Understanding the Critical Needs of Older People:
An Aging Perspective

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Abstract. Much of the existing research on older people's needs is based upon a popular understanding that older people are defined by age strata. However, from the perspective of the multidimensional meaning of aging, people's age is a state that represents a process of change. It cannot be simply defined in years. This concept motivates us to explore the needs of older people from the perspective of aging. This study aims first, to provide a literature review on different aspects of aging in order to better understand the aging process. Second, having considered aging, a critical needs model was proposed. As a result, a design suggestion was made in order for designers to focus their attention on helping people find the meaning of life as a first principle.

Keywords: Critical needs · Aging · Older people · Design

1 Introduction

Understanding the genuine needs of older people is an integral part of designing for older adults and is crucial to the success of any such design. Designing for older people can be understood as designing for older people's needs.

Much of the existing research within design regards the needs of older people based on a popular understanding that older people are defined by age strata[1] [1, 2]. The ages of 60 or 65 years are often used to define the age at which people might be considered as old [4]. However, according to the study of gerontology[2], people's age cannot be simply defined in years. Although people usually use chronology (years) as a metric of age, this is not a good predictor of functional status in biological, psychological and social processes [7]. Age is not a number; it is a state that represents multiple aging processes including chronological aging, biological aging, psychological aging and social aging. In some sense, designing for older people means to design for people who

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[1] According to the life course dimension, age strata may be defined by chronological age or by stages in the life cycle (e.g. infancy, childhood, adolescence, early adulthood, etc.) [3].

[2] In 1903, Elie Metchnikoff was the first person to use the term "gerontology" [5]. The term gerontology is defined in the Concise Oxford Dictionary as 'the scientific study of old age and the process of aging, and of old people's special problems' [6].

are experiencing aging processes. Therefore, the needs of older people should be identified and must then be placed in the context of these aging processes.

Dealing with the issue of older people's needs from the perspective of aging is not only related to surviving but also to death. As a result of the irreversible aging process, death is the final event for older people. From this perspective, some critical needs may emerge from the common needs. These 'critical needs' can be seen as making older people's lives meaningful and alleviating fear of death.

This paper aims at exploring design for the critical needs of older people based on gerontology studies. Firstly, understanding aging is important. It is a multidimensional concept consisting of within-person aging and between-person aging. Secondly, identifying the needs of older people should be based upon the meanings of aging. A critical needs model is proposed. As a result, a design proposition is developed. It must be emphasized that designers do not need exhaustive knowledge of gerontology. They need to understand the consequences of aging rather than the causes of aging so as to help them understand what to focus on.

2 Aging: A Process of Change

Aging is a continuous and process of change that begins the day we are born and only ends when we die [8]. We can recognize aging as a demonstration of time and an expression of the fundamental reality of change. All the changes follow the flow of time. By studying time and the process of change, we can understand the real meaning of aging.

2.1 Time

To a great extent, time as chronometric time is indicated by clocks and calendars [9], which is measured in seconds, minutes, hours, days, weeks, months, years, etc. Time as a general tool can represent the duration of a process or locate in time an event like the birth of a baby, a future appointment, or the death of a person [10]. But our personal estimates of time tend to be unreliable because in certain situations they are relative to our physical states or emotional attitudes [11].

Time is an irreversible vector consisting of past, present and future as a whole. The past and the future are represented, but the present can only be known as past. People cannot capture the present, as it is passing in every second. One cannot go back and repeat the past. Therefore, aging is an irreversible process that we are experiencing in every moment.

2.2 A Process of Change

Time is infinite, but the process of aging is finite. Birth is where the aging process begins and death is the final event.

Aging can be defined as a process of change over time. To speak of our aging is also to speak of the process of change. Changing is constituted in 'becoming from' one state

and 'becoming to' another. The material world is always in a state of change that never ceases. The only thing constant is change itself as Heraclitus held. On biological, psychological, and sociological levels, aging involves a process of continuing differentiation [12]. In other words, as long as we are alive, we are all in a process of change, which has an effect on our bodily, mental and emotional functioning, and social interactions.

Under the guidance of these concepts, designing for older people can be viewed as designing for people experiencing the changing process in different aspects. Actually all people are experiencing this process. Older people are those who are in a particular period within this process, but none of us are outside the process. This also coined the concept of "designing for our future selves" [13].

