

Time and Aging: Enduring and Emerging Issues

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by **Jan Baars**

Introduction

Human beings are born, they grow up, age and die just like other mammals, but these processes are interpreted and organized according to socio-cultural contexts that are very diverse, both in historical and contemporary societies. These contexts are deeply influential as humans go through a relatively long period in which they are dependent on others. They begin to absorb the specific culture in which they are born as soon as they begin to drink the milk that feeds them. Some fundamental cultural assets, such as language, take a long time to acquire but then, eventually, enable the competent speakers to participate more actively in their societies and develop the abilities that are usually associated with human autonomy.

In this short observation we can distinguish already three dimensions - natural (physical and biological), socio-cultural and personal - which *co-constitute* human lives. As human aging can be characterized as living for a relatively long time, it will typically be shaped through these three dimensions that change and interact in time. The *temporal* characteristics of the three constitutive dimensions can, in a first approach, be described as follows:

(1) More or less regular physical and biological processes or rhythms that form and reproduce the materiality or corporeality of aging. Especially in premodern times, natural rhythms have been seen as giving meaning to human aging in the form of ‘seasons’, ‘phases’ or ‘ages’ of human lives (Burrow, 1986; Sears 1986). With the rise

of modern science such traditionally meaningful natural rhythms have been stripped of their meaningful content and used as foundation of chronological time. Characteristic of this form of time is that it contains only instrumental properties of measurement. Besides the difference between precise or imprecise measurement it contains no meaning of itself; all meaning of chronological time has been ascribed to it from the other two dimensions.

(2) Socio-cultural narratives about aging that articulate when ‘aging’ is supposed to begin, what its challenges, qualities and drawbacks are; how the ‘aged’ should be approached; whether they should be respected or not; what counts as ‘young’, ‘normal’, ‘old’, ‘very old’, ‘innocent’, ‘experienced’, ‘wise’, etc.. All this depends on interpretations of what it means to ‘age’ and these interpretations are transmitted and renewed through socio-cultural narratives. These narratives are not just ‘stories’: they carry structural weight in the way markets are organized, political power is exercised, income and lifechances are distributed, etc.

(3) Personal experiences of living in time: persons are unique in the ways they undergo the influences from the other dimensions (such as genetic make up or education) but they also actively form their own lives and actively interact with the other two dimensions as they influence their bodies through their lifestyles, or contribute to the socio-cultural narratives about aging by communicating their experiences and perspectives.

I have called the complex interaction of these three constitutive dimensions of human life over time the ‘triple temporality of aging’ (Baars 2007 b), which will briefly be discussed in the final part of this chapter after having analyzed the major problems that stand in the way.

The main purpose of this chapter will be to demonstrate the problems which arise when aging is simply conceptualized as ‘getting a higher chronological age’, using merely the methodical perspective of chronological time, which is merely the abstract and instrumental form of one of the constitutive dimensions of aging. This criticism does not imply that chronological *time* is not an important analytical tool for many purposes. For gerontological purposes, however, the significance of chronological *age* is limited and its use too often serves to evade the question what aging actually might be. That aging is poorly indicated by higher chronological ages may often be admitted but this does not appear to lead to much change in research practices. The vast majority of studies of aging still use a chronological approach to define populations for research purposes (i.e. determine who the ‘aged’ are that should be studied) and try to establish how (social, economic, health etc.) characteristics of people change as a function of their chronological age. This may lead to an accumulation of data, but in itself not to *explanatory* knowledge.

In this chapter I will discuss the overemphasis on chronological time in two forms, which presuppose and strengthen each other: as a chronologization of *aging* (1) and as a chronologization of the *lifecourse* (2). In this chronologization, the three dimensions that were distinguished at the beginning of this chapter, as co-constituting human lives (natural, socio-cultural and personal) are reduced to an instrumentally reduced version of one domain. Chronological age, however, usually carries more meaning than could strictly be derived from chronological measurements and tends to reduce aging to just one constitutive dimension. This tendency is one of the enduring issues in the study of aging regarding its concepts of time. The emerging issue is to arrive at a better understanding of the ‘triple temporality of aging’ (3): the mutual

presupposition and interconnection of the temporal characteristics that are typical of the three constitutive dimensions of human aging.

