

How is your health in general?

Qualitative and quantitative studies on self-assessed health
and socioeconomic differences herein

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Hoe is in het algemeen uw gezondheid?

Studies naar het enkelvoudig oordeel over de eigen
gezondheid en sociaal-economische
verschillen in dit oordeel

Proefschrift

ter verkrijging van de graad van doctor aan
de Erasmus Universiteit Rotterdam
op gezag van de Rector Magnificus
prof.dr.ir. J.H. van Bommel
en volgens besluit van het College voor Promoties

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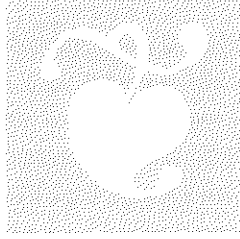
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Summary

What is health?

In the Netherlands, the quality of one's life is largely determined by one's health status. When asking individuals what they consider the most important thing in life, 60 percent choose "good health". But just what is health? Traditionally, in many textbooks health is defined in terms of disease and illness. However, already in 1948 the World Health Organisation abandoned the limited biomedical concept of health, and defined health as "...a state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity". The physical, mental and social dimensions in the WHO definition cover the major aspects of human life and lead to a multidimensional framework for conceptualising health.

The single-item measure of self-assessed health

Measuring perceived health status through the single item "How is your health in general?" has appealed to many researchers. Understandably, as it is an easy to administer, highly reliable measure, with strong predictive validity—self-assessed health is found to be a consistent predictor of mortality. In this global rating the underlying dimensions are not specified; it is the individual's *perception* of his or her health status. Although many studies have been conducted on the single-item measure of self-assessed health, investigators have not yet been able to determine all dimensions which are involved in health-assessments. The process of health assessment is more or less a "black box". We still need to find out which dimensions are involved in answering this question.

Social inequalities in self-assessed health

The existence of social inequalities in health has been consistently demonstrated. The general finding is that as one moves up the social ladder, rates of mortality and morbidity gradually decrease. Self-assessed health is no exception: there is a relationship between SES and the single-item measure of self-assessed health. Individuals from lower socioeconomic groups assess their health more poorly than do individuals from higher socioeconomic groups.

This thesis

In this thesis we present a series of studies which focused on the single-item measure of self-assessed health. Self-assessed health was measured by a single item: “How is your health in general? Is it very good, good, fair, sometimes good and sometimes poor, or poor?”. We investigated which aspects people actually take into consideration when answering this question, and examined differences in the way individuals from different socioeconomic groups tend to answer this question. Socioeconomic status was operationalised through educational level.

Study population

The studies of which we report in this thesis are part of the GLOBE-study. GLOBE –a Dutch acronym for Health and Living Conditions of the Inhabitants of Eindhoven– is a longitudinal study aimed at describing and explaining sociodemographic inequalities in health. In 1991, baseline measurement was performed by postal questionnaire and structured interviews. In 1997, respondents to the baseline measurement were invited to participate in an extensive follow-up study. In 1998, a small group of participants to the 1997 follow-up were asked to participate in an in-depth interview study. Throughout the entire study period, mortality data were obtained from the population register; information on vital status of all participants was obtained between June and October 1998.

Research questions

- 1 Which aspects or dimensions do participants consider when they are asked to assess their health? Do participants from the highest and lowest socioeconomic groups consider the same or different aspects when assessing their health?
- 2 To what extent do socioeconomic differences in the prevalence of objective and subjective health problems, and socioeconomic differences in the perception of and coping with health problems contribute to the explanation of socioeconomic differences in self-assessed health?
- 3 To what extent can the psychological dimension of self-assessed health explain the association between this single-item measure and mortality?

Summary of the findings

In Chapter 2 we presented four theoretical models of health (biomedical, functional, wellbeing, and adaptive). We addressed the role of cognitive processes in health-assessments, and concluded that in studies on self-assessed health, indicators of health status (i.e. constituent elements: biomedical, functional, wellbeing) as well as indicators of the way in which people perceive their situation (i.e. modifying factors/adaptive aspects) should be included. In a narrative review of the empirical literature on self-assessed health, we found that the majority of the studies focused on examining constituent elements of self-assessed health, particularly biomedical aspects. Modifying factors (adaptive aspects) have been given hardly any attention. Based on these findings, we proposed a multidimensional framework that enables researchers a more theory-driven and systematic basis for studying the components of self-assessed health.

In Chapter 3 we present the results of a qualitative study in which we tried to identify the dimensions of self-assessed health. In this study, we asked participants directly which aspects they considered when answering the question “How is your health in general?”. The single-item measure of self-assessed health proved to be a multidimensional concept. A large majority of the participants referred to one or more physical aspects (chronic illness, physical problems, medical treatment, age-related complaints, prognosis, bodily mechanics, and resilience). However, when assessing their health participants also include aspects that go beyond the physical dimension of health. Besides physical aspects, participants considered the extent to which they are able to perform (functional dimension), the extent to which they adapted to, or their attitude towards an existing illness (coping dimension), and simply the way they feel (wellbeing dimension). In our study, health behaviour or lifestyle factors (behavioural dimension) proved to be relatively unimportant in health self-assessments.

In Chapter 4 we investigated whether participants from higher and lower educated groups consider the same or different aspects when assessing their health. In this qualitative study, participants have been asked to assess their health, and to explain their particular response. The main difference between both SES-groups was that lower educated participants emphasised the *presence* of physical and functional problems, whereas higher educated participants emphasised the *absence* of these problems and accentuated feelings of wellbeing. We did not find indications that higher and lower educated participants hold entirely different concepts or definitions of health.

In Chapter 5 we analysed the distinct role of objective health aspects (chronic disease and functional limitations) and subjective health aspects (psychosomatic symptoms and perceived discomfort/ distress) in the explanation of socioeconomic differences in self assessed health. We found that socioeconomic differences in self-assessed health could to a large extent be explained through socioeconomic inequalities in the prevalence of the four types of health problems included in our study. Objective health aspects accounted for a relatively small part of the socioeconomic variability in self-assessed health. Subjective aspects of health accounted for more of the variability.

In chapter 6 we explored whether the way individuals perceive health problems and cope with these problems affects their health self-assessments. We operationalised perception and coping as the interaction between personality traits, coping styles and health variables (chronic disease, somatic symptoms, functional limitations, psychological wellbeing and energy/vitality). As psychological factors (i.e. personality traits and coping styles) vary in their distribution with SES, different socioeconomic groups may perceive their health problems differently. We also investigated whether aspects of perception and coping –in addition to health variables– could explain socioeconomic differences in self-assessed health. Results show that the influence of perception of health problems on self-assessed health is modest. We found that personality traits moderate the relationship between health problems and self-assessed health. We did not find any indication that coping styles moderate this relationship. Although we found just a modest relation

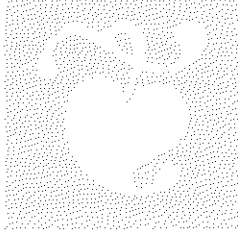
between self-assessed health and aspects of perception and coping, we found that these aspects could be quite meaningful in the explanation of socioeconomic differences in self-assessed health.

In Chapter 7 we describe the results of a study in which we investigated whether, in addition to physical morbidity and risk behaviour, psychosocial factors (social support, psychosocial stressors, personality traits, and coping styles) can further explain the relationship between self-assessed health and mortality. We found that self-assessed health is still strongly associated with mortality, even after controlling for sociodemographic variables, various aspects of health status, and behavioural risk factors. Adding the psychosocial variables to this model did not attenuate the association between self-assessed health and mortality.

In Chapter 8 the main findings of our studies are recapitulated. We found, both in our qualitative and in our quantitative studies, that self-assessed health is a multidimensional concept, and that different aspects are included in this measure. First, self-assessed health includes health problems –i.e. chronic illness, functional limitations, mental health problems (Chapters 3-7). Second, this measure includes positive health –i.e. a sense of wellbeing or vitality, feeling good, feeling fit, energetic (Chapters 3-5). Third, it includes aspects of perception and coping –i.e. adaptation to health problems, primary control or problem-focused coping, secondary control or emotion-focused coping, social comparison, etc. (Chapters 2-4 and 6). However, such psychosocial factors could not further explain the observed relationship between self-assessed health and mortality (Chapter 7). We found that socioeconomic differences in self-assessed health can to a large extent be explained through socioeconomic differences in the prevalence of health problems (Chapters 5 and 6) and personality traits and coping styles. In our qualitative studies, we found that positive health or wellbeing is an important aspect of self-assessed health (Chapter 3), but that lower educated participants barely include such aspects in their health assessments and focus on health problems (Chapter 4). In addition, we got some indications that higher and lower socioeconomic groups use different coping strategies (Chapter 4).

Policy implications

The core message of the final section –on policy implications– is that policy measures should be aimed at the best physical, psychological and sociocultural development of all individuals, irrespective of socioeconomic status. Health policy measures aimed at lower socioeconomic communities, should include primary prevention of health problems, effective primary care, as well as tailor-made life-style intervention programmes. It is, however, probably equally important to strengthen low SES communities with the necessary sociocultural and psychological tools.



Samenvatting

Wat is gezondheid?

In Nederland wordt, net als in veel andere landen, iemands kwaliteit van leven voor een groot deel bepaald door diens gezondheidstoestand. Wanneer aan een groep mensen wordt gevraagd wat zij het belangrijkste vinden in het leven, kiest 60% voor het antwoord “een goede gezondheid”. Maar wat is gezondheid eigenlijk? Van oudsher wordt gezondheid beschreven in termen van ziekte. En dat terwijl de Wereld Gezondheidsorganisatie (WHO) gezondheid al in 1948 omschreef als “... een toestand van fysiek, geestelijk en sociaal welbevinden en niet simpelweg de afwezigheid van ziekte en gebrek.” De fysieke, geestelijke en sociale dimensies in deze definitie zijn de belangrijkste aspecten van het menselijk leven en bieden een multidimensioneel kader om de inhoud van het begrip gezondheid verder te onderzoeken.

De enkelvoudige vraag naar het oordeel over de eigen gezondheid

In veel studies is ervoor gekozen om ervaren gezondheid te meten met behulp van de simpele vraag “Hoe is in het algemeen uw gezondheid?”. Een begrijpelijke keuze: de vraag is eenvoudig toe te passen, is zeer betrouwbaar en heeft een hoge predictieve validiteit. Steeds opnieuw blijkt het enkelvoudige oordeel over de eigen gezondheid namelijk een voorspeller te zijn van mortaliteit, of sterfte. De onderliggende dimensies van deze maat zijn echter niet nader gespecificeerd; het is een subjectieve en persoonlijke inschatting van de gezondheidstoestand. En hoewel er al veelvuldig onderzoek is uitgevoerd naar dit enkelvoudige oordeel over de eigen gezondheid, is men er nog steeds niet in geslaagd om die onderliggende dimensies vast te stellen. Hoe iemand de eigen gezondheid beoordeelt is nog steeds min of meer een ‘black box’, en welke dimensies precies ten grondslag liggen aan het beantwoorden van deze vraag moet nog verder worden uitgezocht.

Sociaal-economische verschillen in het oordeel over de eigen gezondheid

Dat er –ook in Nederland– sociaal-economische gezondheidsverschillen bestaan, is regelmatig aangetoond. Over het algemeen is het zo dat hoe hoger je de ‘sociale ladder’ beklimt, hoe minder vaak je geconfronteerd wordt met ziekte en/of sterfte. Het enkelvoudige oordeel over de eigen gezondheid vormt hierop geen uitzondering: er is een relatie tussen sociaal-economische status (SES) en het oordeel over de eigen gezondheid. Lagere sociaal-economische groepen beoordelen hun gezondheid in het algemeen als minder goed dan hogere sociaal-economische groepen.

Dit proefschrift

In dit proefschrift presenteren we een aantal studies met als het belangrijkste onderwerp van onderzoek het enkelvoudig oordeel over eigen gezondheid. Dit oordeel wordt als volgt nagevraagd: “Hoe is in het algemeen uw gezondheid? Heel goed, goed, gaat wel, soms goed en soms slecht, of slecht?” We bestuderen de aspecten die bij het beantwoorden van die vraag in overweging werden genomen. Ook hebben we onderzocht of personen van verschillende sociaal-economische groepen hierin van elkaar verschillen. SES is in onze studies geoperationaliseerd als opleidingsniveau.

Het onderzoek waarvan in dit proefschrift verslag wordt gedaan maakt deel uit van de GLOBE-studie. GLOBE –Gezondheid en LevensOmstandigheden van de Bewoners van Eindhoven e.o.– is een longitudinale studie naar sociaal-demografische gezondheidsverschillen. In 1991 is de eerste meting gedaan met behulp van schriftelijke vragenlijsten en gestructureerde interviews. In 1997 zijn de deelnemers aan de eerste meting gevraagd om deel te nemen aan een uitgebreide vervolgstudie. Van deze groep is een klein deel vervolgens in 1998 uitgenodigd deel te nemen aan een kwalitatieve studie via diepte-interviews. Gedurende de hele studieperiode zijn sterftecijfers verkregen uit het bevolkingsregister; gegevens over de vitale status van alle deelnemers zijn verzameld in de periode van juni tot oktober 1998.

Onderzoeksvragen

- 1 Welke aspecten of dimensies nemen personen in overweging wanneer ze de eigen gezondheid beoordelen? Denken personen uit de hoogste en laagste sociaal-economische groepen aan dezelfde of aan verschillende aspecten bij het beoordelen van hun gezondheid?
- 2 In welke mate kunnen sociaal-economische verschillen in het vóórkomen van objectieve en subjectieve gezondheidsklachten, en SES-verschillen in de beleving (perceptie) van en het omgaan met (coping) gezondheidsklachten een bijdrage leveren aan de verklaring van sociaal-economische verschillen in het oordeel over de eigen gezondheid?
- 3 In welke mate draagt de psychologische dimensie van het oordeel over de eigen gezondheid bij aan de verklaring van de relatie tussen deze maat en sterfte?

Samenvatting van de bevindingen

In Hoofdstuk 2 introduceerden we vier theoretische gezondheidsmodellen, te weten biomedisch, functioneel, welbevinden en adaptief. We bespreken kort de rol van cognitieve processen in het beoordelen van de gezondheid, en kwamen tot de conclusie dat in studies naar het oordeel over de eigen gezondheid, niet alleen gezondheidsindicatoren (biomedische, functionele gezondheid en welbevinden) maar ook indicatoren van de manier waarop personen met hun situatie omgaan (adaptieve aspecten) zouden moeten worden betrokken. In een overzicht van recente empirische studies naar het oordeel over de eigen gezondheid konden we laten zien dat in de meerderheid van deze studies het zwaartepunt ligt bij het bestuderen van gezondheidsindicatoren, met name biomedische aspecten van gezondheid. Adaptieve aspecten worden in deze studies nauwelijks betrokken. Naar aanleiding van deze bevindingen hebben wij een multidimensioneel, conceptueel onderzoeksmodel voorgesteld; dit om onderzoekers in staat te stellen toekomstige studies naar de

onderliggende dimensies van het oordeel over de eigen gezondheid een wat meer systematische en theorie-gestuurde basis te geven.

In Hoofdstuk 3 presenteren we de resultaten van een kwalitatieve studie waarin we hebben geprobeerd de onderliggende dimensies van het oordeel over de eigen gezondheid te identificeren. We vroegen deelnemers aan het onderzoek rechtstreeks waarop zij het antwoord op de vraag “Hoe is in het algemeen uw gezondheid?” baseerden. Gebleken is dat het oordeel over de eigen gezondheid een multidimensioneel concept is. Een overgrote meerderheid van de respondenten noemde een of meer fysieke aspecten (zoals bijvoorbeeld chronische aandoeningen, lichamelijke klachten, medische behandeling, fysieke weerbaarheid) als belangrijkste reden voor het gekozen gezondheidsoordeel. Maar respondenten noemden ook andere dan fysieke redenen voor hun gezondheidsoordeel. Respondenten verwezen bijvoorbeeld naar de mate waarin ze nog bepaalde handelingen konden verrichten (functionele aspecten), de mate waarin ze zich hadden aangepast aan, of neergelegd bij een bestaande aandoening (aspecten van coping), en sommige respondenten verwezen simpelweg naar het feit dat ze zich goed voelden (welbevinden). In onze studie bleek (on)gezond gedrag of leefstijl van ondergeschikt belang voor het beoordelen van de gezondheid.

In Hoofdstuk 4 hebben we –wederom in een kwalitatieve studie– onderzocht of hoger en lager opgeleide respondenten dezelfde of juist verschillende aspecten in gedachten hebben bij het beoordelen van de eigen gezondheid. Het grootste verschil tussen beide SES-groepen was dat lager opgeleide respondenten meer nadruk legden op de aanwezigheid van fysieke en functionele klachten, terwijl hoger opgeleide respondenten juist de afwezigheid van dit type klachten benadrukten. Bovendien refereerden laatstgenoemden wat vaker aan gevoelens van welbevinden (je goed voelen, fit zijn). We vonden echter geen aanwijzingen dat hoger en lager opgeleide respondenten een totaal verschillende definitie van gezondheid hanteerden.

In Hoofdstuk 5, een kwantitatieve studie, hebben we bestudeerd wat de precieze rol is van objectieve (chronische aandoeningen en functionele beperkingen) en subjectieve gezondheidsaspecten (psychosomatische symptomen en ervaren ongemak/onwelbevinden) in de verklaring van sociaal economische verschillen in het oordeel over de eigen gezondheid. Het bleek dat deze verschillen voor een zeer groot deel verklaard konden worden door sociaal-economische verschillen in het vóórkomen van de vier typen gezondheidsproblemen. Objectieve gezondheidsaspecten droegen maar voor een relatief klein deel bij aan de verklaring van de sociaal-economische variabiliteit in het oordeel over de eigen gezondheid. Subjectieve aspecten konden meer van de variabiliteit verklaren.

In Hoofdstuk 6 hebben we geëxploreerd of de manier waarop respondenten gezondheidsproblemen ervaren (perceptie) en de manier waarop ze ermee omgaan (coping) van invloed is op hun gezondheidsoordeel. In de kwantitatieve analyses hebben we perceptie van en omgaan met gezondheidsproblemen geoperationaliseerd als de interactie tussen persoonlijkheidskenmerken en copingstijlen enerzijds en gezondheidsindicatoren anderzijds (chronische ziekte, lichamelijke symptomen, functionele beperkingen, psychologisch welbevinden en energie/vitaliteit). Bepaalde persoonlijkheidskenmerken en copingstijlen komen vaker voor in de ene sociaal-economische

groep dan in de andere. Hierdoor zouden verschillende SES-groepen gezondheidsklachten wel eens verschillend kunnen ervaren en er verschillend mee kunnen omgaan. We hebben daarom ook onderzocht of indicatoren van perceptie en coping –in aanvulling op gezondheidsindicatoren– sociaal-economische verschillen in het oordeel over de eigen gezondheid zouden kunnen verklaren. Uit de analyses bleek dat persoonlijkheidskenmerken de relatie tussen gezondheidsindicatoren en het oordeel over de eigen gezondheid inderdaad modereerden. Het verband was echter niet erg sterk. Voor wat betreft copingstijlen konden we een dergelijke relatie niet aantonen. Ondanks dat we slechts een beperkte relatie vonden tussen het oordeel over de eigen gezondheid en aspecten van beleving (perceptie) en coping, denken we dat deze aspecten best waardevol zouden kunnen zijn in de verklaring van sociaal-economische verschillen in het oordeel van de eigen gezondheid.

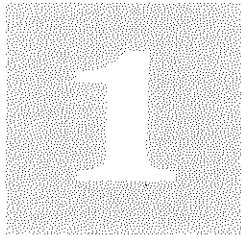
In Hoofdstuk 7 beschrijven we de resultaten van een studie waarin we hebben onderzocht of psychosociale factoren (sociale steun, psychosociale stressoren, persoonlijkheidskenmerken en copingstijlen) de relatie tussen het enkelvoudig oordeel over de eigen gezondheid en sterfte verder konden verklaren. Na correctie voor sociaal-demografische factoren, diverse gezondheidsindicatoren en gedragsfactoren, bleek een minder-dan-goed oordeel over de eigen gezondheid nog steeds sterk samen te hangen met sterfte. De sterkte van dit verband werd niet of nauwelijks verminderd na toevoeging van genoemde psychosociale factoren aan het model.

In Hoofdstuk 8 zetten we de belangrijkste bevindingen nog eens op een rijtje. Zowel uit de kwalitatieve als uit de kwantitatieve studies bleek dat het oordeel over de eigen gezondheid een multidimensioneel concept is en dat verschillende aspecten onderdeel uitmaken van deze maat. Om te beginnen worden in het oordeel over de eigen gezondheid gezondheidsproblemen betrokken, zoals chronische aandoeningen, functionele beperkingen, geestelijke gezondheid (Hoofdstuk 3-7). Daarnaast wordt ook positieve gezondheid in dit oordeel betrokken, bijvoorbeeld een gevoel van welbevinden of vitaliteit, je goed voelen (Hoofdstuk 3-5). Bovendien wordt het oordeel beïnvloed door de manier waarop mensen gezondheidsproblemen ervaren en ermee omgaan (Hoofdstuk 2-4 en 6). Dit soort psychosociale factoren kunnen echter geen verklaring bieden voor het sterke verband tussen een minder-dan-goed gezondheidsoordeel en sterfte (Hoofdstuk 7). We vonden dat de sociaal-economische verschillen in het oordeel van de eigen gezondheid voor een flink deel komt door de sociaal-economische verschillen in het vóórkomen van bepaalde gezondheidsproblemen (Hoofdstuk 5 en 6). Uit onze kwalitatieve studies bleek dat positieve gezondheid ofwel welbevinden een belangrijk aspect is van het oordeel over de eigen gezondheid (Hoofdstuk 3), maar dat lager opgeleiden dergelijke aspecten nauwelijks opnemen in hun oordeel. Lager opgeleiden richten zich daarentegen meer op aanwezige gezondheidsproblemen (Hoofdstuk 4). Bovendien hebben we aanwijzingen gevonden dat hogere en lagere sociaal-economische groepen verschillende coping-strategieën hebben.

Beleidsimplicaties

De kernboodschap van de laatste paragraaf –over beleidsimplicaties– is dat het beleid zich zal moeten richten op een optimale fysieke, psychologische en sociaal-culturele ontwikkeling van iedereen, onafhankelijk van sociaal-economische status. Gezondheidsbeleid dat zich richt op

lagere sociaal-economische groepen (of wijken) zal allereerst gericht moeten zijn op het voorkómen van gezondheidsproblemen in deze groepen. Daarnaast zijn een effectieve eerstelijnszorg, alsmede op maat gemaakte leefstijl-interventies van groot belang. Maar het is waarschijnlijk minstens zo belangrijk om lagere sociaal-economische groepen ook op sociaal-cultureel en psychologisch terrein te versterken.



A general introduction to this thesis

1.1 The concept of health

In the Netherlands, the quality of one's life is largely determined by one's health status. When asking individuals what they consider the most important thing in life, 60 percent choose "good health" (Kooiker & Mootz, 1996). In other countries too, health is considered as an important aspect of overall quality of life, wellbeing or happiness. In a British study using open-ended questions, 44 percent of the respondents mention their own health, or the health of another (close) person as the most important thing in their current lives (Bowling, 1996). In the United States, 46 percent of the respondents identify "good health" as the greatest source of happiness (Barsky, 1988). The fact that health is highly valued by individuals can be illustrated with the following anecdote: "In a classic American study where participants were asked to indicate their values by rank ordering a number of concepts, the researchers had to remove health from the list, because all participants valued health more highly than any other state of being" (cf. Kaplan, 1991).

But just what is health? We checked several dictionaries to find a definition of health, and it seems to be quite difficult to define health unequivocally:

"Health is the state of an organism when it functions optimally without evidence of disease or abnormality" (Stedman's Medical Dictionary)

"Health is the general condition of the body, it is the condition of being sound in body, mind, or spirit; especially freedom from physical disease or pain" (Webster's Dictionary)

"Health is the condition of the body and the extent to which it is free from illness or is able to resist illness, it is a state in which a person is not suffering from any illness and is feeling well" (Cobuild's English Dictionary)

Traditionally, in many textbooks –as in these dictionaries– health is defined in terms of disease and illness. In the post-war years, in an attempt to shift away from this biomedical orientation to health, the World Health Organisation (1948) defined health as "...a state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity". They abandoned the limited biomedical concept of health and suggested a broader view on health (Seeman, 1989; Seedhouse, 1986). The WHO definition is an attempt to focus on wider aspects of human life to show that health is something which is positive and enhancing, and is not just achieved by not being ill and diseased (Blaxter, 1990; Seedhouse, 1986). It has been over 50 years since WHO launched its definition, and many of the textbook definitions are still biomedically oriented.

However, the definition we found in the Encyclopaedia Britannica does reflect the notion that health is dependent upon other dimensions besides the physical dimension –as supported by the WHO definition.

"Health is the extent of an individual's continuing physical, emotional, mental and social ability to cope with his environment". (Encyclopaedia Britannica)

The physical, mental and social dimensions in the WHO definition cover the major aspects of human life and lead to a multidimensional framework for conceptualising health. It was the starting point for a social science-oriented approach to the study of health, which increased the interest in subjective aspects of health (Seeman, 1989). Since then, several multidimensional measures of health status have been developed in which the emphasis is on perceived health status.

1.2 Perceived health status and self-assessed health

Multidimensional measures of perceived health status

Health profiles such as the Nottingham Health Profile (NHP, Hunt, McEwen & McKenna, 1985a), the Short Form-36 (SF-36, Brazier, et al., 1992) have been designed specifically to measure perceived health status. The Nottingham Health Profile (Hunt, McEwen & McKenna, 1985a) consists of six dimensions which are based on interviews with a group of patients with a variety of chronic illnesses. The Short Form-36 (Brazier, et al., 1992) consists of eight dimensions which are based on the WHO dimensions: physical, social and mental health. Considering the differences in the process of selecting the relevant dimensions, and considering the (moderate) overlap between the dimensions in both health profiles following these different types of item selection, the authors seem to have captured at least some basic dimensions of perceived health. There is general consensus that health status measures should be *multidimensional* and should reflect the individual's *subjective experience* of health(iness). However, during the interviews on which these health profiles (NHP, SF-36) are based, respondents were limited to assessing the effects of illness on behaviour, rather than global conceptualisations of health (cf. Bowling, 1991). So, there is no consensus on which health dimensions should be included. This is in fact the main difficulty with health profiles based on a predefined set of dimensions, it is uncertain whether they capture all health domains that are valued by each individual respondent.

Besides such health profiles, in which perceived health status is measured through different dimensions, there is the single-item measure of self-assessed health. This single-item measure may be expressed in many different forms, but in general, individuals are asked to assess their health on a global rating scale, for instance ranging from excellent to poor. The single-item measure of self-assessed health is particularly suitable for measuring perceived health status because in this global rating the constituent dimensions are not specified. It leaves room for the respondent to decide which aspects, either positive or negative, he or she wishes to include in his or her health assessment (Gill & Feinstein, 1994). When this measure is used the measurement of health is automatically individualised, and health status is assessed using the value system appropriate to the individual (Hyland, 1997). Thus, at the individual level the content validity of the single-item measure of self-assessed health is indisputable: it is the individual's perception of his or her health status. An additional feature of this type of health measure is that it is easy to administer and inexpensive to use (Lundberg & Manderbacka, 1996; Goldstein, Siegel & Boyer, 1984). No wonder that this measure has been included in countless studies in the field of health research.

The single-item measure of self-assessed health

The main advantage of the single-item measure of self-assessed health lies in its subjectivity combined with its reliability and strong predictive validity. The reliability of self-assessed health is found to be high, also in comparison with other health measures, with Kappa estimates ranging from good to excellent (Lundberg & Manderbacka, 1996; Fylkesnes & Forde, 1991). Furthermore, the single-item measure of self-assessed health is found to be a strong and consistent predictor of mortality, irrespective of the semantic variations (Table 1.1). In many studies it has been shown that poor self-assessed health increases the mortality risk, even when biomedical and behavioural risk factors have been accounted for; hazard ratios for the “poor health”-category vary from 1.5 to 6.7 (view Idler & Benyamini, 1997 for an excellent review on the subject). This relationship between self-assessed health and mortality indicates that this measure of perceived health status contains important information not detected by health measures which are traditionally considered to be more objective (Fylkesnes & Forde, 1991). The relationship between self-assessed health and mortality is clearly established, and this relationship cannot be explained through “traditional” explanatory variables such as physical health and behavioural factors. Therefore, we should explore alternative explanations for the strong association between this single-item measure and mortality. For example, knowing that psychosocial factors (e.g. life events, social support, neuroticism, perceived control) could have short-term physiological effects and long-term health consequences (Anderson & Armstead, 1995), we could investigate whether the psychological dimension of self-assessed health could explain the relation between self-assessed health and mortality.

Table 1.1

Some examples of the single-item question on self-assessed health

Single-item questions on self-assessed health

- How would you rate your health overall?
- Compared to others your age, how would you rate your health?
- How would you rate your health at the present time?
- In general, how would you rate your physical health?
- At this time, how would you rate your physical health?
- How would you say your health is, in general?
- Compared to family and friends, would you say your health is (possible answers)?
- Would you say your physical health this past year is (possible answers)?
- Generally speaking, how would you describe your present health?
- How would you describe you health now?
- Do you consider your health at the moment to be (possible answers)?
- How about your personal health, is it (possible answers)?
- Where along this scale is your health currently (Cantrill’s ladder)
- In the last four weeks did you feel yourself to be healthy?
- How have you been feeling since I last talked to you?

Early studies on self-assessed health correlated the single-item measure with other indicators of health, such as physicians' ratings (e.g. Fillenbaum, 1979; LaRue, Bank, Jarvik & Hetland, 1979; Maddox & Douglass, 1973; Friedsam, 1963). These studies tried to investigate the criterion validity of self-assessed health using these (biomedical) indicators of health status as objective validators. The aim of these validity studies is not so much to reveal the underlying dimensions of self-assessed health, but to locate self-assessed health in the hierarchy of health status indicators. In this hierarchy, health indicators are usually ranked from objective or "true" measures of health status to subjective or "perceived" measures of health status. Congruence studies are a more contemporary variant of these type of validity studies. In these studies, health assessments are also compared with some objective, or "true" measure of health status, in order to classify individuals as having either congruent (i.e. realistic) or incongruent (i.e. too optimistic or too pessimistic) health-assessments (e.g. Van Doorn, 1999; Borawski-Clark, Kinney & Kahana, 1996; Chipperfield, 1993; Ferraro, 1993; Levkoff, Cleary & Wetle, 1987).

In the early 1960's, Friedsam (1963) already concluded that self-assessed health is not determined by the same aspects which determine so-called objective indicators of health:

"What is at issue in the differences between self and physicians' ratings is not a question of subjective or perceived health as against objective or actual health (...), but rather different dimensions of health. Certain types of data are available to the individual as he measures his health which are inaccessible to the physician, just as certain data are available to the physician (...) which are not available to the individual" (Friedsam, 1963).

In validity studies, as well as in congruence studies it is assumed that an individual's physical health status is the dominant factor determining self-assessed health. In these studies the possibility that respondents may consider other dimensions as being relevant for their health-assessment is largely ignored. However, as the amount of overlap between self-assessed health and physical, or objective health measures is relatively small, we must conclude that self-assessed health is also determined by other dimensions besides physical morbidity.

The determinants of self-assessed health

In recent empirical studies on the single-item measure of self-assessed health, different types of health indicators have been correlated with the single-item measure of self-assessed health. The aim of these studies is mostly to find out which particular health aspects (or dimensions) determine self-assessed health. Examples of the health indicators that have been included in these studies are physical morbidity, functional status, use of health services, health behaviour, psychological functioning, social support, and life stress. Despite the fact that different health indicators have been included in these studies, physical or biomedical aspects are much better represented. The emphasis has thus been on biomedical aspects as possible determinants of self-assessed health; other health aspects only play a minor role. However, as the proportion of variance explained in these studies usually has been relatively small, we need to identify the other dimensions of self-assessed health.

Only few researchers have used a qualitative approach in order to discover these unknown dimensions of self-assessed health. In most determinant studies researchers investigated the relationship between self-assessed health and an a priori defined set of health indicators. However, when assessing their health participants may include health aspects that have not been routinely included in these type of studies. In a qualitative study, individuals can be asked directly which aspects they consider important when assessing their health. If we wish to find the determinants (or dimensions) of self-assessed health we should be heading for new directions of research, especially qualitative research, (Black, 1994; Idler, 1993a).

1.3 Socioeconomic differences in (self-assessed) health

In health literature, the existence of social inequalities in health has been consistently demonstrated. Socioeconomic status (SES) has been associated with health outcomes in many studies, using different indicators of SES, such as education, income, or occupation. It has been shown that the association between SES and health occurs at every level of the social hierarchy, not just below the threshold of poverty. The general finding is that as one moves up the social ladder, rates of mortality and morbidity gradually decrease (Anderson & Armstead, 1995; Adler, et al., 1994; Feinstein, 1993; Williams, 1990). The inverse relationship between SES and health has been observed for summary measures of morbidity (e.g. Blane, 1995), specific diseases, such as heart disease (e.g. Lynch, Kaplan, Cohen, Tuomilehto & Salonen, 1996; Moller, Kristensen & Hollnagel, 1996), cancer (e.g. Schrijvers, 1996), mental disorder (e.g. Ostrove, Feldman & Adler, 1999; Lennon, 1995), and different measures of perceived health status (e.g. Jenkinson, Layte, Coulter & Wright, 1996; Badia, Fernandez & Segura, 1995; Hunt, McEwen & McKenna, 1985b). In addition, it has been observed that there is a relationship between SES and the single-item measure of self-assessed health. Individuals from lower socioeconomic groups assess their health more poorly than do individuals from higher socioeconomic groups (e.g. Ostrove, Feldman & Adler, 1999; Ross & Wu, 1996; Hirdes & Forbes, 1993; Mackenbach, 1993).