3 The Multidimensional Meanings of Aging

Aging is a complex process of change that involves many different factors. Historically, the concept of 'aging' refers to change resulting from some combination of logical, psychological, and social mechanisms [14]. The 'life-span developmental' perspective is a somewhat broader framework [15, 16], as it considers 'aging' to begin at birth and conceptualizes human development as multidimensional and multidirectional processes of growth involving both gains and losses [14]. Aging is often identified simply as "age-related change" [17, 18].

Based on the study of gerontology, two dimensions of ageing in four distinct processes are identified: the within-person aging dimension and the between-person aging dimension. 'Within-person aging' refers to the age-related changing process in a person, including chronological aging, biological aging and personality development. 'Between-person aging' indicates people's various roles, which are established by interacting with other people in different stages of the lifecycle.

3.1 Within-Person Aging

3.1.1 Chronological Aging

Chronological aging is the definition of aging on the basis of a person's years from birth [3]. Its development is parallel with the progression of time.

Chronological age or calendar age is a measure of an individual's age based on the calendar date on which he or she was born.

3.1.2 Biological Aging

Biological aging (or physiological aging) can be defined as the normal process of changes in the body and its components over time. By and large, most functions begin to decline linearly after reaching peak performance in the third decade of life [19]. The changes in different biological abilities occur at varied rates and degrees.

However, the speed of the decline is largely determined by factors related to one's adult life style – such as smoking, alcohol consumption and diet; and the environment

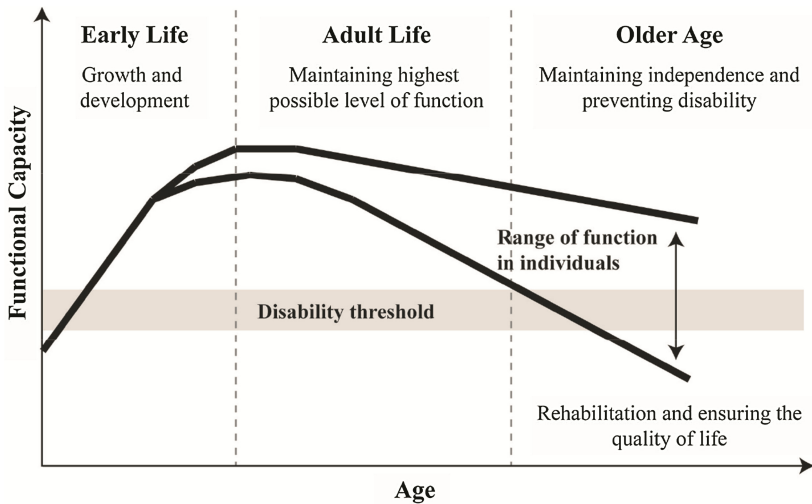where one lives [20]. Maintaining functional capacity is the concept throughout the life course (Fig. 1).

Fig. 1. Maintaining functional capacity over the life course (Source: Kalache and Kickbusch [21]).

Biological age (or physiological age) shows how your body is developing or breaking down compared to the average.

3.1.3 Psychological Aging

Psychological aging mainly means that the aging process influences cognitive abilities and personality. Cognition (to think) refers to mental process such as intelligence, learning and memory. The ways that we all perceive, recall, reason, make decisions, solve problems, and make sense of the world around us are all cognitive processes [22]. Personality can be defined as a unique pattern of innate and learned behaviors, thoughts and emotions that influence how each person responds and interacts with the environment [3].

Aging does not affect all people's psychological functions in the same way. Hooyman and Kiyak [3] provided considerable evidence that normal aging does not result in significant declines of cognitive functioning. Although some decline in cognitive ability occurs with aging, these symptoms are not a normal part of aging [23]. Therefore, this article mainly focuses upon studying personality development as a normal part of aging, which is a positive ego-development process.

Personality development is considered as a process of personal growth and a self-transformative journey, moving to maturation and gaining wisdom. It is also an irreversible process such that the individual cannot repeat a previous developmental stage. Erik Erickson and Carl Jung examined the individual's confrontation with death in the last stage of life. Jung suggested that the aging person must find meaning in inner exploration and in an afterlife [3].

In recently years, scholars have built upon the work of Erikson and Jung to expand the definition of spirituality more broadly than religious belief [7]. Spirituality refers to a personal journey for self-knowledge and personal growth [24–26]. Some theorists have proposed a theory of gerotranscendence, or a distinctive age-related path toward spirituality in which older adults develop a sense of interconnection between themselves and others and between life and death to make sense of the world [27, 28].