1. THE CHRONOLOGIZATION OF AGING

Aging means basically living 'in time' and concepts of time shape the ways in which aging is approached. A fundamental problem and enduring issue in the study of aging is the assumption that chronological age forms the key to the understanding of aging processes. There is a persistent emphasis on chronological age which orients gerontological studies although the results of these studies do not corroborate or justify this. This overemphasis on chronological age does have consequences for the way aging processes are organized. An important problem with this '*chronologization*' of aging is that this approach suggests that the exactness of measuring chronological time (since birth) gives exact outcomes in terms of age-related properties. As its main vehicle is the measurement of chronological time, which is necessarily abstract and carries no meaning of itself, this chronologization often carries implicit narratives about aging without being openly discussed. Moreover, it obstructs the acknowledgement of the importance of meaningful narratives stemming from diverse socio-cultural sources and from personal experiences of aging. Processes of aging are meaningfully constituted in an interplay between natural rhythms and regularities, more generally guiding socio-cultural narratives and personal experiences; if 'chronological age' has any meaning, it comes from this interplay, not from time measurements.

So, what exactly is chronological time ? How can we measure it precisely? Throughout its history chronological time has been indicated by rudimentary or

refined 'clocks' such as water clocks, sundials, hourglasses, mechanical clocks and atomic clocks in combination with calendars which count the years (Baars, 1997). In a sophisticated form they make it possible to measure the duration of a process or locate an event (the birth of a baby, a future appointment) on a timescale. We know that some clocks do not function well; that they are not precise. But how can we determine whether a clock really measures 'the' time precisely? Usually, we establish the accuracy of a clock by comparing it with the clock of an institution with "more authority," such as the telephone company or television. But again, how can we determine the accuracy of such an authoritative clock? To what most "authoritative clock" or most "fundamental time" are these clocks attuned? To the movement of the earth around the sun? Is that time in an ultimate sense? Or something else entirely? Unfortunately, following this line of questioning does not lead to an ultimate time or an ultimate clock. In all chronological time concepts that we know of, a specific, more or less regular process has been selected as a standard to establish what "time" is. In most traditions the movements of the celestial bodies have been taken to represent "time": defining years, seasons, months, day and night, hours and minutes.

But, in principle, there are many processes that might be used as the basis of a chronological time concept. In fact, all natural rhythms could be taken into consideration. But a *general* time concept must be based on processes which cannot be influenced by the different processes it should measure. Therefore the movements of the earth and the moon were excellent candidates to form the basis of a general time concept, as their regular movements are clearly independent of anything happening on earth. But eventually this way of defining time resulted in many problems of measurement since these basic cosmological movements turned out to be

too irregular. The elliptic form of the movement of the earth around the sun and the precession of the equinoxes caused, in the long run, a lack of precision which led in 1582 to a change from the Julian to the Gregorian calendar (Richards, 1998).

After this repair, the calendar has more or less been left to itself as human beings could live very well with small long-term irregularities. These were, however, increasingly regarded as intolerable to the degree that ever more precise measurements became of vital importance for several types of scientific research. Therefore the search has been intensified for still more delicate regular movements that could be used as a basis for a general standard to measure all other movements.

