultural resources we suggest that – in general – women are more religiously inclined than men (Grotenhuis te and Scheepers 2001). Previous studies have suggested that women derive positive mental benefit from religious involvement, *i.e.* enjoy a higher level of cultural resources (Mirola 1999). Consequently, we hypothesised that women who attended church to a lesser extent were more likely to suffer from depressive symptoms in comparison to men who attended church less regularly, and that women who had left their denomination, *i.e.* apostates, were more likely to suffer from depressive symptoms than male apostates, when compared to men and women who had 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 hypothesised that *over time*, the difference in the likelihood of suffering from depressive symptoms between male apostates and church-going men, as well as between female apostates and church-going women, has decreased *(Hypothesis 13)*.

Data

An appropriate way to obtain a reliable estimate of the longitudinal trend in depressive symptoms in the Netherlands, and to evaluate differences between socio-demographic categories, is to use representative individual survey data gathered from the population over many years. The Dutch Social and Cultural Planning Office (SCP) has been collecting this kind of survey data as part of its 'Cultural Changes' project. This secondary data contains information on nine national survey samples over the period 1975–1996. Each survey consisted of approximately 1,800 respondents aged between 18 and 70. The samples are broadly representative of the national Dutch population concerning gender, age and marital status, and also the degree of urbanisation (Dekker and Ester 1993).

Dependent variable
Over the years, a similar questionnaire on depressive symptoms has been administered to nine samples of respondents. People were asked whether they were experiencing feelings of loneliness, pointlessness, dejection and discomfort. These symptoms of depression represent the lower case-levels of depression and are reliable indicators of depressive symptomatology in the open population (Horwath *et al*. 1992). The formulation of the items resembles those that appeared in measurement tools developed at a later date, such as the Self Rating Depression Scale (SDS) and the Centre for Epidemiological Studies Depression Scales (CES_D). These measurements are based on self-report questionnaires which measure depressive symptomatology

in the general population. They appear to be valid and reliable measurements (Radloff 1977, Zung 1965).

We recoded the response categories in such a way that a higher score implied more depressive symptoms. Next, we computed a scale by adding up the scores of the response categories: the higher the score, the more severely the person suffered from depressive symptoms. We standardised the scores by transforming the mean-scale scores so that the general mean over time was X = 500 (SD = 100); scale scores ranged from 400 to 800. Because the frequency distribution of the depression scale showed a significant positive skew, a log transformation was employed. The internal reliability of the scale is sufficient (standardised Cronbachs alpha .64). Appendix 1 contains the exact formulations of the items.

Independent variables
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 time, 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)[3]. The number of missing answers in the dataset was relatively large (20 per cent). To avoid a small effective sample size, we treated these missing data as a separate category in the analyses. *Education level* was measured as the highest level attained by the respondent, ranging from primary education to a university degree. *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 full-time homemakers (male and female), students, pensioners or people dependent upon social security.

The indicator for the level of social resources was 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[4]. *Church attendance* was measured by asking how often the respondent had attended church in the past six months. The answer categories were: never go to church, less than once a month, go to church once a week, and go to church more than once a week.

Church membership and apostasy were ascertained by combining three questions. First, on whether the respondent had been brought up in a religious way. Secondly, on whether s/he still considered her/himself to be a church member. and thirdly, about the denomination to which the respondent felt s/he belonged or which s/he had left: Roman Catholic, Dutch Reformed, Dutch Re-reformed[5]. We distinguished between people who had never been members of a church, people who were still church members 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 0 'man' and 1 'woman'.

As control variables we included cohort and size of the respondent's municipality. Size of the municipality ranged from less than 5,000 inhabitants to more than 400,000 inhabitants. 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 distinguished five birth cohorts: people born before 1929, people born between 1930 and 1940, between 1941 and 1955, between 1956 and 1966 and people born between 1967 and 1978.

