

# **Part I**

## **General Introduction**



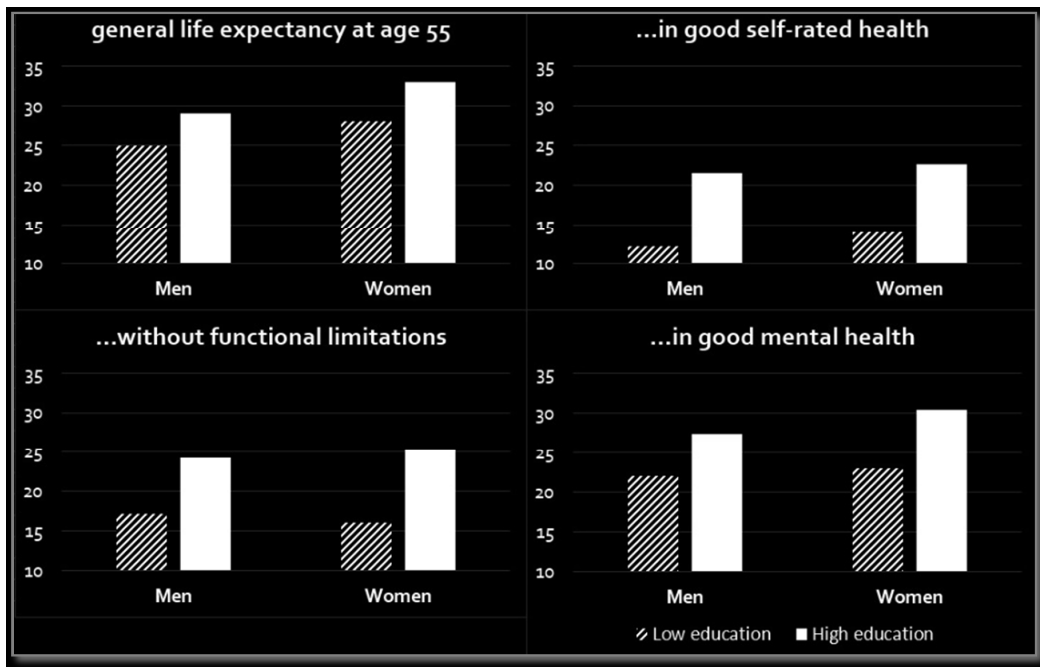
# Chapter 1: General introduction

## 1.1 Background

Older adults are tremendously heterogeneous in functioning (1). Whereas some individuals live up to over 100 years in good mental and physical health and stay actively engaged with their social surroundings, others may face a low life expectancy because they develop chronic diseases and disabilities already in their forties, and experience debilitating effects of cognitive decline and loneliness. Understanding and explaining the heterogeneity in functioning of older adults is one of the central aims of gerontology. Scholars from many disciplines agree that this requires an interdisciplinary and life-course oriented approach (2–4).

This thesis focuses on one fundamental aspect of social life that produces systematic heterogeneity in social, mental, and physical functioning of older adults: socioeconomic inequality. We use the term *systematic*, because unfavourable levels of functioning in various domains of functioning tend to cluster in groups with a lower socioeconomic position (SEP), and this observation holds across countries and across time (5–10). The scope of this phenomenon is summarised well by the large differences in life expectancy between the low and high educated. Currently, a Dutch adult aged 55 with elementary education has a life expectancy of about five years less than a Dutch adult of the same age with higher vocational or university education (11). For life expectancy without functional limitations, in good self-rated health, and in good mental health, these differences amount to about ten, six, and eight years, respectively (Figure 1). As Figure 1 shows, socioeconomic inequalities are not restricted to physical health outcomes, but extend to emotional functioning as well. Moreover, studies have also demonstrated that those with a lower SEP have smaller social networks, less social support and lower levels of social participation (12–14). Socioeconomic inequality thus affects many key domains of functioning in which changes tend to occur when growing old.

