

# Chapter 9: General Discussion

## 9.1 Summary of findings

This thesis aimed to answer three questions: 1) to what extent do Dutch older adults age successfully, if Successful Aging (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 successful aging affected by individual socioeconomic conditions and psychosocial factors across the life course?; and 3) what characteristics and experiences distinguish subgroups of older adults who aged successfully despite lifelong exposure to socioeconomic adversity? Seven empirical studies were conducted to answer these questions. In brief, their findings were as follows:

On the basis of analyses in the MRC National Survey of Health and Development (NSHD), we distinguished seven life course trajectories of socioeconomic adversity. Applying this typology, we found that psychosocial factors such as lower self-management and higher emotional instability (neuroticism) were associated with adverse trajectories. Moreover, those with adverse trajectories had more negative expectations of social mobility, and assigned lower importance to education as a means to change social class. This study suggested that individual socioeconomic conditions and psychological dispositions may influence one another, and that such processes starting early in life contribute to socioeconomic inequality in old age.

To study the consequences of socioeconomic adversity for health and functioning in old age, in Chapter 3 I developed an index of successful aging (SA). This index was based on data from the Longitudinal Aging Study Amsterdam, and included nine indicators of mental, social, and physical functioning (LASA). Successful trajectories often reflected an absence of decline in functioning, but I also observed recovery from unfavourable functional states and considered this as successful aging. The chapter showed that over half of the participants had successful trajectories of functioning in more than five indicators of SA, but also that there is much diversity in the extent to and the way in which Dutch older adults aged successfully.

Chapter 4 showed that lower education, lower occupational skill level, and lower income independently predicted lower levels of SA. Socioeconomic inequalities were observed across physical, mental, and social domains, although cognitive and physical functioning were most strongly associated with socioeconomic position (SEP). In Chapter 5, I found that stressful life events in childhood and adulthood strongly affected levels of SA, and that exposure to these life events was partly influenced by parental and adulthood SEP. Unexpectedly, some life events occurred more often with higher rather than lower SEP, which partly suppressed socioeconomic inequalities in SA.

Aiming to better understand how individuals adapt to socioeconomic adversity, chapters 6-8 focused on resilience. I identified psychosocial and lifestyle profiles that distinguished older

adults who aged successfully despite a low lifetime SEP from those with different combinations of SEP and SA. Using data from LASA, in Chapter 6 I found that resilient older adults had exceptional baseline levels of physical activity and a high likelihood of having a partner in their household. Furthermore, in many other respects the resilient resembled those who aged successfully with a *high* SEP. For example, the resilient had an equally low number of chronic diseases, high emotional support and mastery, and were highly likely to be a church member or to engage in prayer. Chapter 7 employed similar analyses as those in Chapter 6, but defined resilience as remaining free from functional limitations despite lifelong exposure to socioeconomic adversity. This chapter used data from the NSHD. The results showed that, even when focusing on one physical aspect of SA, resilience was associated with multiple factors. A combination of high self-management, low neuroticism, and favourable health behaviours characterised resilient individuals. Social factors such as marital status and contact frequency with friends did not characterise resilient individuals in this study.

In the final chapter, I examined resilience from the perspective of older adults themselves, and presented findings from an analysis of qualitative interviews with resilient participants in LASA. Six themes reflected elements of resilience in the face of socioeconomic adversity: drawing support from social contacts; investing in younger generations; taking actions to manage or improve socioeconomic conditions; putting the impact of a low SEP into perspective; persevering; and resigning oneself to adversity. Results supported and illustrated the quantitative findings on factors such as mastery and partner status from Chapter 6. However, I found generativity and resignation as additional factors that may contribute to resilience. These themes indicate potentially important areas for future research.

Below, I synthesise and elaborate on the main findings and highlight several conceptual and methodological issues. Then I provide recommendations for public policy and scientific research, and end with a brief general conclusion. I structure the discussion according to the three main themes of this thesis: successful aging, socioeconomic inequality, and resilience.

## 9.2 Successful aging: conceptual and methodological issues

In the general introduction, I argued that developing a holistic measure of functioning in old age was crucial to study socioeconomic inequality and resilience, because SEP is associated with not one but with many dimensions of health and functioning in old age. Furthermore, I argued that SA is a concept that matches this aim well, because it focuses on identifying heterogeneity in the functioning of older adults across many domains of functioning. Moreover, the operational definition of SA developed in Chapter 3 attended to several criticisms on the concept and its measurement (1), resulting in a more extensive construct than used in previous studies. For example, the current operational definition is based on longitudinal trajectories rather than cross-sectional measurements of functioning, it

acknowledges lay perspectives on SA by including four domains of functioning deemed important for SA by older adults themselves, and it is continuous rather than dichotomous. As such, it is a comprehensive operational definition which is grounded in the scientific literature. Other studies employing a similar approach to measuring SA have recently emerged (2), although the use of longitudinal trajectories to determine relative success is still unique in the literature. Nevertheless, developing this measure of SA was not without challenges or pitfalls. I encountered several conceptual and methodological issues that are worthwhile to discuss.

### 9.2.1 The usefulness of multidimensional outcomes

The use of indices is common practice in the social sciences. An index is a composite statistic that summarizes individual outcomes across several indicators that are typically assigned equal weight for the overall construct (3). One implication of the operationalisation of SA as a count of successful trajectories is that the same scores (except for 0 and 9) may reflect different combinations of successful indicators in different participants. An advantage of this approach is that it allows for compensation: a person may be less successful in one domain, but still be functioning well in another domain. Furthermore, the importance of multidimensional measures for assessing the general quality of the aging process is supported by a recent study, which examined the convergent and predictive validity of five different SA constructs that varied in the included dimensions of functioning (4). This study found that a general SA model including psychological, physiological and social dimensions showed the best fit in confirmatory factor analyses, and the strongest cross-sectional and longitudinal correlations with quality of life and self-rated health, compared to models that included only two of these dimensions (4). Nevertheless, a disadvantage of using the multidimensional SA construct as an outcome, is that the interpretation of the effects of predictors on SA is not straightforward. Regression coefficients may reflect effects on one or multiple domains of functioning, and the domains affected may differ in unknown ways between individuals.