Methods

In order to investigate the general longitudinal trend in depressive symptoms in the Netherlands, we performed one-way analyses of variance, and computed the mean scores per year for our dependent variable. The higher the mean score, the higher the level of depressive symptoms (see also the descriptive statistics in Appendix 2).

To answer our second research question about differences between socio-demographic categories that might account for the extent of depressive symptoms over a time span of 21 years, we combined the nine cross-sectional samples into one pooled data set containing 17,283 respondents. We performed Ordinary Least Square (OLS) regression analysis to ascertain mutually adjusted effects of differences between socio-demographic categories and the likelihood of suffering from depressive symptoms. Because 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. Our estimated parameters were non-standardised regression coefficients that had to be compared to the reference category in order to interpret whether a specific category was more or less likely to suffer from depressive symptoms[6]. In accordance with our theoretical propositions, people with a higher level of resources were considered to be the reference category.

To answer our third research question about gender differences, we specified OLS-regression analyses by gender. Separate OLS-regression analyses to unravel gender effects is equivalent to the approach of adding product terms to gender to specify interaction effects. However, specifying such a number of nominal gender variables in our model leads to multicollinearity, which affects the results. We therefore 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: 53)[7]. In this procedure, we were able to test the statistical significance of subgroup differences between men and

women regarding effects of socio-demographic categories and depressive symptoms computing t-values.

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

Results

Figure 1 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.

The mean level of depressive symptoms decreased from 1975 to 1979. It increased from 1979 to 1983, most significantly between 1981 and 1983 (bold line in Figure 1). From 1983 to 1989 the mean level of depressive symptoms decreased significantly, whereas between 1989 and 1991 it increased significantly. Between 1991 and 1996 the mean 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 over the time period being studied, and showed particularly strong variations during the 1980s.
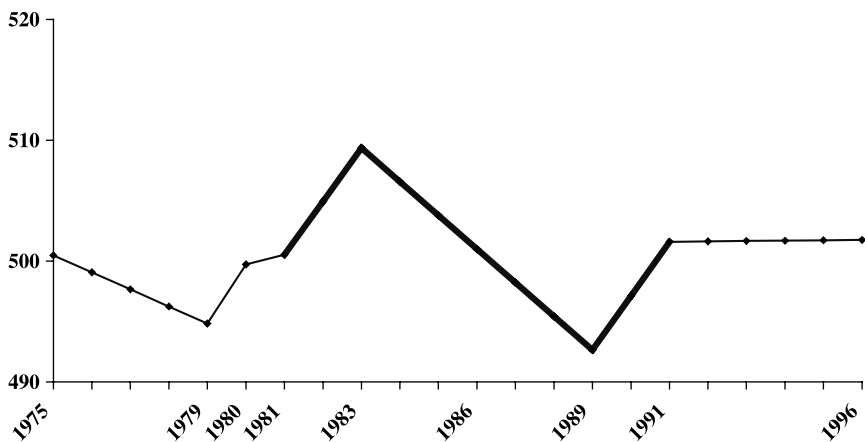
Figure 1 *General trend in depressive symptoms in the Netherlands 1975–1996.* (Bold lines: significant differences in mean scores of depressive symptoms between years of measurement (t > 1,96: p < ,05). Standardised mean scores for depressive symptoms; range from 400 to 800).

OLS regression analyses
In separate models the results of Ordinary Least Square (OLS) regression analysis are presented and reveal the differences between socio-demographic

