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**Well-being in the light of
being very old**

Conceptualizations, associations,
and variations



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Tillägnad Mormor och Morfar
För allt ni har gett mig

Förord

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Marina Näsman

Abstract

Well-being has been increasingly acknowledged as an important measure of societal progress, as well as within paradigms such as successful, active, and healthy aging. Nevertheless, research focusing on well-being in very old age is still limited compared to research focusing on the general older population. Thus, the aim of this thesis was to gain extended knowledge of well-being in very old age. This included an exploration of the conceptualization of well-being in very old age and the conduction of three studies focusing on knowledge gaps regarding morale, which could be seen as a cognitive dimension of subjective well-being. More specifically, four research questions were posed: (1) How is well-being conceptualized in research focusing on very old adults? (2) Are there age differences in the level of morale and its associated factors from young old to very old age? (3) How does morale change over a five-year period among very old adults? (4) What are the risk factors for a decrease in morale over five years among very old adults?

The first research question was addressed through a review of scientific articles with a focus on well-being in very old age published in 2009–2019. Rodgers' evolutionary concept analysis was used as a scientific method for the review. Accordingly, the attributes, antecedents, and consequences of well-being in very old age were explored. The analysis also included an identification of surrogate terms and related concepts. For the studies on morale, data from the Gerontological Regional Database (GERDA) conducted in Northern Sweden and Western Finland was used, since it allows for comparisons between younger old and very old adults as well as longitudinal analyses. One of the studies was based on survey data from 2016 including individuals born in 1950, 1945, 1940, 1935, and 1930. The remaining two studies were based on longitudinal home visits data, which included structured interviews with individuals aged 85 years and older. The Philadelphia Geriatric Center Morale Scale (PGCMS) was used to measure morale. Various sociodemographic, social, and health-related variables, and an index of negative life events were included as explanatory variables. Multiple linear regression was the main method for analysis in all three studies.

The results of the concept analysis revealed four main attributes of well-being in very old age: "Multifaceted"; "Intertwined with health and quality of life"; "Ability to adapt"; and "Part of successful aging". Further, various antecedents, consequences, and related concepts were identified and discussed. Regarding age differences in morale and its associated factors, the results showed that there were age group differences in the level of morale, as well as age group differences in the occurrence of different sociodemographic, social, and health-related variables and their association with morale. Additionally, the results showed that negative life events had a cumulative negative association with changes in morale, and that the death

of one's child, perceived loneliness, and depression were identified as main risk factors of having lower morale in very old age. However, the results also implied that various sociodemographic, social, and health-related factors should be taken into account when promoting morale.

In conclusion, well-being, including morale, in very old age seems to bear both similarities and differences to well-being in other age groups. The results of this thesis also highlight the importance of conducting research, and developing strategies to promote well-being, with a specific focus on this age group while also acknowledging the diversity within this population. A person-centered approach to the promotion of well-being is thus crucial. Nevertheless, preventing loneliness and depression seems to be essential for perceived well-being in very old age. Future research should focus on implementing and evaluating interventions targeting very old adults, in order to gain more information on appropriate actions.

Key words: well-being; morale; very old adults; aging; age differences; conceptualization; concept analysis; longitudinal studies; life events; Finland; Sweden

Abstrakt

Välbefinnande har allt mer uppmärksammats och erkänts som ett viktigt mått på samhällslig utveckling och inom paradigmet såsom framgångsrikt, aktivt och hälsosamt åldrande. Likväl är forskning som fokuserar på välbefinnande hos de allra äldsta hittills begränsad jämfört med forskning som fokuserar på den äldre befolkningen i stort. Syftet med denna avhandling var således att erhålla utökad kunskap om välbefinnande hos de allra äldsta. Detta omfattade en undersökning av konceptualiseringen av välbefinnande hos de allra äldsta och genomförandet av tre studier med fokus på kunskapsluckor gällande livsgnista [eng. morale] som kan ses som en kognitiv dimension av subjektivt välbefinnande. Fyra övergripande forskningsfrågor har inkluderats i avhandlingen: (1) Hur har välbefinnande konceptualiserats i forskning som fokuserar på de allra äldsta? (2) Finns det åldersgruppsskillnader i nivån av livsgnista och dess påverkansfaktorer i ett sampel som inkluderar 66–86-åringar? (3) Hur förändras livsgnistan över en femårsperiod bland de allra äldsta? (4) Vilka riskfaktorer för en försvagning i livsgnistan kan identifieras över en femårsperiod hos de allra äldsta?

Den första forskningsfrågan undersöktes genom en översikt av engelskspråkiga, vetenskapliga artiklar publicerade 2009–2019 som fokuserade på välbefinnande hos de allra äldsta. Metoden för översikten utgick från Rodgers evolutionära begreppsanalys. I linje med metoden utforskades attributen, föregångarna och konsekvenserna av välbefinnande hos de allra äldsta. Analysen inkluderade också identifieringen av surrogattermer och relaterade begrepp. Studierna om livsgnista baserades på data från Gerontologisk Regional Databas (GERDA) som utförts i norra Sverige och västra Finland eftersom materialet möjliggjorde jämförelser mellan yngre äldre och de allra äldsta samt longitudinella analyser. En av studierna baserades på data från en enkätundersökning som utfördes år 2016 och inkluderade individer födda år 1950, 1945, 1940, 1935 och 1930. De två andra studierna baserades på longitudinellt hembesöksdata som inkluderade strukturerade intervjuer med individer som var 85 år och äldre. Mätinstrumentet Philadelphia Geriatric Center Morale Scale (PGCMS) användes för att mäta livsgnista. Olika sociodemografiska, sociala och hälsorelaterade variabler samt ett index över negativa livshändelser inkluderades som förklarande variabler. Linjär regression var den huvudsakliga analysmetoden i de tre studierna.

I resultaten från begreppsanalysen framträdde fyra huvudattribut av välbefinnande hos de allra äldsta: "Multifacetterat", "Sammanflätat med hälsa och livskvalitet", "Anpassningsförmåga" och "En del av ett framgångsrikt åldrande". Därtill identifierades och diskuterades olika föregångare, konsekvenser och relaterade begrepp. Resultaten beträffande livsgnista visade att det fanns skillnader i nivån av livsgnista mellan åldersgrupperna såväl som åldersgruppsskillnader i fördelningen av sociodemografiska,

sociala och hälsorelaterade faktorer och deras koppling till livsgnista. Resultaten visade också att negativa livshändelser hade en kumulativ negativ effekt på förändringar i livsgnista och att upplevd ensamhet, depression och att ens barn hade gått bort var huvudsakliga riskfaktorer för svagare livsgnista hos de allra äldsta. Resultaten visade emellertid att även andra sociodemografiska, sociala och hälsorelaterade faktorer bör tas i beaktande i stärkandet av livsgnistan.

Sammanfattningsvis verkar välbefinnande, inklusive livsgnista, hos de allra äldsta ha både likheter och skillnader jämfört med välbefinnande i andra åldersgrupper. Resultaten från avhandlingen framhäver också vikten av att bedriva forskning och utveckla strategier för att främja välbefinnande med ett specifikt fokus på de allra äldsta samtidigt som mångfalden inom denna grupp tas i beaktande. En personcentrerad ansats i det främjande arbetet är därmed av största vikt. Icke desto mindre verkar förebyggande av ensamhet och depression vara väsentligt för upplevt välbefinnande hos de allra äldsta. Framtida forskning kunde fokusera på implementering och utvärdering av interventioner som riktas till mycket gamla människor för att erhålla mer information om vilka insatser som är lämpliga.

Nyckelord: välbefinnande; livsgnista; de allra äldsta; åldrande; åldersskillnader; konceptualisering; begreppsanalys; longitudinella studier; livshändelser; Finland; Sverige

List of articles

Study I

Näsman, M., Nyqvist, F., & Nygård, M. (2020). Untangling the concept of well-being in very old age: an integrative review using Rodgers' evolutionary concept analysis. Submitted manuscript.

Study II

Näsman, M., Niklasson, J., Saarela, J., Nygård, M., Olofsson, B., Gustafson, Y., & Nyqvist, F. (2020). Morale in old age and its association with sociodemographic, social, and health-related factors in different age groups. *Journal of Aging Research*. <https://doi.org/10.1155/2020/3939718>

Study III

Näsman, M., Niklasson, J., Saarela, J., Nygård, M., Olofsson, B., Conradsson, M., Lövheim, H., Gustafson, Y., & Nyqvist, F. (2019). Five-year change in morale is associated with negative life events in very old age. *Aging & Mental Health*, 23, 84–91. <https://doi.org/10.1080/13607863.2017.1393795>

Study IV

Näsman, M., Niklasson, J., Nygård, M., Olofsson, B., Lövheim, H., Gustafson, Y., & Nyqvist, F. (2020). Risk factors for a decrease in high morale in very old people over a 5-year period: data from two Nordic countries. *European Journal of Ageing*, 17, 31–41. <https://doi.org/10.1007/s10433-019-00521-1>

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List of abbreviations

AAI	Active Ageing Index
ADL	Activities of Daily Living
GDP	Gross Domestic Product
GDS	Geriatric Depression Scale
GERDA	Gerontological Regional Database
IADL	Instrumental Activities of Daily Living
MADRS	Montgomery Åsberg Depression Rating Scale
MMSE	Mini Mental State Examination
OBS	Organic Brain Syndrome Scale
OLS	Ordinary Least Squares
PADL	Personal Activities of Daily Living
PGCMS	The Philadelphia Geriatric Center Morale Scale
PWB	Psychological Well-Being
QOL	Quality of Life
SOC	Selective Optimization with Compensation
SST	Socioemotional Selectivity Theory
SWB	Subjective Well-Being
T1	Baseline (Time point 1)
T2	Follow-up (Time point 2)
WHO	World Health Organization

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1. Introduction

1.1. Background

Perceived well-being is an essential feature of our overall life experience, and is as important in young age as in older age (Lansford, 2018). Overall, well-being can serve as an important marker of societal progress, and is considered as a vital complement to measures focusing on economic growth such as Gross Domestic Product (GDP) (Helliwell, et al., 2020; Stiglitz et al., 2009; Stiglitz et al., 2018). According to Stiglitz et al. (2009), there has been an increasing gap between the information retrieved from GDP and what people consider important for well-being, implying that subjective measures of well-being are highly relevant. Being able to assess and explain individuals' perceptions of their own well-being can for example provide tools for promoting welfare on both an individual and a societal level (Stiglitz et al., 2018). Human well-being is generally affected by factors such as standard of living, social relationships, and health (Diener et al., 2018; Stiglitz et al., 2009). However, each life stage involves varying life situations and circumstances that shape the individual's life and consequently have implications for well-being. In this thesis, well-being is examined in the light of being very old by exploring its conceptualization, its associated factors, and variations between age groups and over time.

Very old age is usually defined as being 80 or 85 years and older, and entails experiencing various social as well as health-related losses (Baltes & Smith, 2003; Smith et al., 2002, World Health Organization [WHO], 2015, p.25). Considering the increasing survival selection occurring with advancing age, it is also likely that very old adults differ from younger old (Smith & Ryan, 2016, p.304). In contrast to younger age groups, very old adults have a different gender distribution (more women than men), and higher prevalence of for example dementia, comorbidity, and institutionalization (ibid.). Importantly, very old adults are at the same time a highly heterogeneous group, with some being independent while others are highly depending on the help and care from others (WHO, 2015). Further, being very old means having a long life experience, denoting that experiences during the life span have shaped the individual. Gains and losses occur during the entire life span, but there is, however, often an imbalance in very old age where the losses outnumber the gains (Freund, 2008). According to Shmotkin (2011, p.34), very old age entails an intertwinement between resiliency and vulnerability, in the sense that surviving into very old age in itself denotes success while it at the same time involves deterioration. The time perspective in very old age also naturally differs from previous stages of life, meaning that future time is limited while a long past can enable a supportive capability, i.e. past experiences can

support current well-being (ibid.). Taken together, it is thus important to take into consideration the circumstances shaping this stage of life when studying well-being.

One of the reasons why research on well-being in very old age is important is related to increased longevity, meaning that a greater number of individuals reach advanced age. Thanks to medical advancements and extensive improvements in living conditions, life expectancy increased rapidly during the 20th century in industrialized countries. In recent decades, increasing life expectancy in high-income countries has mainly been explained by decreasing mortality in older ages (Christensen et al., 2009; WHO, 2015). Additionally, fertility rates are falling worldwide (WHO, 2015), and the working-age population is decreasing (European Commission, 2020). There will thus be an increase in the proportion, and in absolute numbers of older people. The fastest growing segment of the populations in developed countries is very old people (Christensen et al., 2009; European Commission, 2020; WHO, 2011).

A burning question regarding population aging and increased longevity is whether the years added to life are followed by more years living with disabilities or not (WHO, 2015). In an overview conducted by Christensen et al. (2009), the overall trend regarding disability seemed to be positive for people younger than 85 years, i.e., the occurrence of limitations and disabilities were postponed despite occurrence of chronic diseases and conditions. However, research regarding individuals older than 85 years has been less consistent, partly due to less available data, with some more encouraging results and some results pointing to that the last years in life will be characterized by dependency (see also WHO, 2015). In the study of Enroth et al. (2020), based on data from the Vitality 90+ Study conducted in Finland, the disability-free life expectancy had increased in both men and women between the years 2001 and 2018. Nevertheless, the authors still concluded that, taken together, the care needs will increase as the population ages. Similarly, a study forecasting the care needs in England showed that there will be an increase in the number of very old adults who have highly complex care needs (Kingston et al., 2018). Consequently, population aging creates various challenges for social and health care as well as for public budgets, which has become even more evident following the Covid-19 pandemic (European Commission, 2020).

Accordingly, to face the challenges of aging populations, policy emphasis has been put on promoting successful, active, and healthy aging (Foster & Walker, 2015; WHO, 2015), and one important tool within this paradigm is the promotion of well-being. Promoting well-being is crucial from a public health perspective, due to its possible positive effects on health and functioning (Diener et al., 2017; Lansford, 2018). Further, considering the high heterogeneity in old age, research focusing explicitly on very old people is needed. Especially in very old age where at least some decrease in health status and increase in disability is to be expected, perceived well-being

could serve as a more important marker of overall life experience than physical (objective) health (George, 2010). However, research on well-being in older adults has been underrepresented in a European context (Miret et al., 2015). Additionally, policies targeting the very old population are also rare, indicating that research focusing on well-being in very old adults could provide essential information to policy development (Pin & Spini, 2016).

