

Sanna Takkinen

MEANING IN LIFE AND ITS
RELATION TO FUNCTIONING
IN OLD AGE

*timme ja kunniaitimme. Tei-
namme, ja tämä tuntui
niin sulaiselta ja Neveäl-
tä.*

*Sitä sydämmen tuskaa
si voi kukaan muu käittää,
minkä tämmöinen tapau myi.
Tänse tuopi, kuin si, joka
itse on kummaa kokunut. Se
dette ite surussa määräs.*



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ABSTRACT

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This study examined the relationship between meaning in life and functioning in old age: Firstly, the relationship between meaning in life and cognitive functioning was investigated. Secondly, the role of physical activity for enhancing meaning in life and physical health and functioning was studied. Thirdly, the role of meaning in life was examined by applying two models of functioning: a multidimensional model of functioning and a model based on Antonovsky's theory. In addition, the interrelationships between several meaning-in-life measures were investigated. The study was part of the Evergreen project, a longitudinal, multidisciplinary research programme which studies people aged 65 – 92 in Jyväskylä, central Finland. The sample sizes of the present study varied from 55 to 320. The participants were interviewed and some of them attended a medical examination and laboratory tests designed to assess physical, psychological and social functioning. Meaning in life was measured by interview questions, a questionnaire and a life-line drawing. The results showed that the degree of meaning in life was independent of the level of cognitive functioning. However, the content of meaning in life was related to cognitive functioning: persons with high cognitive functioning mentioned human relationships more often as a reason for meaning in life and a source of strength in life than the comparison group. Those persons with high cognitive functioning had also more often found a new field of activity giving meaning in life after retirement and this new activity was more likely to be a social activity. Physical activity was an important factor enhancing meaning in life: persons exercising frequently had a stronger sense of meaning in life and in turn rated their physical health and functioning better. The multidimensional model of functioning showed that the different measures of meaning in life were related to both physical and psychosocial functioning. The relationships were stronger with respect to subjective than objective functioning. A stronger meaning in life was related most closely to such aspects of functioning as fewer depressive symptoms, greater satisfaction with life, less frequent sense of loneliness and better self-rated health. In Antonovsky's model, important background factors facilitating the sense of coherence were cognitive functioning and physical exercise in the whole sample and being married or cohabiting in men. A strong sense of coherence enhanced in turn physical and especially psychological and social health and functioning. The interrelationships between several measures of meaning in life showed that the sense of meaning in life was related to change in zest for life and to sense of coherence. Representing one's life by a linear line and upward trend in the life-line drawing was related to a stronger sense of coherence. A higher life-line was related to a stronger sense of meaning in life.

Keywords: meaning in life, functioning, elderly people, sense of coherence, life-line

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Sanna Takkinen

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- II Takkinen, S., Suutama, T., & Ruoppila, I. (in press). More meaning by exercising? Physical activity as a predictor of a sense of meaning in life, and of self-rated health and functioning in old age. *Journal of Aging and Physical Activity*.
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1 INTRODUCTION

The present study originated from my personal interest in the human life course and its meaning. As a freshly graduated psychologist of four years standing, I found myself experiencing a conflict of feelings about life. I was working in a psychophysiological research group studying new-born babies. My encounters with these tiny two-day-old human creatures was fascinating, but at the same time aroused me in a deep feeling of pity. I felt pity for the fact that these babies have such a long life ahead, a path with many decades to go, to strive, to succeed and to fail, to suffer and last to die. I continuously found myself asking: Why survival? Why such a long life? What is life? Since the new-born babies silently kept the secrets within, I decided that the only way to reach the answer to any of these questions would be to turn to an elderly person who has a long life behind them. So I took a big step from the cradle to the edge of the grave and I began to study persons over the age of 80.

While searching for the answers, I came across the concept *successful aging*. Successful aging has been defined in numerous ways, for instance longevity of life, good health, life satisfaction and morale (Palmore, 1987). It is often considered as the maintenance of good subjective and objective functioning by selection, compensation and optimization as a life-long process (Baltes & Baltes, 1990; Schultz & Heckhausen, 1996). The concept of successful aging deeply impressed me. It impressed me even though it has been subjected to a wealth of criticism. It has been accused of vagueness and exhaustiveness as a concept. The severest critique has focused on the word "successful" as too competition- and performance-oriented in connotation – and too positive. What is positive in aging? Is it not unusual or even macabre to relate success to aging? I have noticed that it seems to be the case: gerontological research field is full of studies concerning pathologies, whereas positive development has seldom been focused on. Also, in everyday life, it seems to be much more acceptable to talk about one's problems and difficulties than confess that one is doing well.

I ended up studying meaning in life. Meaning in life and other questions related to one's existence display a relevant, though often forgotten role in

successful aging. As a developmental psychologist, I was interested in meaning in life from the life-course perspective. I contemplated the usefulness of a life-line drawing representing one's entire life as a method for measuring meaning in life. I was introduced to the data gathered in the Evergreen project from a multidisciplinary perspective concerning the functioning of elderly people. The theme of meaning in life was included in interviews carried out in the course of the project, but it had received virtually no attention in the analyses and was actually regarded as a "make-weight" issue without empirical significance. Moreover, there were no previous studies concerning meaning in life among elderly Finnish people. Thus, I seized the opportunity to use the Evergreen project data to study elderly people's meaning in life by means of several measures within a multidimensional context of functioning.

1.1 Meaning in life as a psychological construct

Meaning can be viewed as specific events that give meaning in life or ultimate, total meaning from which specific aspects of life derive their meaning (Wong, 1989; Yalom, 1981). Generally 'meaning *of* life' refers to ultimate meaning, which is usually of interest to philosophers. 'Meaning *in* life' in turn refers to specific meanings and is usually studied by psychologists.

In the psychological field, the most extensive work in the area of meaning in life has been done by Viktor Frankl (1959, 1978). According to his theory, searching for meaning in life, a *will to meaning*, is a primary motivational force in man. Having a sense of meaning in life enhances well-being, whereas losing meaning in life may lead to an *existential vacuum*: loss of belief in the future and the will to live, apathy and boredom, a feeling that life is not worth to living. Increased meaninglessness may result in a state of existential neurosis manifest as depression, aggression and addiction. In the most extreme cases, the loss of meaning may lead to suicide.

According to Frankl, meaning in life is an independent motive, i.e. meaning in life can be achieved regardless of external conditions and objective circumstances such as age, gender, level of intelligence, education, environment, personality, or religious denomination. Thus having a strong sense of meaning is possible even in objectively miserable conditions and in suffering. Frankl's view was based on his personal experiences in Nazi concentration camps, where as a prisoner he was in an exceptional position to observe the struggle for existence in extreme conditions. Though he postulated that external conditions can not deprive one of the opportunity for seeking meaning, he admitted that external conditions can contribute or hamper the search. The point is, however, that each person has a chance to choose his or her attitude toward what happens in life and choose what action to take in a particular situation.

Frankl's theory emphasises man's freedom to make choices. It follows that the individual is responsible for all his or her choices. This view is widely recognized in existential psychology and philosophy. For instance, Sartre (1957)

postulated that existence precedes essence, i.e. first man exists – he is born and develops – and only afterwards defines himself. In this state, subjectivity is the starting point: the individual chooses and makes himself. This leads to responsibility: a man is responsible for what he is. Thus man's destiny can be seen within himself and his only hope is in how he acts and involves himself in life. According to Sartre, existential humanism means the connection of subjectivity and transcendence. By transcendence he meant a state of passing beyond, a state where an individual is consistently striving to be outside of himself. The importance of self-transcendence is also pointed out by Frankl (1959): a person is capable of finding meaning only through aiming at something outside of his or herself. Excessive preoccupation with one's self, self-centredness, impedes the opportunity to find meaning.

Frankl himself located his theory midway between existentialism and humanism. Though his thoughts have very much in common with many existential philosophers, his view is tempered with a great deal of optimism and hope, which distinguish him from the more pessimistic theorists (for instance Schopenhauer, Nietzsche and Heidegger). Frankl adopted the existentialists' view that a priori life has no meaning, but he did not wholly share the idea of the forlornness of man in a sense that each person is thrown into the world alone and thus is condemned to make his or her life from nothing. Freedom of choice is frequently, as Frankl sarcastically stated, bounded to the fact that an individual chooses to do what other people do (conformism) or what other people want him to do (totalitarianism). While Sartre (1957) postulated that the meaning in life has to be invented by each individual, Frankl (1959) viewed that rather than being invented, meaning in life is detected. By this statement Frankl referred to the three most often used modes of attaining meaning in life: (1) creativity: to give something to the world, for instance writing an article, composing music, inventing a new tool, (2) experience: to take something from the world, for instance experiencing beauty, joy or love, and (3) suffering: to achieve a deeper understanding through the hardships of life. His optimistic view is shown also in the fact that he believed that meaning in life can be enhanced. He contributed to existential psychology not only by formulating new theoretical constructs but also by inventing a technique of therapy, logotherapy, for enhancing meaning in life.

Another view of meaning in life, which I would like to introduce, is the theory developed by Aaron Antonovsky (1979, 1987, 1991). Antonovsky approached meaning in life from a health sociologist's point of view, thus differing from the framework of Frankl. However, the origin of his theoretical work was astoundingly similar to that of Frankl: while Frankl laid his view on observations of concentration camp prisoners, Antonovsky collected in-depth interviews from women who had survived the concentration camps or some other serious trauma. Antonovsky's question was: how was it possible that these women survived and stayed well regardless of such a stressful life experience? He answered it by formulating the concept of *sense of coherence*. Sense of coherence refers to a global orientation to one's inner and outer environments. It expresses the extent to which one has a pervasive and enduring, though still dynamic sense of confidence that (1) the stimuli deriving from one's internal and external environments in the course of

living are structured, predictable and explicable; (2) the resources needed to meet the demands posed by these stimuli are available to one; and (3) these demands are challenges, worthy of investment and engagement. These three components refer to comprehensibility as a cognitive, manageability as an instrumental, and meaningfulness as a motivational component of sense of coherence.

These three components, comprehensibility, manageability and meaningfulness, are closely related to each other and they all are necessary for constructing a strong sense of coherence. However, the components display unequal importance in terms of overall sense of coherence. Antonovsky, especially in his later work (1987, 1991, 1993), emphasised the role of meaningfulness: as a motivational component, meaningfulness is the most crucial of the three components. A person who welcomes challenges, considers them as worthy of investing energy in, and of commitment, can more easily find a way to acquire understanding and resources. On the other hand, a person who has lost his motivation is likely to cease to respond to the stimuli deriving from his internal and external environment, and the world soon becomes incomprehensible and unmanageable. Thus the way a person acts and orientates himself, is largely determined by the degree of his sense of meaningfulness. A strong sense of meaningfulness is likely to enhance the comprehensibility and manageability, whereas low sense of meaningfulness is likely to decrease comprehensibility and manageability of life. Antonovsky (1987) listed four important spheres of life that are significantly related to sense of meaningfulness. These spheres consisted of one's inner feeling, one's immediate interpersonal relationships, one's major activity, and existential issues (such as death, inevitable failures, shortcomings, conflict and isolation).

Antonovsky considered the sense of coherence a key construct in dealing with stress, and thus an important factor in promoting health and well-being. He saw health as an ease/ dis-ease continuum, rather than a dichotomy of health and sickness. Contrary to the traditional pathogenic model interested in the origins of sickness, Antonovsky formulated a salutogenic model. In this model, the factors promoting movement toward the healthy end of the continuum are of interest. The model suggests that it is an individual's generalized resistance resources that facilitate his or her sense of coherence, which further enhances health. Generalized resistance resources refer to such factors as sufficient income, high education, intelligence, preventive health orientation and social support which are effective in providing the individual with life experiences which are meaningful and understandable, and in which tension is generally successfully managed.