This limitation was accounted for by providing additional analyses of separate indicators of SA in Chapter 4 and Chapter 5. These analyses provided an indication of the contribution of each indicator of SA to the overall associations found between the predictors and the SA index. This enabled me to conclude that socioeconomic inequalities in SA are more strongly due to inequalities in cognitive functioning, functional limitations, and emotional support given, than to social participation and social loneliness. Despite the complementary insights gained from presenting analyses on the overall construct of SA and on the separate constituents of the overall construct, previous studies have provided only the former analysis (exceptions are (5,6)).

Moreover, the analyses on separate indicators of SA support the choice to use a composite measure of SA as the main outcome variable, at least when investigating the topics in the current thesis. I found that almost all predictors of SA (SEP and life events) were associated

with multiple indicators of SA, and this confirms the expected multidimensional impact of these predictors. SA thus seems an appropriate outcome when studying the effects of SEP, life events, and an appropriate yardstick for identifying older adults who were functioning well until high ages despite socioeconomic adversity.

### 9.2.2 Criticisms of SA

Three decades ago, the term 'successful aging' was regarded by many as an oxymoron. At that time, old age was predominantly seen as a period of inevitable decline. Rowe and Kahn explain that around the time they published their influential article on SA, gerontology was dominated by monodisciplinary research focusing on measures of central tendency rather than variation (7). The appeal of SA consisted of the thought that 'better than usual' functioning in old age was possible, and that this observed heterogeneity in the functioning of older adults should receive more attention. Moreover, the concept of SA emphasized multidisciplinary by posing that it involved high levels of functioning across multiple domains (8).

However, the term 'successful' in SA has received criticisms from several scholars (1,9–11). In brief, it was argued that the term success is a normative judgment, implying that those who do not satisfy the researchers' criteria are unsuccessful. Moreover, Rowe and Kahn's emphasis on lifestyle factors and individual action as paramount to SA has been criticised for neglecting the ways in which individual biographies and experiences, and social contexts (among which socioeconomic factors) impact on aging (9,11). Focusing on SA would neglect those who decline in their functioning and they would have to blame themselves for this. (8). The latter has recently been acknowledged and reflected upon by Rowe and Kahn, resulting in a call for "conceptual expansions" of SA that incorporate such issues (7). In many respects, the current thesis answers to this call, and provides a more nuanced use of the concept than in previous studies.

First, the indicators of SA used in the current studies were selected to reflect older adults' own views of what constitutes SA (12–14). This increases content validity and to some extent ensures that no indicators are included of which older adults themselves feel that they can not or should not be evaluated in terms of 'success'. In line with this, indicators of SEP were not selected as indicators of SA, as is the case in some operationalisations (e.g., (15)), but as predictors.

Second, 'Successful' trajectories were determined as objectively as possible by using data driven cut-off points for what could signify the most successful trajectory. Using Latent Class Growth Analysis (LCGA) for this purpose also implies that 'success' is based on relative differences between individuals, because the number of classes depends on the variation present in the particular sample. This may do more justice to the actual variation among older adults than do researcher-defined cut-off points, which in some studies yielded extremely low proportions (<1%) of purportedly 'successful' individuals (16). Moreover, for the majority of indicators of SA, judging which trajectory was most successful was quite

straightforward. For example, a high and stable trajectory of self-rated health can be rather unambiguously considered as the most favourable one.

Third, many definitions of SA included the absence of disease as a requirement for SA. As a consequence, the oldest old can often not qualify as 'successful' (17). The current operational definition showed that abandoning this requirement and using a continuous rather than dichotomous aggregate measure of SA may lead to a more balanced construct. Moreover, the fact that the analysis of trajectories was based on relative differences between individuals rather than absolute differences suggests that the current approach to SA could easily be applied to studies within the oldest age groups.

Fourth, in addition to developing an operational definition of SA that incorporates several criticism on the concept and its operationalisation, this thesis was primarily concerned with social contextual factors that influence individual opportunities to age successfully. I demonstrated that one's educational attainment, occupational skill level, and income (and, indirectly, the SEP of one's parents) are associated with SA, and such factors are partly beyond individual control. I also showed the substantial impact on SA of negative family-related and occupational life events in childhood and adulthood. Rather than implying that individuals are mainly responsible for their own 'success', my studies thus demonstrate the limits imposed on SA by factors such as SEP and stressful life events.

Nevertheless, the criticisms on the concept of SA are valuable because they warn researchers not to emphasize personal responsibility for later life functioning, and not to equate successful aging to 'not aging' (8). A concept such as SA should not make one oblivious to the fact that many older adults face health problems and functional decline at some point in their lives, and that other strengths than, for example, 'high physical and cognitive functioning' may become more relevant. Spirituality, generativity, and wisdom are justly pointed out as potential strengths in old age that are often neglected within the successful aging paradigm (10,17,18).

Still, the reasons why the SA perspective became popular in gerontology should not be forgotten. SA provided a positive and multidimensional perspective on aging that refuted several ageist assumptions. This does not mean that SA should be the primary focus of researchers and policy makers. Rather, SA should be regarded as one perspective alongside other perspectives that each highlight specific aspects of aging.

### 9.2.3 Handling baseline age differences in LCGA

The longitudinal data that we used for identifying trajectories with LCGA was structured according to measurement waves. The data collected in 1992/93 reflected the baseline observation for everyone participating at baseline; data collected in 1996/96 reflected the second observation; and so on. However, at baseline, participants' ages ranged between 55 and 84 years. Because chronological age is correlated with most indicators of functioning included in the SA index, this 30-year age range at baseline substantially influenced

assignment of individuals to latent classes. Those who were older at baseline tended to have lower levels of functioning and were therefore more likely to be assigned to a class with a less successful trajectory. The different latent classes thus partly reflected trajectories of functioning starting at different ages rather than variation in individual trajectories observed at the same ages. Not surprisingly, the correlation between baseline age and the SA index was -0.46.

In the studies in this thesis, I accounted for the influence of baseline age on SA by adjusting regression models for age. However, I made this decision only after examining a potential alternative method to eliminate this influence. This method involved restructuring the measurements in the dataset to eliminate the influence of baseline age on the identification of the trajectories *before* estimating the LCGAs. In brief, the original dataset included six measurements of the same variable that expressed functioning at subsequent waves. I restructured the data contained in these six measurements to seventeen new measurements, which expressed functioning at the age (rather than the measurement wave) at which functioning was observed. Each individual had data for up to six of these measurements, and the remaining measurements were set to missing. This series of seventeen measurements was used as input for the LCGAs, and missing data was handled by the Full Information Maximum Likelihood (FIML) procedure. In **Appendix A**, I explain this method in detail, using Functional Limitations and Cognitive Functioning as examples. Here, I briefly present the results and conclusions from this additional analysis.