Research is ongoing to fully determine and understand the intervening pathways that help explain why it is that SEP affects so many aspects of functioning at older ages (6,9,10,15–17). This strand of research is mainly concerned with explaining differences in health and functioning *between* socioeconomic groups. Additionally, researchers increasingly attend to factors that increase heterogeneity *within* groups that are often regarded as 'vulnerable', such as groups with a low SEP (18). This thesis contributes to research in both areas.



**Figure 1.** Differences in life expectancies from age 55 between men and women with low (elementary school) and high (higher vocational or university) education. (Source: CBS StatLine, 2017)

First, psychological factors and exposure to stressful life events are among the factors that partly explain socioeconomic inequalities in health and functioning of older adults. Contributing to this literature, I examine associations between socioeconomic conditions and psychosocial factors across the life course, and their contributions to inequalities in successful aging. Second, the continuing impact of socioeconomic inequality on health despite increasing knowledge about explanatory mechanisms indicates an urgent need for new research perspectives that complement current understanding of inequality in old age. This thesis applies such a new perspective: resilience. The studies on resilience in this thesis are among the first to address the variety of functioning *within* groups of older adults with a low SEP, and examine the question why some older adults age successfully *despite* a low lifetime SEP. Third, instead of focusing on inequalities in specific outcomes in old age, this thesis provides a holistic assessment of the impact of SEP on individual functioning across physical, mental, and social domains. For this purpose, this thesis develops and applies an index of “successful aging” (19), which integrates multiple domains of functioning at the individual level.

Below, I further introduce and define the concepts of socioeconomic inequality, successful aging, and resilience. Then I formulate the research questions and aims of this thesis, and provide an overview of the subsequent chapters.

## 1.2 Socioeconomic inequality

This thesis is concerned with *socioeconomic* inequalities. These are inequalities based on individuals' positions with regard to specific indicators of social and economic conditions, e.g., educational attainment and income. Thus, I measure socioeconomic inequalities using several indicators of *individual socioeconomic conditions*. This thesis employs two types of indicators of individual socioeconomic conditions. First, I use indicators of SEP such as educational attainment, occupational prestige, and income. Such indicators refer to social hierarchies based on the possession of knowledge, cultural capital, and financial capital. Second, I use measures of material conditions, such as household amenities and home ownership. I use both types of socioeconomic conditions because although the various SEP and material indicators overlap in their associations with health and functioning, they may have partly independent effects (20–22). This often holds for individual socioeconomic conditions at different times during the life course. For instance, studies show that the SEP of one's parents may affect later life functioning independent of one's own SEP in adulthood (23–27). Therefore, this thesis also employs measures of individual socioeconomic conditions at multiple time points, including parental SEP.

Several studies in this thesis refer to the term *socioeconomic adversity*. By using this term, I refer to accumulation of low SEPs or unfavourable material circumstances across multiple indicators and across the life course. Such individuals were expected to have the lowest chances to age successfully (28–31), and this group would thus be most relevant for studying resilience. Thus, whenever I refer to *socioeconomic adversity*, this is meant to indicate multiple unfavourable individual socioeconomic conditions in childhood and adulthood, where 'unfavourable' should be read in terms of expected functioning in old age.