According to Antonovsky, health status is promoted through three different channels. Firstly, a strong sense of coherence decreases the likelihood of perceiving the demands encountered by an individual as stressful. This reduces susceptibility to health-damaging effects of chronic stress by lowering the probability of repeated emotions related to stress perceptions. Secondly, sense of coherence may have a direct physiological health-maintaining consequences in such a way that the perception of the world of stimuli as comprehensible, manageable, and meaningful activates the brain to send messages to other bodily systems which maintain homeostasis. Thirdly, sense of coherence can operate through the selection of health-promoting behaviors.

1.2 Meaning in life in old age

1.2.1 Theoretical perspectives

Though Frankl and Antonovsky focused on the importance of human meaning in life in numerous books and articles, they gave only marginal attention to the role of meaning in life in old age (see the latest works e.g. Antonovsky & Sagy, 1990, Antonovsky, Sagy, Adler & Visel, 1990; Frankl, 1990). The importance of finding meaning in life in old age has, however, been touched upon by a number of developmental theorists. Erik Erikson developed a theory of the psychosocial life-course development which consisted of eight different stages. Though the theory emphasises childhood (five of the eight stages were located before age 20), adult development and old age are also dealt with. According to Erikson (1994), the major developmental task in old age is to achieve *ego integrity*, which is characterized by the feeling that one's life is worthwhile and significant. Integrity is a sense of coherence and wholeness, which is involved in three organizing processes: the soma, psyche and ethos.

Integrity gives a basis for wisdom, which refers to an informed and detached concern with life in the face of death. Death is on the one hand wholly certain and on the other hand wholly unknowable, thus presenting the most exacting riddle of life with which an old person has to deal. The Eriksonian concept of wisdom seems to come very close to finding a meaning in life. The concept of wisdom remains, however, somewhat hazy and Erikson (1978, 1986) made no attempt to clarify this concept in his later books, which mainly concerned the last stages of life.

According to Erikson, if integrity is lost, a person is likely to feel despair. Disdain is the antipathetic counterpart to wisdom, a reaction to feeling oneself (and seeing the other) in an increasing state of being finished, confused and helpless. In his or her ultimate integration, an old person seeks to re-experience each of the psychosocial themes that have shaped the life course. For instance, the "hope" of the first stage is also important in old age: without hope life could not begin or meaningfully end. Similarly, the previous stage of generativity is important; much of the despair of elderly people is due to a continuing sense of stagnation, which impedes the integration of the last stage. An unsuccessful process of integration may also result in pseudointegrity, a compulsive, dogmatic way of seeing one's life as a whole ordered entity. This state resembles Antonovsky's (1987) rigid sense of coherence, in which a person holds an image of absolutely perfect manageability, comprehensibility and meaningfulness of life.

Another developmental view on meaning in life in old age was introduced by Carl Gustaf Jung. According to Jung (1981), aging involves a process of *individuation*. The second half of life is substantially different from the first half of life. An elderly person is more preoccupied with his or her inner self. The earlier interests and values such as money-making, social achievement, family and posterity are given up and a new perspective is constructed. Jung himself is not very explicit in describing this new perspective. He discusses the gradual change in feminine and masculine features; women becoming harder and men softer. He

refers to primitive tribes, where old people are often the guardians of mystery and law who embody the wisdom of the tribe. He defines wisdom as returning to primordial images, symbols, of which one of the most important in old age is the idea of life after death. When one experiences the finitude of life in old age, it becomes increasingly important to discover a goal in death. Jung described life as an intrinsic striving towards a goal. Missing a goal, a sense of meaninglessness in life, Jung called soul-sickness. Though he stretched his developmental view from birth to death in human life, he paid relatively little attention to old age. He postulated that old age, like early childhood, is a period without any intrinsic problems (excluding the possible fear of death). An old person may be a problem for other people, but is not conscious of any problems of his or her own.

An extended perspective on the ideas of Jung can be found in Lars Tornstam's (1989) theory of *gerotranscendence*. This theoretical view is a mixture of several theoretical orientations: disengagement theory, developmental theories (Erikson, Jung), and Zen-Buddhism. The theory in particular concentrates on old age. In gerotranscendence, an aging individual builds a new perspective of the self and others, time and space and life and death. A person shows a reduced need for social contacts, material issues and self-centredness. At the same time, the need for thinking about existential questions is increased. This means a shift to a cosmic and transcendent metaperspective on life. Tornstam, as Jung and Erikson, emphasises the importance of getting to know one's inner self and one's life. The positive development of getting to know one's inner self is likely to create wisdom and reduce the fear of death. However, a substantial difference between the views is in time orientation. Erikson emphasises life reviewing, integrating one's life by looking into the past, whereas Jung and Tornstam insist on the formulation of a new perspective which is orientated to the future.

A rather new perspective dealing with personal meaning in life and the life-course development is *gerodynamics* (Schroots, 1996; Schroots & Yates, 1999). This view is based on general systems theory. The basic idea is that each living system has two opposing tendencies: a tendency to maximal entropy, chaos, disorganization and death, and to maximum negentropy, order, organization and life. Life is a non-linear series of transformations into higher and lower order structures and processes. As a person gets older, there is an increasing tendency toward more disorder than order with death as an ending point. The perspective of gerodynamics regards aging simultaneously as a general, group-specific and individual process. To detect life and its meanings from the gerodynamic perspective, branching models, life-lines and fractal structures can be applied (Schroots, 1996). Branching models illustrate life as a chain of transitions, branching points, which are important and meaningful events, experiences and happenings that shape the life-course. An insight into these branching points and their meanings can be attained by using for instance guided autobiography (Birren, 1987; Birren & Deutchman, 1991). As branching models, life-lines also illustrate significant life events. In addition, life-lines allow the graphical expression of affective meanings during the course of life. Branching models and life-lines illustrate life in two-dimensional form on the basis of classical linear models. Fractal models attempt to extend this perspective by modelling multidimensionality and irregular forms of the life course. Fractal structures illustrate the self-similarity of

life and try to overcome the problem of stability vs. change in life by integrating both these components into a single picture. The idea of representing life by fractal models presents many interesting opportunities. The empirical modelling, however, has thus far proved difficult and appropriate research methods are still in the process of development.

1.2.2 Empirical findings

Research has focused on the degree and content of meaning in life. The degree of meaning in life refers to how strongly meaningful (or meaningless) a person finds his or her life. Meaning in life has been considered to increase with age. This tendency has been found in cross-sectional settings in adult populations (Battista & Almond, 1973; Orbach, Iluz & Rosenheim, 1987; Reker, Peacock & Wong, 1987). Battista and Almond (1973) proposed that in the first half of one's life, the development of self-esteem occupies a central position, and thus forming a positive self-regard is important. In the later part of life, the sense of meaning in life becomes increasingly important, and thus forming a positive life-regard characterizes advanced age. By comparing younger and older age groups, Battista and Almond found support for this hypothesis.

Reker et al. (1987) also studied the degree of meaning in life in different age groups varying from young adulthood to old age (range 16 – 93 years). Goal seeking and future meaning decreased with age, whereas will to meaning and life control remained approximately the same between the age groups. Life purpose and acceptance of death increased with age. Feeling an existential vacuum was lowest in middle age, whereas the highest level was found in young adulthood and in old age. Orbach et al. (1987) compared the commitment to meaning in life in young adulthood, middle age and late adulthood. They found the strongest commitment to meaning among the late adulthood group. The results of these studies were consistent with the developmental theories suggesting that issues related to meaning in life have greater importance in old age than in earlier phases of life (e.g. Erikson, 1994; Frankl, 1959, Tornstam, 1994). However, the cross-sectional settings of these studies limited to the opportunity to control such factors as cohort differences, which may in fact have more importance for the sense of meaning in life than age. The investigation of developmental changes requires longitudinal data.

Although the degree of meaning in life is often claimed to be unrelated to gender (Antonovsky, 1979; Frankl, 1959), some differences between men and women have been found. Orbach et al. (1987) reported that men had a stronger degree of commitment, i.e. a stronger sense of meaning in life, than women. Reker et al. (1987) found that men and women expressed an equal degree of existential vacuum, death acceptance, goal seeking and future meaning. However, women had a stronger will to meaning and viewed life as more under their control than men in early middle-age and young-old age. These findings of gender differences in meaning in life seem to be somewhat contradictory.

The content of meaning in life specifies the sources or reasons for finding one's life meaningful (or meaningless). The most often expressed content of meaning in life has been shown to be human relationships regardless of the age of

the respondents (DePaola & Ebersole, 1995; DeVogler & Ebersole, 1981; McCarthy, 1983; Orbach, Iluz & Rosenheim, 1987; Prager, 1996). Religion has also often been reported as one of the contents of meaning in life, and its importance seems to increase with age (McFadden, 1995; Orbach et al., 1987). Other often mentioned domains among elderly persons have been pleasure in life and health (DePaola & Ebersole, 1995; Ebersole & DePaola, 1986). In comparing the content of meaning in younger and older adults, Orbach et al. (1987) found that such factors as growth and obtaining material possessions seem to be less often mentioned by older persons, whereas belief and service as the contents of meaning are more often mentioned by older than younger persons. Prager (1996) arrived at a similar result when he compared the sources of meaning in younger, middle aged and older adults. The most often mentioned contents in all three age groups were personal relationships, meeting personal needs and preserving values and ideals. The most distinct difference between the older group and the two younger ones was that older persons reported less often a striving for recognition of achievements and were more interested in preserving values and ideals.

Though meaning in life has been studied among different age groups, including elderly people, we still lack knowledge of changes in meaning in life in the same people over time. Moreover, we have virtually no previous results concerning meaning in life among elderly Finnish people. To fill this gap in our knowledge, as the foundation of doctoral thesis, I examined meaning in life in Finnish elderly men and women in follow-up (Takkinen & Suutama, 1999a) and cohort designs (Takkinen & Suutama, 1999b). The study was part of the Evergreen project being conducted in Jyväskylä. The follow-up study consisted of about 600 elderly persons aged 65–84 at the baseline in 1988. The follow-up was carried out eight years later in 1996. The cohort study was based on two 65–69-year-old age cohorts, one measured in 1988 ($n = 350$) and the other in 1996 ($n = 319$). The participants of the follow-up and cohort study were interviewed by means of questions concerning the degree of meaning (the sense of meaning in life, change in zest for life), and the content of meaning (the reason for meaning in life, the source of strength of life, a new activity found after retirement giving meaning in life, the meaning of death).

The result showed that majority of the elderly Finnish people reported their life as meaningful (60–70%) and no change in their zest for life (70–80%). A smaller number (10–20%) found their life meaningless and reported an increased or decreased zest for life. Meaninglessness in life and decreased zest for life were especially reported by the older participants of this study. About a fourth of the participants could not tell whether their life was meaningful or not. During the follow-up, the sense of meaning in life slightly decreased among the men, and zest for life decreased among the oldest participants. No differences between men and women were found. In comparing the two cohorts, finding life meaningful was higher in the later born cohort.

The most often mentioned reason for meaning in life was human relationships (about 25% in men and 30–40% in women). Reasons related to life (e.g. respect for life, interest in life, belief in the future) (about 20% among both genders) and health and functioning (about 10% among both genders) were also mentioned quite often. Other reasons given were hobbies and work, psychological

well-being, material well-being, and religion. The significance of reasons related to life increased during the follow-up. The most often mentioned reasons for meaninglessness were a sense of being worthless in old age (about 30%), and loneliness (about 20%). Poor health and physical functioning was mentioned by 3% at the baseline, but in the follow-up this proportion had risen to 32%.