To be able to plan and implement appropriate actions to promote well-being in very old age, a greater understanding of what the concept actually entails is needed. Issues regarding inconclusiveness in the use of the concept have been raised both in research on well-being in general (e.g. Dodge et al., 2012; Foregard et al., 2011) and in gerontological research (George, 2010). Explicating the concept of well-being in the context of very old age could increase its utility (Rodgers, 2000), and guide future research and policy development. The first study of this thesis is thus a concept analysis including contemporary research on well-being in very old age.

Considering the many social and health-related changes that are likely to occur during very old age, this thesis has further a specific focus on morale, which can be seen as a cognitive dimension of subjective well-being (SWB) (Bowling, 2005) that can be defined as future-oriented optimism or pessimism regarding challenges associated with aging (Mannell & Dupuis, 2007). Morale could thus be considered to be able to reflect the implications of facing changes, and may consequently be considered as an interesting dimension of well-being to look into when focusing on very old adults. The use of the Philadelphia Geriatric Center Morale Scale (PGCMS) (Lawton, 1975) to measure morale further supports this notion due to its multidimensionality and specific design to suit assessments of older adults. Additionally, high morale has shown to be associated with increased survival and a lower risk of suffering from depressive disorders five years later in very old age (Niklasson et al., 2015a; Niklasson et al., 2017), highlighting the relevance of examining morale further. Even though morale in old age has been examined previously in various settings, there are still some gaps in knowledge that this thesis aims to fill. There is a need for more information about morale in different age groups, in particular whether the same factors affect morale in different stages of old age. Therefore, one of the studies focused on examining age group differences. By contrasting results regarding younger old and very old adults, increased knowledge on well-being in very old age can be retrieved. Especially more longitudinal studies focusing on very old adults are needed in order to identify potential risk factors of having lower morale. Accordingly, two of the studies included in this thesis have a longitudinal design, and a focus on changes over time.

1.2. Aim

The aim of the present thesis is to gain extended knowledge of well-being among very old adults. This will be achieved by an exploration of the

conceptualization of well-being in the context of very old age, and by empirical investigations of morale with focus on age group differences and changes over time based on data from Sweden and Finland. The following research questions were posed:

1. How is well-being conceptualized in research focusing on very old adults? (Study I)
2. Are there age differences in the level of morale and its associated factors from young old to very old age? (Study II, III & IV)
3. How does morale change over a five-year period among very old adults? (Study III)
4. What are the risk factors for a decrease in morale over five years among very old adults? (Study III & IV)

1.3. Structure of the thesis

The thesis is based on four original articles (Study I–IV), and consists of five chapters. An overview of the studies can be found in Table 1. The first, introductory chapter is followed by an overview of central concepts, theories, and previous research on well-being in very old age. Chapter three encompasses the methods used in each article, and chapter four comprises a summary of the studies and their results. The last chapter includes a discussion of the main findings, a methodological discussion, and a summary of the conclusions and implications of the findings.

Table 1. *Overview of the studies included in the thesis.*

Article	Aim	Data	Sample	Study design	Main explanatory variables	Analysis
Study I Untangling the concept of well-being in very old age – an integrative review using Rodgers’ evolutionary concept analysis	Explore the conceptualization of well-being in very old age	Scientific articles	49 articles included in the final analysis	Literature review/concept analysis	-	Rodgers’ evolutionary concept analysis (Rodgers, 2000)
Study II Morale in old age and its association with sociodemographic, social, and health-related factors in different age groups	Examine factors associated with morale in different age groups among older adults	GERDA survey	66-, 71-, 76-, 81-, 86-year-olds, n=9047	Cross-sectional	Age Socio-demographic, social, and health related variables	Multiple linear regression
Study III Five-year change in morale is associated with	Investigate changes in morale in very old people over a	GERDA home visits	85-, 90-, ≥95-year-olds, n=204	Longitudinal T1 data from 2000–2002 and 2005–2007	Index of negative life events, PGCMS at T1	T-test, Correlation, Multiple

	negative life events in very old age	five-year follow-up period and the association with negative life events			T2 data from 2005–2007 and 2010–2012		linear regression
5	Study IV Risk factors for a decrease in high morale in very old people over a 5-year period: data from two Nordic countries	Identify risk factors for a decrease in morale over 5 years in very old people among those with high morale at baseline	GERDA home visits	85-, 90-, ≥95-year-olds, n=174	Longitudinal T1 data from 2000–2002, 2005–2007, and 2010 T2 data from 2005–2007, 2010–2012, and 2015	Living alone, deceased children, number of visits, feelings of loneliness, ADL, MMSE, impaired hearing, impaired vision, self-rated health, depressive disorders	Multiple linear regression

GERDA Gerontological Regional Database, PGCMS the Philadelphia Geriatric Center Morale Scale, ADL Activities of Daily Living, MMSE Mini Mental State Examination, T1 Time point 1, T2 Time point 2

2. Concepts, theories, and previous research

2.1. The concept of well-being

Well-being is highly complex, both as a phenomenon and as a concept, as it encompasses multiple domains and measures (Tov, 2018). It can denote both objective and subjective aspects (Foregard et al., 2011). Objective aspects focus on standard of living, including housing and income. Subjective measures such as life satisfaction, on the other hand, assess how people perceive their life situation and their life as a whole (ibid.). Some views on well-being focus on either objective or subjective aspects, societal or individual factors, while others try to combine them. In this thesis, emphasis is put on the subjective, self-perceived, part of well-being, while acknowledging that objective and subjective well-being are connected.

Perceived well-being is often studied from two different schools of thought: the hedonic perspective, and the eudemonic perspective (Deci & Ryan, 2008). These perspectives are, however, correlated and could be seen as complementary (Deci & Ryan, 2008; Tov, 2018). The hedonic view is based on assumptions that humans seek pleasure and avoid discomfort. SWB is usually connected to this perspective, and is generally described as consisting of cognitive and affective (i.e., emotional) components (Diener, 1984). The most commonly examined cognitive component of SWB is called life satisfaction, and refers to subjective evaluations of one's life as a whole (ibid.). The affective components are usually divided into positive and negative affect, where positive affect refers to feelings such as joy, and negative affect to feelings such as anger. High SWB is assumed to occur when the individual experiences low levels of negative affect, and high levels of positive affect and life satisfaction. Positive and negative affect are more clearly of hedonistic nature, while it could be argued that life satisfaction also possesses some eudemonic elements (Deci & Ryan, 2008). Hedonic well-being could also be described as positive feelings, while eudemonic well-being refers to positive functioning (Tov, 2018).

The eudemonic perspective is consequently more focused on fulfilling one's potential, and goes beyond mere feelings of happiness (Deci & Ryan, 2008). Additionally, the eudemonic view is more based on the assumption that well-being is a process rather than an outcome, or an end state (ibid.). Psychological well-being (PWB) is seen as adhering to this perspective, and consists according to Ryff (1989) of six different aspects: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Taken together, the hedonic and eudemonic aspects of well-being can also be seen as forming a state of flourishing. Seligman (2011, p. 16–25) has for example developed a model of flourishing called PERMA, which consists of positive emotions, engagement, relationships, meaning, and achievement.

Further, there is also a large variation in how different aspects of well-being are described. According to George (2010), the terms SWB, PWB, happiness, positive affect and morale are often used synonymously. Whilst all refer to a positive orientation towards life, they all have their conceptual differences, for example regarding stability (see also Bowling, 2005). Nevertheless, George (2010) concluded that the concepts are more alike than different. Additionally, even though there is no consensus regarding how well-being should be defined, well-being has increasingly been acknowledged as consisting of many different aspects (Tov, 2018). There are also several other closely related concepts to well-being such as quality of life (QOL), health, and welfare (Foregard et al., 2011; Veenhoven, 2000). These concepts bear similarities with well-being, and are often used more or less interchangeably, but could be seen as distinct concepts. The use of these concepts is also inconsistent, as they can be both used as umbrella terms for “all that is good”, but also to denote specific aspects (Veenhoven, 2000).

2.2. Theories of well-being

The research field of SWB is often seen as atheoretical, i.e., most studies do not build upon a specific theory (George, 2010). Similarly, research in social gerontology has also been known to use theories to a limited extent (Alley et al., 2010). There are, however, several theories of well-being of more overarching type, and theories related to aging well and to adaptation that can serve as frameworks for interpretation. In this thesis, the studies are not designed to test a specific theory, but theories have together with previous research been used as guiding lights when posing the research questions and when choosing which variables to include, as well as in the interpretation of the results. An overview of the theories included in this chapter, and how these could be seen as connected to well-being in very old age is presented in Table 2.

Table 2. *Overview of included theories and how they can be connected to well-being in very old age*

Theories	Short description	Connection to well-being in very old age
Overarching		
Allardt's model of welfare ¹	Having, loving, and being denote three essential aspects of well-being stemming from both subjective and objective indicators	Objective and subjective well-being are interconnected. Various sociodemographic, social, and health-related factors are important to take into account when examining well-being
Veenhoven's four qualities of life ²	Quality of life constitutes of life chances and life results that are connected to external and internal resources	
Aging well		
Successful, active, and healthy aging ³	Policy frameworks emanating from a view that old age is more than losses and disabilities, and that older adults should be supported in being able to contribute to society and do things that they value	Frameworks for aging well and well-being are dynamically linked. Well-being can promote aging well, while different parts of successful, active, and healthy aging can promote well-being
Adaptation		
Hedonic treadmill and Set-point theory ⁴	Individuals have a certain set-point level of well-being that they eventually return to after experiencing adversities	Very old people could be able to adapt to new circumstances and return to their initial level of well-being

Well-being according to Dodge et al. ⁵	Well-being is the balance point between an individual's resources and the challenges faced	Decreasing resources and simultaneously increasing challenges in very old age might inhibit the ability to adapt and deteriorate well-being
Selective optimization with compensation ⁶	The use of the strategies selection, optimization, and compensation important to the management of resources by maximizing gains and minimizing losses	The use of SOC-strategies can be used to compensate for losses and promote well-being
Socioemotional selectivity theory ⁷	Shifts in time perspective have implications for emotion regulation and social relationships	Social selection and regulation can be used to promote well-being

¹Allardt, 1993 ²Veenhoven, 2000 ³Bowling, 2007; Foster & Walker, 2015

⁴Diener et al., 2006; Headey, 2008 ⁵Dodge et al., 2012 ⁶Baltes & Baltes, 1990

⁷Carstensen, 2006

There are several different models/theories of well-being of a more overarching type, which encompass both external and internal, objective and subjective parts. For example, Erik Allardt (1993) proposed a model of measuring welfare by three main components: having, loving, and being. The component “Having” refers to material conditions such as economy, housing, employment, health, and education. The component “Loving” denotes the importance of feeling connected to others, and can for example be measured with aspects of quality and quantity of social contacts. Lastly, the component “Being” denotes the importance of integration with society and personal growth and fulfillment, for example through different forms of participation.

Another example is Veenhoven’s model regarding four qualities of life (2000), consisting of inner and outer qualities as well as life chances and life results. The life chances can be divided into two different parts: environmental chances (outer) and the inner capacities to make use of these. The environmental chances are also called “livability of the environment” and highlights the importance of good living conditions. The “life-ability of the person” constitutes of personal resources, such as physical and mental health, that affect the ability to deal with challenges and problems. The life results focus on outcomes, consisting of “utility of life” which denotes that life has a meaning, and “appreciation of life” which denotes the individual’s own perception, often referred to as happiness, SWB, or life satisfaction. These theories could be considered relevant to the current thesis, since they highlight the importance of including various factors in the examination of well-being. Accordingly, the three studies focusing on morale have included sociodemographic, social, and health-related variables of both more subjective and objective character. Additionally, various antecedents and consequences of well-being in very old age have been discussed in Study I.

Furthermore, since this thesis has a specific focus on very old adults, frameworks related to aging well, such as successful aging, and their connection to well-being deserve closer examination. Theories related to adaptation also become relevant when examining well-being in very old age, considering that this stage of life is characterized by facing changes that often require adaptation and readjustment, which is also reflected in the studies of this thesis. These theories are described in more detail below.

2.2.1. Frameworks for aging well

As previously mentioned, different efforts to promote aging well has been central in policy-making during the last decades, partly due to population aging. Accordingly, several frameworks focusing on aging well including successful, active, and healthy aging have been developed. These frameworks are closely related but also have their differences (Bowling, 2007; Foster & Walker, 2015). In this section, emphasis is put on what these frameworks have in common, and more specifically their association with well-being. All of these concepts are for example connected to a discourse focusing on that

old age is more than losses and disabilities (Foster & Walker, 2015; WHO, 2015).

Both successful aging and active aging are based on the activity perspective (Foster & Walker, 2015), i.e., an emphasis to stay active by maintaining social relationships and social roles, or replacing them with new ones (Teles & Ribeiro, 2019). Rowe and Kahn (1987) have proposed one of the most widespread definitions of successful aging, including three main determinants: low probability of disease, high cognitive and physical function, and active engagement with life. Since then, various models of successful aging have been suggested, from biomedical to more socially or psychologically oriented (Bowling, 2007; Wahl, 2020). Well-being is usually included in the more psychosocial models, for example by measuring life satisfaction (Bowling, 2007).

While successful aging has been the dominant framework in the United States, active aging has been the primary focus in Europe (Foster & Walker, 2015). There is no concise description of active aging, but one way of describing this framework is that it facilitates the rights of older people to stay healthy, to be able to remain in work life longer, and to be able to participate in the community and in politics (Foster & Walker, 2015). According to Foster and Walker (2015), it is important that the dimensions of active aging also aim to promote well-being. Mental well-being is also included in the Active Ageing Index (AAI), which was developed in 2012 to create a useful tool to policymakers in their efforts to develop appropriate strategies and actions to promote active aging (Zaidi et al., 2017).

WHO developed a policy framework for active aging in 2002 (WHO, 2002), but has since then shifted focus from active aging to healthy aging. According to WHO (2015), both active aging and healthy aging highlight actions across multiple sectors that enable older people to remain a resource to their families, communities, and economies. Well-being is also seen as central to the framework of healthy aging, which is reflected in the definition according to WHO (2015, p. 28) where healthy aging is seen as "... the process of developing and maintaining the functional ability that enables well-being in older age". WHO (2015) has thus acknowledged that a definition of healthy aging as being disease-free is problematic, and has applied a more holistic approach where emphasis is put on that the individual should be able to do the things he or she values, rather than being free from disability or disease. Accordingly, the framework of healthy aging suggested by WHO could be considered to be connected to the capability approach developed by Amartya Sen and Martha Nussbaum (Alexander, 2008).