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

	Model 1		Model 2 Trend (Interaction
	b	*Stand Dev*	*With year (b))*
(Constant)	**612.01**	*0.77*	
Level of Education	0.17	0.09	−.05
Income			
Lowest	**5.98**	0.56	**.24**
Below mean	**2.82**	0.48	.08
Above mean	**1.16**	0.43	−.01
Missing	**1.53**	0.48	.00
(Highest = ref.)			
Socio-economic position			
Student	−0.15	0.72	.01
Housewives/househusbands	**1.29**	0.44	.07
Dependent on social security	**6.77**	0.51	.14
Pensioned off	−0.64	0.59	.02
(Employed = ref.)			
Marital Status			
Divorced	**12.43**	0.69	**−.38**
Widowed	**7.96**	0.64	.01
Never married	**3.18**	0.45	**.11**
(Married = ref.)			
Church membership and apostacy			
Never church member	0.02	0.40	.03
Apostates from Catholic Church	**1.93**	0.48	−.09
Apostates from Dutch			
Reformed Church	**2.13**	0.98	−.08
Apostates from Dutch			
Re-Reformed Church	0.58	0.58	−.03
(Church member = ref.)			
Church attendance	**−0.72**	0.11	.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 *(men = ref.)*	**3.62**	0.37	−.05
Degree of urbanisation	**0.67**	0.09	
Year			−.04
Adjusted R square	*.10*		*.11*

(Data: Cultural Changes (SCP) (N = 17,283) analyses by authors)
(Bold = significant (t > |1.68| p < 0.05)

categories and the likelihood of 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 previously.

Economic resources and changes over time
Model 1 in Table 1 shows, in contrast to our expectations, a positive but not significant estimated coefficient of educational level. The non-standardised regression coefficients of the different income levels were positive and significant[8]. This indicates that people with a lower income were more likely to suffer 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 encounter depressive symptoms. The socio-economic position coefficient was positive and significant for housewives and househusbands, and people who depended on social security: they were more likely to suffer from depressive symptoms than employed people (partially confirming Hypothesis 1).

Model 2 in Table 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) were positive, but do not reach significance[9]. Only the category of people with the lowest income level had a positive and significant parameter. This implies that over time the difference in the likelihood of suffering from depressive symptoms between people on the lowest income level and people on a higher one has increased (partially confirming Hypothesis 2).

Social resources and changes over time
Model 1 in Table 1 shows that all the non-standardised coefficients of the different categories of marital status were positive and significant. People who were divorced, widowed or never married were more likely to suffer from depressive symptoms than people who were married (Hypothesis 3 is supported).

Model 2 in Table 1 shows that the linear interaction effect of the divorced category was negative and significant. This implies that over the years, the difference in the likelihood of suffering from depressive symptoms between being divorced and 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 the likelihood of suffering from depressive symptoms between people who were never married and married people has increased (partially supporting Hypothesis 4).

Cultural resources and changes over time
The positive parameters of church membership and apostasy in Model 1 in Table 1 imply that apostates of the Catholic and Dutch Reformed Church were more likely to suffer from depressive symptoms than people who

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

	Model 1 Men b	St Dev	Model 2 Trend* b	Model 1 Women b	St Dev	Model 2 Trend* b	Model 3 Difference t-value*
(Constant)	*610.52*	*0.99*		*617.36*	*1.21*		
Level of Education	**0.35**	0.11		−0.08	0.14		**2.36**
Income							
Lowest	**5.22**	0.78	.20	**6.22**	0.82	.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		
(Highest = ref.)							
Socio-economic position							
Student	−0.20	0.87		−0.05	1.19		
Housewives/househusbands	−1.01	2.64		**0.99**	0.55		
Dependent on social security	**7.63**	0.60		**6.01**	0.92		
Pensioned off	−0.15	0.69		−0.59	1.33		
(Employed = ref.)							
Marital Status							
Divorced	**11.07**	1.09	−.51	**13.00**	0.92	−.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			−.09			−.11

(Data: Cultural Changes (SCP) Men N = 7,288 Women N = 8,450 analyses by authors)
(Bold = significant (t > |1.68| p < 0.05) (* only significant effects presented)

considered themselves to be members of any Church. The parameter of apostates from the Re-reformed Church was also positive, but not significant. In general, these results show that people who had left their religious community were more likely to suffer from depressive symptoms than those who had remained faithful to their denomination. Church attendance had a significant negative effect: people who went to church less often were more likely to suffer from depressive symptoms than people who went to church more regularly (Hypothesis 5 is supported).