The sources of strength in life were very similar to the reasons for meaning in life. The main difference was in the role of religion. For the older persons religion was the most important source of strength in life (about 25% in men and 50% in women) followed by human relationships (about 15% for both genders). Religion was also mentioned by the younger participants (about 20% in men and 35% in women), but approximately as often as human relationships (about 25%). Health and functioning, psychological and material well-being were also mentioned. The importance of psychological and material well-being decreased during the follow-up, whereas the importance of religion increased, especially among the men.

In regard to finding a new field of activity giving meaning in life after retirement, most of the participants (almost 60 %) reported that they had not found a new field of activity. In those who had found new activities, the most often mentioned activities were social interests, especially among the women, and outdoor activities such as gardening, fishing and hunting, especially among the younger male participants. A number of other activities were also mentioned; such as handicrafts, arts, reading, and travelling.

The meaning of death was reported by nearly half of the participants as an unavoidable, natural event. Some of the elderly persons saw death as hope for a new life (about 10% in men and 15 – 20% in women) or an end of everything (about 20% in men and 10% in women). Death was also described as a liberation from suffering, rest and peace, and as a riddle. Only a very small minority saw death as a fearful or unpleasant thing. The meaning of death was very stable over the cohorts and over the follow-up period. Only among the younger female participants was there a decrease in fearful feelings toward death during the follow-up, whereas among the older women there was a decrease during the follow-up in considering death as the end of everything.

1.3 Meaning in life and functioning

The level of functioning and changes in it has received much attention in gerontological research. Functional decline (for instance, an increase in the number of physical disabilities, memory problems, and depressive mood) is often associated with old age. Deterioration in functioning is a common concern in aging. The functional changes in normal aging are, however, regarded as quite small, whereas the increased number and severity of diseases related to aging may drastically reduce functional abilities. A distinction between normal and pathological functional decline is often difficult to make (Heikkinen, 1995). The changes in functioning also vary in different domains of functioning. For instance, physical decline related to the biological aging process starts earlier and is more prevalent than decline in psychological functioning. Moreover, within the same domain of

functioning, the rate of change may vary: for instance cognitive abilities concerning speed, accuracy and flexibility are more exposed to age-related decline than cognitive abilities which are based on knowledge (e.g. language and professional skills) (Baltes, 1993; Schaie, 1996). Great interindividual differences in the level of functioning are also characteristic in old age. Though limitations in functioning may have drastic effects on everyday life by reducing the possibilities for carrying on an independent life, interaction with other people and attending activities, it is important to note, however, that limitations themselves do not necessarily lead to a bad quality of life. The critical question in successful aging and successful functioning is how well limitations can be compensated so that a person can continue to live adequately despite them (Baltes, 1993; Baltes & Baltes, 1990).

Even though much empirical interest has recently been shown to functioning in old age, the concept of functioning remains unclear. Functioning has mostly been used to refer to physical ability or – even more often – physical disability. Studies have mainly focused on (dis)abilities to perform different activities of daily living (ADL), such as eating, dressing, moving indoor and outdoors for the physical activities of daily living (PADL) and using the telephone, preparing meals, and handling money for the instrumental activities of daily living (IADL). Among very old people, especially, the majority of studies have focused on pathological changes and disabilities: how much difficulty is experienced in carrying out a particular physical task? At the same time, the abilities and aspects of psychosocial functioning have received very little attention (e.g. Johnson, 1994; Pearlin, 1994; Talo, 1992).

In expanding the perspective and to overcome the overemphasis on disease and disability, several theoretical models have been formulated. The WHO's (1998) new proposed ICIDH-2 classification system for functioning introduced new terminology concerning disability: for instance disability was replaced by activity and handicap by participation. The classification system has shifted from a medical perspective to an integrated biopsychosocial perspective on functioning and well-being. Functioning as a multifaceted concept including physical, psychological and social domains is also included in Lawton's (1983) model. He defines functioning as a behavioral competence consisting of health, physical functioning, mental abilities, enriching activities and social behavior. In each of these domains of functioning, the behavior may vary from simple to complex. For instance, a simple mental ability is sensory reception, whereas a complex one is creative innovation. Lawton's model was a basis for further modifications of the theory of functioning, for instance the model by Heikkinen (1986). A versatile approach to functioning has also been introduced by the WHO (1958) concerning the three domains of health: physical, social and psychological. The multifaceted definitions are broad and view the human being as a holistic entity with physical, psychological and social dimensions. For this reason, such definitions have sometimes been criticised as too vast and too vague and thus difficult to study and test empirically (see Antonovsky, 1979; Whitelaw & Liang, 1991). Moreover, it is difficult to show the hierarchical structure from simple to complex behaviour in the psycho-social area of functioning.

The relationship between meaning in life and certain aspects of functioning in old age has been focused on in some empirical studies. These studies have

mainly concentrated on such aspects of functioning as life satisfaction and depression: the sense of meaninglessness is frequently associated with depression (Prager, Bar-Tur & Ambramowici, 1997; Reker, 1997). The sense of meaningfulness is related to general psychological well-being, including life satisfaction, self-esteem and an absence of negative emotions (Reker et al., 1987; Zika & Chamberlain, 1992), and self-rated physical health and vitality (Reker et al., 1987). Antonovsky (1979, 1987) presumes that a strong sense of coherence has a central role in promoting health and well-being. This health enhancing role of sense of coherence has been found in numerous empirical studies (see for review Antonovsky, 1993; Feldt, 2000). A positive relationship between sense of coherence and health-related issues has also been reported among elderly persons (Langius & Björvell, 1993; Midanik, Soghikian, Ransom & Polen, 1992; Sagy & Antonovsky, 1990; Steiner et al., 1996).

As the above indicate, there is still rather scanty knowledge about many areas of functioning in relation to meaning in life in old age. For instance, cognitive capacity is known to be an important factor in increasing life expectancy and well-being in old age (see Jalavisto, Lindqvist & Makkonen, 1964; Lehr, 1982; Palmore, 1982; Ruoppila & Suutama, 1997). This, in turn, raises the question as to the role of cognitive functioning in terms of meaning in life. Furthermore, there are numerous studies which stress the importance of physical activity in old age and its facilitating effect on several areas of physical and psychological well-being (see Brown, 1990, 1992; Sime, 1984). It would be interesting to know whether physical activity also promotes meaning in life, as has been suggested in some theoretical discussions (Antonovsky, 1979; Frankl, 1978). Though a multifaceted approach to functioning has been successfully undertaken in a number of gerontological research programs (for example in those conducted in Finland, Denmark and Sweden, see Heikkinen, Berg, Schroll, Steen & Viidik, 1997), very few attempts have been made to incorporate several aspects of functioning in a single study. Moreover, the role of meaning in life as one aspect of multidimensional functioning has not been reported thus far.

1.4 Measuring meaning in life

Measuring meaning in life is a challenging task. Meaning in life and other existential questions are abstract and far-reaching issues, which are difficult to conceptualize. Probably for this reason, the theories of meaning in life have been put into practice very seldom. Examination of the ultimate meaning in life is beyond the tools of empirical research, and as such are the province of philosophers. However, the specific, practical meanings attributed to life by the individual can be identified by applying the qualitative and quantitative methods used in social sciences. It is important that adequate methods for studying the phenomenon are developed, since meaning in life is an essential factor in human life and well-being.

Meaning in life is often studied by means of interview questions and essays in order to obtain individual views on the sense and the sources of meaning in life (Debats, Drost & Hansen, 1995; DePaola & Ebersole, 1995; Ebersole & DePaola,

1986; Takkinen & Suutama, 1999a). Several questionnaires have also been constructed for assessing the global sense of meaning. The Purpose in Life (PIL) questionnaire was developed by Crumbaugh and Maholich (1969). PIL is based on Frankl's theory of meaning in life. The questionnaire consists of 20 items of which one total sum score is calculated to represent the individual's degree of sense of meaning. The questionnaire has been widely used and it has shown good internal consistency and validity (see Chamberlain & Zika, 1988). It has, however, been criticised over its validity: it has been shown to be very sensitive to social desirability and moreover, the items are heterogeneous and do not necessarily represent a single factor (Yalom, 1981).

To overcome some of the difficulties related to the PIL, a Life Regard Index (LRI) was developed by Battista and Almond (1973). The LRI has 28 items, which comprise two subscales: (1) a framework representing the framework, perspectives or life-goals from which meaning is derived and (2) fulfilment, the degree to which the framework or life-goals are fulfilled. The LRI has shown good internal consistency and validity (Battista & Almond, 1973; Chamberlain & Zika, 1988).

Reker & Peacock (1981) developed the Life Attitude Profile (LAP). LAP is also based on the theory of Frankl (1959), and contains 56 items to assess the degree of meaning and motivation to find meaning in life. LAP consists of six subscales: life purpose, existential vacuum, life control, death acceptance, will to meaning and future meaning. Of these six scales, a total sum score can be calculated. This questionnaire has been shown to have quite good internal consistency and validity. The Sources of Meaning Profile (SOMP) was constructed to measure the sources and degree of personal meaning in one's life (Reker & Wong, 1988). SOMP consists of 16 items. It has also shown good psychometric properties.

Another relatively new questionnaire for studying meaning in life is Antonovsky's (1987) Orientation to Life questionnaire. This method was originally developed for studying the degree of sense of coherence which is composed of the three components, manageability, comprehensibility and meaningfulness of life. The questionnaire has been shown to be closely related to other meaning-in-life questionnaires (Chamberlain & Zika, 1992). Antonovsky introduced (1987) two versions of this questionnaire: a 29-item and a shortened 13-item questionnaire. The characteristics of both scales have been closely studied and they have shown good internal consistency and validity (see Antonovsky, 1993; Feldt, 2000).

The methods mentioned above are frequently used in studies of meaning in life. They are easy to carry out and not very time-consuming. These measures have, however, also been criticised. Long lists of statements or questions may increase the statistical fit of the questionnaire, but do not necessarily add to our knowledge in depth (Yalom, 1981). The ability of the questionnaires to grasp highly personal goals and meanings and underlying psychological mechanisms may be weak (Yalom, 1981; van Selm & Dittman-Kohli, 1998). Another important point is that when meaning in life constitutes only one small part of the entire interview, given the limitations of space and time, very long sets of questions can not be used. Moreover, in the case of elderly persons, who often tire easily and have difficulties in filling in complex questionnaires, simple questions may be advocated. New approaches have indeed been developed, e.g. the SELE questionnaire, which consists of open-ended sentence completion tasks dealing with personal goals

and desires, expectations, hopes and fears (Dittmann-Kohli & Westerhof, 1997). Experiences from these sentence completion tasks have been promising, although the scoring is rather time consuming, as in the use of open questions in general.

The measures of meaning in life seldom involve the developmental perspective concerning meaning in life in the light of personal life history. If we think of elderly persons, they have a long course of life behind them filled with different meanings. A method which has not previously been used to study meaning in life, but which concerns issues related to one's life from a developmental perspective, is that of the life-line drawing. The life-line demonstrates the affective changes, "ups" and "downs", experienced during the life course (Bourque & Back, 1977; Schroots, 1996). The line contains qualitative and quantitative data on the respondent's orientation toward life, which can be analysed at the individual and group levels (Bjerén, 1994). Life-line drawings have also proved to be effective clinical tools in integrating the affective changes in the life course, and in suggesting the goals of treatment (Martin, 1997). Some evidence has been produced to show that certain types of drawings (for instance life-lines with an upward trend and higher mean level) are related to such areas of well-being as higher socio-economic status (Back & Averett, 1985), life satisfaction and happiness (Back & Averett, 1985; Martin, 1997). The meaning of most indices of the life-line is, however, unknown in terms of functioning and well-being, especially in old age.

1.5 The aims of this study

The purpose of this study was two-fold: firstly, I examined the associations between meaning in life and physical, social and psychological functioning in old age. Secondly, I investigated the interrelationships between various measures of meaning in life.