All of these frameworks have received criticism, for example, depending on the criteria being set, that they are based on aspects that are more or less impossible to achieve in very old age (Wahl, 2020). For example, in a study of those 85 years and older conducted in the Netherlands, only ten percent fulfilled all criteria for successful aging (von Faber et al., 2001), when it was defined as optimal physical, social, and cognitive functioning, and well-being.

This might in turn give rise to stigmatization of those who are aging “unsuccessfully” (Wahl, 2020). Accordingly, researchers have also made efforts to develop models of how to age well in very old age. For example, the Active Ageing-Well Being Index has recently been developed with very old adults in mind (Fritzell et al., 2020). The index is focused on resources and contains six dimensions: economic resources, participation in activities, health resources, access to care, family and social relations, and participation in society. In contrast to the AAI, less emphasis is for example put on employment, which is not considered relevant for very old adults.

A lay perspective, i.e., to listen to the older adults themselves has also been highlighted as a way to get a more nuanced picture of aging well (Bowling & Dieppe, 2005). In an interview study conducted by Jopp et al. (2015), the authors identified some of the aspects of successful aging suggested by Rowe and Kahn (1987) in the respondents’ answers, but also a more multifaceted picture, including resources such as social relations, finances, and well-being. Successful aging was thus seen as multidimensional and more than the absences of illness and disability. In qualitative interviews with very old adults, well-being and social functioning were deemed more important than physical and cognitive functioning for successful aging (von Faber et al., 2001). Similarly, Nosraty et al. (2015) found that although physical health was perceived as important for successful aging in interviews with nonagenarians, social and cognitive aspects were considered even more so. Nordmyr et al. (2020) found similarities between healthy aging and mental well-being as conceptualized by very old adults. Mental well-being was seen as consisting of activities (enjoyment and fulfilment), capability (functioning and independence), orientation (awareness, shifted perspectives and values), and connectedness (sense of belonging). Similar to the other studies, they concluded that physical health and functioning was not the principal component of healthy aging in very old age.

In sum, models of successful, active, and healthy aging have increasingly acknowledged the importance of including well-being, both in general and in very old age. These frameworks could thus be considered relevant to the current thesis from two different, but dynamically linked, perspectives. On the one hand, well-being is seen as an important aspect of successful, active, and healthy aging. On the other hand, the promotion of other aspects of these frameworks, such as functioning and social connectedness, could also be expected to promote well-being.

2.2.2. Theories related to adaptation

Within the well-being paradigm, there are a few theories such as the hedonic treadmill (Diener et al., 2006) and set point theory (Headey, 2008; 2010), which propose that individuals have a certain baseline, or set point, level of well-being that the individual eventually return to despite experiencing various positive and negative life events (i.e., they adapt to new

circumstances). According to these theories, an individual's level of well-being/happiness is largely determined by personality traits, heredity, and experiences early in life (Headey, 2008; 2010). This would in turn imply that efforts in enhancing perceived well-being would not be especially fruitful in the long term. However, evidence questioning these theories has emerged (Headey, 2010). Headey (2008) found that levels of SWB (measured with life satisfaction) did show long-term changes (in both positive and negative direction) among some individuals (20 % of the sample), even though the level remained stable among the majority. Similarly, Diener et al. (2006) pointed out several flaws in the hedonic treadmill, including that there is empirical evidence showing that the level of well-being can change. Additionally, they highlighted that there are individual differences in adaptation, for example depending on which coping strategies the individual is prone to use. In conclusion, despite its relative stability, there are promising results pointing to that SWB can be promoted by measures taken by the individual and by the society. Additionally, results showing that well-being also can decline over time highlight the need to take preventive measures to avoid such deterioration.

Deriving from theories regarding set-points and individuals' need for homeostasis, Dodge et al. (2012) proposed that well-being should be viewed as the balance point between an individual's resources and the challenges he or she faces, which they illustrated as a seesaw (see Figure 1). Accordingly, if the challenges outnumber the resources at hand, well-being is being compromised. In turn, this implies that adapting to challenges in very old age would be possible, given that the individual possesses adequate resources.

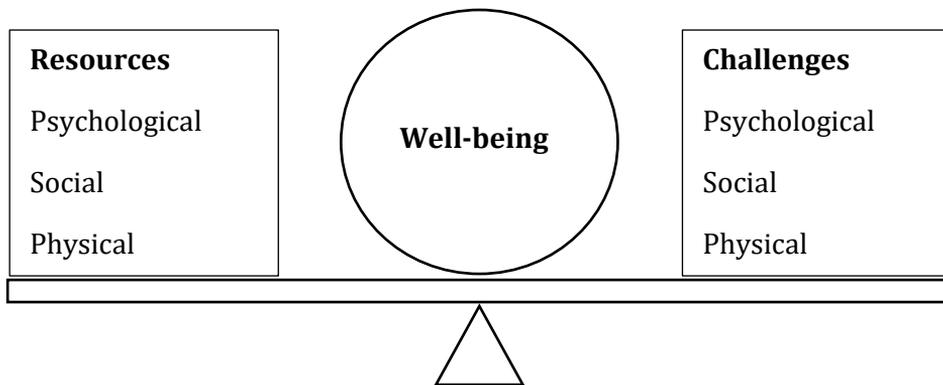


Figure 1. Definition of well-being according to Dodge et al. (2012, p.230). Replicated with permission.

Another theory related to adaptation is Selective Optimization with Compensation (SOC), which is a theory of human development that can be used as an explanation to how older adults can cope with challenges related to aging (Baltes & Baltes, 1990). The SOC model can also be seen as a key in understanding successful aging (Freund, 2008), and effective use of SOC-strategies can have positive implications for perceived well-being (Teshale & Lachman, 2016). The use of SOC-strategies have for example shown to be beneficial for experiencing higher SWB and other positive outcomes when suffering from multiple chronic conditions (Zhang & Radhakrishnan, 2018), and could thereby be considered highly relevant in very old age.

The model focuses on the management of resources and entails an aspiration of maximizing gains and minimizing losses by using the strategies selection, optimization, and compensation. Selection refers to the process of choosing personally important goals to allocate resources on, and invest time and energy in (Freund, 2008). Further, optimization means pursuing the selected goals in an attempt to maximize gains. In situations where an older person is no longer able to perform a certain task, he or she can use compensation as a strategy to deal with the losses (Freund, 2008). Resources are also important to take into consideration in the model, which in a broad sense refer to different means needed to achieve one's goals (Freund, 2008), for example social, economic, mental, physical, and functional resources (Randall et al., 2011). In old age, the conservation of resources becomes increasingly more important than the acquisition of new ones (Freund, 2008). Previous research has shown that individuals possessing more resources were more prone to use the strategies included in the SOC model (Lang et al., 2002). Further, Jopp and Smith (2006) found that resources could have a direct effect on SWB in very old adults, but also that SOC-strategies could buffer the effect of having low resources on SWB. Taken together, these results show on the one hand that those who are rich in resources use SOC-strategies to a greater extent, and on the other hand that those who have limited resources could benefit even more from using these strategies.

The Socioemotional Selectivity Theory (SST) is another theory of human development describing changes over the life course, with an emphasis on time perspective, emotion regulation and social relationships (e.g. Carstensen, 2006). SST argues that when an individual perceive their future time as limited, he or she starts to put more emphasis on emotionally important relationships (ibid.). These individuals are also more focused on short term goals rather than investing resources in things that might pay off in the long run. Likewise, they put more effort into experiencing positive emotions and try to avoid the negative, which in turn leads to a generally enhanced appreciation of life (Carstensen et al., 2003). The use of social selection and other types of social regulation could according to Charles and Carstensen (2010) consequently be used as means to maintain high levels of well-being. Nevertheless, if the individual is exposed to prolonged and unavoidable stress, stemming from for example social network losses and

restraints in health associated with very old age, the positive effects of socioemotional selectivity might be compromised (ibid.).

To sum up, these theories related to adaptation emphasize that resources needed to be able to adapt are important, but also that development over the life course could contribute to the adaptation process that is crucial for maintaining well-being in very old age. Additionally, adaptation might be possible to a certain limit, but is compromised if the challenges occur too frequently and become too overwhelming.

2.3. Well-being in very old age

Considering the scope of this thesis, it is important to elucidate what “very old” refers to. In research, very old age is usually defined as being 80 or 85 years and older, even though there is no concise cut-off when very old age commences. Very old adults can also be referred to as “old old”, “older old”, or “oldest old”, in contrast to younger old, denoting that this phase of life is a stage at the farthest end of the lifespan. Similarly, a distinction has been made between the third and the fourth age. The fourth age is the last stage in the human lifespan and is characterized by an imminent risk of frailty, losses and impairments (Baltes & Smith, 2003). On a population level, the transition from the third age to the fourth age can be considered to occur when 50 percent of the individuals in the same birth cohort who reached the age 50 or 60 are no longer alive, which in developed countries would refer to individuals aged 80-85 (ibid.). The fourth age can also be described as beginning when the individual is no longer able to lead his or her life independently. From this view, a cut-off based on chronological age is not easy to apply. Hence, the former definition based on a population level (chronological age) is often used in research.

It is also relevant to discuss whether well-being in very old age differs from well-being in younger ages. According to Donisi et al. (2020), mental well-being seemed to largely be of similar, multidimensional structure in very old age as in younger old age and in adults, even though some differences were identified. Additionally, some predictors of SWB such as deprivation and close social relationships are largely consistent over the lifespan, while others are more related to a certain phase in life such as employment (Lansford, 2018). On the one hand, it could thus be argued that well-being in very old age does not differ much from well-being in previous stages of life. On the other hand, as previously mentioned, becoming and being very old entails an accumulation of social and health-related changes (Baltes & Smith, 2003; Jopp et al., 2016; Smith et al., 2002). Consequently, this often leads to a transition from the third age to the fourth age, i.e., the individual is increasingly depending on the help from others. These changes could in turn be expected to affect well-being, and it is therefore important to take into account the specific life circumstances of very old adults.

Regarding social changes, for example, Shaw et al. (2007) saw in their ten-year follow-up of older adults, a decrease of contacts with friends but relatively stable levels of contact with family. They also noted that the respondents started to provide less support to others, while they on the contrary started to receive more support from others. Similarly, Broese van Groenou et al. (2013) found that network sizes decreased especially in very old age, which largely could be explained by an inability to replace lost relationships with new ones. Smith and Ryan (2016) pointed out that as people reach very old age, many of their age-peers die. Being married or living together with someone is relatively rare among 85-year-olds (about a third) but is even rarer among ≥ 95 -year-olds (Nygqvist et al., 2017). At the same time, Krause (2005) has found that, when exposed to stress, very old people benefitted the most from emotional support. In very old age, there is thus a risk of an increased gap between the social support available and the social support needed.

Changes in health and functioning occur in many different aspects, for example increases in the prevalence of sensory impairments and chronic diseases (Jaul & Barron, 2017), and decreases in activities of daily living (ADL) (Yu et al., 2016) and cognitive function (Salthouse, 2010). Consequently, frailty and multimorbidity become increasingly prevalent in older age (WHO, 2015). Considering these changes, it could be assumed that well-being declines in very old age. However, there are mixed evidence concerning this notion. There are, for example, studies that have indicated that the effect of health on well-being is weaker in very old age compared to younger age. In the study of Puvill et al. (2019), the effect of ADL disabilities on life satisfaction was strongest in the youngest participants (age 50) and was thereafter weaker by age. Wettstein et al. (2016) also noted that the discrepancy between objective health and the individuals' subjective appraisals of their health widened in very old adults over five years, in the sense that the objective health declined whereas the subjective health appraisals remained unchanged. These and other similar results (e.g. French et al., 2012; Schöllgen et al., 2016) have given support to a so called well-being paradox, i.e., that older adults are able to maintain a high level of well-being despite adversities.

Further, whether the level of well-being is stable over the life span has been subject to much debate. A u-shape, i.e., that well-being would be higher in younger ages and older ages, have found considerable support (e.g. Blanchflower & Oswald, 2008). However, this seems to depend on many different factors, such as which countries have been examined (Bauer et al., 2017), as well as the GDP of the countries (Swift et al., 2014), and on the measures being used (Jebb et al., 2020). Jebb et al. (2020) also argued that the u-shape of well-being has been exaggerated and that the changes over the life span consequently are small in magnitude. Nevertheless, several studies have observed that well-being seem to decline in very late life (Baird et al., 2010; Bauer et al., 2017; Hansen & Slagsvold, 2012; Smith & Ryan, 2016, p. 315). According to Gerstorf et al. (2008), this decline could be driven by

mechanisms related to closeness to death rather than merely chronological age. Importantly, Hansen and Slagsvold (2012) highlighted that the patterns of change can vary between different aspects of well-being, which was reflected in their study where life satisfaction decreased, negative affect increased, and positive affect remained stable in the oldest age group over a five-year period.

In sum, well-being in very old age seems to bear both similarities and differences to well-being in younger ages. Further, there have been found both encouraging results pointing to resiliency among very old adults, suggesting that perceived well-being does not necessarily decline despite the occurrence of changes and losses, as well as results indicating that the well-being of very old adults is greatly challenged. Nevertheless, research focusing explicitly on well-being in very old age is still fairly limited, and warrants further examination.

2.4. Morale – a dimension of subjective well-being

As depicted in the chapter regarding the concept of well-being, there are many different aspects of perceived well-being that could potentially have been examined in this thesis. The rationale to focus on morale as the outcome in Studies II–IV was based on several considerations. First, morale could be considered an interesting concept to explore in relation to changes, which is a central theme in the current thesis, as it involves the individual's attitudes towards challenges in old age (Lawton, 1975; Mannell & Dupuis, 2007). Second, having high morale has shown to have some protective features (Niklasson et al., 2015a; 2017) indicating that the promotion of morale in very old age could have important implications for aging well, and was thus considered important to examine further. Third, the PGCMS which is a validated measure of morale is considered suitable to use when assessing very old adults, as it is commonly used, sufficiently brief, and has shown to work adequately also when assessing people with cognitive decline (Niklasson et al., 2015b; Ryden & Knopman, 1989). Below, the concept of morale is described further, and a summarizing review of previous research and knowledge gaps is provided.