How can we explain the observed socioeconomic differences in self-assessed health? One possibility is that socioeconomic differences in the prevalence of physical health problems account for these differences. In low socioeconomic groups the prevalence of health problems (e.g. chronic conditions, functional limitations) is much higher than in high socioeconomic groups, and this is generally explained through the concept of social causation. Social inequalities in physical health (morbidity) are caused by a higher prevalence of health damaging behaviour (smoking, alcohol consumption, lack of physical exercise, dietary deficiencies), unfavourable material circumstances (level of living conditions, housing, occupational and other exposures), and stress-related circumstances (life events, social support) in low socioeconomic groups (Elstad, 1998; Adler, et al., 1994; Feinstein, 1993; Mackenbach, 1993). As the prevalence of physical (or biomedical) health problems is much higher in lower socioeconomic groups this could account for the observed socioeconomic differences in self-assessed health. However, socioeconomic differences in self-assessed health are generally larger than socioeconomic differences in other health measures, such as chronic conditions or mortality rates (Blane, Power & Bartley, 1996;

Mackenbach, 1993). Therefore, we should explore other mechanisms that may explain why low SES individuals assess their health more poorly than do high SES individuals. But finding alternative explanations for the observed social inequalities in self-assessed health is hindered by the fact that it is still uncertain which dimensions are actually included in this health measure. Therefore, we need to identify the general dimensions of self-assessed health. Only then we will be able to discover the mechanisms that may explain the observed socioeconomic differences in self-assessed health

1.4 This thesis

Problem definition

Measuring perceived health status through the single item “How is your health in general?” has appealed to many researchers. Understandably, as it is an easy to administer, highly reliable measure, with strong predictive validity and –at the individual level– high content validity. However, although many (mostly quantitative) studies have been conducted on the single-item measure of self-assessed health, investigators have not been able to determine all dimensions which are involved in health-assessments. This illustrates that the greatest advantage of the single-item measure on self-assessed health over other measures of perceived health, the fact that it is fully individualised, is at the same time its greatest disadvantage; the process of health assessment is more or less a “black box”. We still need to find out which dimensions are involved in answering this question.

Research questions

In this thesis we will answer the following research questions:

- 1 Which aspects or dimensions do participants consider when they are asked to assess their health? Do participants from the highest and lowest socioeconomic groups consider the same or different aspects when assessing their health?
- 2 To what extent do socioeconomic differences in the prevalence of objective and subjective health problems, and socioeconomic differences in the perception of and coping with health problems contribute to the explanation of socioeconomic differences in self-assessed health?
- 3 To what extent can the psychological dimension of self-assessed health explain the association between this single-item measure and mortality?

Methods

With the traditional, usual quantitative, approach public health research on self-assessed health has come a long way in determining the dimensions of self-assessed health, but there are still some loose ends. In this thesis, we took a qualitative as well as a quantitative approach, and integrated research methods and techniques from different disciplines, such as social epidemiology, sociology and health psychology. The need for greater collaboration between different disciplines has been expressed before, in the context of the “new” public health (Morgan,

1998; Dean & Hunter, 1996; Popay & Williams, 1996; Baum, 1995) as well as in the field of health inequalities (Popay, Williams, Thomas & Gatrell, 1998; Chamberlain, 1997; Adler, et al., 1994). Combining the strengths of different disciplines could be a fruitful strategy in trying to discover the remaining and unknown dimensions of self-assessed health (Morgan, 1998; Dean & Hunter, 1996).

Study population

The studies of which we report in this thesis are part of the GLOBE-study. GLOBE –a Dutch acronym for Health and Living Conditions of the Inhabitants of Eindhoven– is a longitudinal study aimed at describing and explaining sociodemographic inequalities in health. Detailed information on the GLOBE-study can be found elsewhere (Mackenbach, Van de Mheen & Stronks, 1994). In 1991, baseline measurement was performed by postal questionnaire (response rate=70%; N=19.000), a few months later followed by more extensive structured interviews in two subsamples of respondents (response rate=76%; Total N= 5.700). In 1997, respondents to the baseline measurement were invited to participate in an extensive follow-up study; they received a postal questionnaire followed by a structured interview (response rate=75%; N= 4.100). In 1998, a stratified sample of participants to the 1997 follow-up was asked to participate in a small-scale interview study (response rate=63%; N= 40). Throughout the entire study period, mortality data were obtained from the population register; information on vital status of all participants was obtained between June and October 1998.

Measures of self-assessed health and socioeconomic status

Self-assessed health was measured by a single item: “How is your health in general? Is it very good, good, fair, sometimes good and sometimes poor, or poor?”. Both in the postal survey (structured questionnaire) and in the qualitative study (semi-structured interview) the question on self-assessed health would be the first to be asked. In the questionnaire, following the question on self-assessed health –literally as phrased above– respondents were asked to tick one of five answering categories. In the semi-structured interview, the interviewer read out the question (“How is your health in general?”), and showed the interviewee the possible answering categories in writing.

Socioeconomic status (SES) was operationalised through educational level. The socioeconomic status of the participants to this study was indicated by the highest level of education attained, students being classified by their current training. Four categories were distinguished: Primary school only (Low); Lower secondary or vocational education (2); Intermediate secondary or vocational education (3); and Higher education / University degree (High). In the quantitative analyses (Chapters 5–7) we included socioeconomic status classified as above. In the qualitative studies we included high SES individuals (higher education or university degree) and low SES individuals (primary school or lower vocational education). Detailed information on study population, explanatory variables, and data analysis is presented in the subsequent chapters.

Outline of this thesis

In Chapter 2 we present the results of a narrative review of the quantitative empirical literature on self-assessed health. We described which components (or dimensions) of self-assessed health have been identified thus far, and contrasted these with four theoretical definitions, or models, of health. We integrated the empirical findings with the theoretical health models, and proposed a multidimensional framework which could guide future empirical research on self-assessed health.

In quantitative empirical studies, the relationship between self-assessed health and an a priori defined set of variables is investigated. However, when assessing their health, individuals may include health aspects that have not been routinely included in quantitative analyses. In Chapter 3 we present the results of a *qualitative* study in which we tried to identify the dimensions of self-assessed health. In this study, we asked participants directly which aspects they considered when assessing their health. In Chapter 4 we describe the results of an additional qualitative study on socioeconomic differences in self-assessed health. We investigated whether participants from higher and lower socioeconomic groups differed in the way they arrive at their health assessment. We were particularly interested in finding out more about the aspects individuals from higher and lower socioeconomic groups had in mind when assessing their health. In other words, do different socioeconomic groups include the same or different aspects in their health assessments?

In Chapters 5 and 6 we present the results of two quantitative studies in which we explored some alternative mechanisms that may explain why low SES individuals assess their health more poorly than do high SES individuals. Self-assessed health is not simply a measure of physical or “objective” health, and in Chapter 5 we investigated whether other, more subjective health aspects might explain the observed socioeconomic differences in self-assessed health. We analysed the distinct role of objective health aspects (chronic disease and functional limitations) and subjective health aspects (psychosomatic symptoms and perceived discomfort/distress) in the explanation of socioeconomic differences in self assessed health. Also, health assessments may be influenced by psychological factors, such as personality traits (e.g. neuroticism, perceived control) and coping styles (e.g. confrontation, palliation). As these psychological factors vary in their distribution with SES, different socioeconomic groups may perceive their health problems differently. In Chapter 6 we investigated whether individual differences in perception of and coping with health problems could further explain socioeconomic differences in self-assessed health.

The relationship between self-assessed health and mortality is clearly established, and cannot be explained through “traditional” explanatory variables such as physical health and behavioural factors. We explored to what extent the psychological dimension of self-assessed health could contribute to the explanation. In Chapter 7 we describe the results of a study in which we investigated whether, in addition to physical morbidity and risk behaviour, psychosocial factors (i.e. stressors, buffers, personality traits and coping styles) can further explain the relationship between self-assessed health and mortality.

In Chapter 8 we briefly summarise the findings, and address some general methodological issues of the studies we presented in the previous chapters. Finally, we integrate and evaluate the results of the empirical studies and put these in broader perspective.

2

The components of self-assessed health. A review of the literature based on four theoretical health models

In this paper, we present four theoretical models of health. The biomedical model describes health as something which occurs when disease or illness is absent. The functional model describes health as the ability to perform the necessary activities. The wellbeing model considers health as a subjective state of emotional and physical wellbeing. And finally, the adaptive model describes health as the ability to adapt to, or cope with problems concerning one's constitution. In recent years it has become clear that a number of non-medical factors influence an individual's perception of health status. Coping styles and personality factors are important in the cognitive process in which an individual "translates" health status into self-assessed health. We conclude that in studies on self-assessed health, indicators of health status (i.e. constituent elements: biomedical, functional, wellbeing) as well as indicators of the way in which people perceive their situation (i.e. modifying factors/adaptive aspects) should be included.

We present the results of a narrative review of the empirical literature on self-assessed health, in which we included 28 studies on the single-item measure of self-assessed health. The majority of these studies focused on examining constituent elements of self-assessed health, particularly biomedical aspects (e.g. chronic conditions) . Modifying factors (adaptive aspects) have been given much less attention. Although most empirical studies applied the concept of multidimensionality, it was not in a conceptually consistent manner.

Finally, we integrated our theoretical findings on health models and empirical findings on self-assessed health, and propose a conceptual framework that will enable researchers a more theory-driven and systematic basis for studying the components of self-assessed health.

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2.1 Introduction

In recent years, many studies have been conducted to discover the components of self-assessed health. Through these studies, researchers have tried to unravel the “mystery” of health: what makes people consider themselves to be healthy or not? An important question to answer, if only because it has been shown that poor self-assessed health increases the mortality risk, even when (physical) health status has been controlled for (see e.g. Idler & Benyamini, 1997). In empirical studies, researchers have investigated the relationship between self-assessed health and different health variables. Over the years, many variables have been presented as possible components of self-assessed health. Given the wide variety of these components one might suspect a general lack of conceptual insight into the components of self-assessed health. Too often, the choice of components seems to be dictated by the availability of particular health variables, rather than by a conceptual framework. Not surprisingly, in studies on self-assessed health the proportion of variance explained usually has been relatively small. The aim of the present paper is to contribute to the development of a conceptual framework which will enable researchers a more theory-driven and systematic basis for studying the components of self-assessed health.

In the first section of this paper, we present an overview of the relevant theoretical literature on health, in which we address two topics. First, we present four definitions, or models of health, which we derived from the extensive body of theoretical literature about this subject. In these health models, the essential components for either health or ill-health are formulated (Table 2.1). Second, we discuss health from a more psychological perspective. Individuals with similar health status may vary widely in their health assessments, and in health psychology the importance of cognitive processes in health assessment has been clearly established. This psychological perspective can be considered an operationalisation of the fourth health model (‘the adaptive model’). In the next section of this paper, we present a narrative review of the quantitative empirical literature on self-assessed health. This review is based on a selection of studies we consider to be representative of the current state of research on self-assessed health. In this narrative review, we identify the components of self-assessed health which have been investigated in the empirical studies thus far, and relate these components to the four theoretical models of health. In the final section of this paper, we briefly summarise the theoretical overview, followed by a discussion of the findings of the narrative review. We then discuss a multidimensional perspective on health, integrating the findings of the theoretical overview and the narrative review. Finally, we propose a conceptual framework on self-assessed health which may be helpful in guiding future empirical work in this area.

2.2 Theoretical overview

Health models

In the next section we present an overview of the relevant theoretical literature on health. For many years, investigators from various disciplines have tried to define health, and in this theoretical overview we have included literature from disciplines such as medicine, nursing,

sociology, and psychology. From this extensive body of literature we have been able to identify four definitions of health –or health models– in which the essential components for either health or ill-health are formulated (Table 2.1).

Table 2.1
Theoretical models of health

Health model	Description
The biomedical model	Health occurs when disease or illness is absent.
The functional model	Health is the ability to perform the necessary activities, to fulfil one's responsibilities.
The wellbeing model	Health is a subjective state of emotional and physical wellbeing.
The adaptive model	Health is the ability to adapt to, or cope with, problems concerning one's (physical or psychological) constitution.

The biomedical model The biomedical model defines health as the absence of disease (Aggleton, 1990; Simmons, 1989; Seedhouse, 1986; Anderson, 1983; Smith, 1981). In this model, which has its roots in biology and physiology (Wilson & Cleary, 1995; Radley, 1994; Blaxter, 1990), health is closely tied to the concepts of disease and illness, in which disease refers to any physical abnormality (e.g. clinically diagnosed disease), and illness refers to unpleasant sensations with a physiological basis (e.g. pain) (Aggleton, 1990; Seedhouse, 1986; Anderson, 1983). Following the biomedical model, as long as an individual shows no signs of physical abnormality, or as long as an individual does not experience any unpleasant physical sensation, he should be considered healthy. A prospective aspect of the biomedical model is represented in the role of behaviour: people may be considered healthy when they engage in any behaviour in order to prevent disease in the future (Radley, 1994).

The functional model The functional model defines health as the ability to perform the activities which are expected of you, to fulfil one's responsibilities (Seedhouse, 1986). Health is "...the state of optimum capacity of an individual for the effective performance of the roles and tasks for which he has been socialised" (Radley, 1994; Simmons, 1989; Calnan, 1987; Seedhouse, 1986; Smith, 1981; Twaddle, 1974). By making a distinction between role-performance and task-performance, the specific role of psychosocial and physical aspects on functional health can be made visible. Role-performance refers to the participation in a social system (psychosocial aspects), whereas task-performance refers to a set of physical operations to perform certain functions (physical aspects) (Twaddle, 1974). Following the functional model, an individual may be "biomedically" ill, if he can function adequately, he is considered healthy. On the other hand, failure to perform the necessary activities (role- or task-performance) means ill-health, even if someone is biomedically healthy (Simmons, 1989; Smith, 1981).

The wellbeing model The wellbeing model defines health as a subjective state of physical and emotional wellbeing; this model emphasises wellness in stead of illness (Anderson, 1983). Sometimes health is described as an ideal state, a state of maximum wellbeing. A famous example

may be the WHO-definition, which describes health as “a state of complete physical, mental and social *wellbeing* and not merely the absence of disease and infirmity” (World Health Organization, 1948). In this model the concept of balance or equilibrium is incorporated. It is the subjective experience of physical, mental and social equilibrium which causes a general sense of wellbeing. The physical aspect of wellbeing has to do with the functioning of the body, and is expressed as being fit, vital, and energetic (Bowling, 1991; Anderson, 1983). The mental and social aspects of wellbeing have to do with emotional states, life satisfaction and life stress (Anderson, 1983). Following the wellbeing model, an individual may be in “biomedical” and “functional” ill health, if he does experience a general feeling of wellbeing, he should be considered healthy.

The adaptive model The adaptive model considers health as the ability to adapt to, or cope with problems concerning one’s constitution. It is not really important whether or not an individual is in ill health in terms of the biomedical, functional or wellbeing model; health is a way of adjusting adequately to changing circumstances, such as health problems (Simmons, 1989; Seedhouse, 1986; Smith, 1981; Dubos, 1979). Following this model someone is healthy when he is capable of handling the “pains and problems of life” with his adaptive resources (Anderson, 1983; Smith, 1981). Therefore, being healthy is not so much dependent upon problems concerning one’s (physical or psychological) constitution, but is dependent upon the ability to cope with these problems.

Cognitive processes in health-assessments

Persons with similar health status may vary widely in their health assessments, and health psychology has provided for a clear understanding of the cognitive processes that intervene between an individual’s health status (i.e. disease, functional disability, lack of fitness) and subsequent health assessment. In recent years it has become clear that there are a number of non-medical factors influencing an individual’s perception of health status (Barsky, 1988; Calnan, 1987). Acknowledging the importance of these non-medical factors requires a view of health that is not strictly symptom-centred, in which one primarily considers health assessments as being influenced by the individual’s health status. Instead, it requires a person-centred view of health; in which one considers health assessments as being also influenced by the psychological characteristics of the individual who makes the assessment (Costa & McCrae, 1985). In this respect, Lazarus and Folkman’s (Lazarus & Folkman, 1984) psychological theory on stress and coping is particularly important, as it emphasises the role of individual differences in dealing with stressors, such as health problems. According to their theoretical work on health appraisal, the influence of health status on self-assessed health will be modified by the meaning the particular situation has for the individual. Situations should be considered in terms of their significance to the individual, and may be evaluated as positive, neutral or negative (stressful) in their consequences; the two important modifying factors are coping and personality. This theory of stress and coping can easily be applied when considering the relationship between health status and self-assessed health. When an individual encounters a health problem, he or she must mobilise all possible resources to change either the situation or its meaning in order to restore or

maintain his or her own conception of healthiness (Taylor, 1991; Lazarus & Folkman, 1984; Anderson, 1983). The extent to which this will be successful is dependent upon the individual's coping styles and personality traits. Thus, coping and personality are important factors in the cognitive process in which an individual "translates" health status into self-assessed health. This notion bears a clear resemblance to the adaptive health model we defined earlier. According to the adaptive health model, health is not so much dependent on problems concerning one's constitution (biomedical, functional, or wellbeing), but is dependent on one's ability to adapt to, or cope with these problems.

Legitimacy of the four health models

When we consider the four health models we identified (i.e. biomedical, functional, wellbeing, and adaptive) to be equally valid, the dimensions that can be derived from these models should be represented in empirical studies on the components of self-assessed health. In these studies researchers should, therefore, include indicators of health status (i.e. constituent elements) as well as indicators of the way in which people evaluate their situation (i.e. modifying factors) (Mootz, 1986). In the qualitative empirical literature the legitimacy of these health models has been clearly demonstrated. In lay definitions of health individuals include aspects from different dimensions, which are comparable with the biomedical, functional, wellbeing and adaptive model (Manderbacka, 1998; Borawski-Clark, Kinney & Kahana, 1996; Krause & Jay, 1994; Blaxter, 1990; Houtaud & Field, 1984; Herzlich, 1973).

The question is whether quantitative empirical research has taken up the notion of self-assessed health as being determined by the proposed dimensions. From the theoretical (and qualitative empirical) literature we gained insight into which dimensions are involved in feeling healthy. Next, quantitative studies should shed light on the relative importance of these dimensions. A prerequisite, then, is that the dimensions we identified are actually included in empirical quantitative studies on self-assessed health.

2.3 Review of the empirical studies on self-assessed health

In this section we will present a review of the empirical quantitative literature on self-assessed health. The review is based on a selection of articles we consider to be representative of the current state of medical and psychological research on self-assessed health. It can be characterised as a *narrative* review as we only used basic descriptive statistics (i.e. frequency counts and percentages) as opposed to the more extensive statistical analyses that are used in quantitative reviews such as meta-analyses. The aim of this review is to identify the components of self-assessed health that have been studied in quantitative empirical research.

2.3.1 Data and methods

Literature selection

In selecting the relevant literature for the current review, we used different strategies. We systematically searched the electronic databases PsychLit and Medline for relevant empirical studies on self-assessed health. Furthermore, we searched the literature, using reference lists contained in the available articles. When a relevant article was found, the reference list for that article was screened for other earlier relevant work that we might have missed using the other strategy.

Initially, we applied a broad search strategy. Both PsychLit and Medline were scanned for abstracted citations in the English language, covering the period from January 1966/67 through June 1999. For this search we selected articles which mentioned in the title, list of key words or abstract one of the following words: 'health' or 'health status' combined with either 'self-assessed', 'self-rated', 'perceived' or 'subjective'. This yielded an enormous body of potentially relevant articles: a total of 1468 articles. To select the appropriate studies from this enormous body of articles, we screened the abstracts and applied four additional selection criteria. First, we only included studies in which the primary focus of the study was to identify the components of self-assessed health. We therefore excluded studies in which the focus was to find correlates of self-assessed health in order to explain subgroup-differences (e.g. between different cultural or socioeconomic groups) in self-assessed health. Second, we only included quantitative empirical articles. Third, we only included studies in which the study population originated from the general population. We included studies with primarily elderly participants, but excluded studies in which participants were patients with a particular chronic illness (e.g. osteoarthritis or diabetes). And finally, we only included studies in which self-assessed health was measured with a single item. Studies we found by screening relevant reference lists had to meet these criteria as well.

Eventually, 28 citations turned out to be eligible for our review of the empirical literature on self-assessed health (Appendix 2.1, Manderbacka, Lahelma & Martikainen, 1998; Menec & Chipperfield, 1997; Shi & Lu, 1997; Ongaro & Salvini, 1995; Dixon, Dixon & Hickey, 1993; Hirdes & Forbes, 1993; Idler, 1993b; Hooker & Siegler, 1992; Rodin & McAvay, 1992; Fylkesnes & Forde, 1991; Liang, Bennett, Whitelaw & Maeda, 1991; Levkoff, Cleary & Wetle, 1987; Jylhä, Leskinen, Alanen, Leskinen & Heikkinen, 1986; Blaxter, 1985; Goldstein, Siegel & Boyer, 1984; Stoller, 1984; Wolinsky, Coe, Miller & Prendergast, 1984; Cockerham, Sharp & Wilcox, 1983; Williams, 1983; Murray, Dunn & Tarnopolsky, 1982; Linn & Linn, 1980; Blazer & Houpt, 1979; Fillenbaum, 1979; Garrity, Somes & Marx, 1978; Tessler & Mechanic, 1978; Wan, 1976; Tissue, 1972; Friedsam, 1963).

Operationalisation of concepts

Self-assessed health The single-item question on self-assessed health may be expressed in many different forms. Not all authors literally reproduced the question on self-assessed health, some confined themselves to a brief description: "Respondents were asked to assess their own health (compared with others of their own age)". Other authors did report the phrasing of the question,

and it can be generally concluded that there is hardly any uniformity in wording. The question on self-assessed health could generally be answered with a three to six-point ordinal scale, or visual analogue scale (VAS) varying from “Excellent” to “Very poor”.

Health is the absence of disease and illness: biomedical aspects We categorised a total of 91 biomedical variables into 8 health aspects: chronic conditions (e.g. number of chronic diseases), illness (e.g. illness episodes, health related problems, days in bed), symptoms (e.g. physical symptoms, psychophysiological symptoms, pain), use of health services (e.g. number of physician visits, hospitalisations), prescribed medication, physical/mental functioning (e.g. physical or mental health rating, cognitive functioning, physician rating), prognosis (e.g. self-assessed health prognosis) and health behaviour (e.g. weight, physical exercise, smoking).

Health is the ability to perform certain functions: functional aspects We categorised a total of 22 functional variables into 2 health aspects: functional status (task performance, e.g. ADL, IADL, mobility) and restricted activities (role performance, e.g. health interferes with work, social life or other activities).

Health is a subjective state of physical and emotional wellbeing: wellbeing aspects We assigned personality traits to the wellbeing model when a study only investigated the direct effect of personality traits on self-assessed health, and did not investigate the modifying role of personality traits on the relationship between biomedical, functional, or wellbeing aspects, and self-assessed health. We categorised a total of 49 wellbeing variables into 5 health aspects: fitness/energy (e.g. fitness, sleep disturbance), mood/affect balance (e.g. depression, happiness, neuroticism, affect balance), life satisfaction (e.g. life satisfaction, activities enjoyed, acceptance of life), and life stress (e.g. life events, health worry, stressfulness of life).

Health is the ability to adapt to problems concerning one's constitution: adaptive aspects We assigned coping styles and personality traits to the adaptive model when a study explicitly investigated the modifying role of coping styles or personality traits on the relationship between biomedical, functional, or wellbeing aspects, and self-assessed health. We categorised a total of 2 adaptive variables into 2 health aspects: biomedical*personality (chronic conditions and self-efficacy); and functional*personality (functional impairment and perceived control).

2.3.2 Results

In Table 2.2 we have summarised the findings of the 28 empirical studies we included in our narrative review. Reference numbers shown in the centre columns of Table 2.2, correspond to the empirical studies on self-assessed health as displayed in Appendix 2.1.

In the first column of Table 2.2 we present the four health models and the health aspects associated with these models (see Methods section for an overview the variables that have been categorised into these health aspects). We ranked the health aspects according to the frequency with which each aspect has been included in the empirical studies, as can be seen in the final column of Table 2.2. Presentation of the findings in this fashion makes it easy to see which health

aspects have been included in many studies on self-assessed health, and which aspects have been included less frequently.

Table 2.2
Summary of the findings of 28 selected studies on self-assessed health

Health model	Type of studies^a		N_{total}=28
Health aspects	Univariate (1-12) ^b	Multivariate (13-28) ^b	N (%)
<i>The biomedical model</i>			
Chronic conditions	2, 3, 5, 6, 10, 11	13, 14, 16–24, 26–28	20 (71%)
Symptoms	4–7, 10	15, 17, 18, 21, 23, 24, 26, 28	12 (43%)
Illness	1, 3, 4, 8	14, (15) ^c , (16), (23), (24)	9 (32%)
Use of health services	1, 2, 4, (8) ^c , 11	13, 16, (17), 22	9 (32%)
Health behaviour	(2), 8, 9, 12	21, 25, 28	7 (32%)
Physical / mental functioning	(4), 9	14, 18, 21, (23)	6 (21%)
Prescribed medication	3, 4	16, 17, 21, 22	6 (21%)
Prognosis	2, 6	23	3 (11%)
<i>The functional model</i>			
Functional status	2, 4, 6, 9	13, 16, 17, 20, 23, (24), 26–28	11 (39%)
Restricted activities	10, 11	13, 17	4 (14%)
<i>The wellbeing model</i>			
Mood / Affect balance	1, 2, 4, 5, 9, 10	13, 14, 17–19, 21, 22, (24), 28	15 (54%)
Stress/worry	1, 2, (4), 11	(13), 15, (22)	7 (32%)
Life satisfaction	(2), 4, 11	(13), 17, 22, 24, 25	7 (32%)
Fitness/energy	5, 10	21, 24	6 (21%)
Social isolation	–	21, (22), (24)	3 (11%)
<i>The adaptive model</i>			
Biomedical * personality	–	(22)	1 (4%)
Functional * personality	–	27	1 (4%)

a In the Univariate studies (references 1-12) analyses were conducted for each health aspect separately; in the Multivariate studies (references 13-28) analyses were conducted for all health aspects combined into one model, i.e. controlled for each other

b Numbers refer to the studies included in the narrative review, as displayed in Appendix 2. 1

c Numbers in parentheses refer to studies in which the health aspect had been included, but no significant relationship with self-assessed health was found

Table 2.2 (final column) shows that both the biomedical aspect of chronic conditions and the wellbeing aspect of mood / affect balance have been included in many studies. These are the only two health aspects that have been applied more or less consistently, being included in fifty to

seventy percent of the studies. Other health aspects, such as the biomedical aspects of illness, symptoms, use of health services and health behaviour, the functional aspect of functional status, or the wellbeing aspect of life satisfaction, although less frequently, have still been included in twenty-five to forty percent of the studies. The remaining health aspects, the biomedical aspects of physical/ mental functioning and prognosis, the functional aspect of restricted activities, and the wellbeing aspects of fitness/energy, social isolation, life satisfaction, and stress/worry have been included in a rather haphazard manner.

Health aspects from the biomedical, functional, and wellbeing model which are included in these studies, represent the constituent elements of self-assessed health. In all studies the relationship between one of the constituent elements (biomedical, functional, or wellbeing) and self-assessed health has been investigated. However, only two of these studies also applied the adaptive model. Hence, only two studies investigated the modifying role of personality traits on the relationship between biomedical, functional, or wellbeing aspects, and self-assessed health. One study investigated the modifying role of self-efficacy on the relationship between chronic conditions and self-assessed health. The other study investigated the modifying role of perceived control on the relationship between functional impairments and self-assessed health.

In Table 2.3 we briefly summarise which health models have been included in either of the 28 studies included in the review. To what extent did these studies apply a multidimensional health model, using aspects from the biomedical, functional, wellbeing, as well as the adaptive health model?

Table 2.3
Multidimensionality of 28 selected empirical studies on self-assessed health

Studies including aspects from the 4 models				Total number of studies		
Biomedical model	Functional model	Wellbeing model	Adaptive model	All studies (1-28)	Univariate ^a (1-12)	Multivariate ^a (13-28)
yes	–	–	–	n=4	n=4	–
yes	yes	–	–	n=5	n=1	n=4
yes	–	yes	–	n=8	n=2	n=6
yes	yes	yes	–	n=9	n=5	n=4
yes	yes	–	yes	n=1	–	n=1
yes	–	–	yes	n=1	–	n=1
total=28	total=15	total=18	total=2			

a In the Univariate studies (references 1-12) analyses were conducted for each health aspect separately; in the Multivariate studies (references 13-28) analyses were conducted for all health aspects combined into one model, i.e. controlled for each other

In Table 2.3 the number of studies using one or more aspects from the four health models are presented. The final row in this table shows that all 28 studies included aspects from the biomedical model, fifteen studies included aspects from the functional model, eighteen studies included aspects from the wellbeing model and two studies included aspects from the adaptive model. From the rows in Table 2.3 can also be seen that none of the studies included health aspects from all four of the health models. Four of the 28 studies investigated the relationship between self-assessed health and biomedical aspects only. Five studies included both biomedical and functional aspects (of which four used a multivariate approach), and eight studies included both biomedical and wellbeing aspects in their investigation (of which six used a multivariate approach). Nine studies included biomedical, functional, together with wellbeing aspects in their investigation (of which only four used a multivariate approach). Only two studies included adaptive aspects in their investigation, one study included biomedical, functional and adaptive aspects, the other study combined biomedical, wellbeing, and adaptive aspects.

We further examined the proportion of variance explained by six studies that applied a multivariate approach and included aspects from at least three health models (multidimensional approach) in their investigation. The proportion of variance explained ranged from an estimated 20 to 55 percent (not shown), which indicates that for these study populations considerable variance remained unexplained.

2.4 Discussion

Main findings In this study, we presented an overview of the theoretical literature on health, followed by a narrative review of the quantitative empirical literature on self-assessed health. In the theoretical overview we identified four definitions, or models of health: the biomedical model, the functional model, the wellbeing model, and the adaptive model. Integrating these theoretical health models with the psychological theory on stress and coping, we concluded that in studies on self-assessed health indicators of health status (i.e. constituent elements, such as biomedical, functional and wellbeing aspects) as well as indicators of the way in which people perceive their situation (i.e. modifying factors or adaptive aspects, such as personality traits and coping styles) should be included.

Narrative review In the narrative review we examined 28 studies which we considered to be representative of the current state of research on self-assessed health. Taking into account the findings of the theoretical overview we can draw several conclusions from this review. First, the focus of the majority of these studies has been on examining constituent elements of self-assessed health. The emphasis has obviously been on biomedical aspects of self-assessed health, 28 studies included biomedical aspects (91 different variables), as opposed to 18 studies including wellbeing aspects (49 different variables) and 15 studies including functional aspects (22 different variables). Aspects from the adaptive model have been given hardly any attention in quantitative empirical studies on self-assessed health. In only two studies the modifying role of personality traits has been studied; the modifying role of coping styles has not been studied at all. As this

model is relatively new, we did expect that adaptive aspects would be slightly underrepresented in the empirical literature. However, we must conclude that in empirical research on self-assessed health the modifying role of coping styles or personality traits remains greatly disregarded. Second, in most studies the relationship between personality factors and self-assessed health has been studied within the framework of the wellbeing model. In these studies, personality traits such as neuroticism and affect balance have presumably been considered as being general psychological measures of mood states, thus as constituent elements. However, in our opinion personality traits should be considered as modifying factors and should be considered within the framework of the adaptive model. Third, not one study included constituent elements as well as modifying factors from all four of the health models; the relationship between self-assessed health and biomedical, functional, wellbeing and adaptive aspects has not been analysed simultaneously. We must, therefore, conclude that none of the studies yet applied an entirely multidimensional model of health.

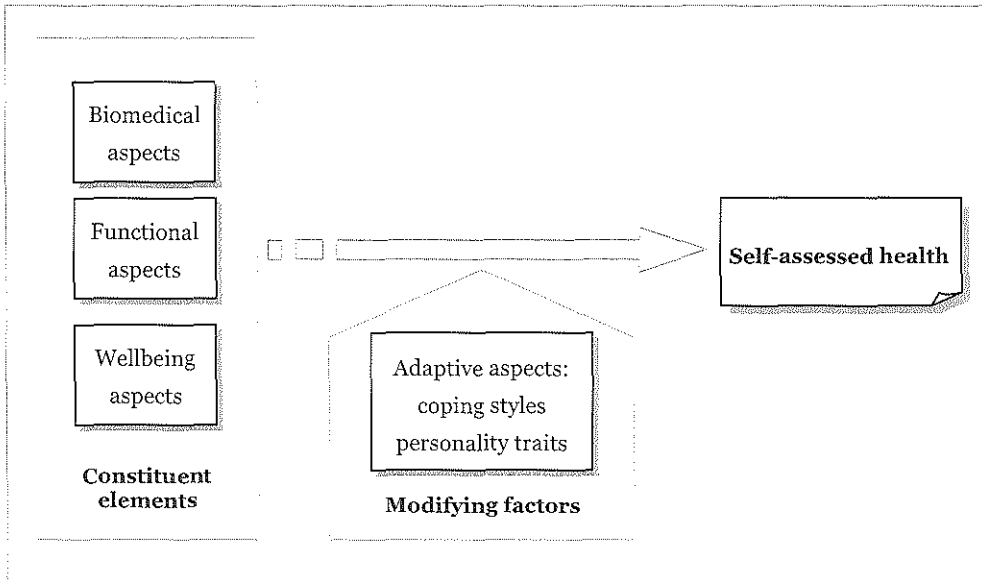
Multidimensional perspective A multidimensional concept of health corresponds well with lay notions of health. Qualitative studies have indeed shown that individuals often consider aspects from more than one health model when defining or assessing their health (Manderbacka, 1998; Borawski-Clark, Kinney & Kahana, 1996; Krause & Jay, 1994; Blaxter, 1990; Houtaud & Field, 1984; Herzlich, 1973). Some quantitative researchers also suggested that self-assessed health represents a summary statement in which numerous aspects of health, both subjective and objective, are combined within the perceptual framework of the individual respondent (see e.g. Idler, 1993b; Tissue, 1972). Although we may conclude from the narrative review that most studies on self-assessed health applied the concept of multidimensionality, it has not been in a conceptually consistent manner. In the 28 studies we included in our review, the four health models have been operationalised by quite a number of health aspects, which in turn have been operationalised by a large number of health variables. Moreover, these health aspects/variables have been studied in many different combinations, but not one single study included aspects from all four health models.

A conceptual framework Future research on self-assessed health could benefit by greater use of theory, and we therefore propose a multidimensional conceptual framework that integrates the four health models we identified from the theoretical literature. We integrated our theoretical and empirical findings on health models and self-assessed health into a multidimensional conceptual framework (Figure 2.1). It requires only a slight adjustment to the research paradigm that has been used so far to be able to apply this multidimensional design to quantitative empirical studies on self-assessed health.