As expected, I found that the association between baseline age and having a successful trajectory in functional limitations and cognitive functioning was strongly reduced when using the restructured dataset. The OR of baseline age predicting a successful trajectory changed from 0.89 (CI = 0.88 – 0.90) to 0.98 (CI = 0.97 – 0.99) for Functional Limitations and from 0.90 (CI = 0.89 – 0.91) to 1.02 (CI = 1.02 – 1.03) for Cognitive Functioning. The percentages in the successful trajectories differed up to 15%, and the association between being classified as having a successful trajectory in the original versus the alternative models was strong (phi-coefficient: 0.69 for functional limitations and 0.61 for cognitive functioning). However, this still indicates that a sizeable proportion of the respondents was classified differently in the original versus restructured approach. Nevertheless, the associations between SEP and the odds of a successful trajectory in Functional Limitations and Cognitive Functioning were similar between the two approaches, which is reassuring for the robustness of some of the key findings in this thesis.

While effective in reducing the influence of baseline age on the odds of having a successful trajectory, for three reasons, I eventually decided to use the default LASA data structure in the final manuscripts. First, with the alternative data structure, the proportions of missing data at low and high ages became very large (up to 90%). This led to a growing discrepancy between observed and estimated trajectories, particularly in small latent classes ( $n < 50$ ). Therefore, we excluded observations above age 90, which implies suboptimal use of the available data. Moreover, using high proportions of missing data increased the risk of biased

estimates if the assumptions of FIML (e.g., data is missing at random) are not satisfied. Second, in the original data structure, all participants were exposed to the same period effects at the same time. The alternative method blends these period effects across the study sample by assuming that all respondents had the same age at the same time. This may influence the results to an unknown degree. Third, the main aim of my studies was to assess the effects of SEP and life events on SA. As appendix A shows, I did not find substantial differences in these effects on SA between the models using the original and restructured data. This suggests that for my main purposes, either data structure would be sufficient.

Given these various arguments, I decided to use the original data structure and to adjust for age afterwards. Nevertheless, the additional analyses indicate that researchers should carefully check the LCGA results if they suspect that a particular covariate (such as age) strongly influences latent class membership. They should make an explicit decision to handle this influence in advance or afterwards. Based on discussions on the *Mplus* online forum, restructuring the data currently seems to be the only method that can rule out the influence of a covariate in LCGA.

### 9.3 Socioeconomic inequality

#### 9.3.1 Evaluating the size and composition of socioeconomic inequalities in SA

Analyses on SA demonstrated that SEP affected multiple aspects of functioning in the same older individuals. Based on results from Chapter 4 and Chapter 5, I conclude that the association between SEP and SA is weak to moderate in strength. Correlations between indicators of SEP and SA ranged between 0.19 (occupational skill level) and 0.24 (income) and correlations between a composite index of adult SEP and SA were 0.16 for men and 0.29 for women. In absolute terms, those with the lowest education, occupational skill level, and income had 1.2, 1.3, and 1.5 successful trajectories less than those with the highest positions on these indicators. These differences partly add up when individuals have lower positions on multiple SEP indicators. Because previous studies have used different measures of SA and SEP (16), I cannot compare the size of these inequalities to the present results. However, the association between SEP and SA was weaker than I expected, and this could be partly due to specific features of the SA index.

First, the identification of 'successful' subgroups based on longitudinal trajectories rather than cross-sectional measurements. Chapter 4 showed that for most indicators, SEP was associated with the intercepts but not with the slopes of the trajectories. This implies that while older adults with a lower SEP may have had lower initial levels of functioning than those with a higher SEP, their slopes may have been similar. As assignment of individuals to a 'successful' class is weighted on both (although how exactly this is done appears unclear in the literature), this may result in relatively small socioeconomic inequalities. Additional analyses would be needed to test this assumption. Second, the SA index included relatively

few indicators of domains in which socioeconomic inequalities tend to be large, such as cognitive and physical functioning (see Chapter 4). Other studies on the associations between SEP and SA used definitions of SA in which 60-100% of the indicators reflected physical functioning, cognitive functioning or disease, compared to 33% in the SA index. My impression that the current associations between SEP and SA seem relatively weak can thus relate to the fact that the SA index included indicators such as life satisfaction and social loneliness, in which socioeconomic inequalities were small or absent.

### 9.3.2 The role of psychosocial factors in socioeconomic inequality

This thesis aimed to contribute to the understanding of psychosocial mechanisms associated with socioeconomic inequality across the life course. The main strength of the approach in this thesis was that multiple psychosocial factors at different stages of the life course were integrated into single studies (e.g. personal characteristics, attitudes, life events in childhood and adulthood and across family and occupational domains). Moreover, I was able to link these factors to detailed longitudinal measures of socioeconomic conditions. This enabled assessment of multiple mechanisms or chains of mechanisms within the same study samples, and these mechanisms may help to better understand heterogeneity in functioning across multiple domains of older adults. On the one hand, the findings provide evidence for a persistent socioeconomic gradient in psychosocial characteristics across the life course. On the other hand, several findings demonstrate exceptions to this evidence and increase understanding of the considerable heterogeneity within groups with a low SEP. I review some current findings in light of two theoretical perspectives that represent complementary life course approaches to understanding heterogeneity in health and functioning at older ages: the cumulative advantage/disadvantage perspective (CAD) (19,20), and the social stress perspective (21).

The CAD perspective states that birth cohorts become more and more heterogeneous in functioning across the life course, because those born in disadvantageous positions accumulate risk factors and those born in advantageous positions accumulate health benefits throughout their lives. Many findings in this thesis confirm that socioeconomic disadvantage often goes hand in hand with disadvantage in psychosocial factors. However, I highlight three findings that diverged from this pattern and nuance the premises of the CAD perspective.