2.4.1. The concept of morale in old age

Morale in old age can be described as a multidimensional concept containing an overall sense of well-being, satisfaction with oneself, a feeling that there is a place in the environment for oneself, and acceptance of things one cannot change (Lawton, 1972). It has further been viewed as future-oriented optimism or pessimism regarding challenges associated with aging (Mannell & Dupuis, 2007). According to Lawton (1975), the three factors comprising the PGCMS are attitudes toward own aging, agitation, and lonely dissatisfaction. Niklasson (2015, p.88) has additionally suggested a more

resource based composition of morale, namely positive attitudes toward own aging, emotional resources, and social resources.

Morale is in this thesis viewed as a cognitive dimension of SWB, in line with the description of morale suggested by Bowling (2005). According to George (2010), morale is often conceptualized as a relatively stable orientation towards life compared to for example happiness which is seen as more fluctuating. Further, morale could be considered more future-oriented while life satisfaction, which is also considered a cognitive aspect of SWB, is more retrospective in nature (Niklasson, 2015, p. 10). Morale could, nevertheless, also be seen to adhere to PWB and the eudemonic perspective, considering that it contains psychological aspects such as optimism, and that the attitudes toward own aging factor relates to how an individual handles challenges, which is seen as an important indicator of PWB (e.g. Palgi, 2013). On the same note, psychological concepts such as resilience, which can be described as the ability to adapt to and recover from adverse circumstances (Mitamura et al., 2014) could thereby also be considered to bear similarities with morale in old age, but the relationship between these concepts has to my knowledge not been elucidated in the scientific literature.

2.4.2. Previous research on morale in old age and knowledge gaps

Most research on morale has focused on the general older population and/or has had a cross-sectional design. The cross-sectional studies of the general older population have identified various sociodemographic, social, and health-related variables related to morale. The sociodemographic variables include level of education (Iwasa et al., 2006), income (Wenger et al., 1995), and housing (renting or owning one's home) (Breeze et al., 2004). Both more quantitative and qualitative social variables have been associated with morale, such as type of social network (Litwin, 2001), social support (de Guzman et al., 2015; Loke et al., 2011), and living alone (Iwasa et al., 2006). Regarding health-related variables, both factors related to physical health and mental health have been examined. Regarding physical health, fatigue, poor visual acuity, (Mancini & Quinn 1981), chronic conditions (de Guzman et al., 2015; Iwasa et al., 2006), disability due to chronic illness (Loke et al., 2011), sleep (Yokoyama et al., 2008), low levels of activity, problems with mobility, moderate to severe pain, and limitations in self-care (Kisely & Shannon, 1999) have been associated with lower morale. Regarding mental health, anxiety (Nagatomo et al., 1997), psychological and affective distress (Cederbom et al., 2014; Kisely & Shannon, 1999), catastrophizing thoughts (Cederbom et al., 2014), and depression (Nagatomo et al., 1997; Woo et al., 2005) have been associated with lower morale.

A few longitudinal studies on morale and the general older population have been conducted. In the study of Scott and Butler (1997), being married at baseline was a significant predictor of lower morale after 12 years. Further,

remaining married after 12 years was also associated with a decrease in morale. Additionally, persons who had experienced a decrease in morale had to a larger extent also reported lower perceived economic adequacy. In the study of Klotz et al. (2018), worse oral health-related quality of life was able to predict lower morale over ten years among individuals in their fifties and seventies.

In cross-sectional studies focusing on very old adults, social support from the family (Deng et al., 2010) and perceived loneliness (von Heideken Wågert et al., 2005) are social factors that have been associated with morale. Regarding health-related variables, stroke (Niklasson et al., 2014), urinary tract infection (Eriksson et al., 2010), lower cognitive function (Deng et al., 2010), number of symptoms (von Heideken Wågert et al., 2005), depression (Bergdahl et al., 2005) and depressive symptoms (von Heideken Wågert et al., 2005) have been associated with lower morale. Further, living in an institutional setting was also associated with lower morale in the study of von Heideken Wågert et al. (2005). Nakagawa et al. (2018) found some cultural differences in the predictors of morale between centenarians in the United States and in Japan, but also that health predicted level of morale in both settings. In longitudinal studies of very old people, higher morale has been associated with increased survival and lower risk of suffering from depressive disorders in five-year follow-ups (Niklasson et al., 2015a; 2017).

The association between morale and age has in previous studies been inconclusive. In a cross-sectional study conducted by Woo et al. (2005), morale was higher in those aged 90 and over compared to younger old. The study by Iwasa et al. (2006), which included individuals aged 50–74 years, showed that the level of morale was higher in older ages, but only for men. The results of de Guzman et al. (2015) showed on the contrary that older age was associated with lower morale (age span 65 to 85+).

Further, changes in morale (PGCMS) over time have been scarcely studied. Scott and Butler (1997) conducted a twelve-year follow-up of older adults aged 70 years and older living in rural areas. The results revealed that 55 percent of the sample showed a decline, 16 percent showed no change, and 30 percent showed an improvement in morale. The mean change from baseline to follow-up was -0.9 (SD=3.3) points in PGCMS. Changes in morale among very old adults specifically has thus to my knowledge not been previously studied.

Overall, various sociodemographic, social, and health-related factors were examined in Study II, III, and IV considering the previously discussed complexity of factors connected to well-being (e.g. Allardt, 1993; Veenhoven, 2000). This thesis also aims to fill some knowledge gaps by including variables that have not previously been examined regarding morale. First, a variable regarding language groups was included in Study II, since Finland is a bilingual country with both Finnish and Swedish as official languages. Swedish speakers are nationally in clear minority, considering that only 5.2 percent of the population are registered as Swedish speakers (Statistics

Finland, 2020). However, the share of Swedish speakers in Ostrobothnia, where a part of the data for this thesis has been collected, is 52 percent (Statistics Finland, 2020) which makes it possible to examine a large population-based sample of both language groups living in the same geographical area. Despite being a minority, previous research has indicated that Swedish speakers have stronger social capital, and better self-rated health compared to Finnish speakers (Nyqvist et al., 2008), warranting further exploration of the language groups. Second, previous research has also indicated some differences between the regions Ostrobothnia (Finland) and Västerbotten (Sweden), for example in self-rated health among older adults (Nyqvist & Nygård, 2012), and was thus also examined. Third, living in an urban or rural environment has previously been associated with outcomes such as mental well-being in older adults (Alcañiz et al., 2020), but has not been investigated regarding morale and was therefore included in Study II. A variable regarding whether the respondent had been born where he/she lives now was also included in order to examine place of residence further. Fourth, some of the negative life events included in Study III and Study IV (such as the death of one's child) had to our knowledge not been previously examined regarding morale. Additionally, examining the cumulative effect of negative life events in relation to morale has not been previously studied. Previous studies on measures such as sense of coherence, self-transcendence, and depressive symptoms have, however, identified an adverse effect of negative life events (Chan et al., 2012; Lövheim et al., 2013, Norberg et al., 2015). Overall, assessing social and health related changes over time and their association with changes in morale in very old age has not been done.

3. Methods

3.1. Study I

3.1.1. Method

Rodgers' evolutionary concept analysis (Rodgers, 2000) was used to elucidate the concept of well-being in very old age. The method served as a valuable framework for this type of review, where emphasis is put on exploring the concept as well as synthesizing results. The approach is inductive, and is based on the assumption that a concept's meaning and use is influenced by time and context. Accordingly, the goal of the analysis is not to establish an absolute definition, but to guide further research and development.

The method entails the identification of the concept's attributes, antecedents and consequences as well as related concepts and surrogate terms (Rodgers, 2000; Tofthagen & Fagerström, 2010). Attributes refer to the cluster of characteristics that compose the concept. Antecedents are things leading to the concept, which in this case was interpreted as factors that either promote or deteriorate well-being. Consequences are the outcomes of the concept, i.e., what the consequences of high respectively low well-being are. Surrogate terms are other words that can be used interchangeably with the chosen concept, while related concepts bare some common aspects with the concept but still differ in some ways, i.e., they are not entirely synonymous.

According to Rodgers (2000, p.85) the concept analysis includes the following overlapping activities:

1. Identifying the name and concept of interest and associated expressions
2. Identifying and selecting the appropriate setting
3. Collecting the data to identify:
 - a. The attributes of the concept
 - b. The contextual basis of the concept
4. Analyzing the data
5. If appropriate, identify an exemplar of the concept
6. Identifying hypotheses and implications for further development of the concept

According to Tofthagen and Fagerström (2010), Rodgers' evolutionary concept analysis can also be divided into three main phases: the initial phase, the core analysis phase, and the further analysis phase. The initial phase involves choosing the concept and exploring its context, as well as collecting the data and selecting which texts to include. The core analysis phase includes the identification and synthesis of the concept's attributes, antecedents, and consequences, and the further analysis phase focuses on the implications of the results and presenting future directions.

3.1.2. Search strategy and analysis

Considering the inductive approach used in Rodgers' concept analysis, the broad term well-being was used in the search for literature. Further, QOL was initially considered a surrogate term to well-being and was therefore also included in the search string. The search strategy was developed with the help of an academic librarian. Searches were conducted in March 2019 in the databases Social Science Citation Index (SSCI), PsycINFO, Medline, Cinahl, and Academic Search Premier in order to enhance the probability of finding relevant articles from various disciplines.

The initial search criteria were that the article should have been peer-reviewed, published during the last ten years (2009–2019) in English, include the concepts well-being or QOL, and include subject terms related to the age group ("oldest old", "very old", "old old", "fourth age", octogenarians, nonagenarians, centenarians). In order to identify articles providing as relevant information as possible considering the aim of the study, more specific inclusion criteria were applied. First, to ensure a relevant focus on very old age, the age group had to be mentioned in the title or aim. Second, well-being or QOL should be mentioned in the title or aim, and third, a definition of the concept needed to be included. This generated a sample of 76 articles. After reviewing the articles in more detail, it was concluded that the articles focusing on QOL generally differed from the articles on well-being to such an extent that they were excluded from the final analysis. The final sample consisted thus of 49 articles focusing on well-being.

The first author (Marina Näsman) had the main responsibility for the literature search as well as the process of including and excluding articles in accordance with the criteria that were set. During the process of designing the literature search and setting the criteria for inclusion, an ongoing dialogue was held with the co-authors. In each step, the articles were thoroughly reviewed by the first author to assess whether the criteria were fulfilled. In cases of uncertainties, the articles were also reviewed by the second author (Fredrica Nyqvist). Data on the concept's attributes, references, antecedents, and consequences were derived by close reading and by creating data sheets of each article. The final sample of 49 articles was analyzed using thematic analysis and read repeatedly in a whole-part-whole manner in order to identify relevant data and generate cohesive themes. Again, the data extraction and analysis was mainly done by the first author, but was also partly replicated by Nyqvist to increase validity. The results were further discussed and validated by all three authors.

3.2. Study II

3.2.1. Data set and sample

The survey data used for Study II was derived from the Gerontological Regional Database (GERDA). GERDA is a multidisciplinary project initiated in the early 2000's with the aim to investigate health and living conditions of older adults, and has over the years been conducted in collaboration between researchers from Umeå University in Sweden and Åbo Akademi University, Novia University of Applied Sciences, University of Vaasa, and Seinäjoki University of Applied Sciences in Finland. An interdisciplinary approach to the research was thus made possible through the collaboration between medicine, health sciences, and social sciences. The data from GERDA thereby include extensive information on sociodemographic, social, and health-related factors that was considered valuable for the study of well-being.

Both Sweden and Finland adhere to the Nordic welfare model, and policies such as aging-in-place are also emphasized in both countries (e.g. Anttonen & Karsio, 2016; Ulmanen & Szebehely, 2015). The backdrop of the project originated hence from similar challenges in Ostrobothnia and Västerbotten concerning for example that a relatively large share of the aging population lives in rural areas. Additionally, collaboration over the Gulf of Bothnia (Swe. Kvarken) was encouraged by the Interreg programs Mitt-Skandia and later on Botnia-Atlantica which were two main funders for the project. The project also enabled comparisons between the regions, which thereby made it possible to identify similarities and differences that could bring added value to the investigation of the life circumstances of the older adults in these regions (see Jungerstam et al. 2012 for more information about the project). Since the project was initiated, the survey has been conducted in the years of 2005, 2010, and 2016.

The survey from which data was used for Study II was sent out by post in the autumn of 2016 to 15 municipalities in Västerbotten in Sweden, and to 15 municipalities in Ostrobothnia and to the Seinäjoki-area in Southern Ostrobothnia in Finland. Questionnaires were sent out to every person born in 1950, 1945, 1940, 1935, and 1930 (later referred to as 66-, 71-, 76-, 81-, and 86-year old persons) except for in the city of Vaasa in Ostrobothnia where every second individual in each of the five groups was randomly selected, and in the cities of Skellefteå and Umeå where every third individual was randomly selected. The study population was identified by the National Tax Board in Sweden, and the Population Register Centre in Finland. In Finland, the questionnaires were sent out in either Swedish or Finnish depending on the registered language of the respondent. The survey was sent to a total of 14,805 individuals of whom 9,386 answered the questionnaire. In Study II, the sample consisted of individuals who had answered twelve items or more in the PGCMS, i.e. 9,047 individuals. Participants with no information regarding age or gender had also been excluded. Of the 9,047 respondents,

2,614 were Finnish speakers, 2,201 Swedish speakers in Finland, and 4,232 from Västerbotten.

3.2.2. Measures

Outcome variable

The PGCMS was used to measure morale and was thus the outcome variable. PGCMS was developed by Lawton (1972; 1975) to specifically be suitable for assessments of older adults. The Swedish and Finnish version of the instrument have been translated from the British English version of PGCMS (Challis & Knapp, 1980) which contains 17 questions all with the answer alternatives yes and no (see Appendix). In the original 17-item version of the instrument created by Lawton (1975), the items 3, 8, and 15 are phrased slightly different with the answer alternatives much/not much (How much do you feel lonely?), better/worse (As you get older, are things _____ than you thought?), and satisfied/not satisfied (How satisfied are you with your life today?).

The instrument is considered to consist of three subscales: attitude toward own aging, lonely dissatisfaction, and agitation (ibid.). In Study II, as well as in Study III and IV, the instrument was however used as one entity. The maximum score is 17 points where higher scores indicate higher morale. In line with the scale instructions (Lawton, 2003), each answer indicating high morale was given one point, and unanswered questions were given zero points. According to Lawton (1975), 0–9 points indicate low morale, 10–12 points moderate morale, and 13–17 points signify high morale. In line with previous studies (Niklasson et al., 2015a; 2017), twelve items or more had to be answered in the PGCMS to be included in the analysis. The psychometric properties of the Swedish version of PGCMS have been examined, partly based on data from the GERDA home visits, and were found satisfactory (Niklasson et al., 2015b). Additionally, the PGCMS has also been evaluated in various contexts (Pinar & Oz, 2011; Wong et al., 2004) and age groups (Liang et al., 1986) with acceptable results, implying that PGCMS is a valid instrument to use in older populations, although some cultural variations have been noted (Liang et al., 1987; Liang et al., 1992).