The technical criteria which must be met have become extremely demanding. To be able to establish a natural process as a standard for measuring time, we need a periodic process with extremely short phases, that can easily be reproduced and which has outcomes that are highly stable with respect to possible external disturbances. In searching for this time standard, the frequency of the periodical processes has risen to the level of the cesium atomic clock, which is based on a cycle of over 9 billion vibrations during one (old) astronomical second. This has become the basis of the International Atomic Time which is continuously broadcast from stations in Colorado (US), Rugby (UK) and Braunschweig (BRD) and which is received by the authoritative clocks referred to above. On this atomic foundation it is, in principle, possible to make chronological measurements extending from the millions of years that astrophysicists work with to the nano-seconds which are needed in other areas of physical research. This time is indicated precisely by the clock, but this is in no way "time as such". Its foundation is only a specific stable movement which has been

selected to function as a standard for chronological measurement. It is only a very sophisticated convention which enables time to be measured by offering a precise instrument to be used for exact measurement and for the temporal coordination of actions or processes (Baars, 2007 b).

Concepts of time are so important because we have no organ to perceive time like we can *see* objects in *space*. And although what we can see for ourselves may often seem self-evident but actually be self-deceiving, grasping time is even more difficult. Therefore, spatial images and evenly distributed distances have often been used to represent time, as in an old fashioned clock where the pointers tick away the time as they move over the face of the clock. Another example of a spatial projection of the passage of time is drawing a straight line, which visualizes the time which is passing even during this action of drawing. This can easily be transformed into the "arrow of time" or into one of the axes in the common diagrams which show changes in certain characteristics as a function of aging. These visualizations tend to reduce time to spatial characteristics, as if time is something which moves with a regular pace from A to B - from birth to death – and would affect everybody equally. In that way somebody's chronological age would be the key to understand a person and his or her situation.

Mistaken associations: time working as a regular cause

Generalizations about people with a certain calendar age actually presuppose a *causal* concept of time: because time has worked for a certain duration in aging people, certain inevitable effects should be reckoned with. Moreover, the effects are assumed to develop steadily and universally according to the rhythm of the clock. However,

such a causal concept of time can never generate knowledge that might explain something of the differences that exist between human beings of the same age, nor allow us to understand that aging is a generalizing concept that is actually composed of many specific processes. While it is true that all causal relations are *also* temporal relations, or relations working "in time," it would be wrong to identify causality with time or to reduce the process of aging to the causal effects of time.

However, the grand ambition of gerontology often seems to be to establish how the chronological or calendar age of persons determines the characteristics of aging persons. This would eventually reduce gerontology to a straightforward set of simple formulas in which scientific precision and practical use would be united. In the early days of gerontology this option was stated with much self-assurance. Birren (1959 p, 8), for example, argued that: "Chronological age is one of the most useful single items of information about an individual if not the *most* useful. From this knowledge alone an amazingly large number of general statements or predictions can be made about his anatomy, physiology, psychology and social behavior."

Although such an explicit claim may be scarce, this articulates the presupposition of much research on aging. Its author has been one of the few theorists who has dealt extensively and over a long period of time with temporal aspects of aging. Forty years later he expressed serious reservations about these claims which, however, still appeared to be held as part of the 'data-rich' but 'theory-poor' character of gerontology: "By itself, the collection of large amounts of data showing relationships with chronological age does not help, because chronological age is not the cause of anything. Chronological age is only an index, and unrelated sets of data show correlations with chronological age that have no intrinsic or causal relationship with

each other.” (Birren 1999, p. 460). Although *processes* (which can be measured in chronological time) will have their effects, time by itself does not have any effects. To assume this leads away from an understanding of aging although it may produce neat distributions of characteristics of persons according to their ages.

In spite of their importance, explicit analysis of the different concepts of time that are inevitably used in the study of aging have still been scarce, although there have been some notable exceptions (cf. Baars & Visser, 2007).