We also hypothesised that in the 1970s, apostates were more likely to suffer from depressive symptoms than those in the 1990s. The coefficients of Model 2 in Table 1 were, as expected, all negative, but not significant. There were no significant linear interaction effects over time in apostates on the likelihood to suffer from depressive symptoms (Hypothesis 6 is refuted).

Control variables
People who lived in large cities were more likely to suffer from depressive symptoms than those living in rural areas. This is consistent with earlier empirical findings (Stern Smith and 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 were less likely to suffer from depressive symptoms than people born between 1930 and 1940. This is consistent with previous research that showed a cohort effect of depressive symptoms in people who were socialised during the Second World War (Klerman and Weisman 1988, 1989).

Gender differences in economic, social and cultural resources and changes over time
As can be seen from the gender effect in Model 1 of Table 1, women were significantly more likely to suffer from depressive symptoms than men. This is consistent with a large number of empirical findings (Culbertson 1997). The linear interaction effect of gender was negative, but not significant (see Model 2 of Table 1) (partial refutation of Hypothesis 7).

In Model 1 of Table 2 we specified the level of resources by gender. The effect of educational level in men was positive and significant. In women, the coefficient for educational level was negative and not significant. According to the significant t-value in Model 3, these findings indicate that the association between educational level and depressive symptoms differs between men and women: women with a higher level of education were less likely to suffer from depressive symptoms than men with a higher level of education.

Socio-economic positions specified by gender showed that women who depended on social security and homemakers were more likely to suffer from depressive symptoms than employed women, *i.e.* the reference category. Men who depended on social security also differed significantly from employed

men: they were more likely to suffer from depressive symptoms. There are no significant differences in this likelihood between men and women according to their socio-economic position[10] (partial confirmation of Hypothesis 8). It also proved that, over time, the difference in the likelihood of suffering from depressive symptoms between non-employed women and employed women has not increased (Hypothesis 9 is not confirmed).

Categories of marital status specified by gender showed that unmarried, divorced or widowed men and women were more likely to suffer from depressive symptoms than married men and women. These effects do not differ between men and women (Hypothesis 10 confirmed).

Model 2 in Table 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 the likelihood of 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 attended church frequently were less likely to suffer from depressive symptoms (Model 1). But female churchgoers were even less likely to suffer from depressive symptoms than males, according to the significant t-value in Model 3. Belonging to a church and apostasy specified by gender 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 reached significance. Female and male apostates from the Catholic Church and male apostates from the Re-reformed Church had a significant positive parameter. In general, these findings imply that there are no differences between men and women who had left their church as far as the likelihood of suffering from depressive symptoms is concerned (Hypothesis 12 is partly confirmed). There were no significant linear interaction effects over time in male and female apostates (Hypothesis 13 is refuted).

With respect to *control variables*, degree of urbanisation and birth cohort, the results do not differ between men and women: both men and women who lived in urban settings were more likely to suffer from depressive symptoms. Also men and women who had been born after 1941 were less likely to suffer from depressive symptoms than men and women born before the Second World War.

Conclusion and discussion

As far as we know, this study is the first to examine longitudinal trends in depressive symptoms in the national population of the Netherlands. We used large-scale national and longitudinal data to examine the extent of depressive symptoms in the general Dutch population during the period 1975 to 1996. This research was limited to the use of secondary data.

In answer to our first research question, we can state that in the Netherlands, the longitudinal course of depressive symptoms in the general population has fluctuated: in the 1980s it showed particularly strong variation. In the Netherlands, some suggest an increase of depressive symptoms based on numbers of general practitioners and community care services. There may, however, be a discrepancy between the extent of depressive symptoms assessed in population studies and statistics on seeking help due to behavioural changes in service utilisation in recent years (Schnabel, Bijl and Hutschemaekers 1991).