Our overview of the theoretical literature revealed four models of health: biomedical, functional, wellbeing, and adaptive. Furthermore, our review of the empirical literature revealed that many biomedical, functional, and wellbeing aspects show a significant relationship with self assessed health.

Figure 2.1

Integration of four theoretical health models into a multidimensional conceptual framework



On theoretical grounds we may assume that adaptive aspects, such as coping styles and personality traits, will modify the relationship between these health aspects and self-assessed health. Adaptive health aspects could easily be included in empirical studies through investigating the modifying role of coping styles and personality traits on the relationship between biomedical, functional and wellbeing aspects on self-assessed health. Health aspects which are already included in many studies, including personality traits such as neuroticism and affect balance, should no longer be considered constituent elements of self-assessed health, but should be considered modifying factors. Consequently, instead of a purely deterministic research design in which only constituent elements define self-assessed health, researchers should apply an interactional design.

Future empirical studies on self-assessed health Although research into the components of self-assessed health has always been multidisciplinary, it is still strongly influenced by the biomedical model of health. And it is probably due to this biomedical tradition that the deterministic research design is still mostly applied, and that modifying factors have been given hardly any attention. Integrating theories from related disciplines such as medical sociology and health psychology may bring research on self-assessed health a step further. With the development of our multidimensional conceptual framework we have made an effort to do so. However, the proposed framework should by no means be considered final; it could be extended with concepts from other promising research areas. From the sociological and psychological literature, for example, the concept of social comparison surely warrants further investigation (Manderbacka & Lundberg, 1996). And although we have focused on individual characteristics that may modify the relationship between health status and self-assessed health, these factors are

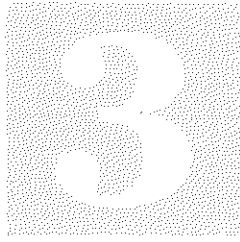
not the only possible modifiers of self-assessed health. Different studies have shown that also cultural and contextual factors can modify the relationship between health status and self-assessed health (view e.g. Jylhä, Guralnik, Ferrucci, Jokela & Heikkinen, 1998; Shetterly, Baxter, Mason & Hamman, 1996). As one author stated: "(...) health concerns also reflect a wider range of areas and are not limited to what one would traditionally consider health problems" (Millstein, 1989).

Hopefully, the research design we proposed in this paper will prove to be a meaningful contribution to the development of a comprehensive conceptual framework for empirical research on self-assessed health.

Appendix 2.1

References in Table 2.2 refer to the following 28 empirical studies on self-assessed health:

1. (Friedsam, 1963)
2. (Tissue, 1972)
3. (Fillenbaum, 1979)
4. (Blazer & Houpt, 1979)
5. (Murray, Dunn & Tarnopolsky, 1982)
6. (Williams, 1983)
7. (Cockerham, Sharp & Wilcox, 1983)
8. (Goldstein, Siegel & Boyer, 1984)
9. (Wolinsky, Coe, Miller & Prendergast, 1984)
10. (Blaxter, 1985)
11. (Hooker & Siegler, 1992)
12. (Shi & Lu, 1997)
13. (Wan, 1976)
14. (Tessler & Mechanic, 1978)
15. (Garrity, Somes & Marx, 1978)
16. (Linn & Linn, 1980)
17. (Stoller, 1984)
18. (Jylhä, Leskinen, Alanen, Leskinen & Heikkinen, 1986)
19. (Levkoff, Cleary & Wetle, 1987)
20. (Liang, Bennett, Whitelaw & Maeda, 1991)
21. (Fylkesnes & Forde, 1991)
22. (Rodin & McAvay, 1992)
23. (Idler, 1993b)
24. (Dixon, Dixon & Hickey, 1993)
25. (Hirdes & Forbes, 1993)
26. (Ongaro & Salvini, 1995)
27. (Menec & Chipperfield, 1997)
28. (Manderbacka, Lahelma & Martikainen, 1998).



How is your health in general? A qualitative study on self-assessed health

The single-item measure on self-assessed health has been widely used, as it presents researchers with a summary of an individual's general state of health. We initiated a qualitative study to find out which particular aspects are included in health self-assessments; which aspects do people consider when answering the question "How is your health in general?". In this qualitative study on self-assessed health we also studied subgroup differences with respect to gender, age, health status and health-assessment.

Self-assessed health proved to be a multidimensional concept. Almost 80 percent of the participants referred to one or more physical aspects (chronic illness, physical problems, medical treatment, age-related complaints, prognosis, bodily mechanics, and resilience). However, when assessing their health participants also include aspects that go beyond the physical dimension of health. In total, 80 percent of the participants –whether or not in addition to physical aspects– referred to other health dimensions. Besides physical aspects, participants considered the extent to which they are able to perform (functional dimension –28 percent), the extent to which they adapted to, or their attitude towards an existing illness (coping dimension –28 percent), and simply the way they feel (wellbeing dimension –20 percent). In our study, health behaviour or lifestyle factors (behavioural dimension –3 percent) proved to be relatively unimportant in health self-assessments.

We found that, for most part, subgroup differences in self-assessed health could be attributed to experience with ill-health: being relatively inexperienced with health problems vs. having a history of health problems.

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Submitted for publication

3.1 Introduction

The single question "How is your health in general?" is a crude and simple measure which has been widely used, as it presents researchers with a summary of an individual's general state of health. It is presumed that in self-assessed health numerous aspects of health are combined within the perceptual framework of the individual respondent (see e.g. Idler, 1993b; Murray, Dunn & Tarnopolsky, 1982; Tissue, 1972). This measure proved to be a powerful predictor for mortality; poor self-assessed health increases the mortality risk, even when other (more objective) indicators of health status have been controlled for (see e.g. Idler & Benyamini, 1997). This may be the reason that this single-item measure on self-assessed health has kept researchers occupied for several decades.

Many studies have been conducted to find out which particular aspects are included in health self-assessments. In quantitative studies the relationship between a priori defined health measures and self-assessed health has been analysed. In these studies, however, a significant proportion of variance in self-assessed health remains unexplained. This suggests that when assessing their health, participants may include health aspects that have not been routinely included in quantitative analyses. Therefore, in addition to these quantitative studies, some researchers have used a qualitative approach to identify the remaining and unknown aspects of self-assessed health. Briefly summarising, self-assessed health seems mainly to be associated with physical health problems, functional capacities, health behaviour, and psychological aspects (Idler, Hudson & Leventhal, 1999; Van Doorn, 1999; Manderbacka, 1998; Borawski-Clark, Kinney & Kahana, 1996; Krause & Jay, 1994). Additionally, some studies found that aspects such as health comparison (Krause & Jay, 1994), health transcendence, externally focussed, non-reflective (Borawski-Clark, Kinney & Kahana, 1996), social role activities, and social relationships (Idler, Hudson & Leventhal, 1999) were included in health self-assessments. Only two of these qualitative studies attempted to include equal numbers of participants of different sociodemographic backgrounds (Manderbacka, 1998; Krause & Jay, 1994). The other studies included convenience samples predominantly consisting of women, elderly, highly educated participants (Idler, Hudson & Leventhal, 1999; Van Doorn, 1999; Borawski-Clark, Kinney & Kahana, 1996), or participants with health problems (Van Doorn, 1999). However, health standards may vary among different subgroups, and probably depend very much upon gender (Borawski-Clark, Kinney & Kahana, 1996), age (Krause & Jay, 1994; Blaxter, 1990) and experience with health problems (Blaxter, 1990). Therefore, it is difficult to decide whether the findings in these studies reflect general health conceptions, or are determined by the most prevalent subgroup. It would be relevant to know whether participants from different subgroups consider entirely different aspects when assessing their health, but with the exception of Krause and Jay's study (1994), qualitative studies on self-assessed health rarely examined subgroup differences.

We initiated a qualitative study on self-assessed health and intended to study subgroup differences with respect to gender, age, health status and self-assessed health. As it would be insufficient just to include equal numbers of participants of each subgroup, we based our study on

a sample that has been stratified on background characteristics, health status, and health-assessment. In the present paper we will describe the results of this qualitative study which focuses on the aspects that people consider when answering the question “How is your health in general? Is it very good, good, fair, sometimes good and sometimes poor, or poor?”. We believe that health assessments follow an individual process of ordering and weighing different health aspects. Therefore, we asked participants what went through their minds when answering the question on self-assessed health. We included all health aspects they mentioned in the analyses, as these are all part of the process of health assessment. The analysis was guided by the following research questions: Which aspects do participants consider when answering the question on self-assessed health? Do participants with different background characteristics (age and gender), and participants with different health status (with and without current chronic conditions) consider the same or different aspects when assessing their health? Do participants with good and less-than-good self-assessed health consider the same or different aspects when assessing their health?

3.2 Data and methods

Study population

Our study population consists of participants of the GLOBE-study, a longitudinal study designed to describe and explain sociodemographic inequalities in health in the Netherlands. Design and objective of the GLOBE-study have been described in detail elsewhere (Mackenbach, Van de Mheen & Stronks, 1994). At baseline in 1991, participants constituted of a cohort of non-institutionalised men and women with Dutch nationality, 15-74 years of age, who were living in the city of Eindhoven or surrounding municipalities. In 1997, a subgroup of respondents to the baseline interview were approached to participate in a follow-up study. For our qualitative study, we drew a stratified sample from the respondents to the 1997 follow-up. The interviews took place in 1998.

The variables for stratification have been chosen because of their supposed relationship with self-assessed health: gender, age, socioeconomic status, and health status. In order to obtain maximum contrast, we included men and women, younger than 40 years of age and older than 60 years of age, with the highest level of education (university degree) and with the lowest level of education (primary or lower vocational education), with a chronic illness (COPD/asthma or chronic back complaints) and without a current illness. Furthermore, we stratified on the most recent available (i.e. 1997) health-assessment and thus included participants with (very) good, as well as participants with less-than-good self-assessed health. We have drawn the stratification table in Appendix 3.1.

Non-response and changes in health assessments

In each stratum, participants were randomly selected. It was, however, not possible to select participants in all strata, due to various reasons. First, some strata did not exist in the population from which we drew our study sample. Second, the number of possible participants that fitted a

particular profile (i.e. stratum) could be very low. When these participants all refused to participate in our study, there were no other eligible participants we could approach. Third, some participants changed their health-assessment during the 1998 semi-structured interview as compared to the follow-up data (1997) on which we based our initial selection of respondents. These factors (non-existing strata, non-response and change in health assessments between 1997 and 1998) caused some cells in the original stratification scheme to remain empty, and others to contain more participants than expected. All in all, we were able to select participants for 74 percent of the existing strata.

From May till December 1998, we approached 63 people by mail and telephone. Fourteen persons were unwilling to participate in the study, we were unable to get into contact with six persons, and three persons were unavailable during the study-period, although willing to participate. Thus, we interviewed 40 participants, a response of 63 percent. The distribution of the different stratification variables can be seen in Table 3.1.

Table 3.1
Distribution of stratification variables in study population

Stratification variables	Categories	N
Gender	Women	20
	Men	20
Age	Younger (40-)	14
	Older (60+)	26
Socio-economic status	Low education	19
	High education	21
Health status	No current illness	20
	COPD or Back complaints	20
Self-assessed health (during interview)	Good ^a	26
	Less-than-good	14

a Includes category "very good" (n=1)

Semi-structured interview

All participants were interviewed in their homes by the principal investigator (JS). The semi-structured interviews, lasting approximately 35 minutes, were tape recorded and transcribed verbatim. Following a brief introduction the interviewees were presented with the core question "How is your health in general? Is it very good, good, fair, sometimes good and sometimes poor, or poor?", and were then asked to explain their particular response.

Interview analysis

We started with analysing the *verbatim text* of the interviews. In each interview, we condensed the answers given to the single-item measure on self-assessed health and the reasons for this

health-assessment. Parts of the text which were representing the same theme were summarised with a single phrase, hereby paraphrasing the participant¹. In this way, each interview could be condensed into *personal themes*. Next, we categorised the personal themes of all participants into a smaller number of recurrent themes, which we will refer to as *health aspects*. Finally, on categorisation of these health aspects, five conceptually meaningful *health dimensions* emerged. Appendix 3.2 shows a flow chart in which the coding process is illustrated. For the development of the overall categorisation scheme, and for the data-analysis that followed we used QSR NUD*IST software (QSR, 1997).

To ensure reliability in coding and analysing the interviews four researchers (JS, JB, IJ and HB) independently read and coded eight of the interviews. The results were compared, and in order to converge to a standardised method for coding the interviews, discrepancies as well as similarities were discussed. The aim of this exercise was to come to a reliable method for analysing the interviews and designing the final categorisation scheme. Next, the principal investigator (JS) read and coded all interviews, and designed the final categorisation scheme. This categorisation scheme includes descriptions (or definitions) of all health dimensions and health aspects that have been derived from the interviews. Finally, one of the other researchers (IJ) independently applied the categorisation scheme (on the level of health dimensions) to eight of the interviews. We then calculated Cohen's Kappa, a measure of inter-rater reliability, and the level of agreement was shown to be good ($\kappa = 0.69$) (Fleiss, 1973).

In this paper we will present the overall frequency distribution of the different dimensions and health aspects, as well as the distribution of health dimensions by gender, age, health status, and health assessment. With chi-square analyses we will examine whether referring to a particular dimension varies significantly for different subgroups.

3.3 Results

Which aspects do participants consider when answering the single-item measure on self-assessed health?

The final categorisation scheme we construed consists of 17 health aspects, categorised into 5 health dimensions (Table 3.2). We considered any health aspect referring to (chronic) disease, physical complaints, or other "bodily"-oriented theme to be an aspect from the physical dimension. Any health aspect referring to the ability to perform we considered to be an aspect from the functional dimension. We considered any theme referring to having adapted to an illness or attitude towards illness to be an aspect from the coping dimension. Any theme referring to feelings, without a clear objective justification, we considered to be an aspect from the wellbeing dimension. And logically, we considered any theme referring to (health) behaviour to be an aspect from the behavioural dimension. The number of dimensions participants referred to ranged from 1 to 3 health dimensions. Almost half of the participants (47%) mentions aspects from only one dimension, half of the participants (50%) mentions aspects from two dimension, and one

participant mentions aspects from three health dimensions. In total, 40 participants make 62 references to any health dimension, thus on average participants mention 1.55 health dimension.

Table 3.2
Frequency of health dimensions and health aspects

Health dimensions	N (% of total)
Health aspects (n)	
Physical	31 (78%)
Chronic illness (15)	
Physical problems (11)	
Medical treatment (6)	
Age-related (“normal”) complaints (6)	
Prognosis of illness (4)	
Bodily “mechanics” (1)	
Resilience (1)	
Functional	11 (28%)
Not being impaired (4)	
Illness-related disability (5)	
Age-related functional abilities (3)	
Coping	11 (28%)
To adapt to illness (5)	
A positive attitude (4)	
Social comparison (2)	
Wellbeing	8 (20%)
Feeling fit (5)	
Feeling good (2)	
Body/mind equilibrium (1)	
Behaviour	1 (3%)
Eating healthy food (1)	

Physical dimension (n=31) Within the physical dimension, seven different physical aspects can be discerned. First, the presence of a chronic illness or a history of chronic illness is an important factor when participants assess their health.

“Well, I guess you could say that my health is reasonably okay, only there’s no getting away from the fact that I’m, uh, thirty, forty percent asthmatic. That’s what I’ve got, so to speak.”

Man, 60+, high ses, copd/asthma, “fair”

Second, when assessing their health participants also consider other physical complaints, not directly related to any chronic illness, such as never being ill, never needing to stay at home due to illness, or only experiencing minor illnesses, such as the common cold.

“Uh, no problems, no headaches, no stomach aches, no menstrual pains like I used to get.”

Woman, 60+, “high ses, no current illness, “good”

Third, participants mention not being under medical treatment, or –just the opposite– being prescribed a lot of medication.

“I never see the doctor, so, uh, sure, I’m in good shape (...) I mean, well, if you don’t need to see the doctor a lot, and you don’t have a whole lot of complaints (...) Healthy? Yes, all of us, we’re healthy. At least, my husband never has to visit the doctor – knock on wood – up to now, so, well. (...) Never been in hospital for anything, well, only to have a baby, and that’s rather a healthy reason, wouldn’t you say.”

Woman, 40-, low ses, no current illness, “good”

The fourth aspect is that of age-related, or “normal” complaints. Participants mention that they do have some physical complaints, but that they consider these to be expected, i.e. “normal”, considering their age.

“I’d say I’m fine. Yes. Of course there’s always some little thing going wrong here and there, but all pretty much to be expected. My arm was giving me problems and the doctor gave me a few shots, I mean, well, it was painful, and after eighty years it’s not a surprise my joints weren’t working as smoothly as when I was twenty. But actually I’m doing fine.”

Man, 60+, low ses, copd/asthma, “fair”

Fifth, participants with a chronic illness or a history of illness sometimes mention the course, or prognosis of their illness, as a reason for assessing their health as they do.

“Well I don’t know whether you read the previous questionnaires? Oh, well two years ago I was operated on for breast cancer, so with that in mind, I’m doing very well (...) Like I said, I may have had an operation but it was localised and I’m fine now. No other complaints.”

Woman, 60+, high ses, no current illness, “good”

One participant refers to the sixth aspect: his body has “mechanical problems” as a result of which he regularly has a stiff neck.

“The only thing, which is why I was wavering between ‘very good’ and ‘good’, uh, mechanically I’m not in great condition. Right now, for example, I’ve got a stiff neck, but I’ve always got a backache. And, uh, that’s because well, it’s just not strong.”

Man, 60+, high ses, chronic back complaints, “very good”

Another participant introduces the seventh aspect, resilience: do you have a “strong body” or don’t you?

“I guess it all has to do with constitution, how strong your body is, you know. What I notice in my case is that that’s not all that strong, that for the rest I feel perfectly healthy, but I’m very quick to notice when I’ve been overdoing it. Like when I’ve had too much to drink. Or forget stuff. That S. I was talking about just now, well, he’s a good example. He can eat, say, half-done chicken legs. If I ate something like that I’d notice

right away. My stomach starts acting up or something and he has no problems at all."

Man, 40-, low ses, no current illness, "good"

Functional dimension (n=11) Functional aspects are mentioned by far less participants; three aspects can be discerned. First, participants refer to general functional abilities and limitations. They refer to being able or unable to do the things they want to, or need to do, without any reference to illness or disease.

"Well, because you can do everything, you do everything. But 'very good', no, I mean there are also all the days that things don't go very well, so I guess 'good' is a happy medium."

Woman, 40-, low ses, no current illness, "good"

Second, participants mention some kind of disability or impaired mobility, due to illness or disease. They mention, for instance, not being able to walk more than a few blocks due to asthma/COPD, or not being able to work anymore due to chronic back complaints.

"It started with my lungs (...) Yes, (my health) it's poor. I mean, if I could get more air. I mean, right now, and then I'm referring primarily to the past few months, after I've walked for, say, 200 metres, I have to stop and, and catch my breath. Take just yesterday. I wanted to go get a haircut, that's 10 minutes away by bike. Halfway there I had to turn around and go home. So I'm hoping that specialist is right and that if I use oxygen when I exert myself, it'll help."

Man, 60+, low ses, copd/asthma, "poor"

Third, some older participants relate their functional abilities to their age. They mention being able to function well "for their age", they can still work around the house without needing professional help.

"Uhh, if a person's healthy, uhhh, he can do anything he's supposed to be able to do at his age. I mean, look, if you're over sixty, I'm sixty-three, obviously you can't be doing all the crazy things you did when you were twenty or thirty."

Man, 60+, high ses, no current illness, "good"

Coping dimension (n=12) Three aspects of coping have been distinguished. First, some participants mention that they have learned to adapt to the illness, they have learned to live with the limitations.

"Because health is extremely complicated. I mean, purely on the physical level, you could check whether every bit of the body is in good working order. And in my case you'd find that there are a great many bits in my body that don't work well. But if you look at the complex, the aggregate and the combination etc. etc. , how I function the way I am, well, the answer is good, I would say. (...) So to my mind it has a lot to do with uhh, on the one hand adapting and on the other taking steps to be able to do want you want to do, only in a different way."

Woman, 60+, high ses, chronic back complaints, "sometimes good and sometimes poor"

Second, other participants mention that they try to maintain a positive attitude towards the illness.

"It's however you look at it, I say. I mean, it's not going at all well to be frank, but I try to take the cheerful view. So, chin up, is what I always say (...) Well, they're not actually very healthy. No, well they always look on the bright side, you see. Yes. And, I mean take someone who has a bug or something else, whatever, that can make you feel really ill, that person knows 'this'll be over in a couple of days, a few weeks', and that holds for a lot of things. And that's what I mean by always looking on the bright side. And even when it's like there isn't one, you still always have to find that tiny spark."

Woman, 40-, low ses, chronic back complaints, "good"

And third, participants compare their own health with that of others of their own age. They use the method of downward comparison, they compare their own health with the health of people who are worse off.

"But there are always worse things, aren't there, and that's some consolation. I was just in hospital and I saw a person come out who was bent over nearly double, what a hump! His nose close to scraping the ground, I mean imagine going through life like that? That would really be awful."

Man, 60+, low ses, copd/asthma, "poor"

Wellbeing dimension (n=8) The three aspects of wellbeing are more subjective, based on feelings. Here, participants do not give any objective justification, they simply mention that they are either "feeling fit" and not feeling tired, or "feeling good".

"Yes, I feel good, I'm never tired and uh especially during the past few years, sure. (...) Yes, physically healthy? I guess, if you're not tired (...) I feel fit, not tired, so I feel healthy."

Woman, 40-, low ses, no current illness, "good"

"Yes, I feel good, I feel absolutely great. For me, health is 'feeling good'. And I do. That's how simple it is. (...) Oh, that's, I guess, not feeling bad."

Man, 40-, high ses, chronic back complaints, "good"

One participant refers to the body/mind equilibrium, not being healthy because of an imbalance due to either mental or physical problems.

"If you're ill and out of sorts, you can forget it, you just feel rotten. If you have a psychological problem you feel just as rotten even though physically, there's nothing wrong. But you're not completely healthy if you've got a problem with either. (...) Healthy is when you have no infections of any kind. I guess that's part of it. And that there's no blackness messing up your mind (...) I mean, you don't have flu, mentally you're okay. And it's like 'everything's good, I'm doing fine'."

Woman, 40-, high ses, chronic back complaints, "fair"

Behavioural dimension (n=1) Only one participant mentions a behavioural aspect in relation to her health assessment, she eats well ("all from our own garden") and she does not eat sweets.

Do participants with different background characteristics and participants with different health status consider the same or different aspects when assessing their health?

In our study, some differences between participants with different background characteristics (gender and age) can be observed (Table 3.3). With regard to *gender* it can be seen that men do

refer to the functional dimension more often than women, 40 percent of the men compared to only 15 percent of the women mention this dimension (not statistically significant), though no differences could be observed with respect to the functional aspects they mention. No gender-differences can be observed in the frequency of physical aspects, aspects of wellbeing and aspects of coping.

Table 3.3

Frequency of different health dimensions, by gender, age, health status and health-assessment

Subgroup Category (n)	Health dimensions					Mean n° of dimensions			
	Physical N (%)	Functional N (%)	Coping N (%)	Wellbeing N (%)	Behaviour N (%)				
<i>Gender</i>									
Women (20)	15 (75)	3 (15)	6 (30)	4 (20)	1 (5)	1.5	t-test		
Men (20)	16 (80)	8 (40)	5 (25)	4 (20)	0 (0)	1.7	n.s. ^a		
<i>Age</i>									
40– (14)	7 (50)	2 (14)	3 (21)	7 (50)	0 (0)	1.4	t-test		
60+ (26)	24 (92)	9 (35)	8 (31)	1 (4)	1 (4)	1.7	p <.10		
<i>Health status</i>									
No current illness (20)	15 (75)	6 (30)	0 (0)	6 (30)	1 (5)	1.4	t-test		
Chronically ill (20)	16 (80)	5 (25)	11 (55)	2 (10)	0 (0)	1.7	p <.10		
<i>Health-assessment</i>									
Good ^b (26)	19 (73)	5 (19)	6 (23)	7 (27)	0 (0)	1.4			
Fair (6)	5 (83)	2 (33)	1 (17)	1 (17)	1 (17)	1.7	anova		
Sometimes poor ^c (5)	4 (80)	2 (40)	3 (60)	0 (0)	0 (0)	1.8	p <.05		
Poor (3)	3 (100)	2 (67)	1 (33)	0 (0)	0 (0)	2.0			

a n.s. Not significant

b Includes category "Very good" (n=1)

c In full: "Sometimes good and sometimes poor"

However, in our study-group clear *age-differences* can be observed. Participants in the 60+ age group refer to the physical dimension (92%, p < .01) and functional dimension (35%, not statistically significant) almost twice as much compared to 40– participants. Older participants with a chronic illness or a history of illness mention aspects such as "prognosis of illness" or "illness-related functional disability" more frequently than do younger participants. Aspects such as "age-related complaints" or "age-related functional abilities" are only mentioned by older participants, as these aspects do not apply to the young. Another significantly age-related dimension is wellbeing (p < .001); "feeling fit", "feeling good", and "body/mind equilibrium" are aspects mentioned almost exclusively by the young. Half of the younger participants mentions aspects of wellbeing, whereas only one elderly participant mentions that he based his health

assessment on “feeling fit”. With respect to the coping dimension, the age-difference is less marked and not statistically significant. Still, almost one-third of the older participants versus one-fifth of the younger mentions aspects of coping.

Participants with and without a *current illness* differ notably on two dimensions. First, more than half (55%) of the participants with a chronic illness mentions coping with a chronic illness, and logically none of the participants with no current illness mentions it ($p < .001$). Second, wellbeing is considered more frequently, although not significantly, by participants with no current illness. Almost one-third (30%) mentions feeling fit or feeling good as a reason for their health assessment, but this aspect is hardly mentioned (only 10%) by chronically ill participants. The functional dimension is mentioned almost equally frequent by participants with no current illness (30%) and chronically ill participants (25%). Although only the former mention functional aspects with a positive connotation: being able to do almost anything, whether or not in relation to (a relatively high) age. Participants with and participants without a chronic illness refer to disability or impaired mobility due to a chronic illness or a history of disease. Nevertheless, for participants with and without a current illness self-assessed health is predominantly associated with the physical dimension. In both groups almost 80 percent of the participants refers to the presence or absence of physical problems.

The final column in Table 3.3 shows that men, elderly, and chronically ill participants refer to more health dimensions than women, younger participants, and those with no current illness.

Do participants with good and less-than-good self-assessed health consider the same or different aspects when assessing their health?

We will refer to participants describing their health as either very good or good as “being in good health”, and to participants describing their health as either fair, sometimes good and sometimes poor, or poor as “being in less-than-good health”. From Table 3.1 can be seen that 26 of the participants (65%) consider themselves to be in good health, one of these participants even considers himself to be in very good health. Fourteen participants (35%) consider themselves to be in less-than-good health; six participants say their health is fair, five participants say their health is sometimes good and sometimes poor, and three participants say their health is poor.

The majority of the participants describe their health as good, and one participant mentions being in very good health. Some participants explain –unprompted– why they do not consider their health to be very good. They mention a (history of) disease as the reason for not describing their health as very good; because of their illness they are in good health and not in very good health. Other participants mention that some aspect of their health could be improved: at times they are not able to do everything, or they are not as fit as they should be.

Table 3.3 shows that the functional dimension is far more important for a less-than-good health assessment (43%) than for a good health-assessment (19%). The gradient from good to poor self-assessed health is very clear, although not statistically significant. When functional aspects are mentioned by participants in good health, it is always with a positive undertone. In addition to

positive functional aspects participants in less-than-good health refer to disability and impaired mobility due to disease or illness. The coping dimension is mentioned more frequently, though not significantly, by participants in less-than-good health (36%) than participants in good health (23%). Remarkably, only participants in less-than-good health compare their own health with that of other people who are worse off. In contrast, aspects of wellbeing –such as feeling fit or feeling good– are mentioned predominantly by participants in good health (27%), only one participant with less-than-good health mention an aspect of wellbeing. Clearly, for good as well as for less-than-good self-assessed health the physical dimension is very important. Still, slightly more participants in less-than-good health (86%) than participants in good health (73%) explain their health-assessment in physical terms (not statistically significant). Participants in good health mention the absence of physical problems, only experiencing minor illnesses or age-related symptoms, and a good prognosis. Being in less-than-good health is also associated with the absence of physical problems or only experiencing age-related symptoms. However, participants in less-than-good health also refer to the presence of physical problems. Of those in less-than-good health, particularly participants in poor health mention the severity of their chronic illness and a poor prognosis: their illness has deteriorated.

The final column of Table 3.3 shows that participants with a less favourable health-assessment refer to more health dimensions than participants with the most favourable health-assessment. A clear gradient can be observed, from an average of 1.4 health dimensions for participants with (very) good self-assessed health up to an average of 2.0 health dimensions for participants with poor self-assessed health.

3.4 Discussion

Summary of the findings The physical dimension of health has –traditionally– been viewed as being the core of self-assessed health, and in our study too this dimension proved to be a central factor in health self-assessments. Almost 80% of the participants referred to one or more physical aspect (chronic illness, physical problems, medical treatment, age-related complaints, prognosis, bodily mechanics, and resilience). Nevertheless, when assessing their health participants also include aspects that go beyond the physical dimension of health: 80 percent of the participants – whether or not in addition to physical aspects– referred to one or more of the other health dimensions. Besides physical aspects participants considered the extent to which they are able to perform (functional dimension), the extent to which they adapted to, or their attitude towards an existing illness (coping dimension), and simply the way they feel (wellbeing dimension). Health behaviour or lifestyle factors (behavioural dimension) proved to be relatively unimportant in health self-assessments. All in all, we may well conclude that self-assessed health is not just a physical but a multidimensional concept.

Table 3.4

Overview of the main dimensions (*in italics*) of five qualitative studies on self-assessed health

This paper	Krause and Jay (1994)	Borawski-Clark et al. (1996)	Manderbacka (1998)	Idler et al. (1999)
<i>Physical</i>	<i>Health problems</i> Presence or absence of health problems and illnesses <i>Physical functioning</i> General physical condition	<i>Physical health</i> Medical/health conditions Physical symptoms	<i>Absence of ill-health</i> Presence or absence of disease <i>Health as an experience</i> Experienced symptoms, illnesses <i>Other</i> Reproductive, sensory functions	<i>Physical health</i> Medical conditions, symptoms, prognosis <i>Psychological, emotional health</i> Age-related complaints
<i>Functional</i>	<i>Physical functioning</i> Physical functioning, mobility	<i>Physical health</i> Functional capacities	<i>Health as a function</i> Functional restrictions	<i>Physical functioning</i> Daily activities <i>Social role activities</i> Social responsibilities
<i>Coping</i>	<i>Health comparisons</i> Comparing to other people	<i>Health transcendence</i> Able to transcend health problems <i>Attitudinal, behavioural</i> Psychological	<i>Health as an action</i> Strength, coping	<i>Psychological, emotional health</i> Attitude <i>Social relationships</i> Social comparison
<i>Wellbeing</i>	<i>Mental health</i> Psychological wellbeing <i>Physical functioning</i> Energy level	<i>Non-reflective</i> Feeling good	<i>Health as an experience</i> Feeling good <i>Health as an action</i> Fitness, vitality, equilibrium	<i>Physical health</i> Energy <i>Psychological, emotional health</i> Positive emotions, happiness
<i>Behaviour</i>	<i>Health behaviour</i> Positive/ negative behaviour	<i>Attitudinal, behavioural</i> Lifestyle	<i>Health as an action</i> Lifestyle, health behaviour	<i>Health risk behaviours</i> Health behaviour
<i>Undefined</i>		<i>Externally focussed</i> External validation, social support, external causes		<i>Social relationships</i> Family relations <i>Psychological, emotional health</i> Luck, faith

Note Van Doorn's paper provided little information on the exact contents of the dimensions that were distinguished; this study is not included in the overview

Methodological issues When interpreting the results of the present study, some methodological issues should be kept in mind. First, since most qualitative studies apply an inductive procedure to analyse the interviews, our study differs from the other studies on self-assessed health both with respect to the terminology used and the final categorisation of these health aspects. Although not all studies describe the contents of the final categories/dimensions in detail, at first glance it seems as if applying our final categorisation scheme to the data in other studies would yield different results (Table 3.4). For instance, Krause and Jay (1994) categorised references to general energy level as “health problems” which in our study would have been categorised as “wellbeing”. Similarly, Borawski-Clark (1996) categorised functional capacities under the header of “physical health” instead of “functional aspects”. Experienced symptoms and feeling good, in Manderbacka’s study (1998) categorised as “health as an experience”, would in our study have been categorised as “physical” and “wellbeing” respectively. Different researchers thus apply a different terminology, but Table 3.4 also shows that –in general– qualitative studies on self-assessed health are quite similar with respect to the health aspects that have been drawn from the interviews. Second, some studies only included those aspects in the analysis which participants mentioned first (single-reference studies), other studies included all aspects which participants mentioned (multiple-reference studies). So it is difficult to compare the results of our multiple-reference study with other, single-reference studies (e.g. Krause & Jay, 1994) with respect to the percentage of participants that referred to any of the health dimensions. Also, in our study we found that participants referred to an average of 1.55 dimensions when assessing their health. Krause and Jay (1994, single-reference study) noted a slightly lower average of 1.39 dimensions, and Borawski-Clark (1996, multiple-reference study) found an average of 1.19 different dimensions. Due to both the multiple-reference / single-reference disparity and the differential categorisation of the health aspects over these dimensions it is quite difficult to compare studies with respect to the average number of health dimensions. Third, even in our small-scale study we were able to identify some statistically significant subgroup differences. In this small study population, it required a difference of over 30 percent points to become statistically significant. This does not imply that the remaining non-significant subgroup differences of 20 to 25 percent we identified should be discarded as irrelevant, as these may very well be real differences. When these findings were to be repeated in a larger study population, these subgroup differences would be statistically significant. Therefore, we included these smaller and non-significant subgroup differences in our interpretation of the findings regarding subgroup differences.