To develop a more intrinsic measure of aging than chronological age would, even in a mere functionalist perspective, require establishing clear indicators of ‘normal’ functioning. If we define aging in terms of ‘biological reliability theory’ (Gravilov & Gravilova, 2006), as a phenomenon of increasing risk of failure with the passage of time, the question remains in what way the statistical notion of increasing risk can be supported by an understanding of aging processes. Even if we would have reliable biomarkers to determine somebody’s (biological or functional) *age*, this would not allow us to explain *aging* as a regular process. If biological aging would develop in synchrony with chronological age, the differently marked *ages* would have to be included in a continuum, as subsequent *phases* which would demonstrate a structured development away from a state of adult ‘health’ or ‘normality’. It is doubtful whether all biological processes of aging can be adequately seen as *continuous* and *regular* functional deterioration; some processes may respond to training or treatment, others may suddenly collapse. Moreover, human aging appears to imply many distinct but interrelated processes which are relatively independent, but also interact with other processes in the same body (Kirkwood et al., 2006). The many different processes of

aging may have their specific dynamical properties, but these usually include an openness to the environments inside and outside the human body, extending to ecological or social contexts and personal lifestyles. This explains their intrinsic malleability (Kirkwood, 2005; Westendorp & Kirkwood 2007) which is demonstrated in the large differences in life expectancy and health that we can observe when we compare several historical and contemporary countries or regions with each other.

How important such contexts are can be gathered from the enormous change in life expectancies that has taken place in the countries of the Global North during the last 150 years; changes that cannot be explained by a major shift or mutation in the evolutionary substrate of human life. Seen from this perspective our bodies basically have hardly change since the ancient Greeks, let alone since the 19th century. Yet the chances to live longer have changed impressively. Social and cultural contexts with their still advancing technological possibilities appear to become increasingly important and may necessitate a rethinking of evolutionary theory (Promislov et al. 2006).

Human Aging and its constitutive contexts

We cannot study processes of aging as we would study other processes, because we cannot isolate ‘aging’ in an experimental group and compare the results with a control group which does not age. Moreover, all human aging takes place in specific contexts which co-constitute its outcomes. This fundamental human condition haunts even the most sophisticated research strategies. The notorious Age-Period-Cohort problem (cf. Baars, 2007 a; Schaie, 2007) confronts us with questions about what we have actually established when we have found, for instance, that a high percentage of a group of 70-

year olds suffers from high blood pressure. Is this because of their age? Is it part of their specific ‘cohort identity’? Is it because they grew up and older in a specific period in a specific society? Is it ‘a little bit of all that’? Human aging cannot be studied in a *pure* form: even a scientifically controlled life in a laboratory would be a life in a specific context which would co-constitute the processes that would take place.

The search for general aging characteristics based on chronological age has produced much counterevidence, testifying to the many differences in aging processes. This counterevidence comes hardly as a surprise when we try to imagine persons with the same chronological age but living in very different circumstances. Think, for instance, of sixty year olds: one would expect major differences in many important respects between, let us say, a contemporary poor Russian farmer, a wealthy Japanese or a homeless American of that age; not to mention sixty year olds in ancient Egypt, in classical China or among 19th century factory workers. The fact that in Western Europe the average life expectancy for males has practically doubled in the last 150 years (Oeppen & Vaupel, 2002) implies that chronological age cannot by itself give any precise reference to (a phase of) aging processes. Statistics using chronological age should not be misused to *explain* aging processes without a further gerontological investigation.

Chronological calculations of life expectancy are prognostic estimates that presuppose specific *historical* contexts. And, as we can read in this Handbook, this is just the beginning: in the *same* historical period different social backgrounds, in education, gender, labor markets, medical care, pension systems, housing, care arrangements or

medical technology are likely to result in different aging experiences. Even a "cohort identity", established by contrast with other cohorts within the same historical context, remains to a high degree an abstract construction which has to tolerate a considerable amount of internal differentiation. Therefore, the analysis of inter-cohort differences has to be supplemented by analysis of intra-cohort differences (Dannefer, 1984, 2003)

2. THE CHRONOLOGIZATION OF THE LIFECOURSE

Just like societies organize ways to educate children to prepare them for active adult lives, they tend to organize aging processes, especially when a relatively large part of the population counts as 'aged'. This social organization of aging processes has many complicated aspects as can be seen in other chapters of this volume. One of them is the way this organization is informed by statistical overviews, gerontological studies or common prejudice which are based on calendar age or chronological age. In such cases, a specific concept of time, chronological time, is directly applied to represent aging processes and their effects, resulting in the many statistical tables in which we find 'age' on one axis and on the other axis certain characteristics that are shown to change with 'age'.