First, Chapter 2 showed that many individuals experienced quite dynamic trajectories of socioeconomic adversity. In some groups, socioeconomic conditions strongly improved during their lives, and for some, adversity increased despite favourable socioeconomic conditions in childhood. Differences between these groups in factors such as self-management and neuroticism suggested that such interruptions or weakening of chains of CAD are associated with psychosocial resources. Additionally, general improvements in living conditions and opportunities for upward social mobility may partly account for the observed decline in socioeconomic adversity in specific groups. Second, Chapter 5 showed



that particular life events occurred more often with higher rather than low SEP, which weakened the association between SEP and SA. These findings indicate that not all intermediate factors may influence the direction of socioeconomic inequalities in favour of those with higher SEP. Third, the studies on resilience showed that particular (combinations of) psychosocial and lifestyle factors may offset the risks associated with persistent socioeconomic disadvantage. Therefore, resilience may be an important concept to complement theory about socioeconomic inequality in terms of CAD.

The social stress perspective aims to integrate sociological and clinical perspectives on stress exposure by evaluating differences in responses to stressful circumstances or events as well as in the social distribution of these stressors (21). One essential premise of the perspective is that “stress is not an inherent attribute of external conditions, but emanates from discrepancies between those conditions and characteristics of the individual – his or her needs, values, perceptions, resources, and skills” (22, p.16). This premise suggests that the extent to which socioeconomic adversity affects SA is determined by the socioeconomic conditions themselves and by the extent to which an individual experiences these conditions as unwanted and unexpected.

This point can be illustrated with results from Chapter 2 and Chapter 8. In Chapter 2, those exposed to socioeconomic adversity were more likely to want to change social class and less likely to think they had better chances in life than their age peers. This showed that, *on average*, more adversity was associated with more negative attitudes towards one’s social class and more negative expectations of the future, suggesting higher stress exposure. This negative attitude might exacerbate the effects of the adverse socioeconomic conditions themselves on SA (e.g. poor material conditions or high physical demands at work). However, the personal accounts of resilient individuals in Chapter 8 illustrated how having particular attitudes regarding social status might lead to more favourable outcomes in similar (adverse) socioeconomic conditions. For example, having a low SEP did not seem to bother some participants, as they emphasised that they didn’t care much about money or enjoyed working with their hands rather than with their heads. Others indicated that poverty was to a certain extent a shared experience, and people helped one another to make ends meet. Thus, in line with the social stress perspective, the findings in this thesis suggest that attitudes and psychological characteristics tend to differ between socioeconomic groups, but that there is substantial heterogeneity in outcomes such as SA *within* these groups due to how individuals view and respond to socioeconomic adversity.

#### 9.4 Resilience in older adults: a synthesis of findings

In the general introduction, I argued that examining resilience in older adults with a low SEP is relevant because it may provide new insights into psychological and social factors that have enduring protective effects against the risks associated with lifelong socioeconomic adversity. This knowledge can be used as a starting point for new interventions and policies aimed at reducing socioeconomic inequalities in the health and functioning of older adults (see also section 9.7). In this section, I summarize the findings from the three studies on resilience presented in this thesis. I have categorized factors associated with resilience in the face of socioeconomic adversity into four domains: self-regulation, social support, lifestyle and chronic diseases, and social security (Figure 1). Below, I elaborate on several similarities and differences between the three studies on resilience. It is important to note that although it is conceivable that several of the protective factors are linked in causal chains (e.g. high neuroticism might lead to unhealthy behaviours, which may in turn lead to chronic diseases), the current quantitative studies give no decisive answer to questions of causal directions amongst them. Rather, the analyses indicate that their associations with resilience were independent from one another.

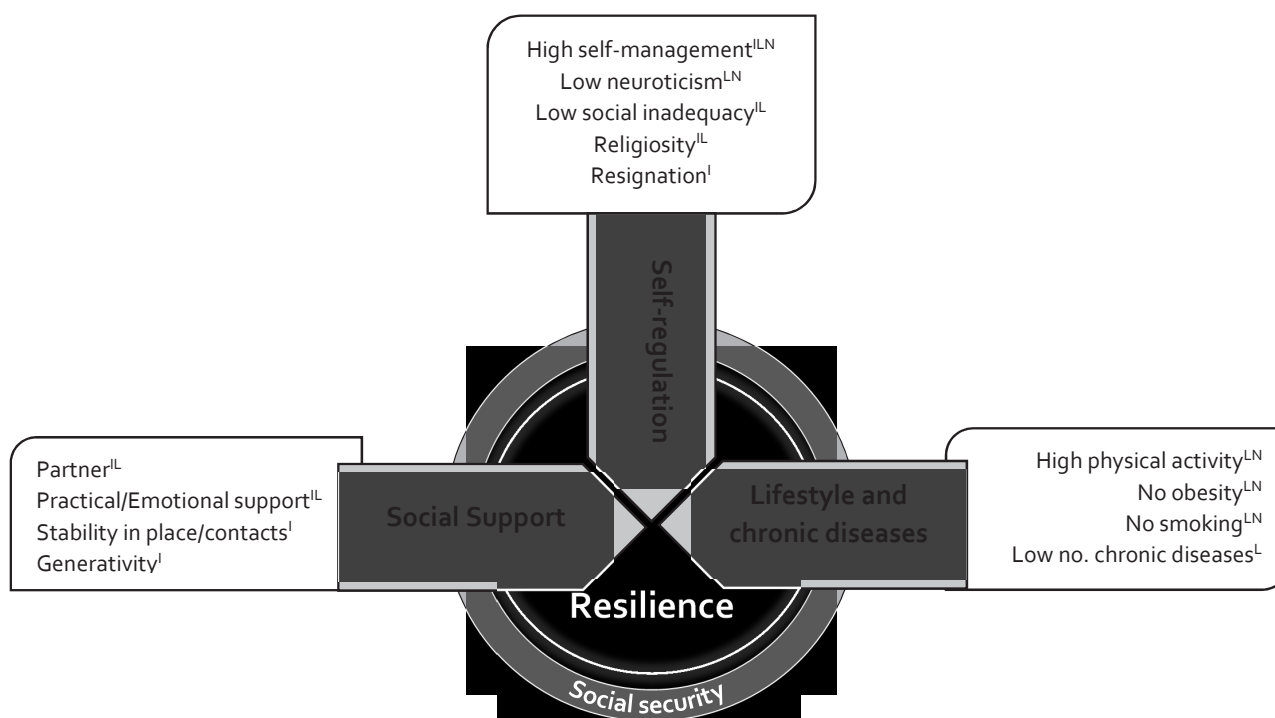


Figure 1. Summary of findings on factors contributing to resilience in the face of socioeconomic adversity. I = finding from qualitative LASA study; L = finding from quantitative LASA study; N = finding from NSHD study

#### 9.4.1 Self-regulation

The domain of self-regulation includes individual characteristics that reflect feelings of control, such as strong self-management, high mastery, and low social inadequacy and neuroticism, which were identified as contributing to resilience in the quantitative studies. Themes from the qualitative study reflected such characteristics. For instance, managing expenses, developing one's working career (even if this did not lead to an 'objectively' high SEP), and emphasizing one's good (manual) skills were expressions of self-regulation. In addition to control beliefs, self-regulation included religiosity (found in both LASA studies) and resignation (identified in the qualitative study). Furthermore, some resilient older adults indicated that it had always been easy for them to initiate new and preserve existing social contacts, which resonates with the low level of social inadequacy found in Chapter 6. It is unclear whether generativity should be categorized as self-regulation or as social support, but because social contacts are essentially the source from which generativity is drawn, I categorized it as social support.