Differences with respect to background characteristics and health status We found that men refer to functional aspects more frequently than women, although this result is only marginally significant. In Western societies men are normally the breadwinner and thus responsible for the main source of income. This may be the reason that men, more than women, have incorporated the functional definition of health as “being able to perform the necessary duties” (Seedhouse, 1986; Twaddle, 1974). However, our study population is not fully balanced, as it contains relatively more older men than older women. We cannot rule out the possibility that this differential age-distribution accounts for the gender-difference we observed. We also

observed clear and some significant age-differences in our study-group. Participants in the 60+ age group referred to physical and functional aspects almost twice as much compared to younger participants. In contrast, half of the younger participants mentions aspects of wellbeing, whereas this aspect is mentioned only incidentally by elderly participants. Although the distribution of participants with and without a current illness is equal in both age-groups, elderly participants more frequently mention a history of illness. Elderly participants probably incorporate these prior episodes of (physical or functional) ill-health in their health assessments. Furthermore, we found some differences between participants with and without a current illness. Aspects of coping are typically mentioned by participants with a chronic illness. On the other hand, aspects of wellbeing are typical aspects of participants with no current illness. Some (predominantly younger) participants are relatively inexperienced with (coping with) physical, functional or age-related health problems. Consequently, these participants do not incorporate these health dimensions in their health assessments, but simply rely on the way they feel. Other (predominantly elderly) participants are more experienced with episodes of ill-health. Yet, for these participants it is not so much the presence of (physical, functional or age-related) health problems but the extent to which they are capable of coping with these problems which determines their eventual health assessment. The importance of experience with health problems and the ability to cope with them is also reflected in the finding that elderly and chronically ill participants include more health dimensions in their health assessments than do younger participants and those with no current illness.

Differences between participants with good and less-than-good health assessment There are some differences between participants in good and participants in less-than-good health, though not statistically significant. Again, these differences may be the result of some participants having experienced less health problems than others. For participants in good health two lines of reasoning can be distinguished. Participants with no current illness or other health problems reason: "I am not bothered by any physical or functional health problem, I am feeling good", participants with (a history of) chronic illness or other (e.g. age-related) health complaints reason: "I am not bothered by physical or functional complaints, I cope with them". Participants in less-than-good health seem to experience more physical and functional health problems than participants in better health –as reflected in the larger number of health dimensions they refer to– which they also present as being more severe. On the basis of these interviews we cannot determine whether the participants in less-than-good health truly suffer from more severe problems than participants in better health, or that for some reason these participants are less capable of coping with health problems.

The role of coping Besides prior or current experience with physical or functional health problems, coping with these problems seems to be important for one's health assessment. It is inherent to our coding process that only explicit statements referring to adapting to illness, attitude towards illness, or comparison were considered to be referring to aspects of coping. These statements all explicitly referred to the way participants coped with their illness. However, if we look closer at the data, we find that there are other, more implicit, references which could be

considered as a way of coping with health complaints. When referring to age-related complaints, for example, all but one participant add that they consider these complaints to be normal or to be expected considering their age. Another example of implicit coping may be the aspect of age-related functioning. Some older participants related their functional abilities to their age. They may not be able to do the things they did when they were 18, but they are able to function well for their age. It seems as if participants who consider age-related physical complaints or functional decline to be normal, are less bothered by them. And although not all participants mentioning age-related (“normal”) complaints or age-related functioning assessed their health as good, it may be just the reason why they did not assess their health more poorly (Suls, Marco & Tobin, 1991).

A qualitative methodology The advantage of applying a qualitative over a quantitative methodology is that it enables researchers to study the dimensions of self-assessed health within the individual’s social context and concrete situation and, more importantly, from the perspective of the individual. We believe that the current study is a meaningful contribution to the empirical literature on self-assessed health, as it is one of only few qualitative studies. The main advantage of our study over other qualitative studies on self-assessed health is that we were able to control for potential confounding variables. Because we wanted to examine subgroup differences, we stratified for age, gender, socioeconomic status and health status. Furthermore, in this study we applied a sound methodology, which made this study systematic and rigorous with respect to the research design (stratified sample), data collection (semi-structured interview, tape-recorded and transcribed), and analysis (QSR NUD*IST software, standardised method for coding the interviews, inter-rater reliability) (Mays & Pope, 2000; Pope, Ziebland & Mays, 2000; Mays & Pope, 1995). But this study also has some limitations which need to be addressed. We wanted to perform an in-depth qualitative study with a strictly stratified sample, which imposed serious limitations to the number of participants. Our findings are based on a population consisting of only 40 participants. Also, in order to obtain maximum contrast, we only included participants younger than 40 years of age and older than 60 years of age, with the highest level of education and with the lowest level of education. Consequently, it is difficult to determine whether the findings in our study can simply be generalised to different subsamples.

The WHO-definition and self-assessed health In our study, we found that self-assessed health is on the one hand very much influenced by the individual’s (in)experience with health problems, and on the other hand by the way an individual is able to cope –implicitly or explicitly– with these problems. A remarkable finding as it seems to dispute the WHO-definition describing health as *a state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity* (World Health Organization, 1948). Indeed, self-assessed health is not a unidimensional concept, our study too shows that it comprises multiple dimensions. Nevertheless, several qualitative studies besides ours have shown that self-assessed health is primarily influenced by “the absence or (coping with) the presence of disease or infirmity” (Idler, Hudson & Leventhal, 1999; Van Doorn, 1999; Manderbacka, 1998; Borawski-Clark, Kinney & Kahana, 1996; Krause & Jay, 1994). The existence of a social dimension of self-assessed health is supported only incidentally through health aspects such as social support (Borawski-Clark,

Kinney & Kahana, 1996) or family relations (Idler, Hudson & Leventhal, 1999). Apparently, the dimensions of self-assessed health do not entirely correspond to the WHO-dimensions of health.

In conclusion We have shown that that self-assessed health is a multidimensional concept. Over the years several qualitative studies on self-assessed health have produced comparable results, even though these studies differed with respect to the subgroups they included and the methodology they applied. The consistency of the findings suggests that we have actually taken a step nearer to identifying which particular aspects are involved in health assessments.

Notes

1. We used the same procedure in order to condense the remainder of the interview. Essentially we used the remainder of the interview to give context to (i.e. to complement and sometimes to clarify) the themes that participants mentioned when answering the core question on self-assessed health.

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Appendix 3.1

Stratification of the participants of the qualitative study

Stratification variables			In good health (n=26) ^c	Less-than-good health (N=14)	
Gender	Education ^a	Age ^b	Health status (n)	Health status (n)	
Men N=19	High N=10	40–	Chronic illness (2)	Chronic illness (0)	
			No current illness (2)	No current illness (0)	
		60+	Chronic illness (1)	Chronic illness (2)	
		N=6	No current illness (3)	No current illness (0)	
	Low N=9	40–	Chronic illness (1)	Chronic illness (0)	
			N=2	No current illness (1)	No current illness (0)
60+		Chronic illness (1)	Chronic illness (3)		
	N=7	No current illness (1)	No current illness (2)		
Women N=21	High N=11	40–	Chronic illness (2)	Chronic illness (1)	
			N=5	No current illness (2)	No current illness (0)
		60+	Chronic illness (0)	Chronic illness (2)	
		N=6	No current illness (4)	No current illness (0)	
	Low N=10	40–	Chronic illness (1)	Chronic illness (0)	
			N=3	No current illness (2)	No current illness (0)
60+		Chronic illness (1)	Chronic illness (3)		
	N=7	No current illness (2)	No current illness (1)		

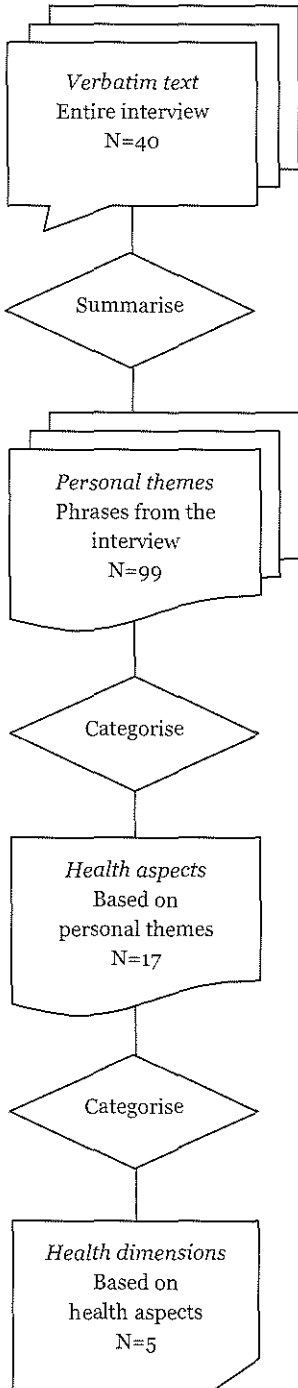
a Low=Primary education, lower vocational education; High=University degree

b 40– =Younger than 40; 60+ =Older than 60

c In good health=Very good, good; Less-than-good health=Fair, sometimes good and sometimes poor, poor

Appendix 3.2

Flow chart describing the phases in the qualitative analysis of the interviews



4

Explaining socioeconomic differences in self-assessed health: a qualitative approach

We investigated whether participants from higher and lower educated groups consider the same or different aspects when assessing their health. Participants were asked to assess their health, and to explain their particular response. We found that, when assessing their health, participants included physical aspects, functional aspects, wellbeing, coping, and –incidentally– health behaviour.

The main difference between both groups was that lower educated participants more frequently mentioned functional health aspects whereas higher educated participants more frequently mentioned aspects of wellbeing. Also, lower educated participants emphasised the *presence* of physical and functional problems, whereas higher educated participants emphasised the *absence* of these problems and accentuated feelings of wellbeing. These findings cannot be attributed to a differential distribution of chronic illness, as our study population was stratified with respect to this variable. We did not find indications that higher and lower educated participants hold entirely different concepts or definitions of health.

We suggested several explanations for the finding that lower educated participants emphasised ill-health whereas higher educated participants emphasised wellbeing. First, lower educated participants may have more (past) experience with ill-health, as the prevalence of health problems is higher in the lower social strata. Second, lower educated participants may suffer from more severe health problems, or health problems that bring about more functional limitations. Third, low SES individuals may have insufficient resources to alleviate existing health problems and, therefore, experience more negative consequences of ill-health. Finally, we should not rule out the possibility that higher educated individuals simply have an eye for the positive, and lower educated individuals do not.

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Submitted for publication

4.1 Introduction

In health literature, the existence of socioeconomic differences in health has been widely established. A considerable amount of research has shown that individuals higher in the social hierarchy are in better health than those below. These socioeconomic differences have been found for several measures of morbidity as well as for mortality. The majority of these studies takes a quantitative, mainly epidemiological perspective in which "health" is operationalised with objective outcome measures, such as cardiovascular disease, major depression, or mortality (for a review, view e.g. Anderson & Armstead, 1995; Adler, et al., 1994; Feinstein, 1993). Additionally, there are studies which have shown that socioeconomic differences also exist in more subjective health measures, such as the single item measure of self-assessed health. In these studies, it was shown that socioeconomic differences in self-assessed health are even larger than differences in specific health problems (Blane, Power & Bartley, 1996; Mackenbach, 1993). Furthermore, socioeconomic differences in self-assessed health could not be explained by the higher prevalence of (objective) health problems in lower socioeconomic groups (Simon, Van de Mheen, Van der Meer & Mackenbach, 2000). It seems to be that other, yet unknown aspects of health contribute to the observed socioeconomic differences in self-assessed health. To gain an understanding of these unknown aspects we should shift away from the quantitative perspective in which socioeconomic differences in self-assessed health are investigated based on a predefined set of health aspects. In a qualitative study, individuals from different socioeconomic groups can be asked directly which aspects they consider important when assessing their health. With a qualitative approach it is possible to find out which health aspects are specific to health-assessments in a particular socioeconomic group and which are more widely held.

Although several qualitative studies have examined lay health accounts, only a limited number of studies have paid attention to possible socioeconomic differences in these accounts. Moreover, none of these studies focused on finding out which health aspects are associated with the single-item measure of self-assessed health. Instead, participants were asked to describe when they consider themselves to be healthy, to compare their present health status with previous times (health in oneself), to elaborate on what makes them consider someone else to be healthy (health in others) or to define health in more general terms (health-in-the-abstract) (Van Dalen, Williams & Gudex, 1994; Blaxter, 1990; Calnan & Johnson, 1985; Houtaud & Field, 1984). In some studies it has been found that individuals from lower socioeconomic groups tend to define health unidimensionally or utilitarian (i.e. absence of illness, physical functioning), whereas individuals from higher socioeconomic groups define health multidimensionally or hedonistic (i.e. vitality, wellbeing) (Calnan & Johnson, 1985; Houtaud & Field, 1984; Herzlich, 1973). This finding was, however, not replicated by another study on subgroup differences (including social class) on health (Van Dalen, Williams & Gudex, 1994). This empirical difference between individuals from high and low socioeconomic groups resembles Kelman's (1975) theoretical distinction between experiential and functional definitions of health. The former defines health as the individual experience of wellbeing (including freedom from illness), the latter as the ability to fulfil their social role. It has been suggested that adverse social and material circumstances may have led

participants from lower socioeconomic groups to adopt such a *utilitarian* definition of health (Calnan & Johnson, 1985; Houtaud & Field, 1984). An alternative explanation is that some of these differences reflect differences in terminology or the vocabulary used by groups rather than real differences in health definitions (Calnan, 1986). A frequently cited study in the context of socioeconomic health differences is Blair's (1993) sociolinguistic study. He found clear socioeconomic differences with respect to the language used by participants from both groups; with middle class participants primarily using mentalistic terms (referring to the mind), and working class participants primarily using physicalistic terms (referring to the body). This study, however, concerned socioeconomic differences in "the personal experience and communication of distress" (Blair, 1993, pg. 27), which is related to but not entirely identical to health.

In none of the empirical studies, however, the differences can undoubtedly be attributed to socioeconomic status, as neither controlled for potential confounding variables, such as age, gender, or health status. As the prevalence of health problems is much higher in lower socioeconomic groups, there is a fair chance that the results found in earlier studies are confounded by health status (e.g. chronic illness). The question remains whether the presumed socioeconomic differences still stand when confounding factors are taken into account. We therefore initiated a qualitative study in which we stratified our study sample on education, gender, age, health status, and health-assessment. In this paper we will describe the results of this qualitative study on socioeconomic differences in self-assessed health. We were particularly interested in finding out more about the aspects participants had in mind when answering this question; do participants from higher and lower socioeconomic groups differ in the way they arrive at their health-assessment? Although our main aim is to study participants from different socioeconomic groups with respect to self-assessed health, we also include other questions on health, and asked participants to elaborate on being healthy and not being healthy. We thus tried to approach the concept of self-assessed health from several different angles. We focus on the following research question: Do participants from the highest and lowest socioeconomic groups consider the same or different aspects when assessing their health?

4.2 Data and Methods

Study population

Our study population consists of participants of the GLOBE-study, a longitudinal study designed to describe and explain sociodemographic inequalities in health in the Netherlands. Design and objective of the GLOBE-study have been described in detail elsewhere (Mackenbach, Van de Mheen & Stronks, 1994). At baseline in 1991, participants constituted of a cohort of non-institutionalised men and women with Dutch nationality, 15-74 years of age, who were living in the city of Eindhoven or surrounding municipalities. In 1997, a subgroup of respondents to the baseline interview were approached to participate in a follow-up study. For our qualitative study, we drew a stratified sample from the respondents to the 1997 follow-up.

We intended to distribute variables with a supposed relation with self-assessed health –gender, age, and health status– evenly over two socioeconomic groups, one group consisting of participants with the highest level of education (university degree) and another consisting of participants with the lowest level of education (primary education or lower vocational education). In each socioeconomic group, we included men and women, younger than 40 years of age and older than 60 years of age, with a chronic illness (COPD/asthma or chronic back complaints) and without a current illness. Furthermore, we stratified on the most recent (i.e. 1997) health-assessment, thus in each socioeconomic group we included participants with (very) good, as well as less-than-good self-assessed health.

Non-response and changes in health assessments

In each stratum, participants were randomly selected. It was, however, not possible to select participants in all strata, due to various reasons. First, some strata simply did not exist in the population from which we drew our study sample. Second, the number of possible participants that fitted a particular profile could be very low. When these participants refused to participate in our study, there were no other eligible participants we could approach. Third, some participants changed their health assessment during the current interview as compared to the 1997 follow-up. These factors (non-existing strata, non-response and change in health assessments) caused some cells in the original stratification scheme to remain empty, and others to contain more participants than expected. All in all, we were able to select participants for 74 percent of the existing strata.

From May till December 1998 we approached 63 people by mail and telephone. Fourteen persons were unwilling to participate in the study, we were unable to get into contact with six persons, and three persons were unavailable during the study-period, although willing to participate. Thus, we interviewed 40 participants, a response of 63 percent. In Table 4.1 can be seen that younger and elderly participants, as well as participants in good and less-than-good health are distributed unevenly over both educational groups. When discussing the findings we will particularly address how these differential distributions may have influenced the results.

Semi-structured interview

All participants were interviewed in their homes by the principal investigator (JS) who had no actual information regarding participants' socioeconomic status or health status. The semi-structured interviews, lasting approximately 35 minutes, were tape recorded and transcribed verbatim. Following a brief introduction the interviewees were presented with the core question "How is your health in general? Is it very good, good, fair, sometimes good and sometimes poor, or poor?", and were then asked to explain their particular response. We hypothesised that for some participants, in particular lower educated participants, elaborating on this rather general question on self-assessed health might be difficult. We extended the interview with other questions on health, and asked participants to elaborate on 'being healthy' and 'not being healthy'. We used this more neutral terminology instead of 'being in good health' and 'being in poor health' as we expected that only few individuals would have experienced poor health. With these

questions on 'being healthy' and 'not being healthy' we implicitly ask participants to elaborate on being in good and less-than-good health. As several authors have argued that individuals show greater fluency in their talk when speaking of their own experiences, rather than about health in general (Radley & Billig, 1996; Calnan, 1987), we included questions of both types in our study. Apart from general or abstract questions, we also included more personal and experiential questions on health¹. All participants were presented the interview questions in exactly the same order.

Table 4.1
Final distribution of stratification variables, by (high and low) education

Stratification variables	Categories	N _{high}	N _{low}	N _{total}
Gender	Women	10	10	20
	Men	11	9	20
Age	Younger (40-)	9	5	14
	Older (60+)	12	14	26
Health status	No current illness	11	9	20
	COPD/asthma	4	4	8
	Back complaints	6	6	12
Self-assessed health (during interview)	Good ^a	16	10	26
	Less-than-good	5	9	14
Total number of participants		21	19	40

^a Includes category "very good" (n=1)

Interview analysis

We started with analysing the *verbatim text* of the interviews. In each interview, we condensed the answers given to the single-item measure on self-assessed health and the reasons for this health-assessment². Parts of the text which were representing the same theme were summarised with a single phrase, hereby paraphrasing the participant. In this way, each interview could be condensed into *personal themes*. Next, we categorised the personal themes of all participants into a smaller number of recurrent themes, which we will refer to as *health aspects*. Finally, on categorisation of these health aspects, five conceptually meaningful *health dimensions* emerged. Appendix 4.1 shows a flow chart in which the coding process is illustrated.

To ensure reliability in coding and analysing the interviews, first, four researchers (JS, JB, IJ and HB) independently read and coded eight of the interviews. The results were compared, and in order to converge to a standardised method for coding the interviews, discrepancies as well as similarities were discussed. The aim of this exercise was to come to a reliable method for analysing the interviews and designing the final categorisation scheme. Next, the principal investigator (JS) read and coded all interviews, and designed the final categorisation scheme. This categorisation scheme includes descriptions (or definitions) of all health dimensions and health

aspects that have been derived from the interviews. Finally, another researcher (IJ) independently applied the categorisation scheme on the level of health dimensions to eight of the interviews. We then calculated Cohen's Kappa, a measure of inter-rater reliability and the level of agreement was shown to be good ($\kappa = 0.69$) (Fleiss, 1973). At this stage of the interview analysis the researchers had no actual information on age, gender, socioeconomic status, or health status of the interviewee.

For the development of this overall categorisation scheme and for the data-analysis that followed we used QSR NUD*IST software (QSR, 1997). In this paper we will present the frequency distributions of the different dimensions and health aspects by socioeconomic status. With chi-square analyses we will examine whether referring to a particular dimension varies significantly for higher and lower educated participants.

4.3 Results

Categorisation scheme The final categorisation scheme we derived from the single-item question on self-assessed health, consists of 17 health aspects, categorised into 5 health dimensions. In Chapter 3 (page 45) we illustrated each of the health aspects with excerpts from the interviews. When we included the additional questions about being healthy and not being healthy in the analysis, one additional health dimension and 7 additional health aspects could be identified (Appendix 4.2). We considered any health aspect referring to (chronic) disease, physical complaints, or other "bodily"-oriented theme to be an aspect from the physical dimension. Any health aspect referring to the ability to perform we considered to be an aspect from the functional dimension. We considered any theme referring to having adapted to an illness or attitude towards illness to be an aspect from the coping dimension. Any theme referring to feelings, without a clear objective justification, we considered to be an aspect from the wellbeing dimension. Furthermore, we considered any theme referring to (health) behaviour to be an aspect from the behavioural dimension. And finally, some participants referred to the fact that you cannot buy a healthy constitution, which we labelled "other" aspects of health.

Average number of health dimensions In Table 4.2 we compare the references regarding the single-item measure of self-assessed health with the references regarding the entire interview (i.e. self-assessed health, health in others, health in oneself, and health-in-the-abstract). It can be seen that, on average, higher educated participants refer to almost the same number of health dimensions than lower educated participants. This result holds true when we include references to self-assessed health only, and when we include references to the entire interview. Higher educated participants ($n=21$) make a total of 29 and 61 references to any health dimension, an average of 1.4 and 2.9 health dimensions. Lower educated participants ($n=19$) make a total of 33 and 62 references to any health dimension, an average of 1.7 and 3.2 health dimensions.

Table 4.2Frequency of health dimensions and themes, by socioeconomic group (N_{high}=21, N_{low}=19)**Overall health dimensions**

Health aspects	Self-assessed health		Entire interview ^a	
	n (%)	n (%)	n (%)	n (%)
Physical	n=16 (76%)	n=15 (79%)	n=16 (76%)	n=18 (95%)
Chronic illness	8	7	8	7
(Absence of) physical problems	7	4	8	10
(Not under) medical treatment	3	3	3	3
Age-related (“normal”) complaints	2	4	3	5
Prognosis of illness	3	1	5	3
Bodily “mechanics”	1	0	2	1
Resilience	1	0	1	1
Importance of family genetics	–	–	2	2
Being ignorant of an illness	–	–	1	3
Functional	n=2* (10%)	n=9* (47%)	n=14 (67%)	n=12 (63%)
(Not) being impaired	2	2	7	7
Illness-related disability	0	4	7	4
Age-related functional abilities	0	3	2	5
Wellbeing	n=6 (29%)	n=2 (11%)	n=18* (86%)	n=11* (58%)
Feeling fit	4	1	4	1
Feeling good	1	1	8	4
Body/mind equilibrium	1	0	5	2
Psychosomatic complaints	–	–	3	1
Illness-related discomfort	–	–	2	2
Happiness	–	–	2	2
Feeling in control	–	–	2	1
Coping	n=5 (24%)	n=6 (32%)	n=9 (43%)	n=12 (63%)
To adapt to illness	4	1	6	3
A positive attitude	0	4	4	6
Social comparison	2	2	2	5
Behaviour	n=0 (0%)	n=1 (5%)	n=3 (14%)	n=5 (26%)
Health-related behaviour	0	1	3	5
Other	n=0 (0%)	n=0 (0%)	n=1 (5%)	n=4 (21%)
You cannot buy a healthy constitution	–	–	1	4
Total number of references	n=29	n=33	n=61	n=62
Mean number of dimensions	1.4 ^b	1.7 ^b	2.9	3.2

a Includes self-assessed health, health in others, health in oneself and health-in-the-abstract

* Frequency distribution of higher and lower educated participants is significantly different (Chi-square test/t-test; p < .05)

References to the physical dimension Clearly, in both educational groups physical aspects are quite important for a health assessment (Table 4.2). Over three-quarters of the higher educated participants and slightly more of the lower educated participants refer to any physical aspect. Higher educated participants refer more frequently to the absence of physical problems, lower educated participants refer to both the absence and presence of health problems when assessing their health. In both groups the presence of a chronic illness is mentioned in relation to their health assessment. When we include the entire interview in the analysis, more lower educated participants (95%) than higher educated participants (76%) refer to physical aspects. We find that participants from both groups bring up some additional physical aspects.

References to the functional dimension When assessing their health, significantly more participants with lower education than participants with higher education refer to functional aspects. Almost half of the lower educated and only 10 percent of the higher educated mention these aspects. Participants with higher en lower education mention functional aspects with a positive connotation, sometimes in relation to their relatively high age: they are able to do almost anything. But only participants with lower education refer to some kind of functional impairment or illness-related disability. However, this dissimilarity fully disappears when participants –in addition to self-assessed health– respond to the other questions on health. Although higher educated participants do not include functional aspects in their actual health-assessment, they do mention functional abilities and illness-related disability when addressing other people's health as well as their own prior health. We find that an almost equal proportion of higher educated participants (67%) as lower educated participants (63%) mention functional aspects.

References to the wellbeing dimension Aspects of wellbeing are referred to more frequently by higher educated participants than lower educated participants, although this result is not statistically significant. Almost one-third of the former mentions feeling fit or feeling good, whereas only 11percent of the latter refers to this aspect when assessing their health. When analysing the entire interview, however, the difference between higher and lower educated participants becomes significantly more marked. For all aspects of wellbeing we found that these are mentioned much more frequently by participants from the highest socioeconomic group (86%) than by participants from the lowest socioeconomic group (58%). Participants from both groups bring up some additional aspects of wellbeing.

References to the coping dimension With respect to coping aspects, mentioned solely by participants with a chronic illness, the difference between the two groups is less marked. Almost one-third of the lower educated and almost a quarter of the higher educated participants refers to aspect of coping when assessing their health. Yet, there is one clear difference between the groups with respect to the kind of aspects they mention. Only lower educated participants explain that they try to maintain a positive attitude, a positive outlook on life; none of the higher educated mentions this. When we consider the entire interview, we find that coping aspects are mentioned much more frequently by participants from the lowest socioeconomic group (63%) than by participants from the highest socioeconomic group (43%). Now, participants from both groups

refer to (good or poor) adaptation, (positive or negative) attitude, and social comparison. However, lower educated participants still show a slight preference for attitude and social comparison, and higher educated participants for adaptation.

References to the behavioural dimension In health self-assessments, behavioural aspects are relatively unimportant. Likewise, when participants answered the additional questions, behavioural aspects were mentioned only occasionally, although more frequently by lower educated participants (26%) than by higher educated participants (14%).

References to other aspects of health Only when participants were elaborating on the importance of health, other aspects of health came up. Some lower educated participants (21%) and one higher educated participant describe health as a valuable possession, because you cannot buy a healthy constitution.

4.4 Discussion

Main findings In this study, we investigated whether participants from the highest and lowest socioeconomic groups consider the same or different aspects when assessing their health. We found that higher and lower educated participants mentioned physical aspects equally frequent when they assessed their own health. We also found that lower educated participants accentuate (impaired) functioning whereas higher educated participants accentuate wellbeing. Moreover, higher educated participants emphasised the absence of physical and functional problems, whereas lower educated participants emphasised the presence of these problems. These findings are particularly interesting because they cannot be attributed to a differential distribution of chronic illness, as our study population was stratified with respect to this variable.

Methodological issues The main advantage of our study over other qualitative studies is that we were able to control for potential confounding variables. Because we wanted to examine socioeconomic differences we stratified for education, as well as for age, gender, and health status. However, before discussing the results we need to address some important methodological issues. First, we wanted to perform an in-depth qualitative study with a strictly stratified sample, which imposed serious limitations to the number of participants. Our findings are based on a small study population (n=40), as are most in-depth studies on socioeconomic health differences (Chamberlain, 1997, 30 participants; Calnan & Johnson, 1985, 60 participants). Two qualitative studies on self-assessed health in which the investigators recruited and interviewed participants until no new themes were emerging (i.e. saturation technique) included 42 and 48 participants, respectively (Van Doorn, 1999; Manderbacka, 1998). Therefore, we do believe that in our study the most important dimensions will have emerged. Second, in order to obtain maximum contrast, we only included participants younger than 40 years of age and older than 60 years of age, with the highest level of education and with the lowest level of education. Consequently, it is difficult to determine whether the findings in our study can simply be generalised to different subsamples. Third, we could only find participants for 74 percent of the existing strata; some cells in the original stratification scheme remained empty, others contained more participants than expected.

We could not truly “match” participants from higher and lower socioeconomic groups, in particular with respect to age and health-assessment. However, in additional stratified analyses we verified whether the differential distribution of age and health-assessments in both socioeconomic groups had affected the results. This appeared not to have been the case, the contrast between higher and lower educated participants could be observed both for younger and elderly participants, as well as for participants with good and less-than-good self-assessed health. Fourth, the fact that a higher educated investigator is performing the interviews may be a problem in its own right. When a higher educated investigator interviews a lower educated participant one runs the risk of eliciting what are called *public accounts* of health. Because of the social distance between interviewer and interviewee, lower educated participants may give answers which they expect to be acceptable to the higher educated interviewer (public accounts). However, we tried to get round this problem by explicitly asking more personal or experiential questions, as these questions are supposed to elicit answers that individuals would give to people “like themselves” (i.e. private accounts). Also, the fact that lower educated participants mentioned as many health dimensions as higher educated participants may indicate that we have moved away from a pure survey setting to a more conversational setting, the latter eliciting private accounts (Radley & Billig, 1996). Furthermore, we tried to reduce the effect of the investigators’ socioeconomic status during the initial stage of the analyses, as they had no actual information on age, gender, socioeconomic status, or health status of the interviewee when coding the interviews and designing the categorisation scheme.

Explaining socioeconomic inequalities in health The findings of this study raise the question whether the explanation of the observed socioeconomic differences may be that higher and lower educated participants hold different concepts or definitions of health. Although higher educated participants emphasised the absence of physical problems and lower educated participants emphasised the presence of physical problems, the physical dimension of health seems to be important for higher as well as lower educated participants. With respect to functional aspects, while chronic conditions are equally prevalent in both groups, mainly lower educated participants referred to the functional dimension (in particular functional impairment or illness-related disability) when assessing their own health. However, this clear and significant difference between the two groups disappeared completely when analysing the entire interview. When addressing their own prior health and other peoples’ health, higher educated participants mentioned functional aspects almost as frequent as lower educated participants. Thus, the physical and functional dimensions of health are not exclusive for the lower educated. An alternative explanation of the socioeconomic differences we observed may be that lower educated participants have relatively more (past) experience with ill-health, as the prevalence of health problems is higher in the lower social strata. In the present study the prevalence of chronic conditions in the higher and lower educated groups is almost equal, due to stratification. Still, lower educated participants are probably more experienced with prior health problems or with health problems in their immediate surroundings. Also, lower educated participants may suffer

from more severe health problems than higher educated participants, or they may experience health problems which bring about more functional limitations.

This experiential difference could explain why higher educated participants more frequently refer to the absence of health problems, but could it also explain why they –more frequently than lower educated participants– refer to aspects of wellbeing? In her classic study on health and illness, Herzlich (1973) found that some people just do not think of health until they have lost it. For them, health is the absence of illness or the unawareness of the body. At the same time, and sometimes by the same people, health is experienced as a presence which is quite positive and of which one is fully aware because of one's feelings of wellbeing. It may be that higher educated participants more frequently refer to aspects of wellbeing because they experience both the absence of illness and the presence of health (which involves positive feelings, such as feeling good and fit), whereas lower educated participants more frequently experience the presence of illness (which involves negative consequences, such as functional limitations).

The finding that lower educated participants more frequently include aspects of coping in their health-assessments also suggests that they are more experienced with health problems than higher educated participants. In addition, higher and lower educated participants differ in the *way* they cope with health problems. Higher educated mainly mention that they have adapted to their health problems, they have found a way to live a normal life given their limited abilities. Lower educated participants prefer to maintain a positive attitude towards their health problems. The former type of coping is considered primary control (i.e. actually dealing with health problems through changing the situation), the latter is considered secondary control (i.e. psychologically dealing with health problems through accepting the situation) (Rothbaum, Weisz & Snyder, 1982). This may be an argument in favour of the hypothesis that higher and lower educated participants hold different concepts or definitions of health. It is, however, also possible that higher educated participants have more opportunities to opt for primary control. As opposed to lower educated participants, higher educated participants may have the financial or personal resources to acquire support in order to relieve their (functional) limitations (e.g. domestic help, home appliances, reduced workload or part-time work). They are, either financially or personally, able to actually adjust their lives to their limitations (primary control) and not just psychologically (secondary control).

Health behaviour Remarkably, in our study, behaviour seems relatively unimportant for health self-assessments and other health conceptions. Behavioural aspects are mentioned only occasionally, although more frequently by lower educated participants than by higher educated participants. In a study on socioeconomic differences in health-related behaviour, Calnan (1991) found that health behaviour was rarely an issue in people's descriptions of their daily lives. He hypothesised that this would only be the case when health behaviour is called into question or problematised. In the United States health risk behaviour (in particular smoking) is the focus of a social discussion, more so than in most Western European countries. This could explain why – contrary to our study– in several US-based studies (such as Idler, Hudson & Leventhal, 1999;

Borawski-Clark, Kinney & Kahana, 1996; Krause & Jay, 1994) health risk behaviour is explicitly incorporated in health self-assessments. Also, the finding that in particular lower educated participants state that “you cannot buy a healthy constitution” is quite remarkable. Lower educated participants sometimes explicitly refer to health as the only thing that’s fair, as if they are unaware of the fact that low socioeconomic status negatively influences health. In a recent study on peoples own conceptions of the reasons for health inequalities, Blaxter (1997) found that even when participants from lower socioeconomic groups were confronted with recent findings on inequalities in health, they declined to believe it. She suggests that “socioeconomic inequalities in health genuinely represent a feeling of disbelief or unease at the notion, or conceptual difficulty, especially among those at risk”.