The danger of an unreflected overemphasis on chronological time presents itself once more as this concept of time has been institutionalized to measure and coordinate processes and actions in modern societies, assuming that societal processes can be optimally organized on the basis of the ages of the people concerned. This can easily lead to self fulfilling prophecies: if in a given society the dominant agents in the labor market are under the impression that productivity is declining after the age of fifty, this will most likely become true; not because this is inherent in their aging process, but as an artifact of the strategies that define these persons as 'older workers'.

According to Kohli (1986) a historical process of ‘chronologization’ would have resulted in a “chronologically standardized ‘normative life course’” (Kohli, 1986, p. 272). Although this proposition has encountered some historical criticism (cf. Grillis, 1987), it has been fruitful in many debates about the life course (Levy et al., 2005; Settersten, 1999, 2003; Vickerstaff, 2006). This section connects with these debates but also introduces some further distinctions.

A first distinction concerns the chronologization of *aging* in gerontological research already discussed above. This specific chronological approach to time has many important limitations but is nevertheless quite dominant as its measurements and age-related generalizations seem to offer a superficial clarity that can be applied in policies regarding aging and the lifecourse. Through such applications, the interrelated complex of gerontological research and age-related policies further strengthen the chronologization of the *life course*. In this regard, it appears also to be fruitful to distinguish a chronologization of the life course from its possible *standardization*. This last aspect of Kohli’s (1986) proposal has aroused much debate, as standardization does not harmonize well with processes of individualization (cf. Beck, 1992; Baars, 2006; Uhlenberg & Mueller, 2004) or, for example, the many effects of international migration (Vincent, 1995, 2005), which lead to deviations from the usual life course patterns with regard to education, work and pensions.

Furthermore, I propose that the concept of a ‘chronologization of the life course’ is not necessarily restricted to *ages* but can also imply that *durations* of participations of persons in institutions and organizations will be regulated and subsequently registered bureaucratically, with consequences for the persons concerned. The number

of years that were (allowed to be) spent in education, in work, in paying for a mortgage or pension may have important effects over the life course. Chronological durations of education or employment may not only structure the way persons remember, evaluate or plan their lives but can also have many consequences in later life, for instance, in terms of both access to and amount of pensions. Consequentially, even if the life course would be less organized or standardized in terms of age, it could still be organized chronologically in terms of durations. This interpretation of a chronologization of the life course can easily be connected to research of event time (cf. Schaie, 2007).

Although careers may tend to become less standardized, the idea of a ‘late modern’ or ‘post modern’ de-standardization of the life course appears to be more adequate for *personal* relationships, where traditional family patterns have become much less dominant in a few decades and lifestyles of many (early) retired older people are changing drastically (Gilleard & Higgs, 2000, 2005; see Walker this volume.....), than for careers in *education* or *employment* (cf. Henretta, 2003). The effects of these careers still remain important during later life as they are connected with the distribution of education and (pension) income (cf. Dannefer, 2003). As institutions and organizations in late modern societies tend to use chronological time to control and coordinate actions and processes, aging processes will not be able to evade the different ‘chronological regimes’ (Baars, 2007 b) that combine chronological age and duration of participations in education, employment, social services or care (cf. Leisering & Leibfried, 1999).