The research questions were set down as follows:

1 How is meaning in life associated to functioning in old age?
(Studies I, II, III, IV)

1.1 Is the degree and content of meaning in life related to cognitive functioning?
(Study I)

It is suggested that the search for meaning in life is an independent motive, and thus a strong sense of meaning can be achieved whatever one's level of intelligence. However, we know that level of cognitive functioning may orientate individual choices and interests. Thus, I hypothesized that in old age the degree of meaning would be relatively independent of the individual's level of cognitive functioning. The content of that meaning may, however, be related to cognitive functioning.

1.2 *Is the sense of meaning in life enhanced by physical activity?*
(Study II)

Physical activity has been shown to be an important factor in enhancing well-being throughout the life course. It sustains and enhances physical functioning, and, at least partially, psychological functioning. Consequently, I hypothesised that physical activity would be a promoter of meaning in life and moreover, that meaning in life may serve as a mediator between physical activity and health and functioning in old age.

1.3 *What is the role of meaning in life in a multifaceted context of functioning?*
(Studies III, IV)

Meaning in life is considered to have an important role in maintaining well-being and adequate functioning. I tested two models: (1) an explorative model locating several measures of functioning in a multidimensional space to see where the meaning-in-life measures were located, and (2) Antonovsky's model hypothesizing that several background factors (generalized resistance resources) facilitate sense of coherence, which in turn enhances physical, psychological and social health.

2 *How are the different measures of meaning in life related to each other?*
(Studies I, III)

Meaning in life was measured in these studies by using interview questions, a questionnaire and a life-line drawing. The measures were hypothesised to measure the construct of meaning in life and thus to be related to each other.

2 METHOD

My study was part of the Evergreen project, which is a multidisciplinary, longitudinal research program being carried out in the town of Jyväskylä, central Finland. The Evergreen project consists of a number of samples of elderly people (for a detailed description see E. Heikkinen, 1997, 1998; Heikkinen, Lampinen & Suutama, 1999; Suutama, Ruoppila & Laukkanen, 1999). In 1988, a sample of 1024 non-institutionalized residents of Jyväskylä aged 65 – 84 were interviewed at home on two occasions, each lasting for about two hours. The participation rate was 80%. Eight years later in 1996 a follow-up interview was carried among the survivors. In this phase, a new sample of 65 – 69-year-old residents of Jyväskylä was also interviewed ($n = 320$). The participation rate for the eligible follow-up group and the new sample was 88% and 80%, respectively. The interviews at the baseline and follow-up dealt with illnesses, somatic symptoms, self-rated health, psychosocial well-being (including meaning in life), physical and mental functioning, living conditions, and life history. The Raitasalo-Beck Depression Inventory (Raitasalo, 1977) for screening depression and Mini-D (Erkinjuntti, Laaksonen, Sulkava, Syrjäläinen & Palo, 1986) for assessing cognitive functioning were administered. Antonovsky's (1987) 13-item Orientation to Life Questionnaire was completed in 1996 in the sample of 65 – 69-year-old persons.

In 1989, the entire 75-year-old population of Jyväskylä and in 1990 the entire 80-year-old population was studied. These two cohorts were followed up five years later in 1994 and 1995. About 90% at the baseline and 87% at the follow-up took part in the home interviews, which were for the most part similar to the interviews of the 8-year follow-up study described above. The study also included laboratory measures, in which the participation rate was about 75% at the baseline and 65% at the follow-up. The laboratory examinations focused on health status, anthropometric status, physical and psychomotor performance, sensory functions, and cognitive functioning.

As no measures of the sense of meaning in life were included in the interviews conducted as part of the 5-year follow-up studies of the 75- and 80-year-old persons, I designed an additional interview for a smaller sample to include participants from both of these cohorts. I myself and a student of psychology

carried out the interviews in summer 1997. The participants were 38 persons with high cognitive functioning and 40 comparison persons aged 83 to 87. The procedure used to select these two groups is described in detail in Study I. The interview lasted on average 1 h 45 min. It started with a life-line drawing and questions concerning the drawing. Meaning in life and self-rated psychological and physical functioning were studied with similar questions as in the 8-year follow-up study (Takkinen & Suutama, 1999a, 1999b). Wisdom was measured by the test for assessing wisdom-related knowledge developed by Staudinger, Smith and Baltes (1994). The test consists of seven tasks simulating problematic everyday situations which the respondent is asked to solve. The interview ended with filling in the 13-item Orientation to Life Questionnaire (Antonovsky, 1987).

In this study, I used several samples from the Evergreen project (Table 1). Thus, I was able to cross-validate the findings, and also select the sample according

TABLE 1 Summary of the variables/factors and methods used in studies I – IV.

Study	Samples	Variables/Factors	Analysis methods
Study I "Meaning in life among three samples of elderly persons with high cognitive functioning"	3 samples studied in 1994 – 1997 <i>n</i> = 78 aged 83 – 87 <i>n</i> = 182 aged 83 – 92 <i>n</i> = 320 aged 65 – 69	Sense of meaning in life Change in zest for life Sense of coherence Reason for meaning in life Source of strength in life New activity giving meaning in life Meaning of death Cognitive functioning	Log-linear models
Study II "More meaning by exercising? Physical activity as a predictor of a sense of meaning in life, and of self-rated health and functioning in old age"	A longitudinal sample baseline study in 1988 and follow-up in 1996 <i>n</i> = 191 aged 75 – 84 in 1988	Meaning in life Intensity of physical activity Health and functioning	Structural Equation Modeling
Study III "Meaning in life as an important component of functioning in old age"	A sample studied in 1994 – 1997 <i>n</i> = 55 aged 80 – 87	Meaning in life: sense of meaning in life, sense of coherence, four life-line indices (trend, linearity, mean level in past and in future) 11 measures of physical, psychological and social functioning	Multi-dimensional scaling
Study IV "The relations between generalized resistance resources, sense of coherence and health among elderly Finnish people"	A sample studied in 1996 <i>n</i> = 320 (188 women, 132 men) aged 65 – 69	Generalized resistance resources: years of formal education, marital status, family income, cognitive capacity, alcohol use, smoking, physical exercise Sense of coherence Physical, social and mental health	Structural Equation Modeling, multisample procedure for men and women

to items relevant to the research topic. In studying elderly people, missing data due to mortality and poor functioning is unavoidable. This reduces the size of samples and may also affect the representativeness of samples. The proportion of missing data varies between different measures: it is higher in laboratory tests which demand great physical or mental exertion than in interviews. In terms of meaning-in-life measures, the amount of missing data was quite small (Table 2). Missing data is especially evident among the very old persons, who in the main

TABLE 2 Missing data in measures of meaning in life among the persons who took part in the interviews.

Measure	Age group	Average percentage (%) of missing data
Meaning in life interview	65 – 69	1
	83 – 87	1
	83 – 92	4
Sense of coherence questionnaire	65 – 69	2
	83 – 87	4
Life-line drawing	83 – 87	18 ^a
Life-line interview	83 – 87	3

^a Also includes incomplete drawings for purposes of statistical analysis.

were the focus of my study. The samples remained small and showed a higher level of functioning than that of their age cohorts. This especially holds true for Study III with its small and highly selected study sample.

The size of samples could have been increased by replacing the occasionally occurring missing data. However, I decided not to do this, because missing values are very difficult to estimate due to the uniqueness of each individual. A great uniqueness characterizes elderly people especially, since the variance between individuals increases during the life course. Replacement would have been changed the nature of the data. Another possibility would have been to use the data so as to include partially obtained information (e.g. pairwise deleting of missing values). When using this option, no changes in the data are made, but a problematic point is that the sample size varies from variable to variable. In the case of longitudinal data, especially, the correlations between the variables may not be comparable, since they are calculated from different persons. Accordingly, my study was based on the original unchanged data, which were smaller in size but with true values. It is important to take the small sample size and selectivity into account in interpreting the results.

3 OVERVIEW OF THE RESULTS

The first purpose of my studies was to investigate the associations between meaning in life and physical, social and psychological functioning in old age. Study I focused on the relationship between meaning in life and cognitive functioning in three samples of elderly people. The relationships were studied by log-linear models (SPSS, 1997). The results showed that the degree of meaning (measured as a sense of meaning in life, change in zest for life and sense of coherence) was not related to the level of cognitive capacity. This suggests that life can be found to be meaningful regardless of one's intellectual capacity. However, cognitive capacity was related to the content of meaning in life: persons with high cognitive ability more often reported human relationships as a reason for meaning in life and a source of strength in life, and they were also more eager to find a new activity (especially social interests) which would give meaning in life after retirement than those with a lower level of cognitive functioning. The results were mostly consistent in the three samples, thus cross-validating the findings.

In Study II, I investigated the role of physical activity as a promoter of meaning in life, and health and functioning in old age. The longitudinal relationships were examined using Structural Equation Modeling within LISREL (Jöreskog & Sörblom, 1996). The hypothesized promotive role of physical activity was confirmed by the models tested: elderly persons displaying more intensive physical activity had a stronger sense of meaning in life and reported better health and functioning. The sense of meaning also mediated the positive effect of physical activity on health and functioning.

Meaning in life in a multidimensional context of functioning was examined in Study III and Study IV. The model in Study III was based on multidimensional scaling (SPSS, 1997), which produces an illustrative configuration of the distances between the variables as a space with a specific number of dimensions. A two-dimensional model was derived, in which the dimensions were named subjective vs. objective functioning and psychosocial vs. physical functioning. The model showed that meaning-in-life measures were more related to subjective than objective functioning. The important relationships were found with both the physical and psychosocial dimensions of functioning: a strong sense of coherence was related to better physical

and, especially, psychosocial well-being (items such as non-depressiveness and non-loneliness). A strong sense of meaning in life was also related to better physical health and functioning, but even more strongly to psychosocial aspects (items such as life satisfaction, social provision and non-loneliness). Life-line measures indicating meaning in life were mostly related to psychosocial functioning, but also to some extent to physical functioning. Life-line trend and linearity were located very close to the sense of coherence, and all these three measures were located close to non-depressive mood, and also to physical health. Thus, people who portray their life as a rising, linear line tend to have a stronger sense of coherence, fewer depressive symptoms and better health. Interestingly, while the mean level of the life-line in the past seemed primarily to reflect psychosocial aspects, the mean level of the life-line in the future was located at the midpoint of the psychosocial vs. physical dimension. The results illustrated that sometimes the relationship can be ambivalent: poor functioning is related to a high level of meaning in life.

In Study IV, Antonovsky's (1979) model was tested among elderly men and women using Structural Equation Modelling within LISREL (Jöreskog & Sörblom, 1996). Antonovsky's main idea suggesting that an individual's generalized resistance resources (such factors as provide a person with meaningful and understandable experiences enabling them to successfully manage tensions) facilitates sense of coherence, which in turn enhances health, was supported. The model showed that such generalized resistance resources as good cognitive functioning and frequent physical exercise enhance sense of coherence. A stronger sense of coherence further facilitates health. The facilitating effect was stronger in the social and psychological domains than those of physical health. The models for men and women were similar except that being married or cohabiting as a generalized resistance resource facilitates a stronger sense of coherence and further better physical, social and psychological health among men. In women, a relationship between marital status and sense of coherence and health was not detected.

The second purpose of my study was to investigate the interrelationships between various measures of meaning in life (Study I, Study III). The interrelationships were investigated between sense of meaning in life, change in zest for life, the meaning of death, and sense of coherence in Study I. The results showed that sense of meaning in life was related to sense of zest for life. For this reason and in accordance with the theoretical background these two items were used as a factor or a sum score in the later studies. The results also showed that sense of coherence was related to sense of meaning in life, thus indicating the important nature of the meaningfulness component in the sense of coherence construct. The meaning of death was not related to the other measures.