In conclusion We found only limited support for the hypothesis that higher and lower educated participants hold entirely different concepts or definitions of health. We could not replicate the finding that lower educated participants hold a unidimensional and higher educated participants hold a multidimensional view of health (Calnan & Johnson, 1985; Houtaud & Field, 1984; Herzlich, 1973). In fact, in our study lower educated participants mentioned on average more health dimensions than did higher educated participants, both with respect to self-assessed health as with respect to the entire interview. Also, we could not demonstrate a clear mentalistic-physiologic distinction between higher and lower educated participants, as suggested by Blair (1993). Both higher and lower educated participants referred to health aspects concerning the body. And even the wellbeing dimension, typical for the higher educated, may be considered as being somewhat physiologic in nature as it comprises the aspect of feeling fit. However, we did find some indication that lower educated individuals tend to focus more on negative aspects of health as compared to higher educated individuals, as has been suggested earlier (Pierret, 1993). We should, therefore, not rule out the possibility that higher educated participants simply have an eye for the positive aspects of health, and lower educated participants do not. This hypothesis should be further explored in future –qualitative and quantitative– research.

Based on the findings of the present study we believe that experience with health and ill-health is a central factor in the socioeconomic differences we observed. Higher educated individuals more frequently experience both the absence of illness and the presence of health (i.e. wellbeing), whereas lower educated individuals more frequently experience the presence of illness and, thus, the absence of health. Furthermore, as lower educated participants have less possibilities to actually alleviate their physical or functional limitations (primary control), they experience more negative consequences of ill-health than do higher educated participants. This experiential difference between individuals from higher and lower socioeconomic status could be included in quantitative studies by changing the focus from *health problems* to *health experience*. Future studies should not just focus on negative health experience (i.e. health problems), but should also include positive health experience, such as aspects of wellbeing (Ryff & Singer, 1998). In addition, the role of coping (i.e. primary and secondary control) could be a promising area of research, as this could further explain why low SES individuals assess their health as more negative than do

high SES individuals, even when the differential experience with health problems is taken into account.

Notes

1. Self-assessed health – How is your health in general? Is it very good, good, fair, sometimes good and sometimes poor, or poor? Can you explain why you chose this particular answer?

Health in others – When do you consider someone to be healthy? Can you give an example of someone you consider to be healthy? When do you consider someone to not be healthy? Can you give an example of someone you consider not to be healthy?

Health in oneself – When do you consider yourself healthy? Has there been a period in time when you did consider yourself to be healthy? When do you consider yourself not to be healthy? Has there been a certain period in time when you did consider yourself not to be healthy?

Health-in-the-abstract – How important is health to you? Can you explain why health is important? If you were asked to describe the meaning of the word 'health', for example to someone who is learning the language, how would you do that?

2. We used the same procedure in order to condense the remainder of the interview. Essentially we used the remainder of the interview to give context to (i.e. to complement and sometimes to clarify) the themes that participants mentioned when answering the core question on self-assessed health.

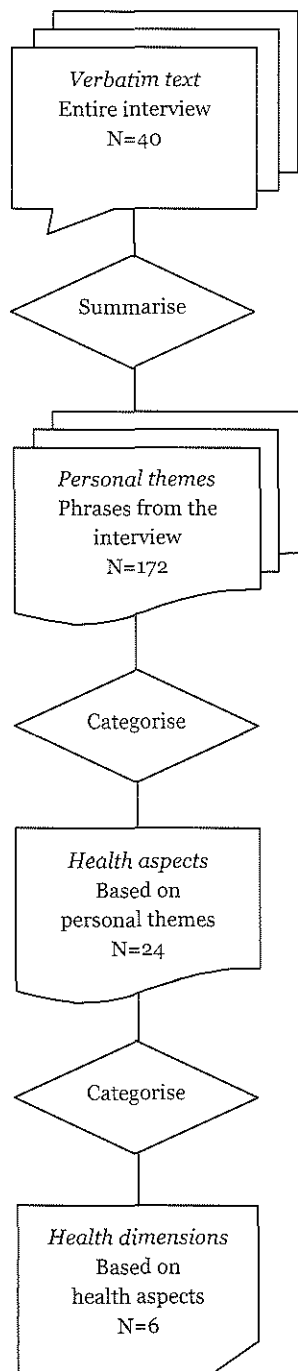
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Appendix 4.1

Flow chart of the qualitative analysis of the entire interview



Appendix 4.2

Physical dimension – Family genetics

“Well, I guess it has a lot to do with genetics. Mostly. Yes, I suppose it’s got a lot to do with genetics. Now, I believe that if parents always, well if parents reached old age and could always manage for themselves, that their children will take after them. Not always, but in many cases, if you ask me. Diseases and stuff, a lot of things are genetic. Or often turn out to be.”

Woman, 60+, low ses, no current illness, “good”

Physical dimension – You never know your “true” health status

“(…) Ten years ago, one of my brothers had just turned 50 in December at Christmas, and in May he was playing volleyball. He’d played two matches and was waiting to play a third time and he goes to get up and keels over, dead. And the man was built like a barn, bigger than me, and he didn’t smoke and trained every week, played volleyball. And that sets you thinking: sure, he was healthy, too. That makes it hard. It’s very hard. (…) And you think: they’re all healthy but you never can tell when the telephone’ll ring and it’s, you know. (…) Really, it’s hard to say. We can’t see ahead, can we? And I think, I’m healthy, and I see people here that I think, they’re healthy, but well… I don’t know.”

Man, 60+, high ses, no current illness, “good”

Physical dimension – Psychosomatics

“But I had a problem with hyperventilation a few years back. You don’t feel well at all, when you have that. The doctor told me that there was nothing wrong with me. But when you’ve got those symptoms, I thought ‘he doesn’t know what he’s talking about’, I mean I could feel it, and my father had just died of a heart attack and I had this pain, so, uh, he ordered a whole lot of tests so I would see with my own eyes there was nothing wrong. When I saw that, it got less.”

Woman, 40-, low ses, no current illness, “good”

Physical dimension – Illness-related discomfort

“I think the most important thing is for a person to be happy, to really feel free. That’s a feeling I don’t have. Oppressive, that’s how it has been described, this asthma, this feeling of not getting enough air, it affects the mind as well. Oh, there’s no question, I’m more pessimistic when I’m short of breath than when I can breathe freely, no, it’s very clear.”

Man, 60+, high ses, copd/asthma, “poor”

Wellbeing dimension – Happiness

“On of the single most important things in life. Well, I’ve said it before, if your health is poor, you can’t function properly. And not being able to function properly makes a person unhappy. So it’s one of the conditions for happiness.”

Man, 60+, high ses, no current illness, “good”

Wellbeing dimension – Feeling calm / in control

“Like I just said, when I’m feeling good. When I can respond to stuff like a normal person. Without losing it, becoming hysterical, angry or whatever, just that I can see the sheer relativity of it all, that you cope, reasonably enough, with whatever comes up. That you can handle things more or less smoothly, and sure, things’ll go better on some days than on others, but generally it’s okay. (…) But once you lose control, let yourself get out of hand, then it doesn’t take long before your health goes as well.”

Woman, 40-, high ses, chronic back complaints, “fair”

Other aspects – You cannot buy a healthy constitution

“Health can’t be bought, it’s true. However wealthy you are, you can never buy good health. What I mean to say is that it’s the only thing, the single thing left in the world that’s fair. However much money you have, when your time comes, you can’t buy your way out. Right.”

Woman, 60+, low ses, copd/asthma, “poor”

5

Socioeconomic differences in self-assessed health in a chronically ill population: the role of different health aspects

We investigated whether socioeconomic inequalities in the prevalence of four types of health problems –chronic disease, functional limitations, psychosomatic symptoms, and perceived discomfort/distress– could explain socioeconomic differences in self-assessed health. Chronic disease and functional limitations were included in the study as representative of the more objective aspects of health. Psychosomatic symptoms and perceived discomfort/distress were included as representative of the more subjective aspects of health.

We performed multiple logistic regression analyses for three different cut-off points of self-assessed health. After adjusting for age and gender, significant socioeconomic differences in self-assessed health could be observed. The analysis showed that after further adjustment for each of the four health aspects, psychosomatic symptoms proved to be the most powerful explanatory factor for a health assessment as less-than-good and less-than-fair. Perceived discomfort/distress proved to be the most powerful explanatory factor for a poor health assessment.

We found that socioeconomic differences in self-assessed health could indeed to a large extent be explained through socioeconomic inequalities in the prevalence of the four types of health problems included in our study. For all cut-off points, objective health aspects –chronic disease and functional limitations– accounted for a relatively small part of the socioeconomic variability in self-assessed health. Subjective aspects of health –psychosomatic symptoms and perceived discomfort/ distress– accounted for more of the variability.

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5.1 Introduction

The single question “How is your health in general” is a crude and simple measure which has often been used as a summary of an individual’s general state of health (Murray, Dunn & Tarnopolsky, 1982; Tissue, 1972). Although there has been some scepticism towards this subjective single-item measure of health, it has proved to be a powerful predictor.

In several studies it has been shown that poor self-assessed health increases the mortality risk, even when objective health status has been controlled for (Idler & Benyamini, 1997; McCallum, Shadbolt & Wang, 1994; Idler & Kasl, 1991; Mossey & Shapiro, 1982). A lot has been hypothesised as to why this relationship between poor self-assessed health and mortality exists. It has been suggested that when the individual assesses his health, he combines information about the bodily system which cannot be captured by objective aspects of health alone (Fylkesnes & Forde, 1991; Goldstein, Siegel & Boyer, 1984). Through his health self-assessment the individual possibly also provides information relevant to more subjective, or psychosocial, components of health (Goldstein, Siegel & Boyer, 1984).

The relationship between self-assessed health and various health aspects has been studied extensively. Clearly, objective health measures such as physiological health measures, acute and chronic diseases, or functional limitations, are associated with self-assessed health (Ongaro & Salvini, 1995; Liang, Bennett, Whitelaw & Maeda, 1991; Goldstein, Siegel & Boyer, 1984; Cockerham, Sharp & Wilcox, 1983; Linn & Linn, 1980; Blazer & Houpt, 1979; Fillenbaum, 1979; Wan, 1976; Maddox & Douglass, 1973). However, in their study on self-assessed health and mortality, Mossey and Shapiro (1982) found that 88% of the variance in self-assessed health could not be explained by objective health ratings. Other researchers have produced similar results (e.g. Andersen & Lobel, 1995; De Forge, Sobal & Krick, 1989; Levkoff, Cleary & Wetle, 1987). Biomedical variables accounted only partly for the variability in self-assessed health. Consequently, several authors have suggested that self-assessed health is *more* than simply the individual’s perception of physical health. It has been shown that subjective aspects of health, such as vitality, psychological wellbeing, life-satisfaction, stress, and stress-related symptoms have an independent relationship with self-assessed health (Shadbolt, 1997; Andersen & Lobel, 1995; Hirdes & Forbes, 1993; Idler, 1993b; Rodin & McAvay, 1992; Fylkesnes & Forde, 1991; De Forge, Sobal & Krick, 1989; Levkoff, Cleary & Wetle, 1987; Jylhä, Leskinen, Alanen, Leskinen & Heikkinen, 1986; Blaxter, 1985; Okun & George, 1984; Murray, Dunn & Tarnopolsky, 1982; Garrity, Somes & Marx, 1978; Tessler & Mechanic, 1978). It may therefore be reasonably assumed that different aspects of health, both objective and subjective in nature, play an important role in the overall assessment of health (Blaxter, 1997; Levkoff, Cleary & Wetle, 1987; Mootz, 1986; Tissue, 1972; Shanas, et al., 1968). This notion has been confirmed by studies on lay concepts of health, which revealed that health consists of several dimensions: physiological/somatic, functional, psychosocial, lifestyle, and aspects of adaptation/coping (Krause & Jay, 1994; Van Dalen, Williams & Gudex, 1994; Dixon, Dixon & Hickey, 1993; Strain, 1993; Hooker & Siegler, 1992; Worsley, 1990; Laffrey, 1986; Wolinsky, Coe, Miller & Prendergast, 1984).

For many years socioeconomic status has been linked to health; individuals higher at the social ladder are in better health than those below. The relationship of socioeconomic status to health is not just established below the threshold of poverty, it is a graded relationship occurring at all socioeconomic levels. This inverse relationship between socioeconomic status and health is strong and very consistent: as one moves up the social ladder, rates of morbidity and mortality generally decrease (Anderson & Armstead, 1995; Adler, et al., 1994). This relationship also holds true for self-assessed health; earlier studies have shown that there are large socioeconomic differences in self-assessed health. People from lower socioeconomic groups more often assess their own health as less-than-good than do people from higher socioeconomic groups (Ross & Wu, 1996; Anderson & Armstead, 1995; Blane, 1995; Adler, et al., 1994; Mackenbach, Van den Bos, Joung, Van de Mheen & Stronks, 1994; Hirdes & Forbes, 1993). In the light of the aforementioned relationship between self-assessed health and mortality it can be considered important to investigate socioeconomic differences in self-assessed health.

A reasonable explanation is that socioeconomic differences in the prevalence of health-problems account for these differences. In the present study, we will investigate the distinctive role that different health aspects play in the explanation of socioeconomic differences in self-assessed health. Socioeconomic differences in self-assessed health will be investigated in relation with the following health aspects: chronic disease, functional limitations, psychosomatic symptoms, and perceived discomfort/distress.

5.2 Methods

Subjects

Subjects were participants in the GLOBE-study, a longitudinal study designed to describe and explain sociodemographic inequalities in health in the Netherlands. Design and objective of the GLOBE-study have been described in detail elsewhere (Mackenbach, Van de Mheen & Stronks, 1994). At the baseline survey in 1991, participants constituted of a cohort of non-institutionalised men and women with Dutch nationality, 15-74 years of age, which were living in the city of Eindhoven or surrounding municipalities. From the population registers of these municipalities a random sample was drawn, stratified by age and zip code. The sample strata were designed to oversample 45 to 74 year-old people, and people from highest and lowest socioeconomic groups. The baseline survey consisted of a postal questionnaire with a response rate of 70% (N≈19000). From the respondents to the baseline survey of the GLOBE-study a subsample was drawn in which people with four specific chronic diseases, i.e. COPD/asthma, cardiac disorder, diabetes mellitus, and severe low back pain were oversampled. A response rate of 72% was obtained, hence 2867 men and women were willing to participate in an additional structured interview. The study population predominantly includes chronically ill people, somewhat over 78% of the participants reported one or more chronic conditions. Cross-sectional data, collected from the postal survey and additional personal interview in 1991, were used in the analyses. Table 5.1 presents some background characteristics of the study population.

Table 5.1Some background characteristics of the study population (N_{total}=2867)

Variable	Number (n)	Percentage (%)
<i>Self-assessed health</i>		
Very good	306	11
Good	1327	46
Fair	646	23
Sometimes good and sometimes poor	443	16
Poor	76	3
<i>Educational level</i>		
Low	685	24
2	1101	38
3	570	20
High	441	15

Measures

Self-assessed health General self-assessment of health was obtained through a single question: “How is your health in general? Very good, good, fair, sometimes good and sometimes poor, or poor?”.

Socioeconomic status We report results based on highest attained educational level as a measure of socioeconomic status. Educational level was divided into four categories: 6 years of education, i.e. primary education only (low), 10 years of education, i.e. lower general or lower vocational education (2), 11-14 years of education, i.e. intermediate general or intermediate vocational education (3), and 15-16 years of education, i.e. higher vocational education or university degree (high; reference group).

Health indicators Both objective and subjective health aspects were used to investigate the relationship between socioeconomic status and self-assessed general health. Chronic disease and functional limitations were included in the study as representative of the more objective aspects of health. Psychosomatic symptoms and perceived discomfort/distress were included in the study as representative of the more subjective aspects of health. The rationale behind this (somewhat artificial) classification is that the self-report measure of chronic disease is in principle based on clinical diagnosis. Both measures of functional limitations are based on questions concerning the way people are limited in well-described daily activities; ideally this leaves little room for people’s own interpretation. Therefore, we considered these measures as being more objective. The other two measures are more subjective in nature, psychosomatic symptoms referring to stress-related symptoms, and perceived discomfort/distress referring to health-related feelings of discomfort or distress.

Chronic disease was measured through a checklist of 23 chronic conditions (Statistics Netherlands, 1992). From the checklist of 23 chronic conditions 10 severe chronic conditions, e.g. stroke, cancer, and 13 mild chronic conditions, e.g. high blood pressure, were identified. Besides, we used questionnaires concerning the severity of four specific chronic conditions, i.e. COPD/asthma (Du Florey & Leeder, 1982; Van der Lende, et al., 1975), cardiac disorder (Baart, 1973; Rose & Blackburn, 1968), diabetes (Pennings-Van der Eerden, 1984), and severe low back pain (Rosier, 1989; Kuorinka, et al., 1987). Details of the construction of the stages of severity have been described elsewhere (Van der Meer, Looman & Mackenbach, 1996).

Functional limitations were measured through a list of items concerning activities of daily living (ADL, 10 items) (Statistics Netherlands, 1992) and the OECD-indicator of long term disabilities (8 items) (Van Sonsbeek, 1996; McWhinnie, 1979). For each measure the activities which the respondent indicated only to be able to do with great difficulty, were summed. Examples of questions concerning functional limitations are: "Are you able to dress and undress yourself?" and "Can you carry an object of 5 kilos, for instance a shopping bag, for 10 meters?".

Psychosomatic symptoms were measured through a 13-item inventory (Van Sonsbeek, 1996; Dirken, 1967). From this inventory two subscales were constructed. Nine items were formed into a psychosomatic subscale (e.g. "Do you often have an upset stomach?") and the remaining 4 symptoms were combined into a subscale concerning energy and vitality (e.g. "Do you usually get up in the morning feeling tired and not well rested?" and "Do you regularly feel listless?").

Perceived discomfort/distress was measured through the Nottingham Health Profile (38 items) (Hunt, McEwen & McKenna, 1985a; Beckett, McEwen & Hunt, 1981), which consists of 6 problem areas: Physical Mobility (e.g. "I find it hard to bend"), Pain (e.g. "I'm in pain when I'm sitting"), Sleep (e.g. "I sleep badly at night"), Energy (e.g. "Everything is an effort"), Social Isolation (e.g. "I feel lonely"), and Emotional Reactions (e.g. "I feel that life is not worth living"). This health profile assesses the levels of distress and discomfort that an individual may perceive on these areas.

Statistical analyses

Multiple logistic regression analyses were used to investigate the relationship between socioeconomic status, different health aspects and self-assessed general health. The regression models were fitted with socioeconomic status as the independent variable, health aspects as intermediate variables, and self-assessed general health as the outcome variable. All models were adjusted for the confounders age and gender. For socioeconomic status, the highest educational level was used as the reference category. Health aspects were modelled as categories with the least health problems as the reference category¹. The regression coefficients and standard errors of the models were used to calculate odds ratios (OR) with 95 percent confidence intervals (CI).

The health indicators included in the study were grouped into four health aspects: chronic disease, functional limitations, psychosomatic symptoms, and perceived discomfort/distress. These health aspects were further classified as objective health aspects, i.e. chronic disease and

functional limitations, and subjective health aspects, i.e. psychosomatic symptoms and perceived discomfort/ distress. Age and gender-adjusted analyses were conducted in three phases. The first phase was to examine the relationship between socioeconomic status and self-assessed general health with separate adjustment for each of the four health aspects. The following step was to observe the relationship between socioeconomic status and self-assessed general health adjusted for all health aspects simultaneously. In the next stage this relationship was examined with separate adjustment for objective and subjective health aspects.

To estimate the contribution of different health aspects to the explanation of socioeconomic differences in self-assessed general health we calculated the proportion of excess risk accounted for by including these variables in a model with confounders and education. The proportion excess risk accounted for is expressed as the percentage reduction in odds ratio (∂ OR) for each educational level, and was calculated as follows:

$$(OR_{\text{conf+edu}} - OR_{\text{conf+edu+health}}) / (OR_{\text{conf+edu}} - 1)$$

Furthermore, the overall contribution of different health aspects to the explanation of socioeconomic differences in self-assessed health was estimated using the decrease of the reduction in deviance (∂ RD) of education. The deviance of a model plays a central role in assessing the goodness-of-fit of a model. For purposes of assessing the importance of an independent variable in predicting the response, we compared the deviance of a model with and without the independent variable. The resulting reduction in deviance (RD) will follow a chi-square distribution, of which the p-value can be obtained. A statistically significant reduction in deviance due to including the independent variable suggests that the independent variable is an important predictor, whereas a non-significant value suggests that the independent variable is not helpful in predicting the response (Hosmer & Lemeshow, 1989). For our study, however, we are not so much interested in the contribution of different health aspects in predicting the response variable. Instead, we are interested in the contribution of different health aspects in explaining *socioeconomic differences* in self-assessed general health. For this purpose we compared the reduction in deviance due to the inclusion of education (RD_{edu}) in a model with just confounders and a model which also included a particular set of health aspects. The decrease of the reduction in deviance (∂ RD) of education between the two models is expressed as the percentage decrease of RD_{edu} that can be attributed to this particular set of health aspects. With this measure it is possible to quantify the respective contribution of objective and subjective health aspects to the explanation of socioeconomic differences in self-assessed general health. Also, the unique contribution of objective and subjective health aspects to this explanation can be calculated with the following formulas:

$$\partial RD_{\text{edu}} (\text{all health aspects}) - \partial RD_{\text{edu}} (\text{subjective aspects}) = \text{unique contribution objective aspects}$$

$$\partial RD_{\text{edu}} (\text{all health aspects}) - \partial RD_{\text{edu}} (\text{objective aspects}) = \text{unique contribution subjective aspects}$$

It was considered inappropriate to view self-assessed health as a continuous measure, because the assessments are ordinal but not necessarily interval measures. For example, the difference

between “good” and “fair” self-assessed health may not be of the same magnitude as the difference between “fair” and “sometimes good and sometimes poor” self assessed health. Therefore, the analyses were conducted for three different cut-off points of self-assessed health: (a) very good or good *versus* less-than-good, (b) very good, good, or fair *versus* less-than-fair, and (c) very good, good, fair, sometimes good or sometimes poor *versus* poor. Comparison of the results for different cut-off points allows us to investigate the distinctive role which both objective and subjective health aspects play in the explanation of socioeconomic differences in self-assessed health. We will be able to examine whether, for instance, the explanation of a “poor” health self-assessment will be determined by the same health indicators as the explanation of a “fair” health self-assessment.

5.3 Results

Each of the health aspects used in the analyses, i.e. chronic disease, functional limitations, psychosomatic symptoms, and perceived discomfort/distress, was significantly associated with self-assessed general health. For each health aspect a statistically significant reduction in deviance (RD, $p < .001$) was obtained (results not shown).

Table 5.2 presents the odds ratios for less-than good, less-than-fair, and poor self-assessed general health by educational level, adjusted for age and gender, and for age and gender plus each health aspect separately. For all cut-off points, significant socioeconomic differences in self-assessed health could be observed after adjusting for age and gender. Compared to people from the highest educational groups, people from lower educational groups had a 4.6 times higher chance of assessing their health as less-than-good, a 6.7 times higher chance of assessing their health as less-than-fair, and a 7.9 times higher chance of assessing their health as poor. After separate adjustment for chronic disease, functional limitations, psychosomatic symptoms, and perceived discomfort/distress, the magnitude of the associations decreased, but remained clearly and significantly graded.

Rather than reviewing all measures computed, i.e. OR, ∂ OR and ∂ RD, we will describe the results based on ∂ RD only. Unlike ∂ OR, ∂ RD is a stable overall measure that is not dependent upon the choice of the reference category.

The logistic regression analyses with separate adjustment for each of the four health aspects (Table 5.2) showed that for a health assessment as less-than-good and less-than-fair, psychosomatic symptoms were the most powerful explanatory factor with ∂ RD 63% and 61% respectively. Perceived discomfort/distress proved to be the most powerful explanatory factor for a poor health assessment, with ∂ RD 73%. When we look at the odds ratios it seems as if socioeconomic differences in poor health self-assessment could be fully explained by each health aspect separately, since they are no longer significantly different from 1. However, looking at the reduction in deviance due to education (RD), it shows that this does not hold entirely true for chronic disease, functional limitations and psychosomatic symptoms. After separate adjustment for these health aspects, education still brings about a significant reduction in deviance.

Table 5.2

Adjusted odds ratios for the association between educational level and self-assessed health, by health aspect

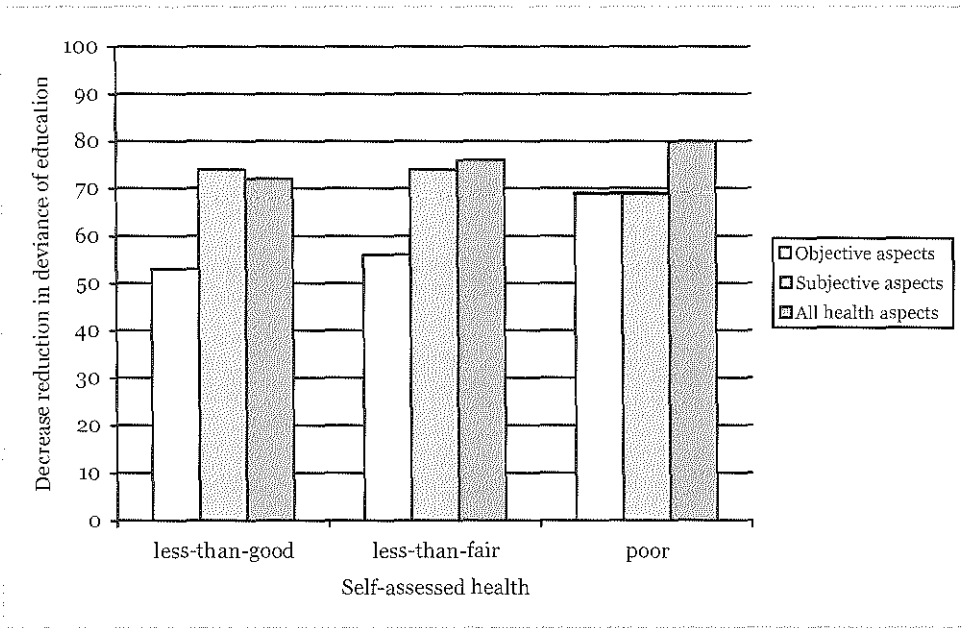
Cut-off-points Education	Adjusted covariates												
	Confounders			Chronic disease		Functional limitations		Psychosomatic symptoms		Perceived discomfort/distress		All health aspects	
<i>Less-than-good health</i>													
Educational level	OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR
Low	4.60 *	4.07 *	14.7%	3.39 *	33.6%	2.91 *	46.9%	3.14 *	40.6%	2.77 *	50.8%		
2	2.45 *	2.14 *	21.4%	2.05 *	27.6%	1.89 *	38.6%	1.97 *	33.1%	1.75 *	48.3%		
3	1.74 *	1.57 *	23.0%	1.51 *	31.1%	1.43 n.s.	41.9%	1.31 n.s.	58.1%	1.24 n.s.	67.6%		
High	1.00	1.00		1.00		1.00		1.00		1.00			
RD (∂ RD)	113.3 ‡	69.2 ‡	(38.9%)	64.8 ‡	(42.8%)	42.1 ‡	(62.8%)	51.4 ‡	(54.6%)	32.1 ‡	(71.7%)		
<i>Less-than-fair health</i>													
Educational level	OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR
Low	6.69 *	5.08 *	28.3%	4.44 *	39.5%	3.65 *	53.4%	3.79 *	51.0%	2.77 *	68.9%		
2	3.26 *	2.67 *	26.1%	2.50 *	33.6%	2.24 *	45.1%	2.18 *	47.8%	1.77 *	65.9%		
3	2.01 *	1.70 n.s.	30.7%	1.58 n.s.	42.6%	1.45 n.s.	55.4%	1.38 n.s.	62.4%	1.14 n.s.	86.1%		
High	1.00	1.00		1.00		1.00		1.00		1.00			
RD (∂ RD)	100.6 ‡	60.9 ‡	(39.5%)	54.4 ‡	45.9%	38.9 ‡	61.3%	41.9 ‡	58.3%	23.8 ‡	76.3%		
<i>Poor health</i>													
Educational level	OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR	OR	∂OR
Low	7.93 *	4.03 n.s.	56.3%	3.10 n.s.	69.7%	3.44 n.s.	64.8%	2.03 n.s.	85.1%	1.36 n.s.	94.8%		
2	5.89 *	4.09 n.s.	36.8%	3.27 n.s.	53.6%	3.72 n.s.	44.4%	2.46 n.s.	70.1%	1.79 n.s.	83.8%		
3	1.71 *	1.19 n.s.	73.2%	0.98 n.s.	100%	1.22 n.s.	69.0%	0.79 n.s.	100%	0.53 n.s.	100%		
High	1.00	1.00		1.00		1.00		1.00		1.00			
RD (∂ RD)	19.5 ‡	10.4 §	(46.7%)	7.9 §	59.5%	8.2 §	57.9%	5.3 n.s.	72.8%	3.9 n.s.	80.0%		

* 95% Confidence interval does not comprise 1; ‡ p < .001; § p < .05; n.s. Non-significant value, i.e. p > .05

Subsequently, we observed the relationship between socioeconomic status and self-assessed general health adjusted for all health aspects simultaneously (Table 5.2, last column). It can be seen that taking into account all health aspects simultaneously has surplus value over each health aspect separately. From 72% (less-than-good), and 76% (less-than-fair), up to 80% (poor) of the socioeconomic differences in self-assessed general health could be explained by simultaneously including all health aspects in the regression models.

Figure 5.1

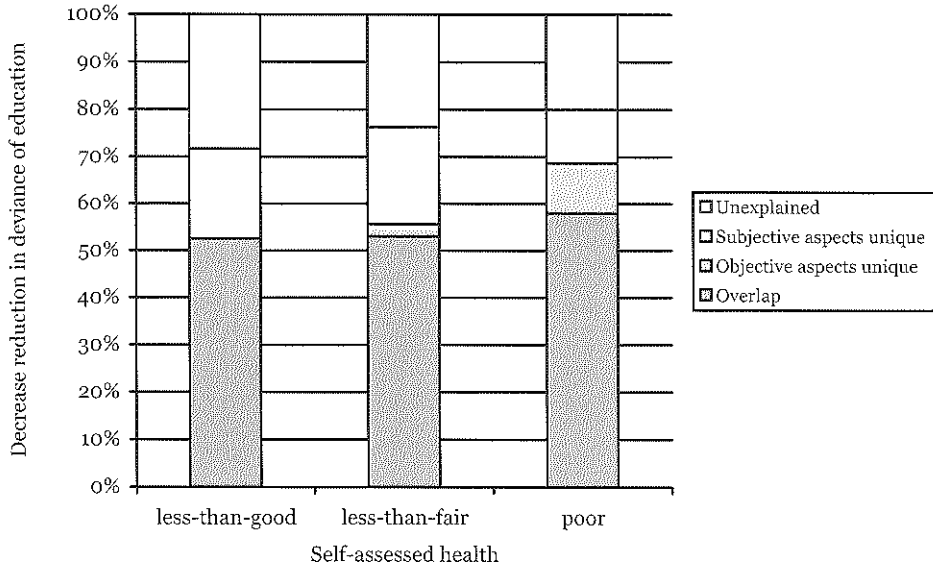
Decrease of the reduction in deviance of education (∂RD) due to adjustment for objective and subjective aspects of health, in percentages



Finally, the combined objective (chronic disease and functional limitations) and subjective health aspects (psychosomatic symptoms and health status) were included in logistic regression models. With deteriorating health assessment the importance of objective health aspects for the explanation of socioeconomic differences (as indicated by ∂RD) increases from 53% (less-than-good) and 56% (less-than-fair) to 69% (poor), whereas the importance of subjective health aspects slightly decreases from 74% (less-than-good and less-than-fair) to 69% (poor). For all cut-off points, subjective health aspects proved to be more, or at least equally, important as objective health aspects (Figure 5.1).

Figure 5.2

Unique contribution of objective and subjective health aspects to the decrease in reduction in deviance of education (∂RD)



To determine the unique contribution of both objective and subjective health aspects to the explanation of socioeconomic differences in self-assessed general health, results from the previous steps were combined. The unique contribution of objective (or subjective) health aspects were calculated by subtracting the ∂RD of education, due to inclusion of subjective (or objective) health aspects, from the ∂RD of education due to inclusion of all health aspects simultaneously (formulas on page 85). Figure 5.2 presents a graphic representation of these calculations for three cut-off points. For a cut-off point less-than-good, objective and subjective health aspects simultaneously explained 72% of the socioeconomic differences in self-assessed general health. Separate adjustment for objective aspects of health explains 53% of the socioeconomic differences. Separate adjustment for subjective aspects of health explains 74% of the socioeconomic differences (Figure 5.1) ². Further examination of Figure 5.2 reveals that objective aspects of health do not have a unique contribution to the explanation of socioeconomic differences in self-assessed health the unique contribution of subjective aspects of health to the explanation of these differences is 19%. The remaining part, i.e. ∂RD due to inclusion of all health aspects minus the unique contribution of objective and subjective health aspects respectively, can be understood as a measure of the overlap between these aspects. Fifty-three percent ($72\% - 0\% - 19\%$) of the socioeconomic differences in self-assessed health could be explained by the overlap between objective and subjective health. For a cut-off point less-than-fair, objective and subjective health aspects together explained 76% of the socioeconomic differences in self-assessed general health.