Chronological regimes

In everyday life chronological age is often, explicitly or implicitly, used to explain aging processes or as an ‘argument’ to distinguish persons who have become ‘older’ (sic!), ‘senior’, ‘elderly’ or ‘aged’ from ‘normal’ adults. In many Western countries, persons who have lived for 50 years are invited to join organizations such as the American Association of Retired Persons (AARP) or one of the many national organizations which are active in the memberstates of the EU, that will support their suddenly weakened existence with age-specific benefits that may partly compensate for the negative effects of the age-segregation these organizations paradoxically emphasize. The media confront us with scientifically based reports about the things these seniors are doing, what they prefer, desire, what they are still capable of, or not any more, although this category of people represents often a third or even half of the adult population. It has even become customary to speak of ‘older workers’ for people over forty years of age; not only in Europe, but also in the US (cf. Henretta, 2003; see Taylor this volume....).

It does not take more than a few moments to realize the absurdity of this situation which could be interpreted as typical of a culture that is so obsessed with youth that a distinction between ‘normal’ and ‘older’ adults is made as soon as possible, followed by indifference regarding the many possible differences between those who deviate from normality. This awkward status of being ‘aged’ may remain with them for several decades, much longer than their ‘normal’ adulthood, and they are likely to change and to "fan out", becoming even more different from other members of their birth cohorts, because they tend to follow their specific interests without being tied down by the institutional regularities of education, work or raising children.

The paradoxical *acceleration of chronologically ascribed aging* in the labor markets of most Western countries stands in strong contrast with the risen and still rising life expectancy (Oeppen & Vaupel, 2002), which can be interpreted as a *slowing down* of aging processes. Here also, chronological age serves as a pseudo-exact labeling device which has been programmed by cultural trends that are easily obfuscated by it. This paradoxical development may offer attractive perspectives of many “golden years” to persons who can afford them, but also enforces age-segregation and even excludes many aging people from important possibilities to gain a decent income (Macnicol, 2006). Women who want to return to the labor market after having raised their children are particularly disadvantaged as they are right from the start labeled as ‘older workers’ (Baars, Beck & Graveland, 1997; Ginn, Street & Arber, 2001). Finally, this acceleration of ascribed aging has increased the pressure on the lives of ‘normal adults’ (25-45 years of age) to combine family life with a short and intense career during which the income of a long life must be gathered. When such long term overburdening eventually leads to health problems these are too often ‘explained’ by referring to the *ages* of the persons concerned, offering another superficial argument to legitimate an early exit from the labor market.

Although age discrimination legislation has been introduced in the EU, the labor market position of older workers fluctuates with the general economic situation and investment in updating or retraining their capacities tends to slow down or stop as soon as they have reached the status of an ‘older worker’ (Baars 2006). Even in the US, where mandatory retirement does not exist, older workers have the lowest rates of re-employment which will typically be in part-time positions or jobs with low skill

and training requirements, resulting in large wage losses (Chan & Stevens, 1999; Hirsch, MacPherson & Hardy, 2000). In spite of generally more positive views about aged workers, employers are still under the spell of negative prejudice. Melissa Hardy concludes in her recent overview (Hardy, 2006) that research on the relationship between age and job performance fails to include contextual factors, thus resulting in little understanding of the relationship that should be clarified (Czaja, 1995, Avolio, 1992). The main reason is again a narrow focus on chronological age, although age accounts for only a fraction of the inter-individual variability in performance (Avolio, Waldman, & McDaniel, 1990).

This situation leads to many unfortunate conflicts, as the abilities and needs of numerous people clash with implicit or explicit prejudice or regulations regarding their calendar age. As populations age in differentiated ways, these developments conflict with life course structures that are not flexible enough, demonstrating the actuality of the theory of “structural lag” which played a central role in the later work of Mathilda Riley (cf. Riley, Kahn & Foner, 1994).