Explanatory variables

Age group was the explanatory variable of primary interest in Study II, consisting of the five age groups mentioned previously. Other included explanatory variables were divided into sociodemographic, social, and health-related variables. The sociodemographic variables included gender, education, marital status, perceived economic situation, region, place of residence, and whether the respondent lived in the same place as where he/she was born. The social variables included frequency of social contacts, membership in associations, number of confidants, trust in friends and neighbors, perceived loneliness, and having gone through a crisis during the

preceding year. The health-related variables concerned impaired vision, impaired hearing, stroke, pain, sleep quality, oral health, instrumental and personal activities of daily living (IADL, PADL), self-rated health, and depression. A more detailed description of the variables, including how they were coded, is included in the manuscript of Study II.

3.2.3. Analysis

Multiple linear regression of the ordinary least square type (OLS) was used to examine the association between age and morale, and whether possible differences between the age groups could be explained by sociodemographic, social, and health-related factors. Collinearity diagnostics were performed to ensure that the explanatory variables were not strongly associated. The analysis included four models, where the first model included only age. The models were thereafter expanded by block-wise addition of the sociodemographic variables, the social variables, and the health-related variables. Additionally, joint effects with age and each of the other explanatory variables were calculated in order to test whether the same factors could explain level of morale in the different age groups. The advantage of using joint effects, instead of interaction effects together with main effects (which is mathematically equivalent), is that the associations can be straightforwardly interpreted from the estimates. Separate models were tested for each joint effect, while adjusting for the main effects of all the other explanatory variables.

3.3. Study III and IV

3.3.1. Data set and sample

For both Study III and IV, data were derived from the GERDA home visits, which included individuals aged 85, 90, and 95 years and older. The home visits have been conducted in the years of 2000–2002, 2005–2007, 2010–2012, and 2015–2017 in the city of Umeå and in the rural municipalities Malå, Storuman, Sorsele, Vilhelmina, and Dorotea in Västerbotten, Sweden. Data were also collected in Ostrobothnia, Finland, in the city of Vaasa and the municipality Mustasaari in 2005–2007 and in Vaasa, Mustasaari, Maalahti, and Korsnäs in 2010–2012. All 90-year-olds and ≥95-year-olds were invited to participate, while every second 85-year-old was invited in the cities of Umeå and Vaasa, and every 85-year-old in the rest of the municipalities.

The home visits data constitute of structured interviews including a broad set of questions and assessment scales, as well as tests such as gait speed and chair-stands, conducted in the home of the respondent. Potential participants were initially contacted by post with a letter containing information about the study. They were thereafter contacted by phone in order to collect informed consent for participation in the study, which was additionally collected in writing in the beginning of the home visit. If needed, due to cognitive

impairment, informed consent was also given from next of kin and/or nursing staff. The home visits were conducted by a medical doctor, nurse, occupational therapist or medical student. All interviewers had received appropriate training before conducting the visits. Each home visit lasted approximately 2–4 hours. Additionally, if permission had been given, information from the respondent's medical records was also collected. Diagnoses were determined by the same specialist in geriatric medicine during the whole study period after reviewing medical records and assessment scales.

The design of the data collection enables longitudinal analyses on individual level, since the same individuals were invited to participate again after five years. To increase the sample size, participants with a five-year follow-up from several data collection periods were included in Study III and IV. For Study III, data from 2000–2002, 2005–2007, and 2010–2012 were used. In Study IV, data from 2015 were additionally used.

Some individuals eligible to participate in the data collection died before contact or declined to participate. Additionally, both in Study III and in Study IV, only a part of the sample who had accepted a home visit fulfilled the inclusion criteria for the current studies. Further, many of the individuals participating the first time were for various reasons, including death and disease, unable to participate five years later. In Study IV, for example, only 388 (47.3 %) out of the 820 answering PGCMS at T1 were alive at T2. Flow charts with an overview of this process are included in the manuscripts of Study III and Study IV. The inclusion criteria of Study III were that the respondents needed to have answered at least 12 items in the PGCMS at both T1 and T2, resulting in a sample of 204 individuals. In Study IV, an additional criterion was that the individuals needed to have had high morale (at least 13 points in the PGCMS) to be included, leaving 174 individuals who fulfilled all criteria.

3.3.2. Measures

Outcome

The PGCMS was the outcome of both Study III and IV, same as in Study II. Unlike Study II, however, Study III and IV had a longitudinal design with focus on assessing change. Therefore, a change score was calculated by subtracting the baseline (T1) scores from the follow-up (T2) scores. A negative value indicated thus a negative change in PGCMS from T1 to T2. According to Ma et al. (2010), the factor structure of the scale has been shown to have sufficient stability over time, indicating that longitudinal studies with PGCMS are feasible. In the study of McCulloch (1991), however, the factor structure of the subscales differed somewhat with increasing age. In the study of Niklasson et al. (2015b), a minimum change of 3.5 points was required to detect a significant change between two assessments with a 95 percent confidence

interval level, and 2.5 points were required with an 80 percent confidence interval level.

Explanatory variables

All variables are presented in detail, and why they were chosen, in the appended articles. In Study III, the main explanatory variable was an index of negative life events, which also has been used in other studies based on GERDA data (Lövheim et al., 2013; Norberg et al., 2015). The index included 13 different negative life events with a maximum score of 15. The index included losses in health (impaired hearing, impaired vision, decrease in ADL according to Barthel's ADL index [Mahoney & Barthel, 1965], decrease in cognition according to the Mini Mental State Examination [MMSE, Folstein et al. 1975]), diseases (stroke, myocardial infarction, hip fracture, and depressive disorders), social losses (becoming widowed, death of one's child), perceived loneliness, moving to an institutional setting, and the own assessment of having gone through a crisis in life. The variable concerning depressive disorders was based on the diagnosis, which was determined according to the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV, American Psychiatric Association, 1994). The diagnosis was set by the same geriatrician during the whole study period after reviewing medical records and interview protocols including the assessment scales the Geriatric Depression Scale (GDS-15, Sheikh & Yesavage, 1986), the Montgomery-Åsberg Depression Rating Scale (MADRS, Montgomery & Åsberg, 1979) and the Organic Brain Syndrome Scale (OBS, Jensen et al., 1993).

All variables included in the index were dichotomized where the occurrence of each event equalled a score of one in the Index of negative life events, except for changes in ADL and MMSE. A change in Barthel's ADL index of -1 to -5 points gave one point in the index of negative life events, and a decrease of six points or more gave two points. Similarly, a decrease in MMSE of two to five points gave one point in the index, and a change of -6 or more gave two points. Age, gender, country, and years of education were used as covariates.

In Study IV, a set of social and health-related variables were included. The social variables included information on whether the respondent lived alone or not, whether they had a deceased child, quantity of social contacts, and feelings of loneliness. The health-related variables included self-rated health, ADL (measured with Barthel's ADL index), cognitive function (measured with MMSE), hearing and visual function, and depressive disorders. Age was added as a covariate. The variables were both based on data from T1 as well as variables representing changes from T1 to T2. To assess changes from T1 to T2, continuous variables were computed by subtracting the T1 value from the T2 value. A negative value indicated thus a negative change. Regarding

changes in dichotomous variables from T1 to T2, a negative change was given the value 1 while no change or improvement was given the value 0.

3.3.3. Analysis

In Study III, t-tests were used to examine whether the change in PGCMS from T1 to T2 was statistically significant in the total sample, and in the different age groups (85, 90, ≥ 95). Pearson's correlation was used to test the correlation between the different negative life events and changes in PGCMS scores. Multiple linear regression (OLS) was thereafter used to examine the association between negative life events and changes in PGCMS scores. Accordingly, Model 1 included the index of negative life events and the covariates age, gender, country, and years of education. PGCMS scores at T1 was added in Model 2 to test whether initial scores were associated with the changes in PGCMS occurring from T1 to T2. Finally, in Model 3, an interaction between PGCMS scores at T1 and the index of negative life events was also included to investigate if higher baseline PGCMS scores attenuated the effect that negative life events had on changes in PGCMS scores from T1 to T2.

In Study IV, linear regression was also used with changes in PGCMS as the dependent variable. Model 0 described the bivariate associations between each social and health-related variable, both variables reflecting the situation at T1 and variables representing changes from T1 to T2, and changes in PGCMS scores. Model 1 described the association between T1 variables that were statistically significant at the five percent level in Model 0, and changes in PGCMS scores. Model 2 described the association between variables describing changes from T1 to T2 that were statistically significant in Model 0, and changes in PGCMS scores. Lastly, variables that were statistically significant in Model 1 and Model 2 were included in Model 3. Age was controlled for in Model 1, 2, and 3. Additionally, interaction terms with age and the different social and health-related variables were constructed to further test the association with age. Corresponding analysis (not shown) was also conducted with logistic regression where the outcome variable was dichotomized according to whether the respondents had had a negative change of 3 points or more in PGCMS or not over the follow-up period.

3.4. Ethical considerations

The thesis follows, where applicable, the guidelines of the Finnish National Advisory Board on Research Ethics (2012).

Study II: The data collection was approved by the Regional Ethical Review Board in Umeå, Sweden (05/084 & 2016/367-32). In Finland, ethical approval is not needed for anonymous population based postal surveys (Medical Research Act 488/1999, English translation available at <http://www.finlex.fi/en/laki/kaannokset/1999/en19990488>).

Study III: The study was approved by the Regional Ethical Review Board in Umeå (99-326, 05-063M, 09-178M and 14-221-31M) and the Ethics Committee of Vaasa Central Hospital in Finland (05-87 and 10-54).

Study IV: The study was approved by the Regional Ethical Review Board in Umeå (99-326, 05-063M, 09-178M, 14-221-31M, and 16-501-32M) and the Ethics Committee of Vaasa Central Hospital in Finland (05-87 and 10-54).

4. Summary of studies and results

4.1. Study I. The conceptualization of well-being in very old age

The aim of the first study was to gain a deeper understanding of well-being in very old age by exploring its conceptualization in scientific articles that had a sufficient focus on well-being, and on the population of interest. In line with Rodgers' evolutionary concept analysis, information on the attributes, antecedents, and consequences of well-being in very old age were derived (see Table 3). Additionally, related concepts and surrogate terms to well-being were discussed.

Four attributes of well-being in very old age were identified: "Multifaceted", "Intertwined with health and quality of life", "Ability to adapt", and "Part of successful aging". The attribute denoting that well-being is multifaceted was in line with previous research on well-being, and indicated that this was a central attribute of well-being in all ages. Well-being was repeatedly described as broad, complex, and multidimensional. The multifaceted nature of well-being was reflected in that various facets of well-being were examined in the articles, from broader terms such as SWB or PWB to more specific terms such as life satisfaction and morale. The analysis also revealed a dynamic aspect, in the sense that different facets of well-being were shown to affect each other and that the boundaries between different facets were not clear-cut.

The second attribute reflected that well-being is intertwined with health and quality of life. This was seen for example in the way that these three concepts were used interchangeably. At the same time, there were also indications of distinctions between them. Qualitative studies included in the review also highlighted that very old adults themselves used these concepts more or less synonymously, or as integrated parts of a larger entity.

The ability to adapt was perhaps the most prominent attribute of well-being in very old age. Adaptation was seen as central in very old age considering the many challenges and changes faced in this phase of life, and emerged in different forms such as coping and reconciliation. There were at the same time concerns regarding very old individuals' ability to adapt due to age-related losses that might inhibit this capacity.

Well-being was also seen as an important part of successful aging, either as an integrated part of successful aging or as a resource for it. Models of successful aging with an emphasis on physical function or being disability free were not seen as feasible in very old age. Older adults themselves also highlighted well-being when discussing aspects essential to successful aging and longevity.

Table 3. Overview of the attributes, antecedents, and consequences of well-being in very old age.

Attributes	Antecedents	Consequences
<i>Multifaceted</i>	<i>Sociodemographic</i>	<i>High well-being</i>
<ul style="list-style-type: none"> • Includes multiple facets • Dynamic relationships between the facets • Inconsistencies in the conceptualizations 	<ul style="list-style-type: none"> • Age • Cohort • Gender • Culture • Economic situation • Housing 	<ul style="list-style-type: none"> • Lower risk of depressive disorders • Longevity • Successful aging
<i>Intertwined with health and quality of life</i>	<i>Social</i>	<ul style="list-style-type: none"> • A long and happy life
<ul style="list-style-type: none"> • Researchers as well as older adults themselves used the concepts interchangeably • Some differences between the concepts were also highlighted 	<ul style="list-style-type: none"> • Quantity and quality of social contacts • Family • Participation 	<ul style="list-style-type: none"> • Living well
<i>Ability to adapt</i>	<i>Health-related</i>	<i>Low well-being</i>
<ul style="list-style-type: none"> • Life changes and losses commonly occurring in very old age • Coping • Need for reconciliation 	<ul style="list-style-type: none"> • Sensory impairments • Cognition • Functional ability • Frailty • Diseases • Mental health • Health care 	<ul style="list-style-type: none"> • Mobility disability • Mortality • Memory decline • Lower levels of purpose in life
<i>Part of successful aging</i>	<i>Inner resources</i>	
<ul style="list-style-type: none"> • Both a part and a consequence of well-being 	<ul style="list-style-type: none"> • Personality traits • Competence • Self-transcendence • Attitudes • Hope 	

Many of the studies examined different antecedents of well-being. However, it was noted that a large variability regarding the identified antecedents occurred. This could be explained by several factors such as age, gender, culture, measurements, and methodology. Nevertheless, the results indicated that sociodemographic, social, and health-related antecedents are affecting well-being in very old age. Additionally, inner resources such as personality traits and self-transcendence were also highlighted.

The consequences of well-being were examined to a lesser extent than the antecedents (even though it in many cases would be difficult to determine causality). Nevertheless, the results indicated that high well-being could have

positive implications for health, while low well-being was associated with factors such as increased disability and higher mortality risk.