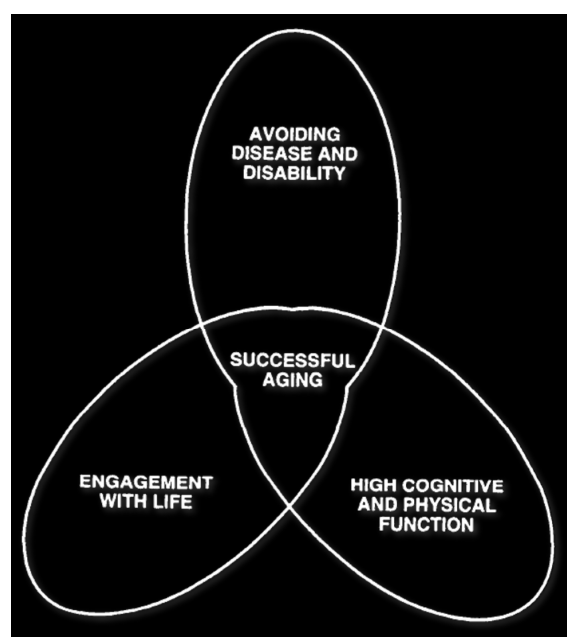
## 1.3 Successful Aging

To enable assessment of the associations between SEP and individual aging, I constructed an outcome that reflected individual functioning across multiple domains: physical, mental, and social. Using a multidimensional outcome was in my view crucial because a low SEP is associated with multiple domains of functioning, and using a multidimensional outcome can demonstrate the effects of SEP on overall individual functioning. Therefore, the main outcome (or dependent variable) in this thesis is *successful aging*. Throughout the last three decades, this concept has been prominent in gerontology, because it altered how researchers thought about the aging process and provided guidelines for developing integrated measures of individual functioning (32,33). Moreover, the concept spawned crucial debates amongst researchers, policy makers, older adults themselves and others about what constitutes a good old age and how that could or should be measured (34).

Although the term successful aging was coined in 1961 (35), it became widespread in gerontology since the publication of John Rowe and Robert Kahn's article *Human Aging: Usual and Successful* in 1987, one of the few gerontological papers published in *Science* (19). Rowe and Kahn, together with 14 other scholars, were invited by the MacArthur Research

Network on Successful Aging in the US to “develop the conceptual basis for a “new gerontology”” (36) (p.1). The concept of successful aging went in against the predominant idea at that time that old age is inherently characterised by deterioration in functioning. Rowe and Kahn stated that the effects of (biological) aging processes on the human life course had been exaggerated. Instead of focusing on average declines in health and functioning with increasing age, they urged researchers to focus on the interplay between psychosocial, physiological, and lifestyle factors that produce heterogeneity amongst older adults. They proposed that this heterogeneity can be approached by making a distinction between “usual aging”, reflecting age-related declines, and “successful aging”, in which age-related declines are reduced, halted, or delayed as a result of positive extrinsic influences such as a healthy lifestyle (19).

In a later paper, Rowe & Kahn offered an empirical definition of successful aging. They proposed that successful aging constitutes three conditions: avoiding disease and disability, high cognitive and physical function, and active engagement with social life ((37); Figure 2). Important features of this model are that it is *multidimensional*, encompassing mental, physical, and social functioning, and that successful aging entails functioning well in all domains. In response to this paper, numerous studies operationalised this model of successful aging, providing prevalences and associated factors, and proposing alternative versions (33).



**Figure 2.** Rowe & Kahn's model of successful aging (Rowe & Kahn, 1997, p. 434)

The model also received criticisms, which were recently summarized by Martinson and Berridge (34). The index of successful aging developed and applied in this thesis is based on the seminal Rowe and Kahn model, but incorporates important modifications and extensions that are based on four of such criticisms. These criticisms hold that most operationalizations of SA have been cross-sectional, have incorporated only one or two domains of functioning, have maintained Rowe and Kahn's criterion that one should remain free from disease in order to age successfully while chronic diseases are highly prevalent yet often unproblematic for older adults, and have applied an unrealistic dichotomization to the composite measure of SA. In addition to serving as an outcome relevant to studying socioeconomic inequalities in health and functioning of older adults, the new operational definition of SA presented in this thesis serves as a yardstick to distinguish resilient from non-resilient groups.

#### 1.4 Resilience

The concept of resilience originated in developmental psychology. The most well-known examples of early studies on resilience come from researchers who studied the impact of childhood trauma on psychiatric disorder (38). They became fascinated by the question why some children who were exposed to serious adversity developed normally as adolescents and adults, against expectations (39). Initially, they focused on neurobiological factors that accounted for this kind of 'resilience'. But as the field matured, studies also started to consider the roles of psychological factors, attachment relationships and family interactions in explaining good outcomes despite adversity (39).

According to its most general definition, resilience "refers to a class of phenomena characterised by good outcomes in spite of serious threats to adaptation or development". Resilience research aims to understand the processes that lead up to these good outcomes (40) (p.228). The broadness of this definition allowed researchers to apply the concept to a wide variety of contexts and outcomes and in scientific fields as diverse as ecology, psychiatry, and – more recently – gerontology (41).