Given these circumstances, knowing the chronological age of persons in such contexts can be quite informative because ages can easily be related to certain characteristics. We can predict that the unemployment of older workers will tend to be longer than the unemployment of ‘normal’ workers. The point is, however, that this does not demonstrate that older workers are, as a result of ‘a higher age’, ‘slower’ or ‘less flexible’, than younger ones. Given the tendency to exclude older workers from the labor market and the importance of work for income, housing, health, social contacts, participation and the articulation of personal identities, these important aspects of life

may become increasingly at risk as people reach higher ages. Such increasing risks of loss and failure cannot be understood as being caused by aging processes per se; they are to a large degree constituted by age-related processes in the labor market. For aging studies, to focus on age without analyzing the processes which constitute many of the characteristics associated with these ages, merely because chronological age has been institutionalized in the societies in which people live, enforces the chronological regimes of these societies and does nothing to advance our understanding of human aging.

Not only are contexts co-constitutive for aging, this also holds for research on aging (Baars 2008). The identification of 'aged' research populations, for instance, presupposes an organization of the life course in which chronological time has become an important instrumental perspective (Kohli, 1986; Mayer & Müller 1986). Concepts such as 'age groups', 'age norms' or 'age grading' presuppose chronological age which has become the typical instrument to regulate many transitions or entitlements. Concepts used in the discussions of 'aging' societies, such as 'age-structure', 'birth cohorts', 'dependency-ratio', 'age-cost profile' and all kinds of tables in which ages are associated with particular characteristics, pretending to give a quick informative overview, have become so general that their gerontological meaning is rarely questioned. In all instances where age-related generalisations are presented without further questioning their suggested meanings, conventional generalizations about aging and the aged are reproduced or new ones introduced. That such generalizations are unfounded does not imply that they are without any effect; even unfounded statements about categories of people with certain ages can be implemented in policies regarding, for instance, specific forms of care or housing for

‘the aged’ and thus contribute to a reality which forces aging people to fit in, because they have no other options than those that were organized for them. Consequently, later research can affirm the earlier generalizations, not because they grasped the realities of aging, but because gerontological expertise has again played its unreflected role in co-constituting the realities of aging. In such cases the analytical apparatus of gerontology runs the danger of becoming an uncritical instrument catering to all kinds of organizational contexts, in which aging people are mainly relevant as the subjects of planning procedures and average estimates, even if the objective is to help and support them.

That *personal* dimensions of aging processes cannot always be acknowledged may be unavoidable, because social entities like institutions, communities and societies want to assure their continuity while individuals fade away, sooner or later. Therefore, these entities tend to use perspectives that are detached from limited personal horizons, and the chronological perspective may be useful for such long term planning as it can interrelate average chronological *duration of activities* with the chronological *ages* or average life expectancies of the actors involved. Practical as such age-related generalizations may seem, they should not guide and certainly not dominate the way aging is approached or understood; for gerontological purposes this can hardly be satisfactory.

Institutional chronological regimes

Chronological time plays an increasingly important role as it is typically used to measure all kinds of events or processes to see whether they can be more efficiently (‘better’) organized: smoother or faster and less ‘time-consuming’. Such a

restructuring of processes and situations from the perspective of chronological measurements may have several important consequences for the aged. We can think of the phenomenon of *time budgets* in institutions for care. There is a crucial transition from measuring the times of particular conversations or acts of care, establishing that these activities take 5 or 9 minutes on the average, to regulations that a conversation or a specific act of care *may not exceed a precise amount of time*. Such tightly calculated chronological regimes may clash with the time perspectives that are inherent in situations of personal contact (cf. Baars, 2007 b) as the need for contact may fluctuate with situations and persons.

3. TOWARDS A TRIPLE TEMPORALITY

As chronological *time* can easily be used in bureaucratic calculations it will tend to dominate other perspectives on time and aging with its implicit pseudo-narrative that chronological *age* would present a reliable indicator of aging. This all too simple model is defied by the constitutive complexity of the three interrelated dimensions that have been distinguished in the Introduction.