The findings on the self-regulation factors indicate that resilience in the face of socioeconomic adversity involves a combination of concepts that can be seen as expressions of 'primary control' and 'secondary control' (22). Primary control refers to efforts aimed at the external environment. Through these efforts, an individual attempts to bring living circumstances in line with one's needs and desires. This type of control is illustrated by participants' actions described in the qualitative study; for instance, trying various jobs to find the most fulfilling one or taking a course to obtain a better social status than one's brothers.

In contrast to primary control, secondary control is not (directly) aimed at the external environment but at the self, and has two goals (22). First, it is used to cope with failed attempts to exert primary control. Examples from my qualitative study are resigning oneself to a lack of opportunities to study or to harsh circumstances resulting from poverty. More generally, one's level of neuroticism may reflect secondary coping strategies, as it indicates how one responds in the face of stressors. People high in neuroticism may be more easily distressed when failing at exerting primary control, respond with anger, and experience feelings of being unable to cope (23). In contrast, those low in neuroticism may resign oneself to the situation or devise new strategies for action – and be more resilient. Second, secondary coping is used to select the goals at which primary control efforts will be aimed, while abandoning others. An example of such selection from Chapter 8 is downplaying the importance of social status and instead highly valuing (and therefore possibly investing in) the good quality of one's social contacts. Furthermore, mastery may be one characteristic associated with the extent to which such strategies are experienced as personal choices and therefore retain a sense of personal control over one's life (24,25).

According to Heckhausen and Schulz (22), the life course is characterized by a constant interplay between both types of control, although secondary control generally tends to

become more important in old age. At first glance, they argue, most people would judge those who have exerted the most primary control throughout their lives as aging most successfully (22). However, they point out that the potential for primary control is substantially affected by sociocultural factors, amongst which SEP (26). The current results are in line with this statement, and suggest that striking a balance between effective exertion of primary and secondary control (rather than primary control only) may enable successful aging in the face of socioeconomic adversity.

My findings that religiosity is associated with resilience in the face of socioeconomic adversity appears to be in contrast with the findings on (primary) control beliefs. Having faith in divine influences may seem to indicate the opposite of believing one has control over one's life chances (i.e., mastery). Indeed, although a review found that in the general population, higher religiosity is associated with higher self-control (27), specific studies indicate that in low SEP groups, this association may be reversed (28,29). However, the current findings suggest that what applies to the general group with a low SEP may be different in those within this group who were resilient. In Chapter 6 we found a high prevalence of church membership and the highest percentage indicating that prayer is meaningful, and in Chapter 8 the participants suggested that prayer invoked a sense of support and control, either emotionally or by believing that one's prayers effectuated favourable changes in life. The specific combination of engaging in religious practices *and* the experience that these practices effectively regulate emotions or help to trigger actual (positive) events in life contributes may thus contribute to resilience in the face of socioeconomic adversity.

#### 9.4.2 Social support

In line with many previous studies (30–36), my findings indicated that social support was crucial for resilience. However, the extent to and the ways in which social support contributed to resilience differed between the three current studies, and seemed to depend on differences in research methods and operationalization. I elaborate on three differences.

First, receiving emotional support was found to be a protective factor in the fully adjusted quantitative analysis (Chapter 6), whereas it was not clearly identified as a theme in the qualitative study. This might be because participants in the interviews did not feel familiar enough with the interviewer to talk openly about the emotional value of their social relationships. Additionally, because the qualitative analyses focused on how participants dealt with socioeconomic adversity, experiences involving instrumental support may have been more obvious to share than emotional ones, as the experiences related to a low SEP that participants shared largely involved dealing with financial and material deprivation.

Second, another difference between the qualitative and quantitative LASA study was that generativity and stability in place and social contacts were identified as contributing to resilience in the qualitative study only. As with resignation, the obvious explanation for this is that these factors were not measured in the quantitative studies, although in retrospect, I might have examined indicators of stability in place in the quantitative study (e.g., measured

as the number of residential moves throughout life). This illustrates that quantitative studies on resilience carried out using secondary data from broad purpose studies may not include factors that appear to matter especially in adverse contexts. I consider generativity to be a promising area for future studies into resilience, particularly as most scales to measure generativity are designed for adults rather than older adults, and the latter have only recently started to emerge (37).

Third, in contrast to the LASA study, the NSHD study found that social factors (contact frequency with friends, voluntary work, and marital status) were not characteristic of resilient individuals. This suggests that social factors are less important when examining specific outcomes related to physical functioning, such as functional limitations. To further examine this suggestion, I performed an additional analysis in LASA that was similar to the NSHD analysis in Chapter 7 (details in **Appendix B**). I distinguished six groups based on three levels of adversity and 'having a successful trajectory in functional limitations' (see Chapter 3) as outcome. I found that the results from the NSHD concerning resilience seem to be robust. As in the NSHD study, in LASA we found that self-control (particularly mastery) and health-related behaviours (particularly remaining free from obesity and engagement in physical activity) are associated with remaining free from FL in a context of high socioeconomic adversity. Also in LASA we found that social factors (partner status and social support) were not related to this particular definition of resilience. Although leading to similar conclusions regarding resilience, this comparison should be interpreted with caution, as most variables only partly matched between the NSHD and LASA datasets.

In sum, emotional and instrumental support are important for resilience with a low SEP in relation to SA, but these factors may be less important when focusing on physical functioning. Moreover, the qualitative results suggest that additional factors (residential stability, generativity, and in the domain of self-regulation: resignation) may have to be included in future quantitative studies on resilience.