Table 5.3

Adjusted odds ratios (OR) for the association between health variables and self-assessed health

Variables (significant associations only)	Self-assessed health		
	Less-than-good	Less-than-fair	Poor
Educational level	OR	OR	OR
Low	2.77 *	2.77 *	1.36
2	1.75 *	1.77 *	1.79
3	1.24	1.14	0.53
High	1.00	1.00	1.00
Severe chronic disease			
1	2.36 *	1.58 *	1.53
2+	2.34 *	1.87 *	1.65
Mild chronic disease			
1-2	1.55 *	1.05	1.05
3+	2.39 *	1.23	0.62
Severity of heart disease			
Aspecific complaints	1.53 *	1.66 *	0.37
Heart related diagnosis	1.03	1.01	5.16
Angina without heart failure	1.63 *	1.27	1.48
Heart failure without angina	1.29	1.41	1.02
Angina and heart failure	3.08 *	1.52	1.26
Severity of COPD/asthma			
Aspecific complaints	1.51	0.98	3.92
Vd Lende stage 1	1.58	0.74	2.56
Vd Lende stage 2	1.55	0.79	0.49
Vd Lende stage 3	3.33 *	1.73 *	1.68
Severity of diabetes			
No complications	1.94 *	1.45	0.81
Complications	3.27 *	0.86	1.72
Activities of Daily Living			
1	1.53	1.92 *	1.02
2+	2.07	3.06 *	6.03 *
Symptoms-somatic			
2-4	1.88 *	1.44	5.08
5-9	2.75 *	2.64 *	7.49
Symptoms-energy			
1-2	1.57 *	1.69 *	0.15
3-4	2.34 *	3.05 *	0.33
NHP-pain			
1-3	1.90 *	1.49 *	1.09
4+	2.45 *	2.17 *	1.89
NHP-energy			
1	2.92 *	1.54 *	54.72 *
2+	2.66 *	2.18 *	85.73 *
NHP-emotional reaction			
1-3	1.47 *	1.13	1.42
4+	1.83	1.49	4.29 *

* 95% Confidence interval does not comprise 1

The unique contribution of objective health aspects to the explanation of these differences is quite small, only 3%, while the unique contribution of subjective aspects is 21%. So, fifty-two percent (76% – 3% – 21%) of the socioeconomic differences in less-than-fair self-assessed health could be explained by the overlap between objective and subjective health. As we set the cut-off point on poor, a different pattern can be seen. Together, objective and subjective aspects of health together explained 80% of the socioeconomic differences in self-assessed general health. The unique contribution of objective and subjective aspects of health is equal, namely 11% each. Fifty-eight percent (80% – 11% – 11%) of the socioeconomic differences in poor self-assessed health could be explained by the overlap between objective and subjective health.

Table 5.3 presents in more detail the results of the regression models, simultaneously adjusted for all health aspects. We only present the results for which we have found a significant relationship, for at least one cut-off point. As we have seen before, the lowest levels of education are significantly associated with higher risk of less-than-good and less-than-fair self-assessed health, but not with poor self-assessed health. It can be seen from Table 5.3 that for different cut-off points, different health indicators play a role in explaining self-assessed health. Thus suggesting that different health indicators determine different health assessments. Having a mild chronic disease, suffering from angina pectoris, or having diabetes is significantly associated with having a higher risk of less-than-good self-assessed health, but is not significantly associated with less-than-fair or poor self-assessed health. This implies that these health indicators are considered when assessing one's health as "fair", and not so much when assessing one's health as "sometimes good and sometimes poor" or "poor". Having a severe chronic disease, having a-specific heart complaints, having severe COPD (stage 3), experiencing energy-orientated psychosomatic symptoms, is also significantly associated with a higher risk of both less-than-good and less-than-fair self-assessed health. Experiencing somatically orientated psychosomatic symptoms is associated with less-than good and less-than-fair self-assessed health. This health indicator is even stronger associated with a poor health-assessment, although the latter result is not statistically significant. Having difficulties with activities of daily living, suffering from pain and having emotional reactions (according to the Nottingham Health Profile) are associated with less-than good, less-than-fair and poor self-assessed health. Although the results may not always be statistically significant, for all cut-off points the odds ratios are clearly raised. Lack of energy (according to the Nottingham Health Profile) is the only health indicator that shows a very clear and significant association with self-assessed health. This result is consistent for all three cut-off points, but particularly the relationship of this health indicator with poor health-assessment is remarkably strong.

5.4 Discussion

Summary In this study, we found that socioeconomic differences in self-assessed health could to a large extent be explained through socioeconomic differences in the prevalence of health problems. Objective health aspects accounted for a relatively small part of the socioeconomic variability in self-assessed general health in this predominantly chronically ill population. More

subjective aspects of health, such as perceived discomfort/distress, could account for more of the variability. In part this relatively small impact of objective health aspects to the explanation of socioeconomic differences in self-assessed health could be attributable to the implicit stratification on chronic disease. The study population consists of predominantly chronically ill people: somewhat over 78% of the respondents mentioned one or more chronic conditions. However, we conducted similar analyses on a different subsample of the GLOBE-study, in which there was no overrepresentation of chronically ill people. Here, we observed the same effect: only a small proportion of the socioeconomic differences in self-assessed health could be explained by chronic disease (unpublished results). For a poor self-assessment, socioeconomic differences in self-assessed health could be almost fully explained by objective and subjective health aspects. Here, perceived discomfort/distress proved to be the most powerful explanatory factor. For a less-than-good and less-than-fair health assessment, socioeconomic differences still existed after inclusion of objective and subjective aspects of health in the regression model. Here too, however, subjective aspects of health dominate the explanatory model for socioeconomic differences in self-assessed health. For both cut-off points, psychosomatic symptoms proved to be the most important health aspect.

~~Discussing the findings~~ With deteriorating health assessments the contribution of objective health aspects to the explanation of socioeconomic differences in self-assessed health increased, while the importance of subjective health aspects slightly decreased. Nevertheless, for all cut-off points, subjective aspects of health were more important for the explanation than objective health aspects. This does not imply, however, that objective aspects of health are of no importance for the explanation of socioeconomic differences. Observing the considerable overlap between the two, it is clear that objective and subjective aspects of health may to a large extent be measuring the same attribute: the physiological basis of health problems, a malfunctioning body from which both objective and subjective health problems stem. If this is the case, the failure of the objective health aspects to play a more dominant role in the explanation of socioeconomic differences in self-assessed health may be related to the strong interrelation with the more subjective aspects of health. Presumably it is not possible to completely unravel the effect of chronic disease (which may cause physical and/or psychological distress) on the self-assessment of health, from the effect of distress (caused by a chronic disease) on the self-assessment of health. Additionally, the large overlap may be ascribed to the artificial classification of the health indicators into objective and subjective aspects of health. It can be expected, for example, that both scales for functional limitations, i.e. ADL and OECD-indicator, and the mobility and pain subscales of the Nottingham Health Profile share at least some common features.

Although we should not emphasise the exact magnitude of the odds ratios of the energy subscale of the Nottingham Health Profile - the 95% confidence intervals were quite broad -, it can still be said that there is a remarkably strong and significant association between (lack of) energy and self-assessed health. Energy may be a health indicator at the intersection of objective and subjective aspects of health (Dixon, Dixon & Hickey, 1993). Because of the known association between vital exhaustion (excess fatigue and lack of energy) and myocardial infarction and

sudden death (Meesters & Appels, 1996), this could be an important finding which warrants further investigation, especially in the light of the relationship between self-assessed health and mortality.

All health aspects together accounted for 72% (less-than-good), 76% (less-than-fair), and 80% (poor) of the decrease in reduction in deviance of education. Between 28% and 20% of the socioeconomic differences in self-assessed general health remains unexplained, which suggests that other factors may contribute to the explanation of these differences. Earlier studies have shown that favourable structural factors, such as housing conditions, have a positive influence on self-assessed health (Blaxter, 1997). In addition, adverse lifestyle factors, i.e. smoking, may play a role in the explanation. The relationship between these factors and self-assessed health on the one hand (Krause & Jay, 1994), and socioeconomic status and these factors on the other hand (Anderson & Armstead, 1995; Adler, et al., 1994), has been established before. In that case, the higher prevalence of unfavourable structural factors and unhealthy lifestyles of people of lower socioeconomic status may account for the unexplained part. Although we did include some aspects of psychological distress (social isolation and emotional reactions, both subscales of the Nottingham Health Profile), including other, more specific measures of mental health may result in a better explanation. The higher prevalence of psychological distress (i.e. depression and anxiety, both associated with self-assessed health (De Forge, Sobal & Krick, 1989)) in lower socioeconomic groups (Anderson & Armstead, 1995; Adler, et al., 1994) may further explain the remaining socioeconomic differences in self-assessed health. Also, including more specific measures of mental health may be useful in further exploring the role of energy and vitality in self-assessed health, whereas lack of energy and vitality are often symptomatic of mood disorders. And finally, in this study only measures of negative health were included. Including aspects of positive health, such as wellbeing or happiness, could perhaps shed another light on the relationship between socioeconomic status and self-assessed health (Blaxter, 1985; Tessler & Mechanic, 1978).

Study limitations A number of limitations in this study are important to consider when reviewing the findings. First, the study is solely based on self-report data, both objective and subjective aspects of health are reported by the individual. Reported problems will in part have some physiological basis, in part they will be based on subjective interpretation. It is possible that alternative measures of objective health aspects, i.e. information based on physical examination, would yield somewhat different results. Second, because the same technique, i.e. self-report, was used both to obtain the dependent variable (health self-assessment) and to ascertain information about objective and subjective health aspects (the independent variables), some agreement between the two is to be expected. It is unlikely though, that this phenomenon will be different for people of different educational levels. Third, in our study we only adjusted for age and gender. One might argue that including other confounding factors, such as marital status, would have yielded different results. Additional analyses showed that including marital status in the analyses only marginally changed the results and did not lead to any other conclusions. Fourth, we must consider the possibility that non-response has influenced our results. There was, however, no

selective response by most sociodemographic characteristics, except for a smaller response rate among people from 15 to 34 years of age. Only a slightly smaller response among those in the lowest educational groups could be detected. Also, no important differences in response by self-assessed health occurred (Van der Meer, Looman & Mackenbach, 1996). Fifth, the results presented here are based on a predominantly chronically ill population and cannot simply be generalised to a healthy population.

In conclusion We have replicated the finding that it is not so much diagnosis (i.e. labelling) that is important in health self-assessment (Shadbolt, 1997; Andersen & Lobel, 1995; Hirdes & Forbes, 1993; Idler, 1993b; Rodin & McAvay, 1992; Fylkesnes & Forde, 1991; De Forge, Sobal & Krick, 1989; Levkoff, Cleary & Wetle, 1987; Jylhä, Leskinen, Alanen, Leskinen & Heikkinen, 1986; Blaxter, 1985; Okun & George, 1984; Murray, Dunn & Tarnopolsky, 1982; Garrity, Somes & Marx, 1978; Tessler & Mechanic, 1978). For the explanation of socioeconomic differences in self-assessed health, psychosomatic symptoms and perceived discomfort/distress, not necessarily related to any diagnosis, play a much more important role. The health problems experienced by lower educational groups may be mainly subjective in nature; this does not make them less valid. Clearly, people from lower socioeconomic groups experience more physical and/or psychological distress than do people from higher socioeconomic groups. These differences may stem from insufficient knowledge or abilities to cope with the life stresses they encounter, such as suffering from a chronic disease. The observed differences may also have their basis in socioeconomic differences in stresses caused by the environment. Therefore, a main target should be to reduce these differences, for instance through improving the working conditions, housing conditions, and other living conditions of people of lower socioeconomic groups. However, implementation of this type of societal interventions usually takes a long time. Consequently, short-term interventions should be targeted at teaching individuals how to cope with (perceived) health problems. These interventions should be especially tailored for people from different socioeconomic groups, for the stresses these groups encounter may be of an entirely different nature.

Notes

1. Health aspects were entered in the logistic regression analyses as simultaneous blocks. When the health aspect “chronic disease” was entered in the analysis, all variables concerning this health aspect, i.e. severe chronic conditions, *and* mild chronic conditions, *and* severity of COPD/asthma, *and* severity of cardiac disorder, *and* severity of diabetes, *and* severity of low back pain, were entered simultaneously. We used the same procedure for the other health aspects, functional limitations, psychosomatic problems, and perceived discomfort/distress.
Chronic disease: Respondents with 1 severe chronic condition and those with 2 or more severe chronic conditions were compared with respondents without a severe chronic condition. Similarly, respondents without any mild chronic condition were compared with those with 1 or 2 mild conditions, and those with 3 or more mild chronic conditions. Additionally, we controlled for disease severity of COPD/asthma, cardiac disorder, diabetes, and severe low back pain; four chronic conditions that were overrepresented in the study

sample. Details of the construction of these stages of severity have been described elsewhere (Van der Meer, Looman & Mackenbach, 1996).

Functional limitations: Respondents who mentioned difficulties with 1 ADL item and those who mentioned difficulties with 2 or more ADL items were compared with respondents who mentioned no difficulties. Likewise, respondents who mentioned difficulties with 1 OECD item and those who mentioned difficulties with 2 or more OECD items were compared with respondents who mentioned no difficulties.

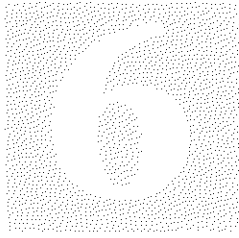
Psychosomatic symptoms: Respondents who reported 2-4 symptoms and those who reported 5-9 symptoms on the somatic subscale were compared with respondents who reported none or only 1 of the symptoms. Respondents who reported 1-2 symptoms and those who reported 3-4 symptoms of the energy subscale were compared with respondents who reported no symptoms.

Perceived discomfort/distress: Based on frequency distributions, the problem areas were categorised as follows (total number of items between brackets): physical mobility (8) 0, 1, 2+; pain (8) 0, 1-3, 4+; sleep (5) 0-1, 2-3, 4+; energy (3) 0, 1, 2+; social isolation (5) 0, 1, 2+; and emotional reactions (9) 0, 1-3, 4+. For each problem area, respondents who reported some or many problems were compared with respondents who reported no problems.

2. This ‘negative’ result, i.e. subjective aspects alone explaining more of the socioeconomic differences in less-than-good self-assessed health than subjective and objective aspects together, may seem quite remarkable. However, adding intermediate variables (i.e. health indicators) to a regression model does not necessarily imply that the effect of an explanatory variable (i.e. socioeconomic status) on the explanation of a dependent variable, as measured by reduction in deviance, will decrease. In our study one of the objective health indicators – severe chronic conditions – and education (socioeconomic status) showed an interrelation after adjustment for all other health indicators. Stratified for number of severe chronic conditions the gradient for education was steeper than in the unadjusted model. Hence, after adjustment for all other health indicators, the relationship between education and severe chronic disease is reversed; the prevalence of severe chronic conditions is higher in the highest educational group as compared to the lowest educational group. Consequently, only adjusting for subjective aspects of health underestimates the explanatory effect of education on self-assessed health. This results in a larger explanatory effect of education on self-assessed health when objective aspects of health (including severe chronic conditions) and subjective aspects of health are simultaneously included in the model.

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Exploring the role of perception and coping in socioeconomic differences in self-assessed health

In the present paper we explored whether the way individuals perceive health problems and cope with these problems affects their health self-assessment. We also investigated whether aspects of perception and coping –in addition to health variables– could further explain socioeconomic differences in self-assessed health.

We used longitudinal data, baseline data (i.e. 1991) on psychosocial variables (personality traits and coping styles) and follow-up data (i.e. 1997) on health variables (chronic disease, somatic symptoms, functional limitations, psychological wellbeing and energy/vitality) and self-assessed health.

Multiple linear regression analyses (least squares regression) were used (i) to investigate the relationship between health variables, aspects of perception and coping (i.e. the interaction between psychosocial and health variables) and self-assessed health and (ii) to investigate whether perception and coping could further explain the relationship between socioeconomic status (education) and self-assessed health. All regression models were adjusted for age, gender, marital status and education.

The results of our exploratory study show that the influence of perception of health problems on self-assessed health is modest. We found that personality traits moderate the relationship between health problems and self-assessed health. We did not find any indication that coping styles moderate this relationship. Although we found only a modest relation between self-assessed health and aspects of perception and coping, we also found that these aspects –in addition to health aspects– could further reduce the predictive power of education on self-assessed health.

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Manuscript

6.1 Introduction

Different studies have shown that there are large socioeconomic differences in self-assessed health. Individuals from lower socioeconomic groups generally assess their own health as poorer than individuals from higher socioeconomic groups (cf. Ostrove, Feldman & Adler, 1999; Ross & Wu, 1996; Hirdes & Forbes, 1993; Mackenbach, 1993). Such self-assessments of health are determined by different aspects of health, as has been shown in recent empirical studies. In these studies, it has become clear that biomedical health aspects such as chronic conditions (Manderbacka, Lahelma & Martikainen, 1998; Menec & Chipperfield, 1997; Ongaro & Salvini, 1995; Dixon, Dixon & Hickey, 1993; Idler, 1993b; Rodin & McAvay, 1992; Fylkesnes & Forde, 1991; Liang, Bennett, Whitelaw & Maeda, 1991), functional aspects such as functional limitations (Manderbacka, Lahelma & Martikainen, 1998; Menec & Chipperfield, 1997; Ongaro & Salvini, 1995; Idler, 1993b; Liang, Bennett, Whitelaw & Maeda, 1991)), and aspects of wellbeing such as negative mood (Manderbacka, Lahelma & Martikainen, 1998; Rodin & McAvay, 1992; Fylkesnes & Forde, 1991) are significantly related to self-assessed health. As the prevalence of health problems, e.g. chronic conditions and functional limitations, is much higher in lower socioeconomic groups (cf. Anderson & Armstead, 1995; Adler, et al., 1994; Feinstein, 1993; Williams, 1990), it has long been assumed that this differential prevalence could account for the observed socioeconomic differences in self-assessed health. However, in an earlier study, we found that health aspects alone could not explain socioeconomic differences in self-assessed health (Simon, Van de Mheen, Van der Meer & Mackenbach, 2000). Therefore, we should explore alternative explanations for the observed socioeconomic differences.

From studies on stress and coping, symptom perception, as well as illness behaviour, we know that individuals differ in the way they perceive and cope with, or deal with internal stimuli. These differences in perception and coping can be attributed to differences in personality traits and coping styles (Barsky, 1988; Costa & McCrae, 1985; Lazarus & Folkman, 1984). Some studies have shown that psychosocial variables (such as neuroticism and perceived control) are related to self-assessed health, although marginally. Only a limited number of studies have investigated whether individual differences in perception of and coping with health problems do affect the way individuals assess their health (Kempen, Jelicic & Ormel, 1997; Menec & Chipperfield, 1997; Rodin & McAvay, 1992). It may well be that individual differences in perception of and coping with health problems could further explain socioeconomic differences in self-assessed health. Besides a higher prevalence of health problems in lower socioeconomic groups, there is also a higher prevalence of unfavourable personality traits and coping styles (Anderson & Armstead, 1995; Adler, et al., 1994). These unfavourable personality traits and coping styles in lower socioeconomic groups may result in a more negative perception of health problems and poorer ways of coping with these problems, which in turn may negatively influence health self-assessments.

In the present study, we explore whether the way individuals perceive health problems and cope with these problems affects their health self-assessments. Then, we investigate whether such

aspects of perception and coping –in addition to biomedical, functional and wellbeing aspects– can further explain socioeconomic differences in self-assessed health.

6.2 Methods

Study population

Our study population consists of participants of the GLOBE-study, a longitudinal study designed to describe and explain sociodemographic inequalities in health in the Netherlands. Design and objective of the GLOBE-study have been described in detail elsewhere (Mackenbach, Van de Mheen & Stronks, 1994). At baseline in 1991, participants constituted of a cohort of non-institutionalised men and women with Dutch nationality, 15-74 years of age, who were living in the city of Eindhoven or surrounding municipalities. The baseline survey consisted of a postal questionnaire with a response rate of 70% (n=19000). From the respondents to the baseline survey of the GLOBE-study two subsamples were drawn, one random sample and one in which people with four specific chronic diseases (COPD/asthma, cardiac disorder, diabetes mellitus, and severe low back pain) were oversampled. In 1991, both subsamples were approached for an additional structured interview, with a response rate of approximately 75% (n=5700). In 1997, respondents to the structured interview were approached to participate in a follow-up study, the response was approximately 72% (n=4100). Longitudinal data, collected from the postal survey in 1991 and from the structured interviews in 1991 and 1997, were used in the analyses.

Measures

With a longitudinal approach we eliminated the possibility of current health status having contaminated scores on personality and coping. As we had data from two different measurement points, we used baseline (i.e. 1991) data on personality traits and coping styles, as these are presumed to be fairly stable. In addition, we used follow-up (i.e. 1997) data on biomedical aspects, functional aspects, aspects of wellbeing, and self-assessed health.

Self-assessed health (1997; outcome measure) Self-assessed health was asked through a single question: “How is your health in general?” (1=Very good, 2=good, 3=fair, 4=sometimes good and sometimes poor, 5=poor).

Socioeconomic status The socioeconomic status of participants is indicated by their highest attained educational level. Educational level was divided into four categories: primary education only, i.e. 6 years of education (low); lower general or lower vocational education, i.e. 10 years of education (2); intermediate general or intermediate vocational education, i.e. 11-14 years of education (3); and higher vocational education or university degree, i.e. 15-16 years of education (high; reference group). Education was included in the regression analyses as a dummy variable.

Covariates Several covariates were also included in the analyses: current age (continuous; range = 20-80), current marital status (dummy variable; married, never married, divorced, widowed) and gender (0=male, 1=female).

Biomedical health aspects (1997) Chronic disease was measured through a checklist of 23 chronic conditions (e.g. stroke, cancer, high blood pressure) (Statistics Netherlands, 1992). Conditions were summed (mean(SD)=1.4(1.7)). Symptoms were measured through a subscale of a 13-item symptoms inventory (Van Sonsbeek, 1996; Dirken, 1967). Nine items were combined into a subscale which we defined as somatic symptoms (e.g. “Do you often have an upset stomach?” (yes, no)). The affirmative answers were summed (mean(SD)=2.1(2.1)).

Functional health aspects (1997) Functional limitations were measured through a selection of 10 items concerning activities of daily living (ADL) (Statistics Netherlands, 1992) and the Dutch version of the OECD-indicator of long term disabilities (Van Sonsbeek, 1996; McWhinnie, 1979). Examples of questions concerning functional limitations are: “Are you able to dress and undress yourself?” and “Can you carry an object of 5 kilos, for instance a shopping bag, for 10 meters?”. Participants could indicate on a four-point scale to what extent they experienced any limitations performing these activities (1=Effortless, 4=Can’t do at all). Scores were summed, higher scores indicating more limitations (mean(SD)=11.7(3.1)).

Wellbeing aspects (1997) Psychological wellbeing was measured with the Dutch version of the 5-item Mental Health Inventory (Ware, Johnson & Davies-Avery, 1979). This measure asks participants to indicate the frequency with which they had certain feelings, using a six-point scale. For example, “How often in the past four weeks you felt so down in the dumps that nothing could cheer you up?” (1=never, 6=all the time). Scores were summed (mean(SD)=10.7(4.3)), with higher scores indicating poorer mental health. Energy/vitality was measured through a subscale of a 13-item symptoms inventory (Van Sonsbeek, 1996; Dirken, 1967). Four items were combined into a subscale concerning lack of energy and vitality (e.g. “Do you usually get up in the morning feeling tired and not well rested?” (yes, no)). The affirmative answers were summed (mean(SD)=1.0(1.3)).

Psychosocial aspects (1991) Neuroticism was measured with the Dutch version of the Eysenck Personality Questionnaire (Eysenck, Eysenck & Barrett, 1985). This inventory consists of 12 items such as “Do you consider yourself a nervous person?” (yes, no). The affirmative answers were summed (mean(SD)=3.2(2.9)), with higher scores indicating higher levels of neuroticism. Perceived external control was measured with an 11 item Dutch version of Rotter’s locus of control scale (Rotter, 1966). This measure asks participants to indicate agreement with statements using a five-point scale. For example, “I often feel a victim of circumstances” (1=strongly disagree, 5=strongly agree). The scores were summed (mean(SD)=30.9(6.9)), with higher scores indicating a more external locus of control). Coping styles were measured with the Utrecht Coping Scale (Schreurs, Tellegen, Vroman & Van de Willige, 1983) consisting of seven subscales. This measure asks participants to indicate the frequency with which they react in a certain manner, using a four-point scale (1=seldom or never, 4=(almost) always); scores were summed. The coping styles measured are confrontation (8 items, mean (SD)= 20.9(4.1)), avoidance (7 items, mean (SD)= 12.7(3.0)), depression (7 items, mean (SD)= 10.1(2.7)), optimism (4 items, mean (SD)= 10.2(2.1)), palliation (6 items, mean (SD)= 12.6(2.9)), disclosure of emotions (3 items, mean

(SD)= 6.4(1.8)), and seeking social support (6 items, mean (SD)= 13.5(3.4)). Items are for example “Take problems as a challenge” (Confrontation); “Trying to withdraw from the situation” (Avoidance); “Take a gloomy view of things” (Depression); “Considering that things could be worse” (Optimism); “Take one’s mind off things” (Palliation); “Show that you are annoyed” (Disclosure of emotions); “Seeking comfort and understanding” (Seeking social support).

Analyses

Multiple linear regression analyses (least squares regression) were used (i) to investigate the relationship between self-assessed health and biomedical, functional, wellbeing aspects and aspects of perception and coping, and (ii) to investigate the relationship between socioeconomic status and self-assessed health.

Aspects of perception and coping were operationalised as the interaction between health variables and psychosocial variables. We selected the psychosocial variables and interaction terms by performing linear regression analyses in two separate steps. In the first step, we only selected the psychosocial variables which had at least a marginal relationship with self-assessed health. In the second step, we investigated the interaction between health aspects and selected psychosocial variables and only selected the interaction terms which had a significant relationship with self-assessed health. In a third and final step we used the outcome of the previous steps, and investigated whether these selected psychosocial variables and interaction terms, in addition to health variables, could further explain the relationship between socioeconomic status and self-assessed health.

In our study population, chronic diseases were overrepresented (Van der Meer, 1998; Mackenbach, Van de Mheen & Stronks, 1994) and we weighted the analyses in order to achieve results that represent the situation in the original baseline population. All models were adjusted for age (continuous variable), gender, marital status and education (dummy variables). Health variables, psychosocial variables, and interaction terms were entered into the regression models as continuous variables.

Step 1: Selection of psychosocial variables We considered each of the psychosocial variables (i.e. neuroticism, perceived external control, confrontation, avoidance, depression, optimism, palliation, disclosure of emotions, and seeking social support) a potential predictor of self-assessed health. Therefore, we manually performed a backward elimination procedure and in each step we eliminated the weakest psychosocial predictor. As our analyses are primarily explorative in nature, and as moderator variables need not to be significantly related to the outcome variable (Baron & Kenny, 1986), we selected psychosocial variables that were at least marginally related to self-assessed health. We entered all nine psychosocial variables into a model in which we had already entered all health variables (i.e. biomedical, functional, and wellbeing aspects), covariates and education. First, we removed the psychosocial variable with the smallest, non-significant *t* statistic; the *t* statistic tests the significance of the correlation between a particular variable and the outcome measure (Norusis, 1994). Then, we repeated this analysis with a model including eight remaining psychosocial variables and selected the next variable to

remove. This procedure was repeated until all remaining psychosocial variables were at least marginally related to self-assessed health (results not shown). The second step in the analyses was undertaken with the following psychosocial variables: Neuroticism ($p < .07$), Perceived external control ($p < .05$), and Confrontation ($p < .003$).

Step 2: Selection of interaction terms With the selected psychosocial variables we performed additional linear regression analyses. First, we created the first-order interaction terms between all health variables and three selected psychosocial variables (i.e. health variables * psychosocial variables). Then, we entered these interaction terms into the model which resulted from Step 1, i.e. all health variables, selected psychosocial variables, covariates and education. Again, we manually performed a backward elimination procedure and in each step we eliminated the interaction term that had the smallest non-significant t statistic and thus proved to be the weakest predictor of self-assessed health. This procedure was repeated until all remaining interaction terms were significantly related to self-assessed health (results not shown). The third and final step in the analyses was undertaken with the following interaction terms: Neuroticism * Somatic symptoms ($p < .05$), Neuroticism * Low energy level ($p < .05$), Neuroticism * Mental health problems ($p < .001$), External control * Chronic conditions ($p < .05$), External control * Functional limitations ($p < .001$).

Step 3: Exploring the role of perception and coping in the explanation of socioeconomic differences in self-assessed health In the previous steps we selected three psychosocial variables and five interaction terms that were marginally or significantly related to self assessed health. In the final step, following this selection process, we investigated whether these aspects of perception and coping –in addition to biomedical, functional and wellbeing aspects– could further explain the relationship between education and self-assessed health. The results of these analyses will be presented in the next section.

6.3 Results

The relation between self-assessed health and aspects of perception and coping

In Table 6.1 we present the results of the hierarchical multiple regression analyses we performed following the selection of psychosocial variables and interaction terms. In the initial regression analysis in which we included age, gender, marital status and education (Model 1) it can be seen that covariates and education alone account for over eight percent of the variability in self-assessed health. In the second analysis we added all health variables simultaneously to the regression model (Model 2). The analysis revealed that covariates, education, and health aspects account for almost 47 percent of the variability in self-assessed health. Chronic conditions, somatic symptoms, functional disability, low energy level and mental health problems are all significantly related to self-assessed health, and account for an additional 38 percent of the variability compared to a model with covariates and education alone. Results are in the expected direction: increasing numbers of health problems are associated with poorer self-assessed health.

Table 6.1

Self-assessed health regressed on confounders, education, health aspects, personality factors, coping, and interactions between health and personality

Variables in regression analysis	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d	
	Beta	sign.	Beta	sign.	Beta	sign.	Beta	sign.
<i>Covariates</i>								
Age (ascending)	.17	*** e	.05	**	.05	***	.04	*
Gender (woman)	.03	ns	-.07	***	-.07	***	-.07	***
Marital status (never married)	.05	**	.03	marg.	.02	marg.	.02	ns
Marital status (divorced)	.05	**	-.03	*	-.03	*	-.03	*
Marital status (widowed)	.01	ns	-.03	*	-.03	*	-.03	*
<i>Education</i>								
Primary education only	.23	***	.10	***	.08	***	.08	***
Lower general education	.12	***	.06	***	.04	*	.04	*
Intermed./higher general education	.08	***	.05	**	.04	**	.04	*
<i>Health aspects</i>								
Chronic conditions (many)			.19	***	.19	***	.02	ns
Somatic symptoms (many)			.22	***	.22	***	.27	***
Disability (high)			.15	***	.14	***	.66	***
Energy level / vitality (low)			.19	***	.20	***	.25	***
Mental health problems (many)			.12	***	.11	***	.05	marg.
<i>Personality and coping</i>								
Neuroticism (high)					-.02	marg.	-.11	**
Perceived external control (high)					.03	marg.	.44	***
Confronting (high)					-.05	***	-.04	**
<i>Interactions/Perception</i>								
Symptoms * Neuroticism							-.09	*
Energy * Neuroticism							-.08	*
Mental health * Neuroticism							.22	***
Chronic conditions * Control							.17	*
Disability * Control							-.75	***
Adjusted R ² (% variance explained)	.08 (8%)		.47 (47%)		.47 (47%)		.48 (48%)	

a Model 1: Confounders and education

b Model 2: Confounders, education and health aspects

c Model 3: Confounders, education, health aspects, personality and coping

d Model 4: Confounders, education, health aspects, personality, coping and interactions

e ns: not significant marg.: p < .10 * p < .05 ** p < .01 *** p < .001

In the third regression analysis we added the selected psychosocial variables to a model already containing covariates, education and health variables (Model 3). The direct effect of psychosocial variables on self-assessed health is very small, and could only account for an additional 0.2 percent of the variability. In the fourth analysis we also included the significant interaction terms we selected earlier (Model 4). Surprisingly, the interaction terms could account for a higher additional percentage of the variability in self-assessed health than could psychosocial variables alone. However, the contribution of these variables to the explanation was quite modest. Aspects of perception and coping (i.e. the interaction between health aspects and psychosocial factors) account for an additional 1.0 percent of the variability compared to a model consisting of health variables, main effect of psychosocial variables, covariates and education. In total, covariates, health variables, main effect of psychosocial variables and interaction terms (i.e. aspects of perception and coping) explain 49 percent of the variance in self-assessed health.

When looking at the interaction between neuroticism and somatic symptoms, we can see that an increase in somatic symptoms has a stronger negative impact on self-assessed health in participants with a low level of neuroticism as compared to participants with a higher level of neuroticism. Similarly, looking at the interaction between neuroticism and energy level, results show that diminishing energy or vitality has a stronger negative impact on self-assessed health in participants with a low level of neuroticism as compared to participants with a higher level of neuroticism. A reverse effect can be observed in the interaction between neuroticism and mental health problems. Here, we found that increasing mental health problems have a stronger negative effect on self-assessed health in participants with a high level of neuroticism as compared to participants with a lower level of neuroticism. With respect to the interaction between perceived external control and chronic disease, results show that an increase in the number of chronic conditions has a stronger negative impact on self-assessed health in participants with a more external locus of control than in participants with a more internal locus of control. We found, however, quite the opposite result for the interaction between perceived external control and functional limitations. An increase in functional limitations has a much stronger negative impact on self-assessed health in participants with a more internal locus of control as compared to participants with an external locus of control.

Can aspects of perception and coping further explain the relationship between education and self-assessed health?

We also investigated whether the selected psychosocial aspects and interaction terms (aspects of perception and coping) could further explain the relationship between education and self-assessed health. The previous analyses have shown that a model including psychosocial aspects as well as interaction terms better fitted the data and could explain more of the variability in self-assessed health than a model containing psychosocial variables alone. Therefore, we decided to calculate the overall contribution of education in the first, second and final model, as presented in Table 6.1, only. In the hierarchical models, covariates (Table 6.1, Model 1), plus health aspects (Model 2), plus psychosocial variables and interaction terms (Model 4) were entered as separate

blocks of variables, and in each model education was entered in the equation last. In the regression models the overall contribution of education was determined by an F -test for change in the proportion variance explained (R^2). With the F_{change} statistic we tested whether inclusion of education in the regression model resulted in a significant increase in R^2 . With each hierarchical step the F_{change} statistic for education is expected to decrease. We calculated the proportion reduction of the F_{change} statistic to indicate the decreasing role of education in the regression models explaining individual differences in self-assessed health.

We found that the overall contribution of education to a model which consists of age, gender and marital status (Model 1) is quite large ($F_{\text{change}}=39.48$, $df_1,df_2=3,3289$, $p < .001$). Including health aspects to the equation (Model 2) decreased the contribution of education considerably. The overall contribution of education was reduced by 69 percent ($F_{\text{change}}=12.13$, $df_1,df_2=3,3289$, $p < .001$). In the final model (Model 4), also including psychosocial aspects and interaction terms, the overall contribution of education was further reduced. Compared to a model consisting of covariates and health aspects, a model consisting of age, gender, marital status, health aspects, psychosocial aspects as well as the interaction terms could further reduce the overall contribution of education by another 12 percent-points. In total, in the final model the contribution of education was reduced by 81 percent ($F_{\text{change}}=7.361$, $df_1,df_2=3,3289$, $p < .001$), as compared to Model 1.