(1) *Natural* (physical and biological) rhythms are constitutive of aging as this remains a process that is ‘bodily driven’, but the complexity and variability of these rhythms cannot be grasped by establishing chronological age. Moreover, human aging is always interpreted meaningfully through (2) *socio-cultural narratives* that are not just interesting ‘stories’, but are connected in complicated ways to structural contexts which co-constitute aging processes. Even within communities that are integrated by common narratives, there may be structural arrangements or forms of social

inequality, that lead to important differences in life chances that defy the idea of uniform aging processes.

When aging is only approached from a chronological perspective, the necessarily abstract character of chronological time discussed above will empty human aging from its constitutive structural backgrounds and meaningful contents that are, however, essential to understand its variations.

Even years, the units of chronological measurement of human lives, are laden with meaning: calendars are not only used to count the years as we do when we speak of calendar age; there are many different calendars around the world and they meaningfully structure the years with religious holidays and the remembrance of historical events ranging from a global to the most personal level. The yearly cycles and the rhythms of the natural environment are meaningfully structured with seasonal activities and festivities, markets, contests and holidays (Zerubavel, 1981). Such socio-cultural narratives also form an interpretative background of human life courses and articulate what it means to be born, to grow up, to become adults, to get older and to die. Meaningful temporal horizons belong to human aging; chronological time can hardly be more than a tool to date and locate events on a time scale.

Because being born and dying are inherent to human life and everything in between - growing up and aging - quite common, generalizations are easily developed. But, paradoxically, being born, growing up, aging and dying never take place 'in general'; only particular persons are born and they grow up, age and die as specific persons in specific circumstances. Therefore, (3) personal experiences of aging as *living in time* deserve a place in gerontology, as the third dimension from which aging processes

derive their meaning. That personal perspectives on aging as living in time are relatively independent from the other two constitutive dimensions can be gained from everyday experiences we can make with time. The ‘same’ time (in terms of duration) is experienced very differently in waiting, sleeping, having a beer with friends or in supporting our favorite football team as it tries to make up for its loss while ‘time’ is running out. From everyday life we also know that our memories do not work according to chronological time. Memories of something that happened 50 years ago can be much more vivid than memories of something that took place last week. Still, the realization that the remembered situation is not actual but lays 50 years behind us adds to the understanding of what it is to live in time, which comprizes more than only personal experiences.

The three fundamental dimensions: natural (physical and biological), socio-cultural narratives and personal experiences continually presuppose each other and are in that sense co-constitutive of aging processes. To attain an better understanding of aging processes it is necessary to understand more of this temporal interplay of these dimensions, what I have called the ‘triple temporality of aging’ (Baars 2007 b).

4. CONCLUSION

The scientific precision that is associated with chronological *time* (as it is expressed in numbers and used in calculations) can easily lead to an uncritical acceptance of certain constructions of chronological *age*. Chronological age, however, is only the amount of chronological time that has passed since somebody was born. We are getting older with every tick of the clock, but this ‘older’ only has a precise meaning

in a chronological, not in a gerontological sense. Therefore, the 'aged' have no more in common than a certain minimal calendar age. As the lifecourses of late modern societies tend to be chronologically organized, research on aging should maintain a certain independence and question age-related generalizations rather than enforce them by failing to investigate actual aging processes. To understand these processes more fully, three co-constitutive dimensions of aging should be taken into account and their interrelated temporal properties analysed as they contribute to aging.

This 'triple temporality of aging' implies a modest role for chronological time. It appears to be indispensable for research on aging processes as it serves to measure durations, but this covers only a part of the complex realities of aging. Chronological age would suffice if the same duration (age) would lead to the same result in all humans and this is only true of durations that exceed the maximum life span, namely death.

The arguments against a widespread overemphasis on chronological age are no denial of the finitude of human life, nor do they deny that "aging" can be observed in any human being, if we compare characteristics of the same person over a relatively long period of time. The question is *how* to approach these themes to get a *better* understanding. To achieve this it is essential to understand the specific significance and relativity of chronological time and its unfounded seductions in relation to aging to open up ways to investigate the ways in which human aging is constituted in time.

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