#### 9.4.3 Lifestyle and chronic diseases

Several aspects related to lifestyle emerged as protective factors within a context of low SEP: a high amount of (moderate) physical activity, avoidance of obesity, and avoidance of smoking. Furthermore, the presence of few chronic diseases characterized resilient older adults in the quantitative LASA study. I placed chronic diseases into this domain together with lifestyle factors because they are associated (38–42). However, I do not intend to suggest that chronic diseases are solely a consequence of lifestyle factors.

While lifestyle factors were related to resilience in both quantitative studies on resilience (LASA and NSHD), they did not seem to contribute to resilience from the perspective of resilient older adults themselves. Some participants did mention that they had been healthy throughout their life, and some of them mentioned aspects of a healthy lifestyle, e.g. cycling a lot or engaging in sports, but in their experience these behaviours were not linked to resilience or successful aging. The fact that lifestyle did not emerge as a theme from their

own accounts seems logical, because consciously deciding to adopt a healthy lifestyle is not an obvious choice to make in response to (practical) problems related to socioeconomic adversity. It is possible, however, that in contrast to other individuals with a low SEP, resilient older adults did not respond to stressors related to socioeconomic adversity by engaging in unhealthy behaviours such as smoking. But this would be a conclusion drawn in retrospect, and for them this was probably not a conscious choice at the time. This suggests that improving the resilience of older adults with a low SEP would require stimulating healthy lifestyles through interventions that aim at conscious as well as unconscious mechanisms (see also 9.7).

#### 9.4.4 Social security arrangements

In my qualitative study, some participants mentioned how particular social security arrangements such as child benefits and subsidies benefiting small businesses helped them to make ends meet. We had no quantitative data available to study such factors. In the Netherlands, many regulations that affect socioeconomic inequalities in favour of those with low incomes have been implemented, and debates on future regulations that may render large groups of individuals with low SEP more resilient are also still ongoing, e.g. on a universal basic income (43). Although the current studies have only touched upon the potential impact of social security arrangements on individual resilience, this indicates that future studies on resilience should incorporate an analysis of how macro-level arrangements may affect individual resilience in the face of socioeconomic adversity.

### 9.5 Resilience: conceptual and methodological issues

#### 9.5.1 Person-oriented versus variable-oriented approaches to investigate resilience

In the social and psychological sciences, three methods are commonly used to investigate resilience: 'person-focused', 'variable-focused', and 'psychometric' methods (44,45). In the present quantitative studies on resilience I adopted a person-oriented approach, and here I elaborate on this choice, as each method has strengths and weaknesses. The person-centered approach, also referred to as *resilience as outcome* (46), uses an 'a-priori' definition of resilience based on adversity-outcome dyads (47,48). It closely matches with the fundamental definition of resilience, namely having a good outcome despite adversity; on the basis of particular criteria, individuals who combined adversity with a good outcome (e.g., a low SEP with SA) are defined as resilient, and characteristics expected to contribute to their resilience are compared with groups that had other combinations of adversity and outcome. This categorization of individuals on the basis of combinations of predictor (adversity) and outcome is what makes this approach *person-centered*.

Psychometric methods employ 'resilience scales' that measure an individual's capacity for dealing with adversity. Such scales are often based on aggregates of multiple psychological constructs such as self-esteem and interpersonal control, sometimes complemented by

indicators of social support (45,49). By focusing on the individual's presumed *capacity* to deal with difficulties in life, in the psychometric approach one can be deemed highly resilient without having been exposed to adversity. This approach did not fit my research purposes well, as exposure to socioeconomic adversity was the principal starting point and focus of the studies on resilience in this thesis. Moreover, I hypothesized that there would be other factors than those included in most resilience scales that would contribute to resilience (e.g. health behaviours and religiousness). Therefore, I opted not to employ a psychometric approach in the current studies.

The variable-focused approach, or *resilience as influential quality* (46), is based on statistical interaction effects, and searches for factors that may be protective *particularly within a context of adversity* (44); examples can be found in (50–53). For instance, if the positive effect of mastery on SA is substantially stronger in those with a low SEP compared to those with a high SEP, it would be concluded that a high sense of mastery is particularly protective in a context of adversity, and thus mastery would contribute to resilience. Alternatively, the same interaction effect could be interpreted as the effect of a low SEP on SA being weaker in those with high mastery. Such interaction effects thus point to factors that are specifically important to address in low SEP groups, and in contrast to the relatively crude definition of resilience in person-focused approaches (one is resilient or not), resilience is regarded as a gradient.

Despite the crude categorization of individuals in the person-centered approach, I argue that it has at least two advantages over the variable-centered approach. First, this approach identifies a *profile of factors* that characterizes individuals with good outcomes despite adversity, rather than focusing on isolated factors that may interact with adversity (because technically, only one interaction with adversity can be modelled simultaneously). Second, through providing means and percentages of potential protective factors in different groups, the person-focused approach demonstrates which level of a factor may be needed for resilience. It also allows comparison of the resilient with those with a high SEP, which may indicate whether exceptional levels of protective factors are needed to attain a good outcome in adverse circumstances (44). Although these means and percentages can be obtained through the variable-centered approach as well after applying appropriate coding of the adversity and outcome variables and subsequent calculations, the person-centered approach provides such information more easily and intuitively.

In sum, the person-oriented approach most closely matched the definition of resilience adopted in this thesis (i.e., aging successfully despite socioeconomic adversity), and provided the least complicated method to obtain the desired statistics about resilient individuals. Nevertheless, the variable-centered approach may provide a valuable addition to the person-centered approach, because it provides a statistical test of whether a protective factor is particularly important for attaining good outcomes at higher levels of adversity.

### 9.5.2 (Not) Blaming the victim

Critics of the concept of resilience have argued that the concept serves a conservative and neo-liberal political agenda. That is, by focusing on resilience one would take adverse circumstances for granted and delegate responsibility for dealing with these circumstances to the individual (54,55). In the context of socioeconomic inequality this would mean that rather than focusing on the dynamic and often conflictual societal forces that produce and maintain socioeconomic inequality (56), demonstrating that some individuals function well despite adversity might result in 'blaming the victims' who do not manage to function well in similar circumstances (57).