Several related concepts were identified during the review of the articles. On the one hand, concepts that could be considered as resources for well-being such as self-transcendence, sense of coherence and resilience were noted. On the other hand, depression and depressive symptoms were sometimes used as a surrogate term for well-being, but could rather be seen as a threat to well-being than as a part of it.

4.2. Study II. Morale in different age groups and its associated factors

There has been a lack of studies examining age differences in morale, and those who have been conducted have come to somewhat conflicting results. Some have seen that morale has been higher in older age groups, while others have seen the opposite (de Guzman et al., 2015; Woo et al., 2005). For the current thesis, it was considered valuable to gain more information on how morale was manifested in very old age compared to younger old age. The aim of Study II was therefore to examine age differences in morale, in particular whether (1) the level of morale differed between the age groups, (2) whether possible differences could be explained by sociodemographic, social, and health-related factors, and (3) whether the same factors could explain level of morale in the different age groups.

The results showed that the mean PGCMS scores were the highest in the youngest age group (66-year-olds), and were subsequently lower in the older age groups with the lowest scores found in the oldest age group (86-year-olds). Descriptive information of the different age groups (66-, 71-, 76-, 81-, and 86-year-olds) showed also that there were both similarities and differences in the distribution of the variables examined (Table 4). Regarding the sociodemographic variables, for example, the percentage having a higher educational level was lower in the older age groups, while the perception of making ends meet without difficulties was on a similar level in all age groups. Of the social variables, the prevalence of having frequent contacts with children and grandchildren was similar in the age groups, while perceived loneliness was more common in the older age groups. Regarding the health-related variables, however, a decline in "good health" and increase in impairments and diseases were overall noted in the older age groups. The occurrence of impaired vision and impaired hearing increased by age group, while the percentage sleeping well decreased. Similarly, the percentage of individuals being independent in IADL and PADL decreased by age group, while the occurrence of poor self-rated health increased. The percentage with depression also increased from 10.7 percent in the 66-year-olds to 22.4 percent in the 86-year-olds.

Table 4. Descriptive information of the sample in Study II according to age group and in total.

	66-year-olds (n=2711) M(SD)/%	71-year-olds (n=2806) M(SD)/%	76-year-olds (n=1619) M(SD)/%	81-year-olds (n=1214) M(SD)/%	86-year-olds (n=697) M(SD)/%	Total (n=9047) M(SD)/%
PGCMS (continuous)	13.6 (3.1)	13.1 (3.2)	12.4 (3.3)	11.7 (3.3)	10.9 (3.4)	12.8 (3.3)
Sociodemographic variables						
Woman	53.3	52.1	51.7	54.1	63.4	53.5
Higher educational level	72.7	60.5	50.9	46.7	39.1	59.0
In a relationship	82.1	79.5	72.1	62.2	44.3	74.0
<i>Region</i>						
Västerbotten, Sweden	43.8	47.0	51.4	46.7	46.9	46.7
Swedish speakers in Ostrobothnia, Finland	23.1	25.6	22.1	25.3	27.4	24.3
Finnish speakers in Ostrobothnia and Southern Ostrobothnia, Finland	33.1	27.4	26.6	28.0	25.7	28.9
<i>Place of residence</i>						
Urban	40.2	40.7	41.7	43.7	41.7	41.2
Semi-urban	18.3	19.1	22.4	19.1	22.5	19.7
Rural	41.4	40.2	35.9	37.2	35.8	39.1
Born in the same place as you live now	36.6	33.6	33.1	36.0	33.7	34.7
Making ends meet without difficulties	63.3	65.1	64.0	64.6	67.1	64.4

Social variables

Frequent contacts with children and grandchildren	56.1	56.0	51.1	54.4	55.3	54.9
Frequent contacts with friends and neighbors	40.8	44.2	42.8	42.3	41.1	42.4
High trust in friends and neighbors	68.3	66.3	64.5	58.5	56.0	64.8
2 confidants or more	69.9	68.5	66.3	67.7	60.3	67.8
Active in an association	45.3	48.1	52.6	47.6	39.7	47.4
Perceived loneliness	7.9	7.6	10.5	14.4	18.4	9.9
Gone through a crisis during the preceding year	46.6	43.9	46.2	47.5	45.8	45.7

Health-related variables

Impaired vision	0.9	1.5	1.8	2.2	4.2	1.7
Impaired hearing	0.7	1.2	1.5	2.4	5.3	1.6
Stroke	4.4	6.7	9.3	11.4	13.0	7.5
Pain	47.2	47.1	46.3	51.1	55.4	48.1
Sleeping well	73.1	70.5	70.4	68.2	63.1	70.4
Mainly own teeth	85.9	77.4	68.7	59.6	48.4	74.1
Independent in IADL	76.2	66.3	53.1	38.2	28.7	60.2
Independent in PADL	96.2	95.3	93.6	92.2	85.2	94.1
Poor self-rated health	23.9	30.7	40.5	52.0	63.7	35.7
Depression	10.7	11.8	13.7	15.1	22.4	13.0

PGCMS Philadelphia Geriatric Center Morale Scale, IADL Instrumental Activities of Daily Living, PADL Personal Activities of Daily Living

Results from the multiple regression analyses are presented in Table 3 in the manuscript of Study II (see Appendix). Older age was associated with lower morale even when controlling for all sociodemographic, social, and health-related variables. Although the effect of age became weaker, the age group differences could hence not be entirely explained by the variables included in the study. Besides older age, the variables being associated with lower morale on a statistically significant level in the final model were being a woman, perceived loneliness, having gone through a crisis during the preceding year, stroke, pain, poor self-rated health, and depression. Variables associated with higher morale ($p < .05$) were making ends meet without difficulties, frequent contacts with children and grandchildren, frequent contacts with friends and neighbors, high trust in friends and neighbors, having two confidants or more, being active in an association, sleeping well, and independence in IADL.

To gain more information on the associations with morale in different age groups, analyses including joint effects with age and the different sociodemographic, social and health-related variables were performed (see Table 4 in the manuscript of Study II in the Appendix for details). The results showed that some of the variables could explain level of morale in all age groups, while some variables only in a part of the age groups, indicating that there were variations in the factors affecting morale. The associations between morale and perceived loneliness, having gone through a crisis during the preceding year, sleeping well, poor self-rated health, and depression were statistically significant in all age groups. Making ends meet without difficulties, having high trust in friends and neighbors, and pain, had a statistically significant association with morale in all age groups except in the oldest. Regarding independence in IADL, the association was statistically significant in the three younger age groups, but not in the two oldest. The associations between morale and being a woman, being a Swedish speaker in Ostrobothnia, having frequent contacts with children and grandchildren, having frequent contacts with friends and neighbors, and stroke were statistically significant in only some of the age groups. Some of the age differences in morale could potentially be explained by the higher prevalence found in the oldest age groups regarding the variables most strongly associated with having lower morale in the regression analysis (e.g. loneliness and depression, see Table 4).

4.3. Study III. Negative life events and changes in morale over five years

The aim of Study III was to study changes in morale in individuals 85 years and older, and to assess the effect negative life events had on morale over a five-year follow-up period. We also wanted to examine, whether higher baseline PGCMS scores could attenuate the adverse effect negative life events

were assumed to have on morale. Thanks to the longitudinal design, we were able to assess and track negative life events that had occurred during the five-year follow-up period. The primary interest here, was however not the different life events separately, but the effect they would have on morale taken together.

The sample consisted of 204 individuals with a mean change in PGCMS scores from T1 to T2 of 0.6 (SD = 2.9) points ($p = .002$). The results also showed that those who had low morale at T1 had a mean change of 1.2 (SD = 3.4), those with moderate morale -0.1 (SD = 2.8), and those with high morale -1.2 (SD= 2.6). There were no statistically significant differences regarding the change-scores between the age groups (85, 90, ≥ 95 years). On average, the sample had a mean score in the Index of negative life events of 3.4 (SD = 2.2), ranging from 0 to 10 points. Additionally, the two older age groups, ≥ 95 -year-olds and 90-year-olds, had a significantly ($p < .01$) higher score in the Index of negative life events as compared to the 85-year-olds ($M = 4.6$ and 3.9 vs. 3.0). The descriptive information regarding the negative life events showed that of the events included, a smaller decrease in ADL (-1 to -5 points), a smaller decrease in MMSE (-2 to -5 points), a larger decrease in MMSE (-6 points or more), and own assessment of having gone through a crisis during the preceding year were the most common.

Results from the regression analyses showed that negative life events had a cumulative negative effect on changes in morale, i.e., the more negative life events experienced, the more negative was the change in morale. Contrary to our expectations, a higher PGCMS score at T1 was associated with a steeper decline from T1 to T2. Further, based on that there was no statistically significant interaction effect between PGCMS scores at T1 and the index of negative life events, the results indicated that PGCMS scores at T1 did not significantly affect the adverse effect of negative life events. This means that negative life events had a detrimental effect on very old adults' level of morale, regardless of initial level.

4.4. Study IV. Risk factors for a decrease in high morale over five years

As a continuation of Study III, Study IV focused on social and health-related variables to further explore factors having a negative association with changes in morale. Additionally, we decided to focus on those who had high morale at T1. Having high morale has previously been associated with increased survival (Niklasson et al., 2015a), and to protect against developing depressive disorders in very old age over five years (Niklasson et al., 2017). At the same time, Study III also indicated that those who had high morale at T1 were more prone to experience a decrease in morale over time. Taken together, preventing a decrease in high morale seems crucial. Similar as Study III, this study also had a longitudinal design, thus enabling explorations of the

situation at T1 as well as changes occurring from T1 to T2. First, we wanted to examine whether variables representing the situation at T1 could predict a decrease in morale five years later. Second, we also assessed changes occurring during the follow-up period and their possible association with a decrease in morale over time.

When looking at the descriptive information of the sample (n=174), it was evident that many changes occurred in the life of the respondents over five years (see Table 5). Based on the T1 variables, it was also noted that for example the proportion living alone, experiencing feelings of loneliness and having poor self-rated health was relatively high already then. On the other hand, they scored on average high in both ADL and MMSE, indicating that their physical and cognitive function was good at T1.

Bivariate regression analysis was performed with each social and health-related variable to identify variables significantly associated with changes in morale. Regarding variables from T1, only poor self-rated health was significantly associated with a decrease in morale from T1 to T2 ($p = .025$). Of the variables assessing changes from T1 to T2, the death of one's child during the follow-up period and the emergence of perceived loneliness were the social variables associated with a decrease in morale. Of the health-related variables, changes in ADL scores, changes in MMSE scores, getting impaired vision, and starting to suffer from depressive disorders were associated with a decrease in morale.

To further identify the main risk factors of having a decrease in high morale, additional multivariable regression models were tested. One model included all statistically significant variables from T1 (poor self-rated health) and one with all variables assessing changes from T1 to T2 that were statistically significant in the bivariate analyses. The models also controlled for the effect of age. Poor self-rated health at T1 remained statistically significant when controlling for age. Of the variables assessing changes, the death of one's child, emerging feelings of loneliness and the development of depressive disorders remained statistically significant. These variables were thereafter included in the same model, which showed that the variables assessing changes remained statistically significant, while poor self-rated health at T1 was no longer significantly associated with a decrease in PGCMS.

Table 5. Sample characteristics at baseline (T1) and changes occurring from baseline (T1) to follow-up (T2) (n=174)

<i>Characteristics at T1</i>	<i>M(SD)/%(n)</i>	<i>Changes from T1 to T2</i>	<i>M(SD)/%(n)</i>
PGCMS ^a	14.6 (1.3)	Changes in PGCMS scores ^a	-1.3 (2.5)
Social variables			
Living alone ^b	64.9 (113)	Living with someone → living alone ^b	11.5 (20)
Deceased children ^b	14.4 (25)	Child died during follow-up period ^b	6.3 (11)
0–1 visit received ^b	35.6 (62)	More than 1 visits received → 0–1 visit received ^b	17.8 (31)
No visiting ^b	35.6 (62)	Visited more than once → no visiting ^b	24.7 (43)
Feelings of loneliness ^b	29.9 (52)	No feelings of loneliness → feelings of loneliness ^b	17.2 (30)
Health-related variables			
Barthel's ADL index ^a (0–20 points)	19.4 (1.9)	Changes in scores in Barthel's ADL index ^a	-2.2 (4.2)
MMSE ^a (0–30 points)	26.0 (3.1)	Changes in MMSE scores ^a	-3.7 (5.1)
Impaired hearing ^b	3.4 (6)	No impaired hearing → impaired hearing ^b	16.7 (29)
Impaired vision ^b	4.0 (7)	No impaired vision → impaired vision ^b	10.3 (18)
Poor self-rated health ^b	25.9 (45)	Good self-rated health → poor self-rated health ^b	18.4 (32)
Depressive disorders ^b	7.5 (13)	No depressive disorder → depressive disorder ^b	12.1 (21)

Note. Mean and standard deviations are presented for continuous variables, and percentages and number of individuals for dichotomous variables.

^aContinuous variables ^bDichotomous variables

PGCMS the Philadelphia Geriatric Center Morale Scale, ADL Activities of Daily Living, MMSE Mini Mental State Examination

Additional regression models including interaction effects between age and the different social and health-related variables were also tested, but no statistically significant interaction effects were found. The results conclusively showed that the death of one's child, the emergence of perceived loneliness, and the development of depressive disorders were main risk factors of having a decrease in high morale over five years. The results also indicated that it was difficult to predict a decrease in morale using T1 variables. Notably, alternative analysis had in an initial stage of the study also been conducted with logistic regression to explore the risk factors of having a significant decrease in morale (i.e. -3 points or more in PGCMS from T1 to T2) (not shown). Even though more variables were tested and the method was slightly different, this analysis identified the same main risk factors of having a decrease in morale (death of one's child, the emergence of perceived loneliness, and the development of depressive disorders).

5. Discussion

The aim of the present thesis was to gain extended knowledge of well-being among very old adults. The thesis could be considered to comprise two main parts. One part consisted of increasing the understanding of well-being in very old age by exploring its conceptualization through a concept analysis based on previous scientific research focusing on well-being in very old age. The second part consisted of filling some knowledge gaps regarding morale, which was seen as a cognitive dimension of SWB. This included examining morale in different age groups in order to see if morale differed in younger old and very old adults. Further, in the two studies focusing explicitly on very old age, changes in morale and potential risk factors over a five-year period were examined. The discussion will first address the research questions that were posed, and thereafter discuss some of the overall findings of the studies in more depth. Additionally, methodological considerations, and the conclusions and implications that could be drawn from the thesis are discussed.