6.4 Discussion

Summary of the findings The results of our exploratory study show that the influence of perception of health problems (i.e. the interaction between psychosocial and health variables) on self-assessed health is modest, and that the results are mixed. We found that personality traits moderate the relationship between health problems and self-assessed health. We did not find any indication that coping styles moderate this relationship. Although we found only a modest relation between self-assessed health and aspects of perception and coping, we also found that these aspects –in addition to health aspects– could further reduce the predictive power of education on self-assessed health.

Methodological issues Before discussing the findings of our study, we will address some methodological issues. First, we should consider the possibility that selective non-response has influenced our results. However, in the baseline (1991) as well as in the follow up study (1997) selective non-response was small, both with respect to socioeconomic status and with respect to self-assessed health (San Jose, 2000; Van der Meer, 1998; Stronks, 1997). Second, the variables we used in our study, i.e. health variables, psychosocial variables as well as self-assessed health, were self-report. Using the same type of data (self-report, survey data) may have strengthened the relationship between explanatory variables and outcome. It may well be that using alternative measures of physical and functional health status, for example physician's examinations or performance tests, would have altered the results. Future analyses should be conducted to study the effect of such alternative measures. Third, in our study, we used "negative" variables such as

mental health problems and diminished vitality, and one could argue whether these truly represent wellbeing. It would be worthwhile to search for conceptually stronger measures of wellbeing and use such measures in future studies on the role of perception in self-assessed health. Fourth, health variables and self-assessed health were measured cross-sectionally (both in 1997), which may also have strengthened the relationship between these measures. We used baseline (i.e. 1991) data on personality traits and coping styles in order to eliminate the possibility of current health status having contaminated scores on the psychosocial variables. A drawback of simultaneously using cross-sectional data and longitudinal data in our study is that the relationship between the former (health variables–1997 and self-assessed health–1997) will probably be stronger than between the latter (psychosocial variables–1991 and self-assessed health–1997). Thus, the strength of the relationship between health aspects and self-assessed health we found may be an overestimation, whereas the strength of the relation between psychosocial variables and aspects of perception may be an underestimation. However, neither a slightly weaker relationship between health variables and self-assessed health, nor a stronger relationship between psychosocial variables and self-assessed health would alter our conclusions.

The role of perception We found that the main effect of psychosocial variables hardly contributed to the explanation of the variability in self-assessed health, but that the interaction between health variables and psychosocial variables could explain more of the variability. However modest, these findings support our hypothesis that personality traits should not be considered intermediate variables, but should be considered moderator variables (Baron & Kenny, 1986). Thus, personality traits hardly affect health-assessments directly, but primarily affect the way individuals perceive existing health problems. And it is this differential perception of health problems which in turn affects health-assessments. The fact that only the main effect of coping (confrontation) is significantly related to self-assessed health, and none of the interaction terms comprising coping, suggests that only personality traits are responsible for individual differences in the perception of health problems. However, this finding warrants further investigation. It could also be that other coping scales –for example those based on Lazarus and Folkman’s theory of problem-focused vs. emotion-focused coping (Taylor, 1991; Lazarus & Folkman, 1984)– would moderate the effect of health problems on self-assessed health.

Participants low in neuroticism seem to perceive somatic symptoms and diminished energy/vitality more negatively than participants with higher levels of neuroticism. In contrast, participants with a higher level of neuroticism seem to perceive mental health problems more negatively than participants low in neuroticism. Participants with an external locus of control seem to perceive chronic conditions more negatively than participants with a more internal locus of control. However, at the same time, participants with a more internal locus of control seem to perceive functional limitations more negatively than participants with an external locus of control. These findings illustrate that personality traits such as neuroticism and external locus of control, which we a priori labelled as “unfavourable”, can have a negative as well as a positive influence on self-assessed health. The direction of the effect seems to be dependent upon the type of health problem from which an individual is suffering, as has been documented by other

researchers. A sense of internal control, for example, does not lead to feelings of better health when the health problem the individual is dealing with is actually beyond his or her control (Chipperfield & Segall, 1996; Helgeson, 1992). Menec (1997) came to a similar conclusion in her study on the interactive effect of perceived control and functional status on health. Future studies on the role of perception of health problems in self-assessed health might include different types of control (cf. Skinner, 1996).

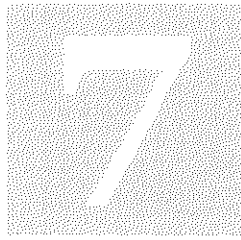
With respect to neuroticism, another mechanism could play a role. Several authors have addressed that neuroticism is a central determinant in the reporting of physical symptoms and subjective distress (Vassend & Skrondal, 1999; Watson & Pennebaker, 1991; Costa & McCrae, 1985). Furthermore, in some studies, trait neuroticism has been operationalised through items on depression, anxiety (Benyamini, Leventhal & Leventhal, 2000; Leventhal, Hansell, Diefenbach, Leventhal & Glass, 1996) and fatigue (Benyamini, Leventhal & Leventhal, 2000). We reduced contamination of health variables (measured in 1997) by psychosocial variables (measured in 1991) and vice versa through the longitudinal approach of our study. However, by controlling for somatic symptoms, mental health problems as well as energy/vitality, we may have partialled out at least some of the effect of neuroticism. Perhaps we have underestimated the contribution of neuroticism, particularly as all of these health measures were self-report. With the type of analysis we used in our study, there is always the complication that it is difficult to disentangle the effect of independent and moderator variables. To solve this problem we should make use of statistical analyses that can model complex relations, e.g. path analysis (Adler, et al., 1994). Also, by partialling out symptom reporting, we may have altered the way we should interpret this measure of neuroticism. We can, however, only speculate how.

Explaining socioeconomic differences Although psychosocial aspects play a only a small role in health self-assessments, they do play a role in the explanation of socioeconomic differences herein, however modest. Adding psychosocial aspects and interaction terms to a model already containing covariates and health variables reduced the overall contribution of education by 12 percent-points. The contribution of these aspects to the explanation of socioeconomic differences in self-assessed health is quite remarkable, certainly compared to the much smaller contribution of these aspects to the explanation of individual differences in self-assessed health. We can draw several conclusions from the findings of our study. First, these results show that it is worth the effort to investigate possible psychological mechanisms involved in socioeconomic differences in self-assessed health. Second, results indicate that there are some differences between socioeconomic groups in the way they perceive health problems. Health problems are more prevalent in lower socioeconomic groups, and the way low SES individuals perceive these problems, either negative or positive, will have a stronger overall impact on self-assessed health in lower socioeconomic groups. Although we found that in higher socioeconomic groups there are also personality traits associated with negative health perceptions, health problems are simply less prevalent in higher socioeconomic groups. Negative perceptions of health problems will therefore have a weaker effect on high-SES health-assessments than on low-SES health-assessments. Lower socioeconomic groups have to deal with a higher prevalence of health

problems as well as negative health perceptions. Furthermore, cumulation of health problems could also reinforce the (negative) effect of perception on self-assessed health.

Conceptualising perception We need more research on the relationship between perception and self-assessed health, in particular with strong psychosocial concepts. The Big Five personality traits (i.e. neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) seem to provide a set of personality dimensions that comprehensively describe most individual differences (view e.g. Vassend & Skrondal, 1999; Smith & Williams, 1992). Also, social comparison (Collins, 1996; Suls, Marco & Tobin, 1991) could be a useful concept in future analyses. Refining the conceptualisation of perception of health problems and the role these may play in health assessments will also bring research into socioeconomic differences in self-assessed health a considerable step further.

Concluding remarks The main contribution of our study is that we were found some indications that psychological processes are involved in the relation between health problems and self-assessed health. We believe that these psychological processes could contribute to the explanation of socioeconomic differences in self-assessed health. However, the questions raised by this study can only be answered through future studies. These studies need to have a strong conceptual basis and should be able to model the complex relationships between health problems, psychosocial variables and self-assessed health.



Self-assessed health and mortality: could psychological factors explain the association?

The single-item question of self-assessed health has consistently been reported to be associated with mortality, even after controlling for a wide range of health measurements and known risk factors for mortality. It has been suggested that this association is due to psychosocial factors which are both related to self-assessed health and to mortality. We tested this hypothesis with data on self-assessed health, sociodemographic variables, aspects of health status, behavioural risk factors, and a number of psychosocial factors (social support, psychosocial stressors, personality traits, and coping styles).

After controlling for sociodemographic variables, various aspects of health status, and behavioural risk factors, self-assessed health is still strongly associated with mortality in our dataset. After controlling for the same set of confounders, many of the psychosocial variables are statistically significantly associated with less-than-good self-assessed health, particularly instrumental social support, long-lasting difficulties, neuroticism, and locus of control. However, only “disclosure of emotions”-coping style has a statistically significant relationship with mortality. Adding the psychosocial variables to a model already containing self-assessed health does not attenuate the association between self-assessed health and mortality.

We did not find indications that the association between self-assessed health and mortality is due to the psychosocial factors included in this analysis. It seems likely that the unexplained mortality effects of self-assessed health are due to the fact that self-assessed health is a very inclusive measure of health reflecting health aspects relevant to survival which are not covered by other health indicators.

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7.1 Introduction

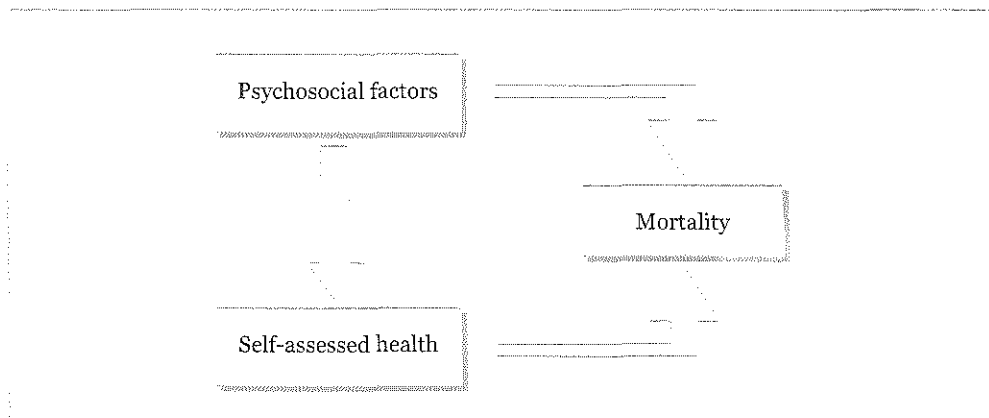
In the early 1980's, Mossey and Shapiro showed that elderly Canadians' self-assessments of health were better predictors of seven-year survival than their medical records, or self-reports of medical conditions (Mossey & Shapiro, 1982). Since then, studies in different countries have confirmed that self-assessed health is an important predictor of mortality in many populations, including adults in the USA (Kaplan & Camacho, 1983), Britain (Wannamethee & Shaper, 1991), Lithuania, the Netherlands (Appels, Bosma, Grabauskas, Gostautas & Sturmans, 1996), Finland (Miilunpalo, Vuori, Oja, Pasanen & Urponen, 1997; Kaplan, et al., 1996), and Sweden (Sundquist & Johansson, 1997); elderly in Japan (Tsuji, et al., 1994), Australia (McCallum, Shadbolt & Wang, 1994), and the USA (Schoenfeld, Malmrose, Blazer, Gold & Seeman, 1994); and different ethnic groups in the USA (McGee, Liao, Cao & Cooper, 1999). Many of these studies controlled extensively for known determinants of mortality, including subjective and objective measures of health.

Although some studies have not been able to reproduce this finding, in a recent review Idler and Benyamini (1997) concluded that 23 out of 27 studies consistently showed a significant effect of self-assessments of health on mortality. This review also summarised the explanations which have been offered for this intriguing finding, including the hypothesis that "self-rated health reflects the presence or absence of resources than can attenuate decline in health". According to this hypothesis self-assessed health may reflect *inter*personal resources (such as social networks) or *intra*personal resources (such as lack of control) which influence survival (Idler & Benyamini, 1997).

One possible interpretation of this hypothesis is that the association between self-assessed health and mortality is not due to a causal effect of health (or its perception) on mortality, but due to a common association of both self-assessed health and mortality with psychosocial factors at the interpersonal or intrapersonal level (Figure 7.1).

Figure 7.1

Schematic representation of the association between psychosocial factors, self-assessed health and mortality



There is indeed an abundance of literature documenting the effects of psychosocial characteristics on either self-reported health, mortality, or both. Perhaps the strongest evidence is available for indicators of social integration such as 'social ties', 'social networks' and 'social support', which have been shown to be related to both self-reported measures of physical and mental health, and to mortality (Berkman, Glass, Brissette & Seeman, 2000; Seeman, 2000; King, 1997). Psychosocial stressors such as bereavement, 'life events' and 'daily hassles' have been found to be related to illness and mortality (Stroebe & Stroebe, 1993; De Longis, Coyne, Dakof, Folkman & Lazarus, 1982; Rahe, 1968), although the evidence has not convinced all researchers, particularly in the case of studies relating self-reported stress to self-reported health (Dohrenwend, Dohrenwend, Dodson & Shrout, 1984). Personality traits such as neuroticism and locus of control have also been found to be associated with self-reported health measures (Syme, 1989; Watson & Pennebaker, 1989; Rodin, 1986), and there is some evidence that locus of control may also be related to mortality (Bosma, Schrijvers & Mackenbach, 1999). Finally, certain coping styles have been found to be related to self-reported health measures, perhaps because of their stress-enhancing (in the case of e.g. 'avoidance' strategies) or stress-buffering effect (in the case of e.g. 'disclosure' strategies) (Thoits, 1995; Cohen & Wills, 1985; Lazarus & Folkman, 1984). It is less clear whether coping is also related to mortality.

In this paper we will test the hypothesis that the association between self-assessed health and mortality can in part be attributed to confounding by psychosocial factors. Psychosocial factors included in the study are social support, psychosocial stressors, selected personality traits, and coping styles.

7.2 Data and methods

Study population

Our study population consists of participants of the GLOBE-study, a prospective cohort study designed to explain sociodemographic health inequalities in the Netherlands. The objectives and study design have been described in more detail elsewhere (Mackenbach, Van de Mheen & Stronks, 1994). At baseline in 1991, participants were an aselect sample of non-institutionalised men and women with Dutch nationality, 15-74 years of age, living in the city of Eindhoven and surrounding municipalities. The study started with a postal questionnaire with a response rate of 70% (n=18967). From the respondents to this baseline survey two subsamples were drawn, one random sample and one in which people with one of four prevalent chronic conditions (COPD/asthma, cardiovascular disease, diabetes mellitus, low back pain) were overrepresented. The latter subsample was recruited in order to increase opportunities for studying determinants of the development of health problems over time. Also in 1991, both subsamples were approached for an additional structured interview, which had a response rate of 75% (n=5667, among whom n=1945 with one or more of the four chronic conditions). This study sample was 50% male; 20% were aged 15-34, 37% 35-54, and 43% 55-74.

Data collection

Self-assessed health was asked in the baseline postal questionnaire through a single question: "How is your health in general? Very good, Good, Fair, Sometimes good and sometimes poor, or Poor?" The category of "Very good" self-assessed health was used as the reference category in the analyses.

Mortality was measured in an administrative follow-up procedure, in which the population registers of the municipalities of residence of the study participants were approached regularly to update vital status and address information. Assessment of vital status is virtually complete, and we used data up to (and including) 1998 for the analyses reported in this paper.

Table 7.1 presents the distribution of the study population by self-assessed health at base-line and by survival status in 1998.

Table 7.1

Study population by self-assessed health at baseline, and mortality status during follow-up

Self-assessed health	N baseline (%)		† follow-up
Very good	709	(12)	18
Good	2766	(49)	107
Fair	1173	(21)	121
Sometimes poor	769	(14)	116
Poor	120	(2)	27
Missing	130	(2)	18
Total	5667	(100)	407

We included three groups of confounders in the analyses: *sociodemographic variables*, *various aspects of health status*, and *behavioural risk factors*. The rationale was that these variables are independent determinants of both self-assessed health and mortality, without being intermediary between self-assessed health and mortality. All confounders were measured in the baseline postal questionnaire. The set of sociodemographic variables included age, gender, marital status, and level of education. The set of health status measures included self-reported chronic conditions (none versus one or more potentially lethal conditions (i.e. stroke, cancer, COPD/asthma, heart disease, diabetes mellitus, kidney disease)) and symptoms (less than three versus three or more symptoms in a 13-item symptom inventory). The set of behavioural risk factors included smoking (4 categories), alcohol consumption (4 categories), physical exercise (4 categories) and obesity (3 categories).

We assessed the contribution to the self-assessed health-mortality relationship of *four groups of psychosocial variables*. Social support was measured with a 9-item Dutch questionnaire asking for the emotional and instrumental support provided by the respondent's three most significant persons (Van Tilburg, 1988). Psychosocial stressors included life events and long-lasting

difficulties. Life events were measured by means of a checklist of 9 negative events experienced in the preceding year, selected as events scoring high on Holmes and Rahe's social readjustment rating scale (Ormel, 1980). Long-lasting difficulties were measured with an 18 item-checklist covering financial problems, social deprivation, neighbourhood problems, health problems of significant others, and problems in relationships (Hendriks, Ormel & Van de Willige, 1990). We included two personality traits: neuroticism and locus of control. Neuroticism was measured by means of the 12-item Dutch version of the Eysenck Personality Questionnaire (Sanderman, Arrindel, Ranchor, Eysenck & Eysenck, 1995). Locus of control was measured by means of the 12-item Dutch version of Rotter's locus of control scale (Rotter, 1966). We measured 7 different coping styles (confronting, avoiding, depression, social support seeking, palliation, disclosure of emotions, and optimism), using the 41-item Utrechtse Coping Lijst (Schreurs, Tellegen, Vroman & Van de Willige, 1983). Each of these scales have been extensively validated in the Netherlands, and have good internal consistency in the GLOBE-study: Cronbach's alpha were 0.60 (emotional support), 0.67 (instrumental support), 0.81 (neuroticism), 0.84 (locus of control) and between 0.59 and 0.80 (various coping styles). In most cases, scores were divided into tertiles.

Analysis

The analysis was conducted in three phases. In phase 1 we related mortality during follow-up to self-assessed health at baseline using Cox proportional hazards analysis. We controlled for three groups of confounders: sociodemographic variables, various aspects of health status, and behavioural risk factors. In phase 2 we related psychosocial variables to self-assessed health (using logistic regression analysis) and to mortality (using Cox proportional hazards analysis), in order to assess which of the psychosocial variables are determinants of self-assessed health and mortality. In the final phase (phase 3) we added each of the psychosocial variables to the regression model used in phase 1, in order to determine the contribution of the psychosocial variables to the explanation of the association between self-assessed health and mortality. Variables were considered to be predictors of self-assessed health or mortality on the basis of an overall test of reduction in deviance (likelihood chi-square test).

Because the study sample had an overrepresentation of four chronic diseases, the analyses were performed with prior weights in order to achieve results that represent the situation in the original study population. These weights were calculated from the number of persons in the original study population that responders with and without chronic diseases represent (number represented is equal to number responding times reverse of sampling fraction times reverse of response fraction). Weights were normalised to obtain a power relative to the number of respondents.

7.3 Results

Phase 1 Table 7.2 shows the results of the analyses in phase 1. In our study population self-assessed health is strongly associated with mortality. After controlling for age and gender, there is a sevenfold excess mortality risk among those who assessed their health at baseline as poor, as

compared to those who assessed their health at baseline as very good. Controlling for additional sociodemographic variables, for other aspects of health status, or for behavioural risk factors attenuates this excess mortality risk. However, even after controlling for all three groups of confounders together, there still is a fourfold excess mortality risk among those with poor health assessments.

Table 7.2

The association between self-assessed health and mortality, before and after controlling for sociodemographic variables, disease and symptom presence, and behavioural risk factors

Self assessed health	Relative Risk of dying				
	Age & gender	Age & gender plus			All (95% CI)
		Socio-demographics ^a	Disease symptoms ^b	Behaviour ^c	
Very good	1.00	1.00	1.00	1.00	1.00
Good	1.33 ns	1.31 ns	1.25 ns	1.30 ns	1.18 (0.67-2.09)
Fair	3.09 *	2.85 *	2.49 *	2.76 *	2.13 (1.15-3.96)
Sometimes poor	4.13 *	3.76 *	3.07 *	3.68 *	2.58 (1.30-5.14)
Poor	7.12 *	6.20 *	5.12 *	5.80 *	3.98 (1.65-9.61)
Reduction in deviance for self-assessed health ^d	67.72 p< .001	55.12 p< .001	28.11 p< .001	46.96 p< .001	18.54 p< .01

* 95% confidence interval does not overlap 1.00

a Marital status, level of education

b Chronic conditions, Symptoms

c Smoking, Alcohol consumption, Physical exercise, Obesity

d 5 degrees of freedom

Phase 2 Table 7.3 shows the results of the analyses in phase 2. After controlling for age, gender and other sociodemographic variables, for various aspects of health status and for behavioural risk factors, many of the psychosocial variables are still associated with self-assessed health: instrumental social support, long-lasting difficulties, neuroticism and locus of control all have statistically significant associations with self-assessed health ($p < .005$), while the association with life events is borderline statistically significant ($p < .10$). The strongest association is seen with long-lasting difficulties: the odds ratio of having less-than-good self-assessed health is 2.50 (95% CI: 1.96-3.18) for those in the highest quartile of long-lasting difficulties. None of the coping styles is related to self-assessed health. By way of illustration, the results for only two coping styles ('avoiding' and 'disclosure of emotions') are shown in Table 7.3.

Table 7.3The association between psychosocial factors and self-assessed health / mortality ^a

Psychosocial factors	Odds Ratio for less-than-good self-assessed health (95% CI)	Relative Risk of dying (95% CI)
<i>Social support—emotional</i>	RD * n.s.	RD n.s.
Lowest tertile	1.07 (0.87 – 1.33)	1.10 (0.79 – 1.53)
Middle tertile	0.92 (0.75 – 1.12)	1.04 (0.74 – 1.46)
Highest tertile	–	–
<i>Social support—instrumental</i>	RD p < .005	RD n.s.
Lowest tertile	1.02 (0.83 – 1.25)	1.04 (0.74 – 1.44)
Middle tertile	0.74 (0.61 – 0.91)	1.09 (0.79 – 1.50)
Highest tertile	–	–
<i>Life events</i>	RD p < .10	RD p < .10
None	–	–
One or more	1.18 (1.00 – 1.40)	1.25 (0.96 – 1.63)
<i>Long-lasting difficulties</i>	RD p < .001	RD n.s.
Lowest quartile	–	–
Second quartile	1.62 (1.27 – 2.07)	0.84 (0.60 – 1.18)
Third quartile	2.25 (1.75 – 2.91)	0.84 (0.57 – 1.24)
Highest quartile	2.50 (1.96 – 3.18)	0.96 (0.67 – 1.38)
<i>Neuroticism</i>	RD p < .001	RD n.s.
Lowest tertile	–	–
Middle tertile	1.05 (0.83 – 1.32)	0.87 (0.61 – 1.26)
Highest tertile	1.66 (1.34 – 2.05)	1.22 (0.89 – 1.67)
<i>Locus of control</i>	RD p < .001	RD n.s.
Lowest tertile	0.51 (0.41 – 0.64)	1.02 (0.69 – 1.50)
Middle tertile	0.79 (0.64 – 0.96)	1.02 (0.75 – 1.38)
Highest tertile	–	–
<i>Avoidant coping style</i>	RD p < .10	RD n.s.
Lowest tertile	–	–
Middle tertile	0.83 (0.68 – 1.01)	0.83 (0.60 – 1.15)
Highest tertile	1.01 (0.81 – 1.25)	1.08 (0.78 – 1.50)
<i>Disclosure of emotions</i>	RD n.s.	RD p < .05
Lowest tertile	1.09 (0.89 – 1.33)	1.12 (0.84 – 1.51)
Middle tertile	0.83 (0.67 – 1.02)	0.71 (0.49 – 1.04)
Highest tertile	–	–

a Controlling for sociodemographic variables, various aspects of health status (excluding self-assessed health), and behavioural risk factors

* RD Reduction in deviance when the psychosocial variable is added to the model

The associations of these psychosocial variables with mortality are much weaker. After controlling for the same set of other variables, the only psychosocial variable which has a statistically significant ($p < .05$) association with mortality is the 'disclosure of emotions' coping style: those in the middle tertile for this variable have the lowest mortality risk. The association with life events is borderline statistically significant ($p < .10$; RR for one or more life events in the preceding year: 1.25 (95% CI: 0.96-1.63)).

Phase 3 In Table 7.4 we present the results of the analysis in which we added the psychosocial variables to the regression model we used in phase 1. Not surprisingly, adding the psychosocial variables to the model as presented in the final column of Table 7.2 does not attenuate the self-assessed health-mortality relationship. Only in the case of 'life events' and the 'disclosure of emotions' coping style do we see a slight decline of the Relative Risks of the self-assessed health-mortality relationship. The strongest effect is seen for 'disclosure of emotions', but even here the reduction of the Relative Risk of dying for poor self-assessed health is marginal (from 3.98 to 3.87). Adding all psychosocial variables to the model has no effect on the Relative Risk of dying for "poor" self-assessed health, and even slightly increases the Relative Risks for the other categories.

7.4 Discussion

In this study we found a strong association between self-assessed health and mortality, even after controlling for sociodemographic variables, various aspects of health status, and behavioural risk factors. We did not find indications, however, that psychosocial characteristics explain this association. In our study population, several psychosocial characteristics are strongly associated with self-assessed health, but they appear to be much less strongly associated with mortality. As a result, they cannot statistically account for the self-assessed health-mortality relationship.

Before we discuss the possible implications of these results, it is necessary to briefly address a number of methodological issues. Our study had several limitations. First, we were unable to include objective measures of physical health in our analyses; such measures were not included in the baseline measurements of the GLOBE-study (Mackenbach, Van de Mheen & Stronks, 1994). Thus, our control for aspects of physical health status may have been incomplete, and the 'independent' effect of self-assessed health on mortality may have been overestimated. In order to explore the possible impact of such overestimation on our overall conclusions, we repeated the analysis with a more extensive control for health status, using the 6 scales of the Nottingham Health Profile (Hunt, McEwen & McKenna, 1986). While the Nottingham Health Profile is entirely based on self-reports, some of the scales (such as 'physical mobility') refer to more objective aspects of physical health status. Adding the Nottingham Health Profile to the statistical models did not, however, change our main conclusions. The association between self-assessed health and mortality, as presented in Table 7.2, remained statistically significant: the Relative Risk of dying for those with 'poor' self-assessed health changed from 3.98 (95% CI: 1.65-9.61) to 3.12 (95% CI: 1.28-7.62). Psychosocial factors, however, still could not explain the association.

The maximum attenuation was again obtained upon inclusion of life events to the model (cf. Table 7.4), when the Relative Risk of dying changed from 3.12 (95% CI: 1.28-7.62) to 2.92 (95% CI: 1.19-7.16). It is therefore unlikely that our results on the negligible role of psychosocial factors would have been different with more extensive control for health status.

Table 7.4

The effect of controlling for psychosocial factors on the association between self-assessed health and mortality

	Relative Risk of dying by category of self-assessed health			
	Good	Fair	Sometimes poor	Poor
Base model ^a	1.18	2.13 *	2.59 *	3.98 *
Controlling for:				
Social support emotional	1.18	2.12 *	2.59 *	3.93 *
Social support-instrumental	1.19	2.14 *	2.60 *	4.08 *
Life events	1.19	2.13 *	2.62 *	3.77 *
Long-lasting difficulties	1.19	2.21 *	2.68 *	4.10 *
Neuroticism	1.20	2.22 *	2.66 *	4.18 *
Locus of control	1.19	2.16 *	2.63 *	4.04 *
Avoiding coping	1.19	2.12 *	2.59 *	3.92 *
Disclosure of emotions	1.18	2.10 *	2.56 *	3.87 *
All psychosocial variables	1.23	2.33 *	2.86 *	3.98 *

a Including sociodemographic variables, various aspects of health status, and behavioural risk factors

* p < .05

Second, we did not include all psychosocial factors which could possibly be involved in the self-assessed health-mortality relationship. Examples of psychosocial variables which we did not measure, and which are known to be related to self-reported health and/or mortality, are 'sense of coherence' (McSherry & Holm, 1994; Antonovsky, 1993) and 'hostility' (Miller, Markides, Chiriboga & Ray, 1995; Buss & Perry, 1992). We also did not measure all possible aspects of social ties (e.g. 'social networks') and psychosocial stress (e.g. 'daily hassles'). Some investigators have argued that positive/negative psychological states (depression, anxiety, hypochondriasis) are reflected in self-assessed health and may be related to mortality (Schoenfeld, Malmrose, Blazer, Gold & Seeman, 1994; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982). We did, however, include a wide range of factors which are likely to at least partly overlap, conceptually or empirically, with such unmeasured constructs. It is therefore unlikely (but of course not entirely impossible) that inclusion of more, or other, psychosocial variables would have changed our results substantially. We nevertheless invite other researchers to repeat the analysis reported in

this paper using more and/or other psychosocial variables. Until all psychosocial factors that are potentially relevant have been investigated, it will be difficult to reach definitive conclusions about their role in explaining the association between self-assessed health and mortality.

Third, the follow-up period of our study was not very long (7 years). If the effects of psychosocial factors on self-assessed health would have a considerably shorter lag-time than those on mortality, we could have missed a contribution of psychosocial variables to the explanation of the self-assessed health-mortality relation.

It could be argued that we have underestimated the effect of psychosocial variables on self-assessed health and/or mortality by controlling extensively for sociodemographic variables, various aspects of physical health status, and behavioural risk factors. Earlier studies did not control this extensively for these other factors, and may thus have found stronger associations between psychosocial variables and health indicators (see introduction of our paper for references). We did control for these three groups of factors because we wanted to investigate the mysterious 'independent' effect of self-assessed health on mortality. Such control, however, is not necessary (and probably even incorrect) if one wants to investigate the effect of psychosocial factors on self-assessed health and mortality. One example is the control for behavioural risk factors: these are known to be important intermediaries in the effect of psychosocial variables on health (both self-assessed health and mortality) (Berkman, Glass, Brisette & Seeman, 2000). We therefore repeated the second and third phase of the analysis with a model controlling for age and gender only (the first model used in Table 7.2). In this alternative analysis, we indeed found stronger associations between psychosocial variables and both self-assessed health and mortality. For self-assessed health, now all associations were statistically significant, whereas statistically significant relationships were found between mortality and life events, locus of control and coping styles (results not shown). This also removed the apparent contradiction between the analysis reported in this paper –showing no association between locus and control and mortality when health status and behavioural risk factors are controlled for– and that reported in a previous paper by our group –showing an association between locus of control and mortality when health status and behavioural risk factors are not controlled for– (Bosma, Schrijvers & Mackenbach, 1999). The overall conclusion, however, remained the same; in the alternative analysis in which we omitted the control for health status and behavioural risk factors, our set of psychosocial variables still could not fully account for the self-assessed health–mortality relationship. Therefore, the main question remains to be answered: “What does explain the independent effect of self-assessed health on mortality?”. In their review, Idler and Benyamini (1997) summarise the explanations which have been offered by several authors.

- 1 Self-rated health is a more inclusive and accurate measure of health status and health risk factors than the covariates used, for example because self-rated health captures symptoms of disease as yet undiagnosed;
- 2 Self-rated health is a dynamic evaluation, judging trajectory and not only current level of health;

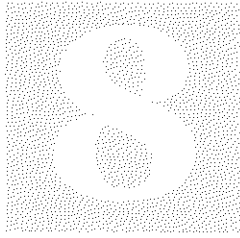
- 3 Self-rated health influences behaviours that subsequently affect health status, for example because poor perceptions of health may lead to less engagement in preventive practices or self care;
- 4 Self-rated health reflects the presence or absence of resources than can attenuate decline in health, for example because self-rated health reflects interpersonal or intrapersonal resources which influence survival.

In the present study we did not find evidence to support the latter explanation, and we therefore tend to think that one of the others is more likely to be true. Of the other explanations, the first is by far the most straightforward, although it may be difficult to accept by researchers who have done their utmost to cover all measurable aspects of physical health status. Could individuals in their self-assessment of health just be better informed than anyone else?

Idler and Benyamini suggest three additional sources of information for the individual: symptoms of disease as yet undiagnosed, complex judgements about the severity of current disease not covered by conventional health measurements, and family history of longevity (Idler & Benyamini, 1997). Others have suggested that cardiophysiological experience (Kaplan, et al., 1996) or physical fitness (Miilunpalo, Vuori, Oja, Pasanen & Urponen, 1997) may be involved. At a more general level, one might conclude that medical science apparently does not yet have a good 'map' of the entire health experience of individuals. If this is true, then these gaps in medical knowledge could perhaps be filled by carefully investigating the reasons why individuals assess their health as they do. We may then be able to determine which of these reasons accounts for the strong relationship between self-assessed health and mortality. In this respect, qualitative studies could be particularly useful in order to discover which aspects respondents include in their health self-assessments (Jylhä, 1994; Blaxter, 1990). These studies show that self-assessed health has several 'content domains', which do not all correspond to conventional dimensions of health, for example resistance to illness, functional capability, bodily or mental experience of health, physical and mental fitness, and health behaviour (Manderbacka, 1998). It is quite clear from these studies that self-assessed health is more than a simple aggregate of the presence or absence of symptoms, diseases, and disabilities, and we suspect that these other, evaluative and subjective components of self-assessed health could account for the 'independent' mortality effect. We therefore recommend further studies in which the components discovered in qualitative studies are linked directly to mortality.

Acknowledgements

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General discussion of
the main findings

8.1 Introduction

In this thesis we presented a series of studies which focused on the measurement of self-assessed health by the single question “How is your health in general?”. We investigated which aspects people actually take into consideration when answering this question, and examined differences in the way individuals from different socioeconomic groups tend to answer this question. The objective of this thesis was threefold: a) to identify the determinants or dimensions of the single-item measure of self-assessed health; b) to explore several possible explanations for the observed socioeconomic differences in self-assessed health; and c) to further examine the relationship between self-assessed health and mortality. In this chapter the main findings of our studies are recapitulated. We will address some methodological issues concerning the different types of data analysis we applied, including aspects of reliability and validity. Then, we will integrate and discuss the findings of the separate studies, and put these into a broader perspective. Finally, we will generally address the policy implications of our study on self-assessed health and socioeconomic differences herein.

8.2 Main findings of our study

Which aspects or dimensions do participants consider when they are asked to assess their health?