Psychological age can be measured by personality development, which is how old one feels, acts, and behaves.

3.2 Between-Person Aging

Between-person aging, or social aging refers to the changing roles and relationships manifested in interactions between the aging individual and others in a particular social context such as family, society and subculture [29, 30]. It considers that an individual as a relational entity is involved with other people and environments. The self-role corresponds to the various social roles the individual plays such as, for example, student, parent and friend. Becoming a grandparent is often seen as the beginning of old age [31].

During the aging process, the individual must abandon many roles that are often not then replaced by others [32, 33]. In spite of the obvious loss of many standardized roles, such as spouse and worker, Rosow [34] has shown that older adults maintain more informal roles [34].

An individual's social roles are embedded in personal networks. A personal network is generally defined as all persons (network members) with whom a focal individual has a direct relationship [35]. The network used in gerontology focuses on the older adult's ties to society through participation in network and social roles [36]. Older people's networks reflect a transition from the roles they held earlier in life. From this viewpoint, between-person aging or social aging suggests a process of change in a personal network.

Sociology defines age by one's role in society [8]. In other words, social age also refers to an individual's role in her or his networks.

3.3 Key Insights Related to Aging and Age

Based on an understanding of the four types of aging processes presented, the following insights related to aging and age are revealed:

3.3.1 Insights Related to Aging

- Understanding the meaning of aging requires the consideration of the four processes simultaneously. It seems as if there are four 'clocks' all running at a different pace, measuring the individual's four aging processes. All of these processes are interconnected, and each affects the others.
- The process of growing old is unique to each individual [37]. There is no single and uniform way in which adults grow old [38].
- Under the concept of within-person aging, biological aging and personality development tend to have an opposite relationship with one another. However, they do

still share some interdependency. Biological aging is considered as a gradual declining and an inevitable process that begins in early adulthood. The process is universal, deleterious and progressive [3]. Age-related change in appearance and physical functioning is most highly correlated with chronological age. Conversely, psychological aging is not necessarily a process of decline over time. It should be a positive process, especially taking into account people's personality development.

- In addition, an individual's biological aging and personality development do not progress at the same rate. For example, a person can have a psychological age that exceeds his or her biological age if he or she has a mature personality.
- Although people can slow down the progress of biological aging, the overall trend is an irreversible decline that cannot be changed. However, personality development can be controlled by people's intentions and actions.
- Biological aging can have an effect on social aging. For example, a decline in biological functions such as hearing impairment can impose restrictions upon older people's ability to engage in interaction with others.
- Positive psychological changes have effects on physical health [39] and interpersonal relationships including quality of marital relationships and friendship relationships [40].
- Under the concept of between-person aging, social aging is regarded as a process of change in personal networks. The personal networks of individuals reflect their social opportunities and personal choices to maintain a specific set of relationships with relatives, neighbours, friends, acquaintances, and so on [41, 42]. Social aging can be potentially influenced by individuals to meet their needs.

3.3.2   Insights Related to Age

- The meaning of age includes four dimensions consisting of chronological age, biological age, psychological age and social age. Chronological age is easy to measure in years, but others are difficult to evaluate. A person's age cannot be simply calculated in years. Age is not a number; it is a state representing four aging processes.
- Each individual has a unique aging process [37, 38]. If age is a state representing one's position in these various aging processes, each person can be said to have a distinctive age such that there is no absolute equivalent between the ages of any two people.
- Although people usually use chronology (years) as a metric of age, it is not a good predictor of functional status in biological, psychological and social processes [7]. This means that biological age, psychological age and social age cannot be clearly defined by chronological age. For example, we may know a 70-year-old person has a younger appearance and a good physical condition very much like a 60-years-old. For another example, a 30-year-old may have the facial features of a 40-year-old, yet behave and dress more like a 20-year-old. Some may perceive this person to be "old" for his or her age, while others may perceive the person to be "immature" [30]. Moreover, social age is not the same as chronological age. For instance, the passage into the role of being grandparents may occur at age 50 or age 70, or never.

- Biological age is not necessarily equal to psychological age and social age. For example, we may remark that a person acts older (or younger) than his or her biological age. For another example, different norms, roles and expectations for people of different biological ages exist in different societies and cultures.