5.1. Main findings

The first research question concerned how well-being has been conceptualized in research focusing on very old adults. The results revealed that there seems to exist a movement between the general aspects of well-being, and the specific aspects of very old age. The attributes identified in the analysis showed that the concept of well-being in very old age is multifaceted, and intertwined with health and quality of life. Further, an emphasis was put on the ability to adapt, and that well-being in very old age was considered a part of successful aging. The results supported the notion that well-being should be emphasized in policy development (e.g. Foster & Walker, 2015), considering that well-being was highlighted as central to successful aging both by researchers and very old adults themselves.

The second research question addressed whether there were age differences in morale and its associated factors, which was examined primarily in Study II, but was also touched upon in Study III and IV. The results of Study II revealed that the level of morale was lower in the older age groups, seemingly with a stepwise pattern (mean PGCMS scores for 66-year-olds: 13.6, 71-year-olds: 13.1, 76-year-olds: 12.4, 81-year-olds: 11.7, 86-year-olds: 10.9). Further, older age was associated with lower morale even when controlling for sociodemographic, social, and health-related factors. The differences between the age groups could thus not entirely be explained by the explanatory variables included in the study. The variables associated with morale in all age groups were perceived loneliness, having gone through a crisis in life, poor self-rated health, depression, and sleeping well, indicating that various factors are important to take into account when promoting morale. Additionally, the oldest age group seemed to be more exposed to the

factors most strongly associated with lower morale identified in Study II. Similarly, the results in Study III also showed that the oldest age group (≥ 95 -year-olds) had experienced on average most negative life events during the last five years, but there was however no statistically significant effect of age on changes in morale here. Additionally, social and health-related factors had the same effect on changes in morale regardless of age in Study IV.

The third research question was “How does morale change over a five-year period among very old adults?”. The results of Study III showed that the sample had a mean change of -0.6 points in the PGCMS over five years, which was statistically significant. However, according to Niklasson et al. (2015b), a change of 3 points or more in PGCMS would be required to detect a significant change on individual level. Thus, the majority of the sample (69.1%) in Study III would according to this criterion not have had a significant change in morale. This indicated on the one hand that the level of morale was relatively stable over five years, aligning with the set-point theory of well-being and the hedonic treadmill (Diener et al. 2006; Headey, 2008; 2010). On the other hand, the results also showed that about 20 percent of the sample had a significant decrease in morale on individual level, and nine percent a significant increase, implying that well-being does change for some individuals, which also Diener et al. (2006) pointed out. We also found that having higher morale at T1 was associated with a greater decrease in PGCMS compared to the sample as a whole, and that those with low morale at T1 had on average an increase in PGCMS scores over five years.

The fourth research question was “What are the risk factors for a decrease in morale over five years among very old adults?”. In Study III, negative life events had a cumulative negative effect on morale, i.e., the more negative life events experienced the steeper the decline in PGCMS. Experiencing various negative life events could thus have a detrimental effect on morale. Additionally, having higher morale at T1 did not seem to attenuate the adverse effect of negative life events. In Study IV, individual risk factors of having a decrease in high morale over five years in very old age were investigated. The emergence of perceived loneliness, developing depressive disorders, and the death of one’s child during the follow-up period were identified as factors significantly associated with a decrease in morale over five years.

5.2. Reflections on the main findings

Both Study I and Study II supported the notion that very old age in some instances differ from previous stages of old age. For example, the analysis in Study II showed some variability between the age groups, including that fewer variables were associated with morale in the oldest age group compared to the younger. The results from Study I also indicated that well-being in very old age in some instances is affected by other factors than among younger adults, implying that research focusing explicitly on this age group is

of importance. In a larger context, the significance of acknowledging the diversity that exists in old age has also been highlighted by WHO (2015) as one of the key challenges for policy-making aimed at promoting healthy aging. Accordingly, a comprehensive public health response must be able to address needs of both those who are in good health and those with multimorbidity.

Taken together, the studies confirmed in various ways that being very old entails going through a number of changes and losses, which are likely to affect well-being (see for example Table 4 in the results of Study II and Table 5 of Study IV). For example, in Study II, the proportion being independent in IADL was 76.2 percent in the 66-year-olds while only 28.7 percent in the 86-year-olds. There was also a notable increase over five years in the occurrence of all social (e.g. living alone, decrease in social contacts) and health-related risk factors (e.g. decrease in ADL and MMSE) included in Study IV. These results imply that the transition from the third age to the fourth age, often occurring at 80 to 85 years of age, generally involves a decrease in resources that generates great challenges to the well-being of the individual (Baltes & Smith, 2003; Smith et al., 2002). However, not all of these factors were significantly associated with morale, indicating that some changes and losses do not necessarily affect morale.

Both Study II and III showed that negative life events affected morale, supporting previous research on negative life events in old age (Chan et al., 2012; Lövheim et al., 2013; Norberg et al., 2015). In Study II, having gone through a crisis in life during the preceding year was associated with lower morale in all age groups. Study III additionally showed that negative life events had a cumulative negative effect on morale in very old age over five years. These results could be considered to reflect the model of well-being suggested by Dodge et al. (2012), i.e., that the cumulative effect of negative life events (challenges) might prevail the resources the individual have, thus leading to lower well-being. Besides that there is an increased risk of experiencing negative life events and losses in very old age, the occurrence of negative life events simultaneously leads to a decreased set of resources to handle new challenges (Cairney & Krause, 2008). It would thus be crucial that adequate support is given to those who have experienced negative life events. As shown in Study IV, the death of one's child seems to be one of the most detrimental life events experienced in very old age. Nevertheless, research on this topic seems to be scarce, and the need for additional training among health care personnel regarding grief and losses by large has also been highlighted (Van Humbeeck et al., 2016), implying that increased attention should be given to this matter.

Study III also reflected that all individuals were not affected by negative life events in the same ways and to the same extent, considering that the points in the Index of negative life events ranged from 0 to 10 points among the sample. Further, the results showed that some individuals were exposed to a number of negative events and still displayed no or only minor changes in morale. The reasons behind that some individuals are able to maintain the

same level of well-being despite experiencing adversities have not explicitly been examined in this thesis, meaning that possible explanations could only be speculated on. As indicated by the hedonic treadmill and set-point theories (Diener et al., 2006; Headey, 2008), it is possible that the individual is able to adapt to the new circumstances, and thus return to their initial level of well-being. Accordingly, it is possible that some negative life events might not have long lasting effects. Similarly, the observation that those with high morale on average had a decrease in morale over time, and that those with low morale on average had an increase, could be reflections of long-term changes in well-being, but could also be connected to similar mechanisms that are described in these theories. Importantly, since our analysis was limited to two points in time, short-term fluctuations were not examined, which could have provided more nuanced information regarding this phenomenon.

Nevertheless, the ability to adapt seem crucial, which was also identified as one of the main attributes of well-being in very old age. In Study I, several of the authors in the included studies (e.g. Hansen & Slagsvold, 2012; Nakagawa et al., 2018; Palgi, 2013) raised concerns whether very old adults are able to adapt to all changes and adversities they are exposed to. At the same time, some of the results also indicated that the ability to adapt is possible even in very old age (e.g. Ihle et al., 2017; Neubauer et al., 2017; Schilling et al., 2013). Several possible explanations were posed, including those based on theories such as SOC and SST reflecting that very old adults used strategies such as selection, optimization and compensation as well as socioemotional selectivity in order to preserve well-being. Considering the positive association between the use of SOC-strategies and well-being in old age found in previous research (Teshale & Lachman, 2016; Zhang & Radhakrishnan, 2018), it is possible that the use of SOC-strategies could buffer some of the effects negative life events and changes have on morale. Further, as indicated in Study I, adaptation could also occur in the form of reconciliation, which is also reflected in the definition of morale suggested by Lawton (1972) as accepting things one cannot change.

All studies showed that various sociodemographic, social, and health-related factors can be associated with well-being and morale, in line with the models suggested by Allardt (1993) and Veenhoven (2000) which denote the complexity of well-being. The results also showed that these associations can vary depending on factors such as age, implying that a comprehensive assessment of the individual's life as a whole is crucial when promoting well-being. Additionally, it is important to acknowledge the cumulative effect of negative life events/risk factors, as shown in Study III, as well as the individual's subjective perceptions of these. It is thus difficult to pinpoint single factors that deteriorate well-being. Nevertheless, both depressive disorders and perceived loneliness were identified as being strongly associated with having lower morale in Study II and IV, and will therefore be discussed in more detail.

In Study II and IV, depression was identified as one of the major risk factors of lower morale, both cross-sectionally and longitudinally, which corroborate previous cross-sectional findings of morale (Bergdahl et al., 2005; Nagatomo et al., 1997; Woo et al., 2005). Even though higher morale has previously been associated with lower risk of suffering from depressive disorders (Niklasson et al., 2017), the results of Study IV indicated that even those with high morale are at risk of developing depressive disorders. Considering that depression causes high disease burden (GBD, 2018), and is viewed as one of the greatest threats to aging well due to its many negative consequences (Gustafson, 2012; McCall & Kintziger, 2013), preventing depression is utmost important. Additionally, depression in very old age seems to be underdiagnosed and undertreated (Bergdahl et al., 2005). The prevalence of unmet care needs has also shown to be higher among very old adults with depression compared to non-depressed (Stein et al., 2016). Consequently, increased research on, as well as implementation of, efficient detection, treatments and interventions in very old age are needed.

Building upon previous cross-sectional research (von Heideken Wågert et al., 2005), perceived loneliness was corroborated as a risk factor of lower morale both cross-sectionally and over time. In Study II, it was noted that the prevalence of perceived loneliness was most prevalent in the oldest age group, ranging from 7.9 percent in the 66-year-olds to 18.4 percent in the 86-year-olds. In Study IV, 29.9 percent of the sample felt lonely at T1 and 17.2 percent started to feel lonely during the follow-up period, indicating that perceived loneliness is commonly occurring in very old age. Even though the relationship between social contacts and perceived loneliness is complex (de Jong Gierveld et al., 2006), it is important to acknowledge that involuntary social losses are often highly prevalent in very old age, in turn decreasing the possibility to maintain close social contacts which according to SST is important for the well-being of the individual (Charles & Carstensen, 2010). It could be hypothesized, that perceived loneliness to some extent reflects a lack of social resources (objectively and/or subjectively), which are mentioned as important in the model of well-being suggested by Dodge et al. (2012) and in the SOC-model (Freund, 2008), as well as when it comes to dealing with stressful life events (Krause, 2005). Hence, considering the relatively high prevalence of loneliness in very old age found in the studies of this thesis as well as in previous research (Nyqvist et al., 2017; Yang & Victor, 2011), preventing loneliness is key. According to Ferreira-Alves et al. (2014), sociodemographic, social, as well as health-related factors could influence loneliness, indicating that the underlying causes of loneliness should be examined in order to be able to give adequate support. Additionally, previous research has suggested that the predictors of loneliness could be different for men and women (Dahlberg et al., 2015), implying that factors such as gender should be taken into account when developing strategies for preventing loneliness.

5.3. Methodological considerations

The following section includes a methodological discussion regarding internal and external validity, including various strengths and limitations concerning the current thesis. A more detailed description of the specific strengths and limitations of Study I–IV can be found in the appended articles.

The internal validity of Study I could be considered to concern the method as well as the process of including and excluding articles. The use of Rodgers' evolutionary concept analysis was considered an appropriate methodological framework, including systematic guidelines for collecting and analyzing data (Toftthagen & Fagerström, 2010). Although foremost used in nursing, Study I could be considered to support the use of Rodgers' method in future concept analyses in social policy, as it provides a deeper understanding of the concept of interest as well as an overview of the research field. To enhance validity, the process of including and excluding articles as well as the analysis were conducted in dialogue with the co-authors, and was based on clearly stated criteria.

Potential participants for both the GERDA survey and the GERDA home visits were selected based on year of birth from the National Tax Board in Sweden and the Population Register Centre in Finland, which could be considered to increase internal validity. Regarding the GERDA survey, every individual in the various age groups were invited, except for in the cities of Umeå and Skellefteå where every third individual was randomly selected, and in Vaasa where every second individual was selected. In the home visits, every individual aged 85, 90 years and every individual aged 95 years and older was invited to participate, except for in the cities of Vaasa and Umeå where only every second 85-year-old was invited. It should be noted that only certain age groups were selected for both data sets, meaning that the samples were not based on the entire older (65+)/very old (85+) population.

As mentioned in the methods section, those who conducted the GERDA home visits received training beforehand, to ensure that the visits were conducted in a consecutive manner. Further, all diagnoses were determined by the same geriatrician during the whole study period, also implying high cohesiveness. Another strength of the data set is that it contains validated instrument such as PGCMS, GDS, MMSE, and Barthel's ADL index (Folstein et al., 1975; Lawton, 1975; Mahoney & Barthel, 1965; Sheikh & Yesavage, 1986), including instructions on how they should be administered, as well as information from the participants' medical records. Regarding the GERDA survey, focus groups consisting of older adults were invited in both Finland and Sweden to give feedback on the questionnaire before it was sent out, in order to increase its utility.

A general strength of the GERDA data sets is also that they have been designed through interdisciplinary collaboration, ensuring that various aspects of aging well have been included in the data collections. Similarly, Study II, III, and IV have been co-authored together with experts within the

fields of geriatric medicine, occupational therapy, nursing, demography, and social policy, which could be considered fruitful when examining complex phenomena such as well-being in very old age.

There are also a few points that merit attention regarding the generalizability of the results. Regarding the generalizability of the results of Study I, it should be taken into account that the inclusion criteria that were determined affected the set of articles that were included in the analysis. It is also important to take into consideration that well-being is multifaceted. Cognitive aspects of well-being such as morale could thus be considered driven by other mechanisms than the affective parts. Hence, even though they are interlinked, they do not necessarily follow the same pattern. Further, Study I showed that culture might play a role in which factors (antecedents) that are associated with well-being, which is probably also the case regarding morale considering the results of Nakagawa et al. (2018) who detected some differences in the factors associated with PGCMS among centenarians in Japan and in the United States. The results from Study II, III, and IV might thus not necessarily directly apply to other cultural settings, even though our results find support in previous studies conducted elsewhere (e.g. Woo et al., 2005).

It is worth noting, however, that no differences in level of morale between Finnish speakers, Swedish speakers in Finland and participants from Västerbotten were found in Study II, in contrast to previous research on the regions and the language groups concerning for example self-rated health (Nygqvist et al., 2008; Nyqvist & Nygård, 2012). The groups were therefore not analyzed separately here. Nevertheless, the different regions were controlled for in Study II and country was controlled for in Study III in order to detect possible effects of including individuals living in different areas.