Despite agreement about the very general definition mentioned above, when applied to particular research questions, resilience has been defined in various ways (42,43). Some lines of research developed resilience scales to capture individuals' purportedly stable (psychological) capacity for dealing with adversity. Others did not primarily consider resilience as a trait that one can possess or not, but as a process in which protective factors at three levels may interact: individual attributes, interpersonal relationships, and environmental supports (41,44). While no consensus definition of resilience exists, most scholars agree that in order to be able to speak of resilience, two requirements need to be met: 1) there should be demonstrable adversity or risk, that is: solid empirical evidence should be provided that the adverse condition or event (e.g., low SEP) normally predicts worse outcomes; and 2) there should be an outcome that can reasonably be evaluated as good (40,42). The premise is that those with unexpectedly good outcomes given their exposure to a high risk context can be considered resilient.

The empirical studies on resilience in this thesis focus on older adults who aged successfully despite having had unfavourable socioeconomic conditions throughout their lives. Following the general principles of resilience mentioned above, in this thesis I first develop a measure of successful aging on which high scores can be considered as good outcomes. Then, I examine whether those with a lower SEP indeed age less successfully than those with a higher SEP, *on average*. Subsequently, I identify a group of older adults who has an unexpectedly high level of successful aging *despite* having a low SEP. This group of resilient older adults provides the key population in which to identify protective factors that have contributed to resilience. It is my expectation that these analyses result in valuable insights for the wider at-risk population.

One way to identify these characteristics is by comparing the resilient group to two "normative" groups that show expected levels of successful aging given their exposure to socioeconomic adversity (low or high; see Figure 3). In some parts of the thesis this categorisation will be extended to include two groups with intermediate exposure to adversity.

Another way of identifying factors that contribute to resilience is to draw from the experiences of resilient older adults themselves. Qualitative research is important for studying resilience because qualitative methods enable researchers to uncover protective processes that bear particular importance within very specific (adverse) contexts. An in-depth understanding of the experiences and perspectives of those living in these contexts can illustrate and expand quantitative studies on resilience (45). For these reasons, part of this thesis is dedicated to a qualitative study based on interviews with older adults who aged successfully despite a low lifetime SEP.