My response to this issue is threefold:

- 1) people with a low SEP tend to be stigmatized, and prejudice about the low educated is common (58–60). One benefit of the resilience perspective is that demonstrating that some older adults with a low SEP age successfully despite a low SEP may help to show that this prejudice is incorrect, and therefore the findings from studies on resilience may reduce stigmatization of individuals with a low SEP.
- 2) rather than trivializing the importance of socioeconomic adversity for SA by showing that there are individuals who overcome the risks associated with it, resilience emphasises the problem of socioeconomic inequality by trying to better understand how people experience adverse contexts. In doing so, it highlights the potential problems that emerge within these contexts.
- 3) the results from the studies in this thesis largely invalidate the idea that individuals could be held solely responsible for dealing with adversity. Findings demonstrate the importance of personality characteristics, but also of instrumental and financial support granted by others and of social security arrangements for resilience. Moreover, while control beliefs seem to be an individual matter, the current studies showed that they at least partly depend on social interaction. For example, when older adults transfer knowledge and skills to younger generations or draw satisfaction from helping others, this may increase feelings of control and self-esteem. These results are in line with the growing body of research on resilience that adopts an 'ecological approach', demonstrating that efforts to increase health and functioning of individuals living in adverse circumstances should move beyond the individual (35).

### 9.6 General strengths and limitations

Strengths of this thesis are that it is based on multidimensional, prospective, longitudinal data from two well-defined observational studies in the Netherlands and the UK (61,62). These studies provided data based on observation periods of 16 years and 64 years, respectively, and sufficiently large samples to address the complexity underlying the



research questions. Furthermore, a sophisticated statistical method was applied (Latent Class Growth Analysis (63,64)), which enabled me to reduce the large heterogeneity in socioeconomic trajectories and SA into a manageable amount of meaningful categories. Another strength was the combination of quantitative and qualitative methods, which was crucial because the topic of resilience in older adults with a low SEP was largely unexplored (65). In addition to providing insight in older adults' own perspectives on socioeconomic adversity and resilience, the qualitative study illustrated some of the quantitative findings and indicated potentially fruitful new areas for studies on resilience. Nevertheless, a few general limitations of the studies in this thesis that have not yet been addressed should be discussed.

First, one of the consequences of working with multidimensional and longitudinal data is that I had to deal with a substantial amount of missing data and sample attrition. Analyses in LASA and the NSHD could be carried out for 70% and 55% of the baseline samples respectively. As is common in observational studies, these final samples had higher adulthood SEP and were healthier than the baseline samples. Therefore, underrepresentation of the lowest SEP groups may have resulted in underestimation of socioeconomic inequalities in SA, and the proportion of resilient respondents may have been overestimated. Nevertheless, these biases may be minor in terms of generalizability, because in old age, such selection effects also occur in the general population, as those with low SEP and bad health tend to have a lower life expectancy. Additionally, the LCGA models used maximum likelihood estimation to account for sample attrition and in several chapters we applied multiple imputation. These are sophisticated, robust, and commonly used methods to handle missing data (66–68).

Second, methods such as LCGA have particular features and caveats that should be carefully addressed by researchers when using them. I have followed the general guidelines provided in the literature (63,69,70), and aimed to report my statistical and theoretical considerations when choosing and interpreting models as transparently as possible. However, for one specific issue there currently seemed to exist no clear solution. This issue relates to the fact that latent class membership is probabilistic and inevitably involves uncertainty in classifying individuals. This uncertainty may result in measurement error when relating latent classes to other variables in subsequent analyses. Although methods to account for this uncertainty are becoming available (e.g. using auxiliary variables or pseudo-class draws), these can currently be applied in only a limited number of situations (71,72). However, whereas most previous studies have ignored the issue of classification uncertainty when relating variables to latent classes in subsequent analyses, I accounted for this in two ways.

In Chapters 4 to 6 I used the SA index based on the sum of probabilities to belong to a successful class for each of the nine indicators, rather than the SA index based on the sum of rounded 'highest class probabilities'. Therefore, the scores on this index accounted for those cases assigned to a 'successful' trajectory in which the highest class probability was lower than one. In chapter 7, I adjusted the comparisons of characteristics between resilient and

other groups for a variable called 'classification uncertainty', which for each individual expressed the extent to which there was statistical uncertainty in his/her classification into a single class. This was the inverse of the individual highest class probability exported from *Mplus*. I assumed that this adjustment would at least partly exclude distortions of the observed group differences due to systematic associations (if any) between the uncertainty in classifying individuals and other variables in the models. Although the weak and often not statistically significant associations between classification uncertainty and other variables indicated low risk of such bias, this method has not yet been validated and cannot rule out other potential sources of bias resulting from the specific features of LCGA (e.g. algorithms, assumptions, choices made during the model fitting process).

A third general limitation is that LCGA is data-driven and has relatively low comparability with results from other datasets. Additionally, the choice to use a group-based approach in Chapter 6 and 7 resulted in a rather crude definition of resilience, which may also decrease comparability (47). The advantages of applying a group-based approach to studying resilience have been pointed out in Section 9.5.1, but preferably, future studies should examine the same topic using different ways of operationalizing resilience and compare their findings.

Fourth, and finally, each cohort of (older) adults examined in this thesis has its own specific experiences and characteristics (e.g. war experiences, technological and societal changes, different social norms and attitudes), and psychological, social, and behavioural factors that account for socioeconomic inequalities in health and functioning of older adults may change across cohorts (73). Therefore, the answers to the research questions found in this thesis are partly specific to the cohorts included in this thesis, and may be different in more recent cohorts of older adults.

## 9.7 Recommendations

### 9.7.1 Targets for policy

Life expectancy continues to rise, and so does the share of older adults in many countries around the world. At the same time, within most countries, socioeconomic inequalities in health and functioning of older adults have not declined (74–78). The reasons for this persistence of inequalities have yet to be determined. One proposed explanation is that although in many Western countries, the number of people with a distinctly low SEP has decreased due to increasing access to education, those who do have a low SEP are increasingly marginalized and unhealthy (58,79). Therefore, socioeconomic inequalities in the health and functioning of older adults should be a continuing concern for public health and health care policy makers.