In Study III, the relationships between sense of meaning in life, sense of coherence and four indices derived from the life-line drawing were examined in a broader context of functioning. The interrelations between the measures varied from non-significant to very strong, most of them being significantly related to and located quite close to each other in the multidimensional model. The model showed that a linear life-line with a positive trend was closely related to a stronger sense of coherence. A higher mean level of life-line in the future was related to a stronger sense of meaning in life and sense of coherence. A higher mean level of life-line in the past was related to a higher life-line mean in the future, and also to sense of meaning in life.

4 DISCUSSION

4.1 Meaning in life in relation to functioning in old age

The first research question of the present study was the role of meaning in life as a component of functioning. The first hypothesis was that the degree of meaning in life is independent of cognitive functioning, but that the content of meaning may vary according to the level of cognitive functioning. The results supported this hypothesis. Neither sense of meaning in life, change in zest for life or sense of coherence was related to the level of cognitive functioning. A strong sense of meaning can exist regardless of one's level of intelligence, as suggested by Frankl (1959).

In examining the relationship between the content of meaning and cognitive functioning, the major difference between persons with high cognitive functioning and the comparison persons was in the importance of human relationships and finding a new field of activity after retirement. Persons with good cognitive abilities more often reported human relationships as a reason for meaning in life and as a source of strength in life. Moreover, they had more often found a new activity giving meaning in life after retirement and this new activity was more likely to be related to social issues. The finding is not surprising, when we think about the content of cognitive functioning, which was here conceptualized as good memory, word fluency and psychomotor speed. These abilities, especially those of good memory and word fluency, are important for successful social interaction. In turn, participation in social activities provides practice for the skills that maintain good cognitive functioning.

The results supported the second hypothesis proposing that physical activity enhances meaning in life as well as health and functioning in old age. Thus the results were consistent with earlier findings that physical activity is an effective factor enhancing well-being in old age (see Brown, 1990, 1992; Sime, 1984). This positive effect has mainly been found to be related to physical health, whereas the previous results concerning psychological well-being have been more ambiguous (see Blumenthal et al., 1982; Rantanen, 1998; Seeman et al., 1995). In this regard,

the present study generated more information about the relationship between physical exercise and psychological well-being measured here as sense of meaning in life.

Frankl (1978, 1990) considered physical activity as one form of self-transcendence, a chance to pass beyond self, which has a positive effect on one's sense of meaning. Involvement in physical activity may create a flow experience (Csikszentmihalyi, 1997), a complete state of concentration on the activity in progress, which increases the sense of satisfaction and meaning in life. Physical activity has been shown to have important motivational impacts: it enhances positive mood, bestows a sense of competence, and provides an opportunity for social contacts and health promotion (Hirvensalo, Lampinen & Rantanen, 1998; Lehr, 1992; O'Brians Cousins, 1995; Shephard, 1995). All of these aspects are also important in promoting a sense of meaning in life. Antonovsky (1979) proposed that a preventive health orientation, including physical exercise, is a factor which can enhance sense of coherence and further health. Thus, meaningfulness is considered to be a mediator between physical activity and health. This mediator role was found in Study II. However, in Study IV, the mediating effect was non-significant. This may be due to the different variables used and the control effects of the other variables included in the model in that study. However, both studies supported the suggestion that physical exercise is a factor capable of enhancing meaning in life, and meaning in life facilitates physical well-being.

The multifaceted concept of functioning was dealt with in Studies III and IV. The space of functioning constructed in Study III stressed the importance of a strong sense of meaning in life for good subjective functioning. The results suggest that meaning in life can exist regardless of the level of objective functioning and many external conditions (Frankl, 1959; Wong, 1989). The results were consistent with earlier findings that a strong sense of meaning in life is closely related to such indicators of psychological well-being as being not depressive, not lonely and satisfied with one's life (Prager et al., 1997; Reker, 1997; Reker et al., 1987; Zika & Chamberlain, 1992). A positive connection to physical well-being was also found. Moreover, an ambivalent relationship between some of the factors of functioning was shown in the model: for instance, people who rated their current health as poor tended to experience their past very positively (i.e. drew a high life-line level in the past). Thus, viewing one's past life positively may be enhanced by current hardships in functioning.

In Study IV, the appropriateness of Antonovsky's (1979, 1987) model among elderly men and women was tested. The results mainly supported the model's idea that sense of coherence is a mediating factor between generalized resistance resources and health. Of the several background factors included in the model only cognitive capacity and physical exercise in the whole sample, and being married or cohabiting in men were important factors enhancing sense of coherence and, further, health. Cognitive functioning turned out to be a significant factor enhancing sense of coherence in the model, whereas when its relationship to sense of coherence alone was examined (Study I), the relationship was non-significant. The different findings may be due to the fact that in larger models relationships may emerge due to the complexity of mediator effects and the possibility of controlling for several factors. The model replicated the finding in Study II that

physical activity is a promoter of meaningfulness.

The models for men and women were very similar except for the role of marital status. The similarity of the models suggests that a strong sense of meaningfulness is a facilitating factor for both genders. However, living with a partner seemed to be a protective factor especially for men, as was also suggested by Antonovsky (1979). The mediating and direct effects of sense of coherence were stronger on psychological and social health than on physical health. A similar finding was reported among a Swedish population by Langius and Björvell (1993), who studied the direct effect of sense of coherence on health. One explanation for the stronger relationship with the psychological and social aspects may reside in the internal characteristics of the sense of coherence questionnaire (see Larsson & Kallenberg, 1999). Nevertheless, sense of coherence was related to physical health, and this relationship remained significant even when the effects of the other factors were controlled in the model. Also in Study III, we could see that sense of coherence, though strongly related to some of the psychosocial measures of functioning, was nonetheless located in the physical half of the space allotted to functioning.

In all, the results showed that many areas of functioning are closely related to meaning in life. However, there were a number of factors that seemed to be relatively independent of the personal sense of meaning in life. This raises the question: why does the personal sense of meaning in life show few associations with objective functioning? The relationship may in part be due to the subjective nature of the measures of meaning in life, so that it is more likely to be related to other subjective issues. Objective conditions may also cease to play a critical role when a sufficient basic level of living is guaranteed (Frankl, 1978), for instance an adequate income and social security. Another reason may be that elderly persons represent a better picture of their selves and their living circumstances than what these are the reality. The personal questions in the interview may be dealt with on a superficial level in order to maintain privacy or to quickly provide an affirmative answer that it is felt will satisfy the interviewer. One possible explanation in this regard is "pseudo-integration", i.e. denying those elements that are found to be unacceptable (Erikson et al., 1986). It was attempted to minimize the tendency to overestimate one's well-being by using different kinds of measures, for instance a life-line drawing which is a non-verbal and projective method in nature.

On the other hand, positive answers may also reflect an optimistic attitude toward life, which is an important element in enhancing well-being and sense of meaning in life (Wong, 1989). The elderly person's optimistic view may be based on a lifelong process of reintegration and recasting. Contrary to pseudo-integration, these persons do not exclude feelings of cynicism and hopelessness nor are overwhelmed by these feelings, but admit to them in dynamic balance with feeling of human wholeness, as stated by Erikson et al. (1986). Late life development has been characterized to include processes such as individuation (Jung, 1981) and gerotranscendence (Tornstam, 1989) which involve greater absorption in one's inner life and a decreased concern with external and material conditions.

By reviewing their lives, elderly people may also evaluate their historical and personal development by comparing their present life to their past life: numerous experiences provide a framework with which to evaluate the current state of being. For instance, the persons who completed the life-line drawing were

all born and led their early childhood in the agrarian Grand Duchy of Finland during the era of the Russian czar Nicholas II, and had witness the struggle for independence, the horrors of civil war and the Second World War. They had rebuilt the country and finally ended up as members of a highly technological welfare society with micros and handies. Living through these years had undoubtedly affected their perspective on life. If a person is overly sensitive to external upheavals, surviving such enormous changes may be impossible. In addition to the ability to integrate one's past, present and future, the ability to compensate for various losses and functional limitations, and to compare one's abilities to those of one's age peers help to sustain subjective well-being regardless of what has been objectively lost.

4.2 Measures of meaning in life and their interrelationships

In this study, I used interview questions, a questionnaire and a life-line drawing to measure meaning in life. The measures operated reasonably well: they showed adequate internal consistency and appropriate relationships with other domains of well-being considered to be relevant in terms of meaning in life, and they were considerably related to each other. However, their intercorrelations were not perfect, which suggests that they measured meaning in life from slightly different perspectives. They could be regarded as different traits rather than methods (Campbell & Fiske, 1959). This is not, however, surprising; meaning in life is a multifaceted concept and has been defined in various ways (see Wong, 1989; Yalom, 1981). The meaning-in-life measures used in the present study are difficult to arrange in a hierarchy of importance. They all have advantages and disadvantages as measures as discussed below.

The interview questions concerning meaning in life were formulated for the Evergreen project on the basis of theories in the field (Erikson, 1994; Frankl, 1959). The content of meaning in life was assessed by open-ended questions. The use of open-ended questions has the advantage that it does not constrain the answers to fit fixed categories. This is especially important when no previous knowledge of the possible answers in a particular culture are known as was the case in this study. The inter-rater reliability calculated for the items in the present study was quite high: 86% of the items were rated similarly. The content of meaning in life yielded categories that were very similar to those of earlier studies on this topic (DePaola & Ebersole, 1995; DeVogler & Ebersole, 1981; Ebersole & DePaola, 1986; Prager, 1996). However, there were also new categories, such as reasons related to life (respect for life, interest in life, belief in the future), which have not explicitly been included in earlier questionnaires with fixed categories. It would be useful to compare the answers to open questions and to fixed categories, to see whether they differ. To obtain a closer scrutiny of the meanings behind the categories, a qualitative approach may be useful.

The relationship between the content of meaning-in-life measures and the other meaning-in-life measures was examined only in terms of the meaning of death, which was reclassified for the analysis. The results showed that the meaning

of death was not related to sense of meaning in life, change in zest for life or sense of coherence. The independence of the meaning of death may be due to several reasons. Although developmental theorists have emphasised the importance of the acceptance of death and taking a mature attitude toward death for positive late life development (Erikson, 1994; Jung, 1981; Tornstam, 1989), in the previous empirical work the fear of death has also been shown to be unrelated to the degree of sense of meaning in life (Orbach et al., 1989). An individual's attitude toward death may be rather unstable, varying from fear to hope or vice versa, over even a relatively short time span (Ruth, 1985). The independence of the meaning of death may also be related to the reclassification of the item into negative, neutral and positive meaning categories. There may be other ways of constructing these categories. The answers to the item concerning the meaning of death may also reflect the general, culturally bound view of death rather than the individual's personal affect toward death, which might in fact be more related to the personal sense of meaning in life. As Molander (1999) observed in his interviews concerning dying and death, elderly persons willingly shared their views of death on the general level, but avoided concrete discussion of personal vanishing. The cultural conventions governing talk about death may also explain our finding that the reported meaning of death was very stable over an eight-year follow-up in different age cohorts in old age (Takkinen & Suutama, 1999a, 1999b).

The two items concerning the degree of meaning in life (sense of meaning in life and change in zest for life) were related to each other. The relationship between the two items was comprehensible according to the view of Frankl (1959) that a strong sense of meaning in life sustains and enhances a strong sense of the will to live. On the basis of the theory and adequate internal consistency, these two items were suitable for use together as a sum score or a factor. The factor consisting of these two items showed moderate stability over the eight-year period. Low to moderate stability is usually characteristic of the indices reflecting subjective ratings of functioning (compare for instance to the stability of self-reported depressive symptoms and metamemory in R-L. Heikkinen, 1997 and Ruoppila & Suutama, 1997).