4 Designing for Critical Needs

4.1 Critical Needs of Older People

Critical needs can be distinguished from common needs by reviewing the multidimensional meaning of aging. Critical needs and common needs are defined using two different perspectives; one in which age is understood to be a process and, conversely, another in which age is seen as a number. Common needs are proposed on the basis of surviving and living. The better life quality a person wants to achieve, the more needs they have. But critical needs are identified from the perspective of aging processes. Critical needs help people to face death with the knowledge that it is part of aging.

The individual's psychological state, especially personality development, is considered to be the most critical aspect and is what motivates and guides older people in living a meaningful life. It helps people to experience aging and face death calmly by achieving self-realization and to understand the meaning of life. It also influences the individual's biological condition and social relationships. For example, positive psychological states would help people to keep healthy and promote interpersonal relationships. On the contrary, psychological and social stresses can cause a change in nutrition and a decline in health; or the changing deep-sleep patterns of the elderly may be due to depression rather than physical changes [43, 44].

Maintaining biological condition is another critical concern. Although the ultimate result of the biological aging process is a progressive loss of function, age-related biological changes can be slowed down. As the severity of age-related changes in the body can be affected by disease, injury, exercise, nutrition, smoking, environmental pollution, and other lifestyle factors [45], avoiding some bad habits and improving one's living environment could slow down the aging process or prevent the detrimental effects of aging. For example, the natural decline in cardiac function can be accelerated by smoking, leaving the individual with a functional capacity level lower than what would normally be expected for his or her age [20].

Personal networks are regarded as sources of support, contributing to older people's functioning and wellbeing [35]. If we acknowledge that psychological need is the most critical concern for people who are growing old, then social interaction can be viewed as a kind of support for people to develop their personality.

Most people have these three interdependent needs as long-term requirements concurrently. The arrangement of these needs can be represented as a structure of concentric circles (as shown in Fig. 2). It is not in a hierarchical structure such that a lower basic need is submerged and a new and higher need emerges as postulated by western psychologists such as Maslow. Rather, this model presents that three critical needs are simultaneously demanded and that the psychological needs should be the highest priority for a person's attention.
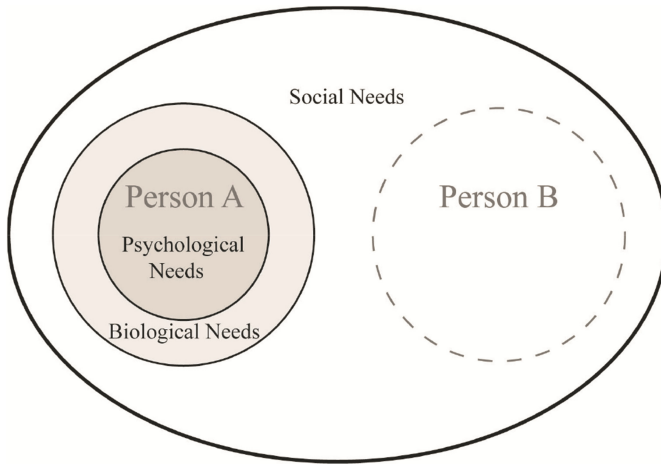
Fig. 2. A critical needs model of older people

4.2 A Suggestion for Design

This model of critical needs suggests a strategy for helping to meet older people's requirements. Design for older people can be understood in terms of design for their critical needs including biological need, psychological need and social need. The purpose of design is not only to help older people adjust to aging, but also to assist them in finding meaning in life. Designers should seek to design in a way so as to inspire older people to achieve self-realization. It also can help people maintain their physical ability and promote harmonious relationships with others.

If designers focus on older people's chronological aging and biological aging as processes of decline, they will emphasize on improving the physical environment, to make it inclusive and cater for different disabilities. If designers acknowledge the primary importance of psychological aging among the different dimensions of the aging process, they will try to support older people's personality development which may bring these older people real wellbeing and happiness.

5   Conclusions

The main aim of this study is to identify the critical needs of older people. These critical needs are viewed as the most important requirements for older people facing death as part of aging. It suggests that design should help older people in finding the meaning of life as its main priority.

This study identifies the need for a design pattern related to the critical needs of older people, but there is a need for further research in this area, in order to define such a pattern in detail. Further studies are required to articulate these needs in a way that could inform design, and future empirical research is needed to guide such design practice.

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