Our second research question dealt with differences in socio-demographic categories and the likelihood of suffering from depressive symptoms. We can state that people with *lower levels of economic resources* were more likely to suffer from depressive symptoms than those with higher levels. People with a lower income, people who depended on social security or their partner's income (housewives/househusbands) were more likely to suffer from depressive symptoms than those with a higher income or who were employed. Previous research into the relationship between socio-economic position and depression has shown similar results (Yu and Williams 1999).

We also found a positive relationship between a *lower level of social resources* and the extent of depressive symptoms. People who were divorced, widowed or never married were more likely to suffer from depressive symptoms than married people. These empirical findings are consistent with other studies in which the absence of an intimate relationship had a negative effect on psychological wellbeing (Hughes and Gove 1981).

Our analyses also showed that a *lower level of cultural resources* increased the likelihood of suffering from depressive symptoms: people who did not go to church regularly and people who had abandoned their religion were more likely to suffer from depressive symptoms than regular church goers and faithful church members. These findings are consistent with research into the relation between religiosity and mental illness (Braam 1999, Koenig 1998, Ventis 1995).

Our third research question was about gender differences in specific socio-demographic categories. With respect to *economic resources*, we can conclude that housewives and women who depended on social security suffered 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 and Fujimoto 1994). Men who depended on social security were also more likely to suffer from depressive symptoms when compared to employed men. We found a significant gender difference in the effect of educational level. When this was specified with gender, our results showed that women derived more mental benefit from a higher level of education than men.

With respect to our results on the level of *social resources*, we can conclude that both men and women with a lower level of social resources, *i.e.* women and men who were divorced, widowed or never married, were more

likely to suffer from depressive symptoms than married men and women. There were no differences between men and women in the association between marital status in this respect. This is in line with a former study (Umberson, Chen and House 1996). Regarding *cultural resources* we can conclude that women who attended church regularly derived more mental benefit than men: they were less likely to suffer from depressive symptoms than men. No differences were observed between men and women in the association between apostasy and depressive symptoms.

According to our results, we can conclude that, except for the level of education and church attendance, the association between lower levels of resources and the likelihood of depressive symptoms is similar in both men and women. Although we made gender differences in socio-demographic categories and the tendency to suffer from depressive symptoms more explicit, 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, distress, specific roles and changes in their relationships (Bartley 1999). However, factors other than the social structural factors may also be responsible for the difference in depressive symptoms between men and women (Nazroo, Edwars and Brown 1998). Unfortunately, these issues could not be tested as our data did not contain any information on factors such as social support, household composition, alternative disorders, perceptions of distress and social roles.

Our fourth research question was about longitudinal changes in the differences between specific socio-demographic categories and the likelihood of depressive symptoms. In general, our analyses showed that the difference in the likelihood of suffering from depressive symptoms decreased over time between divorced and married people. Furthermore, it appeared that, over time, people who had never been married were more likely than married people to suffer from depressive symptoms. This might be related to a decline in social resources due to an ongoing individualisation process in Dutch society (Ester, Halman and Moor 1993). Over the years, the propensity for depressive symptoms increased in the lowest income category compared to the higher income category. The latter result contributes to the discussion about growing inequality in income levels and an increasing economic divisions in the population which may become especially relevant to service utilisation and mental health issues in the Netherlands (Schabel *et al*. 1991).