Although the internal consistency of the factor comprising sense of meaning in life and change in zest for life was adequate, it was not, however, very strong, which suggests that the items may need some modification. One way to increase the internal consistency of the factor would be to increase the number of interview items on the topic. For instance, it would be useful to add items concerning the freedom of life choices, responsibility, the desire to find new goals in life and commitment to the future. More items, however, require more interview time and may not necessarily add new information to what is already known. In large survey studies, the number of items is if necessity reduced to the minimum by which the greatest possible amount of information can be attained. In this respect, I refer to Yalom (1981), who questioned the use of long exhaustive questionnaires for examining meaning in life, when the relevant information may be obtained by using the simple question "How meaningful do you find your life?".

However, there are several advantages in using questionnaires to study meaning in life. By means of questionnaires, a large and abstract construct such as meaning in life can be divided into several items that are easier to comprehend

and deal with. A set of items allows for more reliable results than does a single question, provided of course that the items are relevant and derived from the same construct. Antonovsky's Orientation to Life questionnaire used in the present study comprises only 13 items, which can be answered fairly quickly. The questionnaire has been shown to be a valid and reliable method (see Antonovsky, 1993; Feldt, 2000). Its internal consistency was also satisfactory in the present study. The relationship between sense of meaning in life and sense of coherence supported the emphasis laid by Antonovsky (1987) on the importance of meaningfulness as a component of the sense of coherence. By virtue of its coherent internal structure, the questionnaire has overcome some of the problems that the earlier meaning in life questionnaires suffered from (Yalom, 1981). It has been a widely used method among young and middle-aged adults (see Feldt, 2000), but has rarely been applied to elderly people. Since the general content of the questions is not bound to a specific age or life context, it is thus also suitable for use among elderly people.

Study III introduced life-line drawing as one potential method for measuring meaning in life and other aspects of functioning in old age. The results showed close relationships between the life-line indices and other meaning-in-life measures: a smooth, linear line and an upward trend were related to a stronger sense of coherence. A higher mean level of the life-line was related to a stronger sense of meaning in life. The life-line has several advantages as a research method. The drawing is non-verbal and projective (Martin, 1997). The time-span ranging from past to present and from present to future provides an interesting perspective to the whole life course (Bourque & Back, 1977), which is of special importance in studying elderly persons. The life-history perspective has often been neglected, though it may have a special appropriateness in the study of elderly people (Thompson, 1993). While in an interview a person can choose what to include and what to exclude in his or her life story, the continuous line prevents the omission of any phases of one's life. The life-line is also an easy and simple method to administer, and the procedure is flexible, lending itself to modifications in various ways according to the particular research problem (Bjerén, 1994).

Life-line has, however, some limitations. A single line may not sufficiently illustrate the multiplicity of the life paths (Schroots, 1996). In the same phase of life, a person may for instance experience negative feelings towards his or her marriage while remaining very satisfied with his or her economic well-being. Further, the same life event, e.g. getting married, may be loaded with both negative and positive feelings. The life-line drawings could be extended so that instead of only a single line, a person represents his or her life with multiple lines relating to different life domains (for instance separate lines for one's social relationships, work, health, and hobbies). It is important to note that the life-line is not an objective measure of the life course, but rather a selective general portrayal of personal life experiences. If a person is able to illustrate his or her life by a single line, i.e. grasping the main thread, the life-line can provide especially interesting information on the general life view.

In studying elderly persons, the life-line drawing may cause difficulties because of its graphic nature: the ability to draw a simple line which takes simultaneously into account both level of affect and running time. The requirement is not very demanding and even when suffering from some visuomotor disabilities,

an individual is often able to draw a simple line. Sometimes, however, the task is too difficult to carry out, and in such cases the life-line drawing is not performed. Because of its subjective nature, it is not possible to use substitute drawing done by another person. This characteristic unavoidably reduces the number of life-lines drawn by persons with poor functioning in studies using life-line drawings as a method.

One difficulty related to the life-line lies in data processing. In this study, the life-line was drawn on a sheet of paper and afterwards converted into numerical time sequences for quantitative analysis. This procedure was carried out by manual inspection of the life-line using a grid. This was a very time-consuming task. In future studies, life-lines may be much easier to handle if they are drawn directly as data files using a computer. The computer software for life-line drawings could also be developed to enable more complicated illustrations of the life course. For instance, by applying the ideas of gerodynamics, the graphic illustration of a life-line could contain multiple lines, branching points, and multidimensionality (Schroots, 1996). It would be interesting to put into practice an approach which connects an individual's life-line and branching points into a three-dimensional picture.

The quantitative analysis of life-lines has often been found to be difficult. Life-lines are composed of time series. Existing statistical time series methods were, however, originally developed for other kinds of research problems, and thus it is sometimes difficult to apply them to the analyse of life-line drawings. In the present study, the indices derived from the life-lines were very simple partly due to the limits of the methods of analysis and partly because finding methods as simple as possible was the purpose. I aimed to provide measures that can be interpreted with ease of understanding and that are easily observed by mere visual inspection. For instance, it is possible to approximate an upward or downward trend, a high or low level and a large or small variance of the life-line without employing an exact calculation procedure. This is a great advantage of the indices of the present study. However, many other indices exist that can be derived from the life-line but were not used in this study. The location of minimum and maximum points and the overall locations of life events in the life-line would also be of interest to study. It is important that a content analysis of the significant life events located in the life-line is included in the analysis. Since the life-line has biographical characteristics, applying narrative research methods would be useful (Nilsen, 1994). Life-lines can also be divided into shorter time periods (for instance 'childhood' up to 7 years, 'youth' up to 20 years, 'working age' up to about 65 and 'retirement' from 65 on) which can be examined separately by calculating indices for each in turn. Since life-line drawings are closely bound to chronological time and historical context, it is also important to research other age groups.

4.3 Methodological conclusions

The study was mainly based on cross-sectional data. This was due to the fact that even though the Evergreen project comprises several longitudinal samples (E.

Heikkinen, 1997, 1998), the issue of meaning in life was only partially studied at several timepoints. In further studies, it would be important to apply a longitudinal approach to see the age-related changes in the relationships between meaning in life and functioning. I find longitudinal data important, especially in connection with the model tested in Study IV, in which an assumption about prospective relationships was made. Replication with different age groups is also necessary. We know that people over 65 are not at all a homogeneous group: the life and functioning, for instance, of a 65-year-old person is in many ways different from that of a 90-year-old person.

Another characteristic of the data is the selection due to mortality and drop-out, which is a very common feature of gerontological studies. Comparison of the study samples with the whole age group showed that those who were included in the samples possessed better physical and psychological functioning. This may affect the results, on the one hand by giving a more positive picture of the level of functioning and on the other hand by decreasing the variance in the group in which the correlative relationships between the different dimensions of functioning is likely to decrease. Data reduction is very difficult to redress, as I stated in introducing the methods of this study. For this reason, the missing data was not replaced and I chose a smaller sample size instead of a bigger sample size containing partially missing or artificial values. In this way I could respect the uniqueness of the elderly individuals and the data as a whole. I would like to stress, however, that despite the limitations of the data discussed above, the present study was based on representative community-based samples, which are rather scarce in studies concerning meaning in life. It is also notable that the study settings partially allowed for the analysis of missing data, which was a great help in estimating the effects of sample selectivity.

The selectivity of the data also involves the characteristic that the samples consisted mainly of women. The number of men in the study cohorts was greatly reduced because of active service during the period of wars of 1939 – 1945. Moreover, the proportion of surviving men compared to women fell with age (at age 80 the ratio is about 1:2 whereas at age 90 only 1:4). The men were also often more homogeneous than the women, since the mortality rate among poorly functioning men is greater than among poorly functioning women, which results in greater selectivity and a higher average level of functioning among surviving men than among surviving women. As my study was based mainly on community-based data for persons over 80, the number of men remained very small, limiting the opportunity to form separate gender groups in the analysis. Some methods (for example LISREL) require large study groups and if these groups are to be compared, approximately equal sizes of the groups are required.

With regard to meaning in life, gender differences have generally not been found and thus separate analyses for men and women may not be crucial (see Antonovsky, 1979; Frankl, 1959; Prager, 1996; Takkinen & Suutama, 1999a, 1999b). However, the factors affecting meaning in life and the processes behind the factors may be different in men and women. The present study showed, for example, an interesting difference between the genders in testing Antonovsky's model that being married or cohabiting was a facilitating factor only for men. In future studies, it would be important to take into account possible differences between elderly

men and women. Among very old persons, the examination of gender differences, however, requires exceedingly large, if not stratified, samples. Since elderly men and women represent very different samples, the question remains as to how to interpret the results. If the differences between men and women are found, do they really represent gender differences or are they due to some other characteristics which have affected the selectivity of the samples?

The collection of my own data gave me an excellent opportunity to observe the appropriateness of the methods used in studying elderly people. The length of the interview was almost two hours, which seemed appropriate, though probably quite close to the maximum possible duration for alert participation. The response rate was high (over 90%) for all the measures of meaning in life except the life-line drawing in which 82% of the participants completed the drawing in a way that I could use in the analysis. We made a special effort to create an optimal interview atmosphere for our interviewees by providing a flexible interview framework, enough time for each task and sufficient help in working with paper and pencil. We paid special attention in the instructions to emphasise the subjective perspective and to overcome any assumption that there were "correct" answers to the questions.

The participants produced a great deal of material, even though our interviews were highly structured. The issues were found to be familiar and relevant, and not too intimate. The interviewees were very pleased to talk about their lives and often thanked the interviewer for being interested in hearing their personal story. Though the interviews were carried out for research purpose, I felt that they might have therapeutic implications for many elderly people. We were not only receiving information from them, but giving something important: time and attention in sharing their story. Telling one's story is not, however, simply a happy return to the old days. Looking back over the painful life events and unsolved conflicts may arouse more feelings of anxiety and depression than a sense of coherence and integration. There are several types of reminiscence, and not all of them foster well-being and successful aging (Luborsky, 1993; Wong & Watt, 1991). In this respect, the ethical questions become increasingly important. The interview may produce the kind of material (e.g. suicidal thoughts) that calls for action on the matter. Some meaning-in-life questionnaires also include items that directly ask about the wish to commit suicide. From the ethical point of view, it is precarious to include such themes in a short interview. Thus, great care should be taken in formulating interview questions to avoid unnecessary distress. However, a great ethical problem is also constituted by closing one's eyes to these themes and dealing only with "safe" topics. It might be more comfortable to talk about a broken leg than a lost friend, but we cannot learn from another person's psychosocial life, if we do not dare to ask because of the fear of possible negative and uncomfortable feelings. Therefore, to deal with these issues, firstly the interviewer has to be skilled in probing sensitive questions and, secondly, there should be an opportunity of consulting afterwards, if needed.

Although such ethical questions sometimes aroused concern in the interviews, the greatest difficulties emerged in the practical paper-and-pencil work of drawing a life-line and in filling the sense of coherence questionnaire. The questionnaire was actually completed orally by about 15% of the participants at

age 83 - 87. The life-line could not, however, be drawn by the interviewer. Devising a simpler form of the method to overcome visuomotor problems would be important in gerontological studies. In future interviews, I would also add more interview items concerning the life-line and meaning in life, as discussed above. On the other hand, I would decrease the number of tasks assessing wisdom-related knowledge, since the method in its full form with seven tasks turned out to be too exhaustive (see Takkinen et al., 1999). The reliability of the measure would be satisfactory with only two or three wisdom tasks.

One methodological question concerns how we can generalize the findings of a study such as this. The general view expressed in the theories of meaning in life suggests that sense of meaning in life is universal and thus independent of cultural differences (Antonovsky, 1979, 1987; Frankl, 1959). However, cultures may greatly vary from each other in the resources they can provide, which in turn may affect sense of meaning in life (Antonovsky, 1979). We have evidence that cultural characteristics may actually enhance or impede the search for meaning (Maddi, 1970).