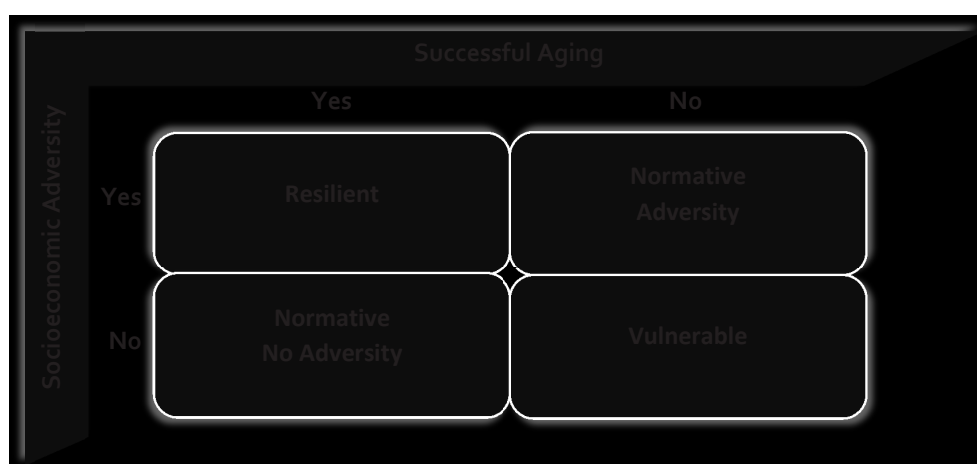


Figure 3. Identification of a "Resilient" group



### 1.5 Summary of key concepts and guiding principles

- Differences in individual socioeconomic conditions are a fundamental and systematic source of heterogeneity in the functioning of older adults. At the same time there is substantial heterogeneity between individuals with similar socioeconomic conditions, and this heterogeneity has been given scarce attention in the scientific literature.
- Socioeconomic inequalities are measured by individual indicators of SEP and material conditions. In this thesis, socioeconomic adversity indicates accumulation of multiple adverse socioeconomic conditions across the life course.
- Successful Aging is a multidimensional concept reflecting the extent to which an older adult functions relatively well across social, physical, cognitive, and emotional domains of aging.
- A comprehensive understanding of socioeconomic inequalities in successful aging requires consideration of the effects of multiple indicators of individual socioeconomic conditions observed at multiple stages of the life course.
- Resilient individuals have aged successfully despite socioeconomic adversity. Psychological, social, and societal processes are expected to contribute to resilience.
- A comprehensive understanding of resilience requires consideration of the perspective of resilient older adults themselves.

### 1.6 Research questions and aims

The central research questions of this thesis are:

- 1) to what extent do Dutch older adults age successfully, if SA is operationally defined on the basis of longitudinal trajectories of subjective and objective indicators of physical, mental and social functioning, and expressed as a continuum?
- 2) how is SA affected by individual socioeconomic conditions and psychosocial factors across the life course?
- 3) what characteristics and experiences distinguish subgroups of older adults who aged successfully despite lifelong exposure to socioeconomic adversity?

The main aims of this thesis are:

- To provide a new comprehensive operational definition of successful aging that incorporates key criticisms on earlier operational definitions.
- To examine associations between early and later life SEP, psychosocial factors, and successful aging.

- To examine what characteristics distinguish resilient older adults – defined as having aged successfully despite a low lifetime SEP – from other groups of older adults.
- To examine which elements contribute to resilience in the face of socioeconomic adversity from the perspective of resilient older adults themselves.

### 1.7 Data sources and methods

Five studies in this thesis employ data obtained from participants in the Longitudinal Aging Study Amsterdam (LASA), the Netherlands. LASA is a prospective cohort study primed to investigate the changes in physical, mental, and social functioning of Dutch adults aged 55 years and over, and the consequences of these changes in terms of care utilisation and autonomy (46,47). LASA's first cohort started in 1992-1993 and is based on a random sample of adults aged 55-84 in 11 municipalities from three geographically distinct regions in the Netherlands. In total, 3,107 participants were included (response rate 62%), and followed up every three years. The most recent measurement wave took place in 2015-2016. Data was gathered through face-to-face interviews, medical interviews, and written questionnaires. In 2002 and 2012, two new cohorts of adults aged 55-64 years were added ( $n=1,002$  and  $n=1,023$  respectively). Because of its interdisciplinary character and long follow-up, LASA was perfectly suited to study successful aging and resilience. Moreover, it provided access to resilient older adults for conducting qualitative interviews. This thesis uses data collected from 1992-1993 to up to 2008-2009.

Two studies in this thesis are based on data from the MRC National Survey of Health and Development in the United Kingdom, also known as the "1946 birth cohort study". The NSHD is Britain's oldest birth cohort study, based on a socially stratified sample of 5,362 singleton births taking place in one week in March 1946 across England, Scotland and Wales (48). Currently, this sample has been followed up 24 times. Up until age 16, one of the main focuses of the NSHD was socioeconomic differences in health and cognitive development. From age 16 the focus shifted to outcomes of education, and from age 32 to aging processes, particularly related to mental and physical capability. The extremely long follow-up of participants in the NSHD provided the possibility to model socioeconomic trajectories in great detail, and to assess their associations with prospectively observed psychosocial characteristics in childhood and early adulthood. Moreover, it enabled investigating multiple social, psychological, and lifestyle factors hypothesised to be contributing to resilience.

In order to optimally utilise these rich datasets, this thesis employed a statistical modelling technique that is able to detect patterns in multidimensional longitudinal data, i.e. latent class growth analysis (49,50). In LASA, this technique was used to distinguish 'successful' trajectories of functioning from less favourable ones. In the NSHD, this technique enabled the identification of distinct types of socioeconomic trajectories on the basis of longitudinal data on multiple socioeconomic conditions. Additionally, this thesis uses path analysis (51) to model hypothesised causal pathways between parental and adult SEP, life events, and

successful aging. Furthermore, this thesis applies more common statistical techniques such as linear and logistic regression analysis, and analysis of covariance. The qualitative study in this thesis applied semi-structured interviews to collect data, and coding techniques from the grounded theory framework as described and elaborated on by Charmaz (52) to analyse these data.