In conclusion we suggest that this study contributes to the filling of a lacuna in sociological and social epidemiological research on longitudinal trends in depressive symptoms in the general population. We examined the relationship between social structural factors and depressive symptoms over time. We derived a number of hypotheses from Social Production Theory (SPF) as this theory appeared to contain certain clues to theoretical propositions on the association between specific social-demographic categories and depressive symptoms. This is in addition to clues which might help explain longitudinal variations in specific socio-demographic categories and

depressive symptoms. On the basis of our results, we conclude that theoretical elaboration of the effects of the level of resources on the likelihood of depressive symptoms has been a fruitful approach. Our results have revealed a consistent pattern in the associations between lower levels of resources and the likelihood of suffering from depressive symptoms. They have also shown that some of these associations change over time. International comparative research, however, should clarify whether temporal trends and longitudinal changes in depressive symptoms are specific to the period investigated or whether they have more general validity.

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Appendices

Appendix 1: *Measurements of depressive symptoms*

Initial items as proposed by Gadourek (1958)	Items of the Centre for Epidemiological Studies Depression Scale (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 time, 2 sometimes, 3 occasionally and 4 most of the time.
Intern consistency: Cronbachs alfa. 64	Cronbachs alfa. 87 (original scale of 20 items)

Appendix 2: *Descriptive statistics*
Means and standard deviations of depressive symptoms in the Netherlands (1975–1996)

Year	Mean	standard deviation	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	98	2181

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

Notes

1   A social approach to mental illness in the general population requires a concept and general measurement of depressive symptomatology which is a good and sensitive psychological barometer for the association with social circumstances (Horwitz and Scheid 1999). Therefore, in this paper, we focused not on major depression or psychiatric cases, but used the concept of depressive symptoms. In order to investigate the influence of social structural factors in the general population we considered depressive symptoms as a continuum from less to severe.

2   Although these data enabled us to study the determinants of longitudinal depressive symptoms, it did not offer opportunities for untangling processes of causation or consequences of depressive symptoms which take place over time. Nevertheless, there is a firm discussion in mental health research of selection and causation processes (Dohrenwend 1992). Some assume that people are 'selected' for poor mental health, *i.e.* they are more likely to suffer from depressive symptoms than others. However, previous research has shown that processes of selection may be more important in the origin of severe mental illness, such as schizophrenia, whereas social causation may play a more important role in the development of less severe disorders such as depressive symptoms (Dohrenwend 1992, Fox 1990). Presumably, selection effects were only marginal to this study.

3   This variable was constructed as follows: first, the ordinal categories of the original variable were given the numerical values 1,2, and so forth. Secondly, for each year we calculated the mean (m) and standard deviation (s) of these values, as well as (m − s) and (m + s). Thirdly, for each year, we recoded the original variable into four ordinal categories whose boundaries are the rounded values of (m − s) and (m + s) respectively. 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 the content.

4   Unfortunately these secondary data did not contain any information on household composition. Therefore, no mutually exclusive categories such as people who were not married, but living together with others, could be distinguished. However, it appeared that this category occurs very marginally in the Dutch population, especially in the 1990s (SCP 2001).

5   There is a growing number of non-Christian religions in the Netherlands. For example, the Islamic tradition is increasing due to large-scale immigration, especially from Indonesia, Morocco and Turkey (Grotenhuis and Scheepers 2001). However, there is only a small representation of these traditions in the Netherlands, especially in the 1970s when data were collected. Because of this marginal representation of non-Christian religions during this era, we left these denominations out of the analyses.

6   Because we use the standardised log transformation of our dependent variable (Log (DepSym) * 100), the interpretation of an unstandardised regression coefficient (b) differs compared to 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.

7   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 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: 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:

$$t = \frac{(b\,(\text{women}) - b\,(\text{men}))}{\text{RSS pooled} * \left[\dfrac{\text{SE b women}}{\text{RSS women}} + \dfrac{\text{SE b men}}{\text{RSS men}} \right]^{1/2}}$$

8   We also performed OLS regression analysis using educational categories as dummy variables. None of the categories, however, reached significance.

9   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.

10 Unfortunately, income as an indicator of the level of economic resources was measured only as the gross household income. Therefore, gender differences in the association between income and the likelihood of suffering from depressive symptoms were marginal where people were living together with a partner.

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