An interesting feature regarding generalizability is that the theoretical work has largely been based on the experiences of concentration camp prisoners or survivors of other serious traumas. The question of meaning in life undoubtedly becomes of crucial importance under such extreme conditions. However, the question remains, as to how well sense of meaning in life in this context resembles that in ordinary everyday life. It is also important to note that the theorists in the field of meaning in life are or have been Jewish in origin and the studies on meaning in life have mainly been carried out within environments in the Judaic-Christian cultural tradition. Within this context Western psychological models which view the self as a single, autonomous and coherent whole are well-fitted (Luborsky, 1993), and the idea of personal meaning in life is appropriate. We do not, however, know how well these ideas suit other cultures whose backgrounds and views of human life are different.

In particular, I find the question of generalizability essential in terms of the use of the life-line drawing. Life-lines reflect personal development, but also project cultural issues, e.g. historical events and common views of life shared in a specific culture. Life-lines are based on the assumption that life has a beginning and an end and that it proceeds in chronological order loaded with negative and positive affects. It is known that in some Eastern traditions the course of life is represented in a spiral or circular form rather than as a line (Sihvola, 1994). It would be interesting to see, for instance, how a person who believes in rebirth and the transmigration of souls would illustrate his or her life-line. I would even question the appropriateness of the linear approach in Western culture. Life is actually quite fragmented; we experience a number of "rebirths" in our career, family life and recreational life. Life may not be a single trajectory, but a number of simultaneous paths. At the same time, we still talk about our lives in the singular and feel some sort of coherence and continuity in our lives. We develop, learn from experience and proceed on the basis of our life as lived so far. In this respect I find especially interesting the gerodynamic approach suggesting that life is not necessarily an linearly ordered whole but a chaos containing both continuity and discontinuity with a highly complex fractal structure (Schroots, 1996). Another question is: how do we measure this chaos?

4.4 Theoretical conclusions

The present study supported the views of Frankl (1959) and Antonovsky (1979, 1987) that sense of meaning in life is an important component in human functioning and well-being. The study demonstrated the applicability of the meaning in life theories in an older population. The results stressed the importance of subjective factors and relative independence of objective factors. This reflects the view of Frankl (1959) that life is potentially meaningful under any external conditions. However, some of the objective factors proved to be related to sense of meaning in life, indicating that these factors may enhance or hinder the search for meaning. Frankl's idea that the sense of meaning is maintained by committing oneself to a human relationship, a task or something else beyond the self was supported by the findings concerning elderly people's sources of meaning in life. In respect to this part of the theory, it would be interesting to study the role of creativity, experience and suffering as sources of the sense of meaning in life, which, according to Frankl, are the three most often used modes of attaining meaning. Frankl's view that the sense of meaninglessness is related to psychological distress was shown in the present study: a low degree of meaning was related to such issues as decreased zest for life, depressive symptoms and loneliness.

The study supported the main idea of Antonovsky's model that generalized resistance resources as background factors enhance sense of coherence which in turn facilitates good health. Thus sense of coherence, in which meaningfulness is a central component, proved to be an important factor in dealing with stress and maintaining well-being, as suggested by Antonovsky (1979, 1987, 1993). Although the model turned out to be significant in elderly men and women, it should be noted that the role of generalized resistance resources was relatively minor for sense of coherence. This may be due to the characteristics of the selected background factors or the sample used, but may also reflect the relative independence of sense of coherence from many external factors. In constructing the model, we also should note that the original model of Antonovsky (1979, see p. 185) is very complicated and includes a number of factors that were not available in the present study as well as feedback loops coming from sense of coherence and health back to generalized resistance resources and from health to sense of coherence. In the present study, the aim was to present the main idea behind Antonovsky's model, as emphasised in his writings. Further work is needed to clarify the causal relationships through longitudinal samples and by studying the role of different background factors.

The developmental theories stress the importance of finding meaning in one's life in old age as a crucial part of a successful aging process (Erikson, 1994; Jung, 1981; Tornstam, 1989). The present study cannot answer whether existential questions are more to the fore in old age than earlier in life, since no data on these people's earlier sense of meaning in life, for instance in young adulthood or middle-age, were available. According to Erikson (1978, 1986, 1994), the last stage of life is a time of forming an integrated and coherent picture of one's life, accepting both negative and positive aspects as part of it. In the present study, an individual's picture of his or her life was illustrated in the life-line drawing. The

multidimensional model showed that those who reported a strong sense of coherence also illustrated their life in a smooth, linear way, whereas those with a weak sense of coherence drew life-lines with a lot of abrupt changes. Elderly people who expressed extremely negatively and/or positively loaded life events were likely to have a lower sense of coherence. These intensively-felt life events may represent something that occupies one's mind and hinders the finding of an integrated picture of one's life as a whole. A further possibility is that a particular personality characteristic explains both an individual's way of drawing a life-line and way of answering the questionnaire. The present study showed similar areas of involvement (human relations, interest in life and religion) that bestow meaning and sense in life in old age as reported by Erikson et al. (1986).

Jung (1981) considered old age as a period of the absence of conscious problems despite the possible fear of death. The present study, however, showed that quite a number of the elderly people suffered from a sense of meaninglessness and that the proportion of such persons even slightly increased with age. This sense of meaninglessness cannot be explained by a negative attitude toward death, since the meaning of death turned out to be independent of the degree of sense of meaning in life. We cannot know whether a sense of meaninglessness is wholly comparable to what Jung meant by conscious problems. However, the sense of meaninglessness was closely related to depressive mood and loneliness, to states that involve subjective distress in old as well as younger ages. Jung's (1981) as well as Tornstam's (1989) views that there is a greater interest in the self and the spiritual aspects of life was at least to some extent supported by our findings in a follow-up study of meaning in life among elderly persons (Takkinen & Suutama, 1999a). The elderly people showed increased interest in religious issues which was seen as a source of strength in life and, similarly, the reasons related to life became a more important reason for meaning in life during the eight year follow-up. The finding supports the ideas of the increased importance of religious and existential issues in old age.

The theories of functioning have mainly focused on physical aspects, whereas psychological and social functioning have received much less attention (Talo, 1992). Though multifaceted models of health and functioning have been introduced (Heikkinen, 1986; Lawton, 1982; WHO, 1958, 1998), these models have been considered too general for empirical study. The present study showed one alternative: that of presenting functioning as a multidimensional space. The model revealed two distinguished dimensions: subjective vs. objective and psychosocial vs. physical functioning. The domain of physical functioning is quite distinct, whereas the psychological and social domains are greatly intertwined. The configuration provided by the model is shaped according to the measures included in it. Thus a different selection of measures may generate a different model. The model was composed of static interrelations between the variables and thus cannot say much about the dynamics between the variables or the location of a particular individual in the space. However, the model succeeded in illustrating the complexity of the relationships by incorporating various aspects of functioning in one model, which hitherto has been difficult to accomplish.

According to the various theoretical views and my findings, I would summarize that the role of meaning in life as part of functioning in old age can be

understood as the interrelation of three factors: involvement, sense of meaning in life and well-being. By involvement, I mean the various activities (physical exercise, hobbies, work) and commitments (to other people, to life and to religion) a person is involved in. Involvement gives pleasure in life, an opportunity for self-transcendence and a greater sense of meaning and coherence in life. Sense of meaning and coherence are related to greater well-being, which means better health and functioning in the physical, psychological and social dimensions. I use the term well-being, because in itself it connotes the subjective feeling that one is well in body and mind. This subjective feeling seems to be of especial importance in terms of meaning in life. Despite the fact that the present study and previous studies have shown the interrelations between involvement, meaning in life and well-being, these concepts are only partially related. This means that there are factors that are yet not known and mechanisms that have not yet been detected. The investigation of possible causal relationships between factors also remain to be studied in the future.

4.5 Implications for theory, research and practice

During the process of this study, I have received encouraging feedback, but also criticism for undertaking to study meaning in life. The idea of studying meaning in life has been accused of being too grandiloquent from the everyday life point of view and insignificant in regard to human functioning. The charge is partially justified. The label of "grandiloquent" in relation to meaning in life is probably due to a confusion between the concepts 'meaning *in* life' and 'meaning *of* life'. The ultimate meaning of life is undoubtedly difficult to operationalize and measure empirically. Philosophers do valuable work in thinking about the ultimate meaning of life, but they have given less attention to the personal meaning found in life by the individual and how to enhance it. It is a task for psychologists and social scientists as researchers and field workers to investigate specific individual meanings and ways of enhancing them in everyday life. As Frankl (1959) stated, we should not search for ultimate, abstract meaning, but rather for concrete assignments to fulfil. Meaning in life does not refer to something vague, but to something very real and concrete. There is consequently a strong case for empirical research aimed at developing methodology, models and interventions in this area.

One may also call into question whether it is really necessary to instruct a person in the fundamental questions of life. We can not give the right answers, nor can we think and act for another person. Everyone has to do his or her own life. What we can do, however, is to provide a range of opportunities for a person to attain the strong personal meaning in life in old age. For instance, physical exercise, activities which sustain current cognitive functioning and opportunities to build enduring social relationships seem to be significant associates of meaning in life in the light of the present study. The only hope is in man's involvement, as Sartre (1957) stated. Thus it is important to activate the positive loop between involvement, sense of meaning in life and well-being. The benefits of these activities are already widely acknowledged. There are, for instance, senior sports activities,

associations for elderly people, and the university of the third age to name but a few. By providing a wide range of activities, the individuals different needs in developing meaning in life can be met.

However, there remain a number of areas which are difficult to satisfy by activities alone. One of the biggest obstacles to a meaningful life is the lack of enduring, satisfying human relationships, which becomes more and more the case as people get older and the probability of losing one's spouse or other close persons is increased. It is difficult to compensate for meaningful human contacts both on physical and mental level by other means. In the present study, we could see that elderly men who were not married or cohabiting were more likely to have a lower sense of coherence, which was in turn reflected as poorer health in the physical, psychological and social domains. Single men seemed to be more vulnerable to the sense of meaninglessness than women. Living single is not a risk only among older men, but it is also shown to be related to poorer functioning among men in younger adulthood in Finland (Rönkä, Kinnunen & Pulkkinen, in press). Widowhood and the increasing rate of divorce and single living may especially constitute a trial for men.

Increasing spiritual needs and interests in existential questions in old age (Takkinen & Suutama, 1999a) are also such areas which are difficult to satisfy by merely providing activities. A chance to explore the self and one's own life is greatly emphasised in the process of gerotranscendence (Tornstam, 1989), individuation (Jung, 1981) and gaining ego integrity (Erikson, 1994). However, involvement in such non-productive and non-engaging activities is not very highly valued today in our society, whereas intimacy and productivity, the primary developmental tasks in young and middle adulthood, are highly encouraged. In our interviews, some elderly people were somewhat ashamed that they had not found a new activity after retirement or did not want to associate with other elderly people. The external pressure for being active and engaging may cause a burden for those elderly people who cannot or do not want to be so engaged.

I do not think that we can afford to neglect issues related to fundamental life questions. We can not remove the fact that depressive symptoms and suicide rates are especially high in Finland. This tendency is particularly evident among elderly persons (see R-L. Heikkinen, 1997, 1998; Heikkinen, Berg & Avlund, 1997). One factor closely related to depressive symptoms and distress is meaning in life, as was shown in this study and in a number of previous studies. We have gained a wealth of evidence concerning this relationship and I believe that instead of replicating these results again and again, it is high time to put this knowledge into practice by developing interventions for enhancing meaning in life and studying their effectiveness in promoting psychological well-being in old age. Though the majority of elderly persons find their lives meaningful, there remain about a third who regard their lives as meaningless or are unable to say whether life for them is meaningful or meaningless (Takkinen & Suutama, 1999a, 1999b). We have to hear the cry for meaning, as Frankl (1978) puts it.