Further, the overall response rate of the GERDA survey in 2016 was 61 percent, which could be deemed adequate considering the overall decrease in participation in surveys during recent decades (e.g. Brick & Williams, 2013). However, there were differences between the regions with a higher response rate in Västerbotten (70.8 %) compared to Swedish speakers in Ostrobothnia (61.7 %) and Finnish speakers in Ostrobothnia and Southern Ostrobothnia (54.9 %). Considering that corresponding regional differences in response rates have been observed also in previous GERDA surveys (in 2005 and 2010), this is something that could be inquired in the future.

There were also differences in the response rates between the age groups with a notably lower response rate among the 81- and 86-year-olds. We had no information of those who chose to not participate in the survey, including the reason to not participate. It could be assumed, however, that those who did not participate to some extent had more health problems than those who did, especially concerning the oldest age groups. For example, vision impairment could be a factor hindering people to participate in postal surveys. Similar concerns could also apply to the home visit data, i.e., those who did not participate may have been in worse health than those who did. Hence, it cannot be ruled out that the samples included in the studies

somewhat differs from the corresponding population in total. In a study on non-response in surveys among older adults, it was noted that the population aged 65–80 was representative of the population concerning morbidity while the sample older than 80 years was slightly healthier than the population, indicating that postal questionnaires could introduce bias concerning the very old population (Kelfve et al., 2015). At the same time, this highlights the strength of conducting home visits, which increases the possibilities for those who are very old to participate. A strength of the GERDA data is also that both community-dwelling and individuals living in an institutional setting are included as well as those diagnosed with dementia, which are important aspects in ensuring an as representative sample as possible (Kelfve et al., 2013).

Nevertheless, especially in the longitudinal studies which have a high dropout rate, attrition could be expected to occur to some extent. This was also reflected in our studies, for example that the sample in Study III who had data from both T1 and T2 had higher PGCMS scores at T1 as compared to the sample as a whole. However, we were able to assess in what ways the samples included in our analyses differed from those who were excluded. For example, in Study III, those who were included in the final sample (n=204) were younger, had at T1 higher scores in PGCMS, MMSE, and in the Barthel's ADL index as compared to those who died during the follow-up period, who declined participation at T2, or were unable to answer 12 items in PGCMS at T2.

Further, analyses in Study IV showed that those who declined re-participation were to a higher proportion female, had lower scores in MMSE, and suffered to a higher extent from depressive disorders compared to those who accepted a home visit at T2. In contrast, there were no differences regarding age, years of education, PGCMS scores at T1, or ADL. Thus, there were both similarities and differences between the sample completing the follow-up and those who only participated at baseline. Additionally, it should be taken into account that the sample that was analyzed in Study IV only included those who had high morale at T1. The remaining samples that were analyzed in Study III and IV were thus relatively small but the analyses were adjusted accordingly, for example regarding the number of variables included in the regression models. Still, the analyses could with advantage be replicated in larger samples for additional corroboration of the findings.

It can also be discussed, whether a follow-up period of five years is appropriate when examining very old adults. On the one hand, five years could be seen as too long, considering that many individuals died or became too ill to participate at follow-up. On the other hand, a five-year follow-up made it for example possible to examine the cumulative effect of experiencing several negative life events and more long-term stability in morale. Despite having longitudinal data, however, it is worth noting that it is difficult to determine causal relationships between explanatory variables such as loneliness and morale, due to for instance the observational design.

In sum, research including very old adults entails thus by large some certain considerations. Smith and Ryan (2016) conclude on the one hand that very old adults participating in research constitute a group of positively selected people, considering that they have outlived many from the same cohort and in addition are well enough to participate in research. On the other hand, these very old adults are nonetheless vulnerable to the social and health-related challenges they are facing, implying that studies of very old adults are still highly valuable.

Concerning external validity, it was interesting to compare the levels of morale found in the studies included in this thesis and other previous studies. The mean score in PGCMS for the whole sample in Study II was 12.8 (SD=3.3), while the mean PGCMS score for those who had answered PGCMS at T1 in the home visits data was 11.8 (SD=3.1). These levels are comparable with the studies of Iwasa et al. (2006) and Lawton (1975), but higher than for example in the study of de Guzman et al. (2015) and Nakagawa et al. (2018). However, making comparisons was not always easy, considering that various versions of PGCMS have been used, for example one containing 15 items (Woo et al., 2005), and various age spans have been included, which considering the results of Study II are likely to affect the level of morale.

How the information has been retrieved could possibly also to some extent have affected the results. For example, the mean PGCMS scores differed between the home visit sample and the 86-year-olds participating in the survey. As can be seen in the flowchart in Study III, those who answered PGCMS at T1 (n=647) had a mean PGCMS score of 11.8 (SD=3.1), while the mean score of the 86-year-olds in the survey (n=697) was 10.9 (SD=3.4). This discrepancy could have several explanations, for example that the social desirability is stronger when being assessed face to face than through a postal survey (Callegaro, 2008), but it could also be actual differences in morale between the samples.

Some of the strengths of using PGCMS include that it has been designed to suit older adults and that it has been validated in various settings over the years (e.g. Niklasson et al. 2015b; Pinar & Oz, 2011; Wong et al., 2004), albeit not yet in the Finnish context. Another advantage is also that it is multidimensional, meaning that it can provide a more nuanced picture of well-being than single-item measures. However, as discussed by George (2010), there is also a risk that the correlates of well-being and well-being in itself may be confounded when using multidimensional instruments. Study I for example showed that depression/depressive symptoms were also used as measures of well-being, while it in the other studies of this thesis was considered a risk factor for having lower well-being (morale). This might raise a question whether well-being and mental illness are just two sides of the same coin or two ends of the same continuum, i.e., that absence of mental illness would signify well-being. There are, however, several arguments to why well-being and mental illness, in this case depression, should be seen as separate entities (see also the discussion of Donisi et al., 2020). For example,

the two continua model, which has received support in various empirical investigations (e. g. Ryff et al., 2006; Seow et al., 2016; Westerhof & Keyes, 2010), posits that positive mental health (well-being is here considered a part of mental health) is more than the absence of mental illness, and thus that mental health and mental illness are related but still distinct dimensions (Westerhof & Keyes, 2010).

Similar concerns might be raised regarding the results that perceived loneliness (Study II, Study IV) is one major risk factor of lower morale, considering that one of the subscales in PGCMS concerns lonely agitation. However, considering that the PGCMS was analyzed as a continuous variable representing the instrument as a whole, and that loneliness was measured with single items, the risk of too much overlap decreased. A correlation analysis was also performed during the initial stage of Study IV, showing that the correlations between the variable assessing loneliness and the subscales of PGCMS were similar (-.260 for agitation, -.276 for attitudes toward own aging, and -.247 for lonely dissatisfaction). Thus, it is reasonable to argue that depression as well as loneliness are distinct from morale.

Lastly, it should be noted that the measurement of depression and loneliness differed somewhat between the GERDA survey and the GERDA home visits, which could have affected the reported occurrence. The variable for depression was in the survey data based on the question “Do you feel depressed?” and on the four item version of GDS. In the home visit data, the variable representing the diagnosis “depressive disorders” set according to the Diagnostic and Statistical Manual of Mental Disorders fourth edition (American Psychiatric Association, 1994) was used. Loneliness was in the survey measured with the question “Do you suffer from loneliness?” while in the home visits with the question “Do you ever feel lonely?”. Regarding the latter, perceived loneliness was considered to occur if the respondent had chosen the answer alternative “sometimes” or “often” in opposite to “seldom” or “never”.

5.4. Conclusions and implications

Promoting well-being in very old age is important in its own right, as well as within discourses such as successful, active, and healthy aging. This thesis has provided extended knowledge on the conceptualization of well-being, and has also filled some knowledge gaps regarding morale in very old age. The results contribute to the growing literature highlighting that research focusing on very old age is crucial. From a policy perspective, increased efforts to develop policies to promote well-being that simultaneously take the circumstances of very old age into account is therefore vital. Taken together, the results of this thesis reflect that very old age is a period during which changes of both health-related and social character is likely to occur. As shown in Study I, the ability to adapt becomes thus all the more important as people reach advanced ages. Additionally, the multifaceted and dynamic nature of well-

being in very old age and its antecedents should be acknowledged. Overall, different changes considered as negative life events seem to have a cumulative negative effect on morale. Further, perceived loneliness and depression emerged as two main risk factors of having lower morale in this thesis, which is aligned with the literature pointing towards that developing actions to promote social and mental health in old age is essential (e.g. Puvill et al., 2019).

There is however still a need to evaluate what kinds of actions that would be beneficial, and that would suit the life situations of very old adults. According to Smith and Ryan (2016), there is little research regarding the efficiency of interventions targeting very old adults in the context of psychological functioning. However, considering the complex and varying needs of very old adults, comprehensive, integrated, and person-centered approaches are most likely beneficial (Biering, 2019; Pin & Spini, 2016). It is also important to acknowledge that in the development of policy and social and health care targeting very old adults, both prevention and promotion as well as adequate support when losses and negative changes have occurred is crucial. Considering the importance of the ability to adapt, interventions focusing on promoting the use of SOC-strategies in very old age could for example be fruitful, and should therefore be tested and evaluated. The SOC-strategies could be useful both from a pro-active point of view as well as when adaptation is required due to a change or loss.

In a broader context, the part of well-being in very old age concerning adaptation could also be considered interlinked with aging well (e.g. Baltes & Baltes, 1990) and should thus be taken into account in policies targeting the very old population. For example, supportive measures such as creating age-friendly environments could enable very old adults to be able to adapt to increasing health constraints. Further, considering that various resources are essential to SOC as well as well-being (Dodge et al., 2012; Freund, 2008; Fritzell et al., 2020; Lang et al., 2002), a focus on the living conditions of the very old population could also be important to reducing inequalities in resources (Fritzell et al., 2020).

Based on the longitudinal studies, it also became evident that assessing changes over time is feasible in research focusing on very old adults. For example, only one of the baseline variables included in Study IV, poor self-rated health, was associated with a decrease in morale five years later, and this effect was diminished when the variables assessing changes were included.

Regarding future research, Study I showed that there were inconsistencies regarding the antecedents of well-being in very old age identified in different studies. To further validate the results from individual studies, meta-analyses would thus be feasible. The analysis also highlighted the need for additional qualitative studies to complement the quantitative knowledge base. Additionally, the results of Study I also pointed to that the consequences of well-being in very old age should be further examined, as this information

could provide essential information for policy-making and the allocation of resources. Lastly, although much focus in this thesis has been on risk factors and negative changes, it would also be important to study and emphasize the aspects that can promote morale and well-being in very old age.

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Appendix

The Philadelphia Geriatric Center Morale Scale (PGCMS) – British English version (Challis & Knapp, 1980)

1. Do things keep getting worse as you get older?	Yes	No
2. Do you have as much energy as you did last year?	Yes	No
3. Do you feel lonely much?	Yes	No
4. Do you see enough of your friends and relatives?	Yes	No
5. Do little things bother you more this year?	Yes	No
6. As you get older do you feel less useful?	Yes	No
7. Do you sometimes worry so much you can't sleep?	Yes	No
8. As you get older, are things better than expected?	Yes	No
9. Do you sometimes feel that life isn't worth living?	Yes	No
10. Are you as happy now as you were when you were younger?	Yes	No
11. Do you have a lot to be sad about?	Yes	No
12. Are you afraid of a lot of things?	Yes	No
13. Do you get mad more than you used to?	Yes	No
14. Is life hard for you most of the time?	Yes	No
15. Are you satisfied with your life today?	Yes	No
16. Do you take things hard?	Yes	No
17. Do you get upset easily?	Yes	No

Answer alternatives in bold indicate high morale and give one point.

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Author contribution statement

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Declaration of contribution of authors:

Gustafson was one of the initiators, and has been the principal investigator, of the GERDA project from which data was used. Näsman, Nygård, Nyqvist, Olofsson and Gustafson contributed to the acquisition of data. All authors contributed to the conception and the design of the article. Näsman was the corresponding author and did necessary preparation of the data as well as conducted the analyses, while all authors contributed to the interpretation of the results. Saarela assisted Näsman when conducting the analyses using joint effects. Näsman had the main responsibility of drafting the article but all authors contributed substantially in both the drafting and the revising. Especially Niklasson contributed to the text regarding the concept of morale. All authors gave their final approval of the version to be published.

Author contribution statement

Article:

Five-year change in morale is associated with negative life events in very old age. Published in *Aging & Mental Health*, vol. 23 in 2019.

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MSocSc Marina Näsman, PhD MD Johan Niklasson, Professor Mikael Nygård, Professor Jan Saarela, Professor RN Birgitta Olofsson, PhD Mia Conradsson, PhD MD Hugo Lövheim, Professor MD Yngve Gustafson, and PhD Fredrica Nyqvist

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Gustafson was one of the initiators, and has been the principal investigator, of the GERDA project from which data was used. Niklasson, Olofsson, Conradsson, Lövheim, and Gustafson have all participated in the collection of data. Gustafson has additionally determined all diagnoses included in the data. The conception and design of the article was discussed among all of the authors. Näsman was the corresponding author and did with assistance from Niklasson necessary preparation of the data. Näsman was additionally responsible for analyzing the data while the interpretation of the results was discussed among all of the authors. Näsman also had the main responsibility for the drafting of the article with assistance from mainly Nyqvist and Niklasson. All of the authors contributed to revising the article. Final approval was collected from all of the authors before submitting the manuscript.

Author contribution statement

Article:

Risk factors for a decrease in high morale in very old people over a 5-year period: data from two Nordic countries. Published in European Journal of Ageing, vol. 17 in 2020.

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Marina Näsman

Well-being in the light of being very old

Conceptualizations, associations, and variations

This thesis examines well-being among very old adults and could be considered to comprise two main parts. One part consists of increasing the understanding of well-being in very old age by exploring its conceptualization through a concept analysis based on previous scientific research focusing on well-being in very old age. The second part consists of three studies where some knowledge gaps regarding morale, which is seen as a cognitive dimension of subjective well-being, are addressed. In these studies, different sociodemographic, social, and health-related factors are studied in relation to morale. One of the studies includes the examination of morale in different age groups in order to see if level of morale and its associated factors differ between younger old and very old adults. Further, in the two studies focusing explicitly on very old age, changes in morale and associated factors over a five-year period are examined.



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