Following careful examination of the theoretical health literature, we concluded that in studies on determinants of self-assessed health, indicators of health status as well as indicators of health perception, such as coping styles and personality traits, should be included (Chapter 2). A narrative review of the empirical literature showed that the majority of studies very much emphasised aspects of health status, in particular biomedical, or physical aspects of health. We proposed a multidimensional framework, in which we included constituent elements i.e. aspects of health status, and modifying factors i.e. aspects of health perception. Furthermore, we suggested that the modifying role of coping styles and personality traits warrants further investigation.

Our suggestion that self-assessed health should not just be considered a proxy for biomedical or physical health status was supported by the results of a qualitative study (Chapter 3). Although we found that physical health aspects are very important for self-assessed health, it unmistakably proved to be a multidimensional concept. When assessing their health, participants often included aspects that went beyond the physical dimension of health. Besides physical aspects, such as chronic conditions, participants included the extent to which they are able to perform (i.e. their functional abilities). Additionally, participants referred to the extent to which they had adapted to existing health problems (coping –i.e. changing the actual situation or changing their attitude towards the situation) or simply to the way they feel (wellbeing –i.e. feeling fit or feeling good without further reference to health problems). Healthy behaviour or lifestyle factors were hardly included in health self-assessments.

In this qualitative study, we found confirmation of the multidimensional model we proposed in Chapter 2. We concluded that physical and functional health problems per se do not lead to poor health assessments; self-assessed health is also dependent upon the way an individual is able to cope with these problems. In addition, we found that self-assessed health also includes aspects of positive health –i.e. wellbeing: feeling good, feeling fit and energetic.

Do participants from the highest and lowest socioeconomic groups consider the same or different aspects when assessing their health?

Some researchers have put forward the hypothesis that socioeconomic differences in self-assessed health may stem from the fact that high and low socioeconomic groups differ in the way they arrive at their health assessments; perhaps both groups consider different aspects when assessing their health. In our qualitative study (Chapter 4), we found that higher and lower educated participants actually included quite the same dimensions in their health assessments. Both groups, for instance, considered physical and functional health aspects to be most important for their health assessments. Our study showed that higher and lower socioeconomic groups do not hold entirely different concepts or definitions of health, although there are subtle differences between both groups. Higher educated participants discuss their health in terms of the absence of ill-health (i.e. *absence* of health problems) and in terms of the presence of health (i.e. feelings of wellbeing). Lower educated participants, on the other hand, discuss their health primarily in terms of ill-health (i.e. *presence* of health problems) and hardly refer to feelings of wellbeing. Thus, only higher educated individuals incorporate wellbeing in their health assessments. This is particularly interesting because these findings cannot be attributed to a differential distribution of chronic illness; our study population was stratified with respect to this variable.

Earlier, we found that aspects of coping are included in general assessments of health (Chapter 3). In addition, in Chapter 4 we found that high and low socioeconomic groups seem to differ in the way they cope with health problems. Higher educated participants seem to adapt to existing health problems actively by finding alternative ways to live a normal life, given their limited abilities (primary control (Rothbaum, Weisz & Snyder, 1982) or problem-focused coping (Lazarus & Folkman, 1984)). Lower educated participants seem to adapt to the situation mainly psychologically, by maintaining a positive attitude towards their health problems (secondary control (Rothbaum, Weisz & Snyder, 1982) or emotion-focused coping (Lazarus & Folkman, 1984)). We suggested that social conditions may influence the extent to which an individual is able to cope with health problems, either actively or psychologically. Whereas individuals from higher socioeconomic groups may have both options, individuals from lower socioeconomic groups often only have the psychological option. The latter may have insufficient financial or personal resources to actually alleviate their physical or functional limitations, and thus experience more negative consequences of ill-health in daily life.

To what extent do socioeconomic inequalities in the prevalence of objective and subjective health problems, and socioeconomic differences in the perception of and coping with health problems contribute to the explanation of socioeconomic differences in self-assessed health?

To a large extent we have been able to explain socioeconomic differences in self-assessed health through socioeconomic differences in the prevalence of health problems (Chapter 5). The general conclusion of our quantitative study was that subjective aspects of health –not necessarily related to any objective diagnosis– were more important for the explanation than objective aspects of health. Remarkably, chronic disease and functional limitations accounted for a smaller part of the socioeconomic variability in self-assessed health. Psychosomatic symptoms (e.g. “Do you often have an upset stomach?” or “Do you regularly feel listless?”) and perceived discomfort/distress (Scales: Limited physical mobility; Pain; Sleeping problems; Lack of energy; Social isolation; and Emotional reactions) could account for a large part of the variability. We considered these variables/profiles to be *subjective* measures of health, as many of the scales in these health profiles have a clear psychosocial component. Consistent with the findings of the qualitative studies, in which we found that aspects of wellbeing and feeling fit were included in self-assessed health, we found that (lack of) energy is a significant factor in poorer health assessments.

Socioeconomic differences in self-assessed health may also have their basis in socioeconomic differences in stresses caused by ill-health. We hypothesised that poorer self-assessed health in lower educational groups may stem from less sufficient abilities to cope with chronic disease. In an empirical quantitative study (Chapter 6) we explored the possibility that unfavourable personality traits and coping styles in lower socioeconomic groups result in a more negative perception of health problems, which in turn have a negative impact on health self-assessments. In general, we found that perceived control and neuroticism modified the effect of chronic conditions, somatic symptoms, functional limitations, energy level and mental health problems on individual self-assessed health. Thus, perception of health problems, operationalised by the interaction between personality traits and health variables, indeed plays a role in health assessments, although modestly. In addition, we found that these psychological mechanisms could further explain the relationship between socioeconomic status (education) and self-assessed health. This indicates that –in addition to socioeconomic differences in the prevalence of health problems– socioeconomic differences in perception and coping contributes to the explanation of socioeconomic differences in self-assessed health.

To what extent can psychosocial variables explain the association between self-assessed health and mortality?

On theoretical as well as empirical grounds we conclude that self-assessed health is a multidimensional concept, determined by objective as well as subjective aspects, including aspects of health perception and coping. The latter finding led us to the following research question: “Given our current knowledge of the existing psychosocial determinants of self-assessed health, are we able to further explain the association between self-assessed health and mortality?” In the final empirical quantitative study (Chapter 7) we set up a systematic series of analyses, in

which we related different sets of health variables as well as self-assessed health to mortality. In the step-by-step analyses we consistently found a strong relationship between self-assessed health and all-cause mortality, even when controlling for a series of other health variables such as potential lethal conditions and health behaviour. Psychosocial aspects, i.e. personality traits and coping styles could not further explain the strong self-assessed health–mortality relationship. Based on the results of the analyses and the systematic way they were set up, we concluded that there is a singular i.e. unique effect of self-assessed health on mortality.

8.3 Methodological issues

8.3.1 Methodological issues regarding the qualitative studies

In the qualitative studies we asked participants from different ages, gender, with and without chronic illnesses, and from different socioeconomic groups directly which aspects they considered important when assessing their health. It enabled us to study the dimensions of self-assessed health from the perspective of the individual, within the individual's social context and concrete situation. In this section we will address some issues concerning the internal and external validity of the qualitative studies.

Internal validity

Bias due to confounding, selection bias due to non-response and researcher bias can be a serious threat to the internal validity of qualitative studies. However, the way in which our studies were set up reduced the chances for either form of bias.

Confounding Although it is rather unusual in qualitative studies, we decided to control for potential confounding variables (age, gender, SES, health status). Because we wished to perform subgroup analyses with a limited number of participants, we set up a study in which we combined the strengths of social-epidemiological research (stratification) and qualitative research (semi-structured interviews). We drew a stratified sample from the respondents to the GLOBE-study.

Selection bias Some strata simply did not exist; in the total study population (n=4,100) there were no respondents who fitted certain profiles. For example, in the study population there were no low educated women, who were younger than 40 years of age, with no chronic illness and a less-than-good self-assessed health. Additionally, in some of the existing strata we could choose from only few respondents; we tried to include participants from each of these strata in our study. However, when neither of these respondents was willing to participate in our study, and no other eligible respondents could be approached, these strata remained empty. Non-existing strata are, for obvious reasons, no threat to the internal validity of our study, nor is non-response of individuals fitting a rare profile. Selective non-response, however, could be a threat to the validity of our study. Our population was slightly imbalanced because of a higher non-response rate among younger men; it contained relatively more elderly men than elderly women, as we recognised in our interpretation of the findings (Chapter 3). With respect to the other stratification

variables (socioeconomic status, health status and self-assessed health) no selective non-response could be observed.

Researcher bias The fact that a higher educated individual is performing the interviews may be a problem in its own right. We tried to overcome the threat of researcher bias by asking very straightforward, experiential questions. These types of questions have a low level of abstraction and are thought to elicit responses which are called private accounts (Radley & Billig, 1996). Also, we tried to reduce researcher bias during the initial stage of the analyses, as the interviewer had no actual information on socioeconomic status or health status of the interviewee. Furthermore, the investigators had no actual information on age, gender, socioeconomic status, or health status of the interviewee when coding the interviews and designing the categorisation scheme. The extent to which the socioeconomic status of the investigator has affected the flow of the interviews or qualitative data analyses is hard to quantify.

External validity

External validity refers to the generalisability of the results. We enhanced the efficiency (Rothman, 1986) of our study by stratifying our sample with respect to possible confounding variables: gender, age, socioeconomic status, and health status. However, in order to obtain maximum contrast, we only included selected age-groups and educational levels. We included younger (40–) and older (60+) individuals, with the highest level of education (university degree) and with the lowest level of education (primary or lower vocational education). By only including selective age-groups and educational groups in our studies, we may have enhanced the precision of our studies but we may also have compromised the generalisability of the results.

Some have argued that generalisability in qualitative studies does not derive from representativeness of the sample but from the concepts that may well be relevant to other settings and individuals (Green, 1999). In general, the results of our study are very much comparable to the results of other qualitative studies on self-assessed health, which did include participants from other age-groups or educational groups (Idler, Hudson & Leventhal, 1999; Van Doorn, 1999; Manderbacka, 1998; Borawski-Clark, Kinney & Kahana, 1996; Krause & Jay, 1994). Nevertheless, as we did not make use of a sample which is representative for the general population, the results of our study cannot be simply generalised.

8.3.2 Methodological issues regarding the quantitative studies

The quantitative studies on self-assessed health were part of the ongoing GLOBE-study, which aimed at explaining sociodemographic health differences (Mackenbach, Van de Mheen & Stronks, 1994). Being part of a larger study has some clear methodological advantages. First, a large number of participants (approx. 20000) filled out an extensive set of health questionnaires. Second, because the GLOBE-study was longitudinal in nature, baseline as well as follow up measurements were available. This allowed us to perform cross-sectional as well as longitudinal analyses, i.e. logistic regression, least squares regression, and Cox proportional hazards. Furthermore, in the GLOBE-survey many health measures have been included, varying from

reasonably objective to more subjective in nature. This wide range of health measures made it possible to explore the value of the multidimensional model we derived from the theoretical health literature. In this section we will address some issues concerning the internal and external validity of the quantitative empirical studies.

Internal validity

Bias due to confounding, information bias and selection bias due to non-response can be a serious threat to the internal validity of quantitative studies.

Confounding In the analyses we have controlled for the most important sociodemographic confounders such as age, gender, and marital status. In addition, socioeconomic status, or rather education, has been included in all quantitative empirical studies, either as a confounding variable or as an explanatory variable. Furthermore, we tried to eliminate residual confounding by selecting health variables that were representative of each of the theoretical health models. However, being part of an ongoing study limits the possibilities for choosing the desired health measures, and we were sometimes forced to make pragmatic choices. We recognise that we could include only a limited measure of the wellbeing-concept, and that we could not include any measure of positive health in the analyses. However, given the objective of our studies, we believe that we have been able to include a substantial part of the relevant dimensions of self-assessed health, as we have been able to explain a large proportion of the socioeconomic variability in this measure. Still, in additional studies the aim should be at refining the theoretical models by including conceptually stronger measurements of biomedical health, functional health, and wellbeing.

Information bias Our quantitative analyses are almost entirely based on self-report data. Both explanatory variables and outcome variables are self-report, which may be a source of information bias. An outcome variable which is also self-report is expected to be more strongly related to self-report explanatory variables than to external health variables. The validity of the results would have been increased if we could also have included external measures such as physical examinations and functional performance tests. However, it is equally important to include variables of perceived health status when exploring the dimensions of self-assessed health. Also, for psychosocial aspects there is no external alternative, here it is quite important to use reliable and valid measures and, in addition, to use psychosocial variables that are conceptually unrelated to the health variables included in the study. In particular the cross-sectional analyses (Chapter 5) could be influenced by information bias. The results of the other quantitative empirical studies are probably less subject to bias as we controlled for psychosocial aspects, and used either longitudinal data (Chapter 6) or used mortality as the outcome variable (Chapter 7).

Selection bias Baseline response was 70%, and differential non-response by socioeconomic status was negligible. Earlier studies only found small socioeconomic differences in response to both the postal questionnaire as the structured interview. (Stronks, 1997). Also, there were no differences with respect to self-assessed health between respondents and non-respondents (Van der Meer, 1998). During follow up, there was a slightly higher non-response among participants

in less-than-good health. However, differential non-response by socioeconomic status was comparable to the baseline study. All in all, we do not expect our results to be substantially biased by selective non-response.

External validity

In the design of the survey, participants from higher and lower socioeconomic groups (postal survey) and participants with selected chronic conditions (structured questionnaire) were overrepresented in order to increase the power of the analyses on socioeconomic inequalities in health. For details concerning the baseline and follow up measurements of the GLOBE-study we refer to earlier studies (cf. Van der Meer, 1998; Stronks, 1997). This overrepresentation of participants in higher and lower socioeconomic groups and participants with chronic conditions would decrease the external validity of the quantitative empirical studies. In order to enhance the generalisability of the results we controlled for socioeconomic status (Chapters 5, 6 and 7) and made use of a data-set that was weighted to the baseline proportion of chronic conditions (Chapters 6 and 7)

8.3.3 Methodological triangulation

In this thesis, we combined various methodologies. We integrated research methods and techniques from different disciplines, such as social epidemiology, sociology and health psychology. In fact, we applied the principle of methodological triangulation. The term triangulation originally stems from surveying, in which people determine their position by taking bearings on two landmarks, lines from which will intersect at the observer's position (Seale, 1999). We studied (socioeconomic inequalities in) self-assessed health from several different angles by performing different types of studies: narrative review, qualitative studies, and quantitative studies.

We found, both in our qualitative and in our quantitative studies, that self-assessed health is a multidimensional concept, and that several different aspects are included in this measure. First, self-assessed health includes health problems –i.e. chronic illness, functional limitations, mental health problems (Chapters 3-7). Second, this measure includes positive health –i.e. a sense of wellbeing or vitality, feeling good, feeling fit, energetic (Chapters 3-5). Third, it includes aspects of perception and coping – i.e. adaptation to health problems, primary control or problem-focused coping, secondary control or emotion-focused coping, social comparison, etc. (Chapters 2-4 and 6)

We found that socioeconomic differences in self-assessed health can to a large extent be explained through socioeconomic differences in the prevalence of health problems (Chapters 5 and 6) and personality traits and coping styles (Chapter 6). In our qualitative studies, we found that positive health or wellbeing is an important aspect of self-assessed health (Chapter 3), but that lower educated participants barely include such aspects in their health assessments and focus on health problems (Chapter 4). In addition, we got some indications that higher and lower socioeconomic groups use different coping strategies (Chapter 4).

Since the findings of our different studies are not contradictory but complementary, and are actually quite consistent, we may conclude that these results are not simply due to an artefact or invalidity associated with one particular method (Morgan, 1998), which is a clear advantage of this “multiplication of methods” (Seale, 1999), or methodological triangulation.

8.4 Discussing the findings

8.4.1 Self-assessed health

A multidimensional concept Not surprisingly, we found that self-assessed health is a multidimensional concept. Although this measure is largely determined by physical aspects of health, we have shown that individuals also include other dimensions of health, i.e. functional, wellbeing and coping. In that respect, our study provides additional evidence for the multidimensionality of self-assessed health, as earlier qualitative (cf. Idler, Hudson & Leventhal, 1999; Van Doorn, 1999; Manderbacka, 1998; Borawski-Clark, Kinney & Kahana, 1996; Krause & Jay, 1994) and quantitative (cf. Idler, 1993b; Murray, Dunn & Tarnopolsky, 1982; Tissue, 1972) studies have shown.

The importance of positive health More interesting is the fact that we have been able to show that positive health aspects are included in self assessed health. In a quantitative study, in which we took the traditional “negative” approach, i.e. we related self-assessed health to health problems, we found that lack of energy is an important determinant of poor self-assessed health. Interestingly enough, lack of energy was hardly an issue during the health interviews in our qualitative study. Rather, we found that an abundance of energy, namely a general sense of wellbeing (i.e. feeling good, feeling fit and energetic) is included in self-assessed health, and may enhance the individual’s sense of healthiness. The role of positive health in self-assessed health has not been investigated before, in spite of the World Health Organisation’s definition of health as being “...more than the absence of disease and infirmity” (World Health Organization, 1948). In this thesis we have accentuated that besides health problems, positive health or wellbeing is an important determinant of self-assessed health, particularly for the higher educated.

The role of perception and coping In addition, we found that psychological mechanisms such as coping, social comparison, and perception are involved in health assessments. Our qualitative studies suggested that psychological mechanisms do play a role in self-assessed health, and we decided to test this hypothesis empirically. Indeed, the results of a quantitative study on the role of perception in self-assessed health modestly indicated that psychological mechanisms do influence health assessments. We found that neuroticism and perceived control negatively influenced the perception of health problems, and thus negatively influenced self-assessed health. Other studies, using a comparable methodological approach, that investigated the role of external control (Menec & Chipperfield, 1997) and neuroticism (Kempen, Jelacic & Ormel, 1997) on health assessments, found similar results.

Self-assessed health and mortality We could not further explain the relation between health assessments and mortality in terms of the psychosocial determinants of self-assessed health. Earlier studies suggested that psychosocial mechanisms may offer an explanation to this intriguing relationship (Menec & Chipperfield, 1997; Chipperfield, 1993; Idler, 1993a). We, however, found no indication that –in addition to physical morbidity and risk behaviour– psychological determinants could be significant explanatory factors. Personality traits and coping styles could not further explain the relationship between self-assessed health and mortality. Based on the findings of our study, we can only maintain the position that self-assessed health has a singular, i.e. unique effect on mortality.

What have we added to the literature on self-assessed health?

We have shown that self-assessed health is a multidimensional concept, and that it consists of both a biomedical and a psychosocial dimension. In addition, we have shown that health assessments are based on negative as well as positive health aspects. Self-assessed health can be negatively influenced by existing health problems but can, at the same time, be positively influenced by feelings of wellbeing or vitality. Furthermore, we have found several indications that psychological mechanisms, such as coping styles or personality traits, may influence individual health assessments, either negatively or positively.

Summarising, we have been able to show that there's a negative as well as a positive side to the multidimensional concept of self-assessed health. Negative health aspects (e.g. health problems, unfavourable personality traits) may diminish an individual's sense of healthiness, whereas positive health aspects (feelings of fitness, effective coping styles) may enhance it.

Future research on self-assessed health

Methodological variation Whereas questions such as “how many, how much or how often” should be answered through a quantitative research methodology, questions such as “why, what processes or which mechanisms” definitely ask for a qualitative approach (Baum, 1995). In particular, complex public health problems such as finding the determinants of self-assessed health and explaining socioeconomic inequalities in self-assessed health require that investigators ask themselves different types of questions. The studies in this thesis have shown that quantitative and qualitative research paradigms can be complementary, which should inspire researchers to design future studies on the subject based on a balanced mix of both methodologies (e.g. Borawski-Clark, Kinney & Kahana, 1996). Also, because of the complexity of the relationship between possible explanatory variables of self-assessed health, quantitative studies should make use of statistical analyses that do this complexity right. Path analysis could be a useful approach to determining the dimensions of self-assessed health and their interrelations (e.g. Leinonen, Heikkinen & Jylhä, 1999).

Measures of positive health To date, the implicit assumption in most quantitative studies on self-assessed health has been that health problems (chronic illness, functional limitations, depression) simply diminish an individual's basic sense of healthiness (Ryff & Singer, 1998). The

notion that positive aspects of health may enhance general health assessments has hardly been disseminated. The difficulty with the concept of positive health, of course, is that there is no one accepted definition. Some have suggested that positive health includes concepts such as “completeness”, “full functioning or efficiency of body and mind” and “social adjustment” (Diener, Sapyta & Suh, 1998; Ryff & Singer, 1998; Bowling, 1991). These concepts, however, do not bring us any closer to an operationalisation of positive health. Other concepts which have been suggested, such as positive health being “the level of physical fitness” and “the ability to cope with stressful situations” (Ryff & Singer, 1998; Bowling, 1991), closely approach our empirical conceptualisations of positive health, and are perhaps easier to operationalise. Also, Antonovsky’s “sense of coherence” (cf. Geyer, 1997) could be considered an aspect of positive health, but the concept is still subject to considerable debate and has not yet been included in many empirical studies on self-assessed health. It will be interesting to find out whether the absence of health problems (vs. the presence of health problems), functional abilities (vs. functional limitations), and vitality (vs. lack of energy) provide some kind of surplus of health and thus enhance general health assessments. Also, it will be worthwhile to investigate whether positive health could be one of the key components in the self-assessed health–mortality relationship. In some studies perceived fitness or vitality could explain part of the relationship between self-assessed health and mortality (Lee, 2000; Miilunpalo, Vuori, Oja, Pasanen & Urponen, 1997; Rakowski, Fleishman, Mor & Bryant, 1993). Future studies, both quantitative and qualitative, should further operationalise the concept of positive health, and explore the role of positive aspects in self-assessed health.

Psychological mechanisms We have shown –both theoretically and empirically– the relevance/significance of psychological mechanisms in self-assessed health. Particularly the findings of our qualitative study represent a good starting point for future research into these mechanisms. What exactly is the difference between primary control / problem-focused coping and secondary control / emotion-focused coping (Lazarus & Folkman, 1984; Rothbaum, Weisz & Snyder, 1982), and how is this relevant for self-assessed health? What is the role of upward and downward social comparison in health assessments (Collins, 1996; Suls, Marco & Tobin, 1991)? Future research on such psychological mechanisms can also bring research on the relationship between self-assessed health and mortality a step further, as there are indications that psychological factors are involved in this relationship. In several studies (Borawski-Clark, Kinney & Kahana, 1996; Chipperfield, 1993) investigators found that health optimists (i.e. individuals whose health assessment was more positive than one would have expected on the basis of their current health problems) had a lower mortality rate than health realists (i.e. individual’s whose health assessment was congruent with their current health problems) although both groups were quite comparable with respect to their current health status. Also, it has been hypothesised that some aspect of social comparison could explain the self-assessed health–mortality relationship (Dasbach, Klein, Klein & Moss, 1994; Idler, 1993a).

8.4.2 Socioeconomic differences in self-assessed health

Socioeconomic inequalities in prevalence of positive and negative health It has been hypothesised that individuals from higher and lower socioeconomic groups hold different definitions of health (Calnan & Johnson, 1985; Houtaud & Field, 1984; Herzlich, 1973) and therefore include different aspects or dimensions in their health assessments. We found little to no support for this hypothesis. Instead, our qualitative study showed that both higher and lower socioeconomic groups consider the same aspects to be important for their health. In our quantitative study we found that socioeconomic inequalities in self-assessed health can to a large extent be explained through socioeconomic inequalities in the prevalence of health problems. In our qualitative study we did find, however, that high socioeconomic groups more often experience a sense of wellbeing or vitality, which has a positive effect on self-assessed health; low socioeconomic groups generally lack these positive experiences.

Socioeconomic inequalities in perception and coping Also, higher and lower socioeconomic groups seem to differ with respect to the way they cope with existing health problems. A finding which is comparable to what has been found in other studies on SES and health (Adler & Epel, 2000). In our qualitative study, we found indications that high SES individuals adapt to their health problems preferably by changing the actual situation (primary control or problem-focused coping), low SES individuals by psychologically adjusting to the situation (secondary control or emotion-focused coping). This finding could easily be explained by the fact that the former may have the necessary financial and personal resources to acquire support (e.g. domestic help, reduced workload) in order to alleviate the burden of existing health problems. Since low SES individuals usually cannot rely on such resources, the best they can do is adapt to the situation psychologically (e.g. maintain a positive attitude). However, even favourable psychological resources seem to be scarce in low SES groups. The prevalence of neuroticism and perceived external control is higher in lower socioeconomic groups (Bobak, Pikhart, Rose, Hertzman & Marmot, 2000), and we found that these unfavourable personality traits negatively influence the perception of existing health problems, thus negatively influence the self-assessed health in lower socioeconomic groups.

What have we contributed to the explanation of socioeconomic inequalities in self-assessed health?

The prevalence of health problems is higher in low socioeconomic groups, and health problems are an important determinant of self-assessed health. Therefore, it is quite understandable that low socioeconomic groups generally assess their health more poorly than do high socioeconomic groups. A low prevalence of general feelings of wellbeing and vitality, combined with a high prevalence of unfavourable personality traits and coping styles in low socioeconomic individuals probably even enlarges the gap between high and low SES health assessments. A notion which has been acknowledged by other researchers in the field of socioeconomic inequalities (Ryff & Singer, 1998; Andersen & Lobel, 1995; Adler, et al., 1994).

Future research on socioeconomic differences in self-assessed health

Methodological variation Again, complex public health problems such as explaining socioeconomic inequalities in self-assessed health require the use of different research methods. In particular, the use of qualitative research methods (Park, Adams & Lynch, 1998; Popay & Williams, 1996; Andersen & Lobel, 1995) and innovative types of data analysis (Adler, et al., 1994) has been advocated. These research methods could complement the standard methodological repertoire in social epidemiology.

Measures of socioeconomic status In order to test some of the hypotheses we mentioned in the different studies, we need to repeat these studies with other, or several different measures of socioeconomic status. For example, to test our hypothesis that socioeconomic variation in the use of problem-focused versus emotion-focused coping has to do with the presence or absence of financial resources, we need to repeat our study with income as an indicator of SES. One would expect that the socioeconomic variation we found in our study would be even stronger when using income as an indicator of socioeconomic status. Future studies on socioeconomic inequalities should, therefore, include multiple measures of socioeconomic status (e.g. education, income, occupational status) (Adler, et al., 1994). In addition, promising areas of research are those on the relationship between alternative measures of socioeconomic status and self-assessed health (e.g. income inequality (Fiscella & Franks, 2000) or material inequality (Bobak, Pikhart, Rose, Hertzman & Marmot, 2000)).

Socioeconomic inequalities and health psychology In sociology and social epidemiology, socioeconomic inequalities in health has been the subject of investigation for quite some time now. In health psychology, however, socioeconomic inequalities in health have hardly been an issue; sociodemographic variables, including SES, have simply been considered as descriptive or confounding variables. However, several psychologists have argued that health psychology should have a more prominent role in this line of research, as there is growing evidence that psychological mechanisms are involved in the SES-health relationship (Elstad, 1998; Park, Adams & Lynch, 1998; Chamberlain, 1997; Andersen & Lobel, 1995; Adler, et al., 1994; Matthews, 1989). Recent studies have shown that health psychology can indeed add a unique approach to the field of socioeconomic inequalities in health. For example by including more psychological-oriented measures of SES such as subjective socioeconomic status (i.e. a representation of the individual's subjective position on the social ladder (Adler & Epel, 2000; Ostrove, Adler, Kuppermann & Washington, 2000)).

6.5 Policy implications

In this section, we will only briefly address some health policy measures, which may enhance individual self-assessed health and reduce socioeconomic differences herein. By no means, we pretend to be comprehensive. For further reading on health policy, we refer to other studies on self-assessed health (Hoeymans, 1997) and socioeconomic inequalities in health (Van de Mheen, 1998; Stronks, 1997; Mackenbach, 1994) and in the use of health services (Van der Meer, 1998).

The core message of this section on policy implications is that policy measures should be aimed at the best physical, psychological and sociocultural development of all individuals, irrespective of socioeconomic status.

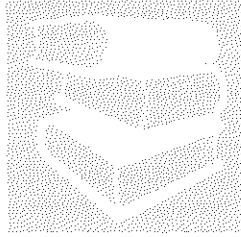
First and foremost, health policy should be aimed at tackling socioeconomic inequalities in the prevalence of health problems. The differential distribution of health problems between higher and lower SES groups is strongly related to socioeconomic differences in self-assessed health. Thus, policy measures aimed at reducing the prevalence of health problems among lower SES individuals would directly influence socioeconomic differences in self-assessed health. Second, effective primary care should be guaranteed in low SES communities. Research has shown the importance of an adequately high level of primary care for individual self-assessed health (Shi & Starfield, 2000). The recent introduction of trained nurses working as nurse practitioners (“praktijkverpleegkundigen”) –the easily-accessible counterpart of the general practitioner– may be a good example of effective primary care in low socioeconomic communities (RIVM, 2001). Third, preventive health care could be effective in reducing socioeconomic differences in self-assessed health. Health promotion programmes (e.g. physical exercise, weight loss) could reduce health problems and may enhance feelings of fitness and vitality, both important components of self-assessed health. Experiments with health promotion programmes have shown that –for lower SES groups– a community intervention approach probably would be the most successful (RIVM, 2001).

Summarising, health policy measures aimed at lower socioeconomic communities, should include primary prevention of health problems, effective primary care, as well as tailor-made life-style intervention programmes. It is, however, probably equally important to strengthen low SES communities with the necessary sociocultural and psychological tools. In the next paragraph, we will describe three possible issues for future health policy.

First, we stress the importance of incorporating sociocultural aspects in health policy. Higher levels of social cohesion and social ties in communities can either directly or indirectly influence individual health status (cf. RIVM, 2001; Rose, 2000). Areas with higher levels of participation and membership (possible aspects of social cohesion) have been associated with better self-assessed health (Ellaway & Macintyre, 2000). But how can we strengthen social ties or enhance social cohesion in low SES communities? Second, health policy could also be aimed at enhancing general feelings of wellbeing in lower socioeconomic groups, although we acknowledge that such measures are rather difficult to design. Nevertheless, as health status and wellbeing are interrelated (Diener, 1984), policy measures aimed at improving health status might also enhance feelings of wellbeing. It is, however, not at all certain that such measures would actually improve self-assessed health. Does a healthy physical and sociocultural environment, and effective health services enhance physical health as well as feelings of wellbeing? Does this in turn effect individual self-assessed health? And if we were able to design effective health policy measures, would we need a different approach for higher and lower socioeconomic communities? Third, formulating a general policy aimed at providing low SES individuals with the necessary

psychological tools (e.g. effective coping skills) is quite complex, although some researchers have encouraged us to try (Anderson & Armstead, 1995). We can only hypothesise that education could play a role in helping children to develop into healthy adults with the necessary skills to cope with the stresses of life. Which tools should we apply, though, to make sure that children in lower socioeconomic communities will in fact develop these skills?

With respect to each of these measures we raised some important questions for which there are no ready answers. No policy measure can be successful, however, unless we have found the answers to these questions. Therefore, it is vital that policymakers and researchers make it a mutual endeavour to find these answers.



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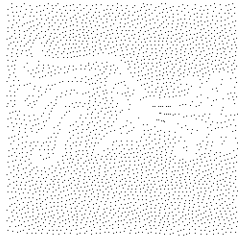
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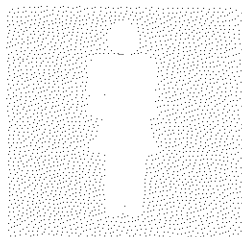
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Curriculum Vitae

Jeanette Simon werd op 2 november 1967 te 's-Gravenhage geboren. In 1986 behaalde zij haar VWO-diploma (Atheneum met Latijn). Van 1986 tot 1988 studeerde zij Geodesie aan de Technische Universiteit Delft; in 1988 stapte zij over naar de Universiteit Leiden, waar zij Psychologie ging studeren. Met de scriptie "Honingkinderen, een onderzoek naar het zelfzorggedrag van adolescenten met diabetes mellitus" studeerde zij in 1993 af als klinisch- en gezondheidspsycholoog. Voor haar afstudeerwerk ontving zij de J.P. Van de Geer-prijs voor de beste scriptie in het studiejaar 1992-1993.

Na haar afstuderen werkte zij aan het project Chronisch zieken en werk (1993-1995), dat werd uitgevoerd door de vakgroep Klinische-, Gezondheids-, en Persoonlijkheidspsychologie van de Rijksuniversiteit Leiden. In 1995 startte zij met de postdoctorale opleiding Epidemiologie aan het EMGO-instituut van de Vrije Universiteit in Amsterdam en in datzelfde jaar behaalde zij haar diploma. Aansluitend was zij werkzaam bij het instituut Maatschappelijke Gezondheidszorg van de Erasmus Universiteit Rotterdam. Als Assistent-in-Opleiding werkte zij aan het project "Achtergronden van sociaal-economische verschillen in het oordeel over de eigen gezondheid", waarvan in dit proefschrift verslag wordt gedaan.

Zij werkte ruim een jaar (2001-2002) als secretaris Kwaliteitszorg bij de Vereniging van Nederlandse Universiteiten VSNU. Ze begeleidde verschillende discipline-georiënteerde commissies, waaronder de visitatiecommissies Kunstmatige Intelligentie en Scheikunde. Sinds mei 2002 is zij senior beleidsmedewerker onderzoek, informatiebeleid en ICT bij het Ministerie van Volksgezondheid, Welzijn en Sport, directie Sociaal Beleid. Ze houdt zich onder meer bezig met de raakvlakken tussen volksgezondheid, zorg en welzijn.

Naast haar wetenschappelijke werk was zij bestuurlijk actief, onder meer als voorzitter van het Interfacultair AiO Overleg Rotterdam (IFAR) van de Erasmus Universiteit, voorzitter van het Landelijk AiO en OiO Overleg (LAI00), algemeen bestuurslid van de stichting TeleTrust (Kindertelefoon, Vertrouwenslijn en Allochtone-Vrouwentelefoon), secretaris van het bestuur van de PvdA Delft en lid van het Binnenstadsforum van de Gemeente Delft. Als Buitengewoon Ambtenaar van de Burgerlijke Stand in Delft heeft zij bovendien enkele tientallen paren in de echt verbonden.