Meaning in life, by reason of its negative pole, meaninglessness, also has the positive pole of meaningfulness. A strong sense of meaningfulness is regarded as the great resource of adaptation, coping and well-being, not only in old age, but through the whole course of life (Antonovsky, 1979, 1987; Reker & Wong, 1988;

Wong, 1989). In this study meaning in life was measured as a continuum which took into account both negative and positive dimensions. The wide range of this concept is an advantage which depression, for instance, lacks, since it refers only to the negative end of this mood. The present study showed that meaning in life is indeed an important factor in a multidimensional context of health and functioning. It seems to be positively related to many areas of physical and psychosocial functioning, acting as an important mediator between the factors in these domains. Wong (1989) titled one section of his review on meaning in life and successful aging as "Meaning – the hidden dimension of health". I hope that in this study and in forthcoming research this "hidden" construct becomes more visible.

In making this construct more visible, methodological development is very important. I highly recommend taking a developmental view when studying meaning in life. One promising method would be the life-line drawing. This method has the advantage of sharing the life story, reviewing one's life, which is considered to be one of the main tasks in old age (Erikson, 1994, 1978; Erikson et al., 1986). The interviews showed that our elderly participants greatly enjoyed talking about their lives. Despite dealing with issues concerning one's life in its totality, the life-line drawing is always a product of the present, from which past and future are projected. In this respect, I find "real" longitudinal research important. Meaning in life does not develop out of nothing. According to Erikson (1994), each stage in human life is based on the solving of the previous stages. Battista and Almond (1973) stated that sense of meaning is largely based on good self-esteem in childhood and youth. There are no studies which have followed up the development of sense of meaning in life from childhood or even young adulthood to old age. A longitudinal approach would enable the factors enhancing the development of meaning in life to be detected and appropriate interventions to enhance it to be planned.

We can do a lot to increase the sense of meaning. However, it is important to note that even if we could arrange for best possible conditions, there would still very likely exist people who find their life meaningless. The existential vacuum is as Frankl (1959, 1978) suggested, a feature of our modern welfare society. Sophisticated modern man, who can not live in an instinctual world alone or rely on cultural traditions, is obliged to think about and find his own meaning. Technological development has made life easier. At the same time each facilitating invention has increased man's responsibility. Concerning old age, probably the most exacting burden of responsibility concerns increased life expectancy. We are living longer or kept living longer. The critical question is: do we have any meaning for this extra long life? Can we cope with life and are we committed strongly enough to life and to longevity?

Thus, life may not become easier in the future, and even in a high tech world an individual will encounter hardships. It is, however, important to note that the individual does not need a tensionless state, but rather a striving towards some goal worthy to him (Frankl, 1959). While life has become more complicated and fragmented, people have acquired numerous opportunities to build up their lives. The increased responsibility due to increased freedom is not necessarily a threat to an individual's sense of meaning. Our cohort comparison, for instance, showed that sense of meaning in life actually was higher at the age of 65 – 69 in a later born cohort than in a cohort which was born eight years earlier (Takkinen & Suutama,

1999b). The independence of meaning in life from many external factors shown in the present study is also a relief. It shows that at least to some extent each person has an opportunity to find meaning in his or her life regardless of the level of objective functioning.

As a final point, I would ask: do we have something to learn from our old people? As I stated earlier, the persons who took part in this study were mainly over 80 years of age. Besides their personal development, they had experienced the enormous development of their society. These people have gained a lot of experience of life and most of them possess a strong sense of meaning in life. Experience is valuable not only for the single individual but for society as a whole. At present we take very little advantage of this knowledge. I think that one of the implications for the future is to find out how to learn from and take advantage of "grey power", the potential of elderly people, one of which is their sense of meaning in life.

YHTEENVETO

Elämän tarkoituksellisuuden kokemista on pidetty tärkeänä ihmisen hyvinvoinnille ja tätä aihetta ovat käsitelleet useat teoreetikot (esim. Frankl ja Antonovsky). Elämän tarkoituksellisuuden ja muiden elämän peruskysymysten pohtiminen on liitetty erityisesti vanhuuden vaiheeseen. Kuitenkin elämän tarkoituksellisuutta iäkkäillä ihmisillä on tutkittu hyvin vähän, varsinkin käyttäen monipuolisia mittareita ja tarkasteltuna laajemmassa toimintakyvyn kontekstissa.

Väitöskirjatutkimuksessani tarkastelin elämän tarkoituksellisuuden kokemisen ja toimintakyvyn välisiä yhteyksiä iäkkäillä ihmisillä. Ensinnäkin selvitin elämän tarkoituksellisuuden voimakkuuden ja sisällön yhteyksiä kognitiiviseen kyvykkyyteen. Toiseksi tarkastelin liikunta-aktiivisuuden vaikutusta elämän tarkoituksellisuuden kokemiseen sekä terveyteen ja toimintakykyyn. Kolmanneksi tutkin elämän tarkoituksellisuutta kahdessa laajemmassa mallissa, joista ensimmäinen oli useiden elämän tarkoituksellisuus -muuttujien sekä psyykkistä, fyysistä ja sosiaalista toimintakykyä mittaavien muuttujien muodostama moniulotteinen toimintakyvyn malli. Toisessa mallissa puolestaan testasin Antonovskyn ajatusta koherenssin tunteen eli elämän mielekkyyden, ymmärrettävyyden ja hallittavuuden tunteen keskeisestä roolista terveyden ylläpitämisessä. Tutkimuksessa tarkastelin myös elämän tarkoituksellisuuden mittaamiseen käyttämäni menetelmien keskinäisiä yhteyksiä.

Tutkimusaineistoina käytin vuosien 1988 – 1997 välisenä aikana kerättyjä Ikivihreät-projektin aineistoja 65 – 92-vuotiaista jyvaskyläläisistä henkilöistä. Otoskoot vaihtelivat eri tutkimuksissa ($n = 55 - 320$). Tutkittavat osallistuivat laajoihin psyykkistä, fyysistä ja sosiaalista toimintakykyä kartoittaviin haastatteluihin sekä osa myös laboratoriomittauksiin ja lääkärintarkastuksiin. Elämän tarkoituksellisuutta tutkittiin haastattelukysymysten, koherenssikyselyn ja elämänviivapiirroksen avulla.

Tulokset osoittivat, että elämän tarkoituksellisuuden tunteen voimakkuus ei ollut riippuvainen kognitiivisen kyvykkyyden tasosta, joskin laajemmassa mallissa tämä yhteys oli merkitsevä. Elämän tarkoituksellisuuden sisältö oli yhteyksissä kognitiiviseen kyvykkyyteen: henkilöt, jotka olivat kognitiivisesti kyvykkäitä, nimesivät muita useammin elämän tarkoituksellisuuden syyksi ja elämän voimanlähteeksi läheiset ihmiset. Kognitiivisesti kyvykkäät henkilöt myös olivat useammin löytäneet uusia (varsinkin yhteisötoimintaan liittyviä) elämään tarkoitusta tuovia toiminta-alueita eläkkeelle jäämisen jälkeen.

Liikunta-aktiivisuus osoittautui elämän tarkoituksellisuuden kokemista edistäväksi tekijäksi: henkilöt, jotka liikkuivat aktiivisesti, kokivat elämänsä tarkoitukselliseksi ja puolestaan arvioivat myönteisesti omaa terveyttään ja toimintakykyään. Moniulotteinen toimintakyvyn malli osoitti, että elämän tarkoituksellisuus oli yhteydessä sekä fyysiseen että psykososiaaliseen toimintakykyyn ja että yhteydet ovat voimakkaampia subjektiiviseen kuin objektiiviseen toimintakykyyn. Elämän tarkoituksellisuus -muuttujat olivat voimakkaimmin yhteyksissä vähäiseen masennusoireiden määrään, elämäntyytyväisyyteen, vähäiseen yksinäisyyden tunteeseen sekä hyvään itse-arvioituun

terveyteen. Antonovskyn mallissa koherenssin tunne oli keskeinen tekijä fyysisen, ja varsinkin psyykkisen ja sosiaalisen terveyden edistäjänä. Merkittäviä koherenssin tunnetta ja terveyttä ylläpitäviä taustatekijöitä olivat kognitiivinen kyvykkyys ja liikunta-aktiivisuus koko aineistolla sekä miehillä naimisissa/avoliitossa oleminen.

Elämän tarkoituksellisuutta kartoittavien menetelmien keskinäisiä yhteyksiä tarkastelessani havaitsin, että haastattelukysymykset elämän tarkoituksellisuuden tunteesta ja elämänhalun muutoksesta olivat yhteydessä toisiinsa, ja muodostinkin näistä summamuuttujan/faktorin. Koherenssin tunne oli yhteydessä elämän tarkoituksellisuuden tunteeseen osoittaen, että elämän mielekkyyden komponentti on merkittävä koherenssin tunteessa. Elämänviivapiirroksista saaduista muuttujista viivan pieni varianssi (lineaarisuus) ja nouseva trendi olivat yhteydessä voimakkaampaan koherenssin tunteeseen. Elämänviivan taso puolestaan oli yhteydessä elämän tarkoituksellisuuden tunteeseen.

Tutkimukset osoittivat, että elämän tarkoituksellisuuden kokeminen on tärkeä tekijä iäkkäiden henkilöiden hyvinvoinnin ja toimintakyvyn kannalta tukien useita aiheita käsitteleviä yleisiä teorioita. Voimakkaimmat yhteydet syntyivät subjektiiviseen ja psykososiaaliseen toimintakykyyn, joskin osittain myös objektiivisen toimintakyvyn tasoon sekä fyysiseen toimintakykyyn. Iäkkäiden ihmisten elämän tarkoituksellisuuden edistämisen kannalta merkittäviä tekijöitä tulosten pohjalta ovat kestävien ja antoisien ihmissuhteiden löytäminen ja ylläpitäminen sekä sellaiset aktiviteetit, jotka ylläpitävät terveyttä, sosiaalisia suhteita sekä mielen vireyttä. Tärkeää on ottaa huomioon yksilöllisyys sekä iän myötä usein kasvava tarve henkisten asioiden pohdiskeluun. Elämän tarkoituksellisuuden voimakkaat yhteydet psykososiaaliseen toimintakykyyn viittaavat siihen, että iäkkäiden ihmisten elämän tarkoituksellisuuden tunnetta edistämällä voisi olla mahdollista vähentää vanhuudessa yleisiä masentuneisuuden ja yksinäisyyden tunteita.

Menetelmien keskinäiset yhteydet osoittavat, että eri mittareilla voidaan tuottaa samansuuntaista tietoa, joskin mittarit näyttävät mittaavan elämän tarkoituksellisuutta hieman eri puolilta. Tutkimus osoittaa, että elämän tarkoituksellisuutta voidaan tutkia useilla eri menetelmillä, joista etenkin elämänviivapiirros nousee mielenkiintoisena vaihtoehtona monipuolisuutensa vuoksi.

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I

**Meaning in life in three samples of elderly persons with
high cognitive functioning**

by

Sanna Takkinen and Isto Ruoppila

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II

**More meaning by exercising? Physical activity as a
predictor of a sense of meaning in life, and of self-rated
health and functioning in old age**

by

Sanna Takkinen, Timo Suutama and Isto Ruoppila

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III

Meaning in life as an important component of functioning in old age

by

Sanna Takkinen and Isto Ruoppila

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IV

**The relations between generalized resistance resources,
sense of coherence and health among elderly Finnish
people**

by

Sanna Takkinen, Kaisa Aunola, Taru Feldt, Raija Leinonen and Isto
Ruoppila

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