Chapter 4 confirmed the existence of such inequalities in the Dutch older population, particularly in physical and cognitive functioning, and in one aspect of social engagement,

i.e., giving emotional support to others. However, in my studies on resilience I found that self-regulation, social support, particular lifestyle factors and remaining free from chronic disease enabled some older adults with a low SEP to age successfully despite socioeconomic adversity. These findings may provide new starting points for policy makers. Based on the research in this thesis, strategies that may be considered to influence socioeconomic inequalities in SA include:

- 1) Designing interventions that increase (feelings of) control in (older) adults with a low SEP. Control over life domains such as education and employment may be particularly important. This could be realised through providing more opportunities for personal development to those in low educated jobs, providing low educated employees with more control over the execution of their work, or better rewarding low educated jobs in terms of prestige (80). Moreover, reducing stereotyping and stigmatization of low SEP individuals may help to increase feelings of control in (older) adults with a low SEP. This could start at ministries and institutions that execute social welfare policies, and at employers (58).
- 2) Making efforts to stimulate healthy lifestyles in (older) adults with a low SEP. Participants in the qualitative study were not particularly aware of any contributions of their lifestyles to successful aging. This implies that creating awareness of the health risks associated with low physical activity, smoking, and obesity may increase resilience in those with a low SEP. However, the sheer fact that such lifestyle factors may damage health is likely to be known to low SEP individuals, and it is questionable whether a strategy aimed at increasing consciousness of such effects will help. Efforts should thus also be made to improve opportunities to adopt a healthy lifestyle (81,82) in people with a low SEP. One strategy could be to create environments that stimulate a healthy lifestyle in order to unconsciously foster resilience, in particular in low SEP neighbourhoods (83).
- 3) Stimulating social participation, particularly through encouraging older adults with low SEP to continue to apply their (manual) skills – either informally or in the context of organisations. The latter would directly increase SA, as participation in organisations was one of the indicators of SA, but only a small group had a successful trajectory. Stimulating participation may be particularly important for those who have become widowed or have no partner for other reasons, as the findings on resilience in LASA showed that partner status was an important protective factor. Stimulating social participation may not only add potential sources of support, but also contribute to feelings of mastery (84), purpose in life, and generativity. Moreover, although not all studies show significant relationships, social participation may be positively related to cognitive and physical functioning (85–87), which appear to be aspects of SA in which the largest socioeconomic inequalities were observed (see Chapter 4).

It is clear that such interventions should not only be targeted at older adults but also at people in earlier phases of the life course. Moreover, as the concept of resilience may carry the danger of 'blaming the victim', it is important that results from studies on resilience are used to not only stimulate individual efforts. Improving on the factors in older adults' environments that contribute to resilience and considering the collective impact of social security arrangements are important as well.

#### 9.7.2 Recommendations for research on SA and resilience

Capturing the richness of an aging process in a single index or scale remains an ambitious scientific challenge. The SA index developed in this thesis has served the research aims well, and perhaps it has brought us one step closer to such a measure. Despite acknowledging SA as a multidimensional construct, the majority of earlier studies has not operationalised it as such (16). Therefore, future studies on SA should focus on developing multidimensional measures. Nevertheless, the studies in this thesis also showed that it is useful to 'unpack' the associations between predictors and SA by examining them for each indicator separately.

Based on the current studies on resilience, it can be recommended that more qualitative research is initiated to better understand results from quantitative studies from the perspective of those living in adversity and to potentially identify new protective factors that have special significance within adverse contexts. Qualitative research is suited for this purpose because it can provide thick description of how a specific adversity is experienced by individuals and it allows these individuals to reflect upon what outcomes they consider to be favourable in these circumstances (65). Moreover, qualitative studies can more extensively explore how particular protective factors 'work' from the perspective of those living in adversity. For example, Chapter 6 in this thesis identified mastery as a protective factor, and this finding was illustrated by the qualitative study, which indicated specific experiences that may have elicited a sense of mastery in older adults with a low SEP (e.g., experiencing a good fit between person and work or saving up small amounts of money for years to be able to eventually buy a house).

Quantitative research on resilience could benefit from developing measurement instruments and surveys that are adapted to the contexts in which they study resilience. Many studies on resilience – including those in the current thesis, have been explorative, 'leaving all options open' as to which factors might explain better than expected functioning given exposure to adversity. However, as evidence on essential protective factors accumulates, we may begin to narrow our analyses down to these factors in order to understand in more detail how and why these factors protect against adversity. Furthermore, qualitative studies often find protective factors that are rarely included in quantitative studies on resilience, for example, attachment to place, *stability in* social support (88), use of social services and support from social workers (89), and – identified in Chapter 8 – generativity and resignation. Such findings should now more explicitly guide follow-up studies that further examine and corroborate the importance of these factors for resilience. In some instances this may require adaptation of

existing instruments to particular contexts (such as adapting a generativity scale for use in older adults (37,90) or developing new measurement instruments.

Additionally, studying resilience may require innovations in analytic methods. Many common statistical methods are applied to discover general patterns and averages, but this will not suffice for studying individuals who function better than expected. Methods that focus on heterogeneity or variation might be better suited to examine research questions on resilience. Currently, latent class analyses, psychometric methods (using resilience scales), group-based approaches based on a-priori definitions and 'variable-oriented approaches' examining interaction effects (16,44) are used to study resilience. As each of these methods has its own advantages and disadvantages, we recommend to carefully consider which method suits the research question and data best, and, if possible, to compare results between different methods. A systematic comparison of these methods applied to research questions on resilience, leading to guidelines for researchers, is still needed.

#### 9.8 General conclusion

The extent to and the ways in which older adults age successfully are diverse and partly confined by one's socioeconomic circumstances. One's SEP is likely to affect multiple aspects of health and functioning in old age. Education, occupation and income partly represent unique pathways towards SA, and these pathways are associated with psychological and social factors across the life course. Multiple indicators of SEP contribute in partly unique ways to SA and should each be considered in order to properly understand socioeconomic inequalities in old age. Additionally, stressful life events in early and later life substantially affect SA, largely, but not completely independent of SEP.

Resilience provides a valuable new lens on SA, because it focuses on heterogeneity in functioning of older adults *within* groups who faced adversity, and identifies factors that protect some individuals against the risks associated with adversity. This thesis defined resilience as successful aging despite socioeconomic adversity, and found that four domains contribute to resilience: self-regulation, social support, lifestyle and avoiding chronic diseases, and social security arrangements. These domains suggest a need for interventions that increase feelings of control, stimulate social participation, and promote healthy lifestyles in people with a low SEP, where responsibility should be shared between individuals and social institutions.

Several areas remain to be further investigated, including the roles of generativity and passive coping strategies such as resignation for resilience, the impact of using particular methods to study resilience on the results, and the extent to which protective factors vary according to the adversity and outcome being studied.

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