## 1.8 Thesis overview

The empirical studies in this thesis are divided into two larger parts. Chapters 2-5 (Part II) are concerned with developing an operational definition of successful aging and demonstrating associations between psychosocial factors, socioeconomic adversity, and successful aging. As such, Part II lays the groundwork for the quantitative and qualitative examinations of resilience in chapters 6-8 (Part III). A short specification of each chapter follows below.

Chapter two demonstrates individual differences in trajectories of socioeconomic adversity across the life course and their associations with psychosocial factors and attitudes towards social stratification in childhood and early adulthood. Although largely descriptive, the chapter increases understanding of the psychosocial causes and consequences of individual socioeconomic conditions across the life course. The analysis is based on data from the NSHD. The typology of socioeconomic trajectories established in this chapter provides the basis for identifying resilient groups in chapter eight.

Chapter three focuses on operationalising the concept of successful aging. The chapter uses data from the LASA study. First, four main criticisms on the concept of successful aging are discussed. Then, the chapter describes how these criticisms have been incorporated into a successful aging index (SA-index) based on 16-year longitudinal trajectories of social, emotional, cognitive, and physical functioning. A frequency distribution and basic correlates of the index are presented. The SA-index is applied throughout chapters four to seven.

In chapter four, the independent impact of three central elements of SEP on SA is investigated; education, occupational skill level, and income. It is argued that while these elements of SEP are interrelated, they each also have partly independent effects on successful aging. Applying the SA-index developed in chapter three, this chapter disentangles the unique contribution of each of the three elements of SEP to socioeconomic inequalities in successful aging.

Chapter five contributes to a special issue in *The Gerontologist on Successful Aging 2.0*, edited by Rowe and Kahn (36). Using path analysis, the chapter focuses on the effects of SEP and life events in childhood and adulthood on successful aging, as measured with the SA-index. The research also examines whether the likelihood of experiencing events such as parental problems in childhood, divorce, and unemployment is influenced by parental and own SEP. The chapter contributes insights into how SEP and stress exposures influence one another and successful aging.

After reaching a better understanding of how socioeconomic adversity may affect successful aging, chapters six to eight engage with the question what characterises individuals who aged successfully *despite* having had a low SEP throughout their lives. Each chapter approaches this question differently. Chapter six is based on LASA data and identifies a group of resilient individuals on the basis of combining a high score on the SA-index with a low SEP based on childhood and adulthood indicators. The chapter compares health behaviours, psychological coping resources, and social resources in the resilient group to those in groups with different combinations of SEP and SA.

Chapter seven returns to the members of the 1946 birth cohort study in the UK, and has a similar structure and research question to that of chapter six. The analysis uses the typology of socioeconomic trajectories developed in chapter 2 to identify a group with high exposure to socioeconomic adversity, and focuses on one aspect of successful aging, namely self-reported functional limitations in activities of daily living. In this study, resilience is defined as remaining free from functional limitations despite exposure to socioeconomic adversity throughout life. As in chapter six, psychosocial and lifestyle characteristics of the resilient group are compared to groups with other combinations of socioeconomic adversity and functioning in old age.

Chapter eight employs qualitative research methods, and is based on in-depth interviews with eleven resilient older adults recruited from the resilient group identified in chapter six (LASA). Among other things, these participants were asked how they dealt with adversity throughout their lives and where they would place themselves on a “societal ladder”. Analysis of the transcripts of the interviews is performed to identify themes that indicate key elements of resilience in the face of socioeconomic adversity.

Finally, chapter nine provides a general discussion of the results from this collection of quantitative and qualitative analyses. Conceptual and methodological issues surrounding successful aging and resilience are further discussed in light of these results, sometimes referring to additional analyses (see Appendix). Future directions for research on successful aging and resilience are provided.

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