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Awareness of Aging: Theoretical Considerations on an Emerging Concept

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Abstract

Humans are able to reflect on and interpret their own aging. Thus, as individuals grow older, calendar age may become increasingly a subjective variable. This theoretical paper proposes the concept of Awareness of Aging (AoA) as a superordinate construct that can serve an integrative function in developmental research on subjective aging. It is argued that the AoA construct can incorporate the theoretical components of other existing concepts by acknowledging that judgments of subjective aging tend to be made on an awareness continuum ranging from pre-conscious/implicit to conscious/explicit. We also argue that processes of AoA are inherently self-related processes and that AoA is a particular aspect of self-awareness that results in specific aging-related self-knowledge. Over time, aging individuals incorporate this self-knowledge into their self-concept and personal identity. We provide theoretical evidence showing that although all major theories of adult development and aging draw on phenomena related to AoA, the explicit incorporation of aging-related awareness processes has been missing. We also provide an overarching framework to illustrate in a heuristic way how AoA in combination and interaction with other influences affects developmental outcomes. Finally, we argue that attention to AoA-related processes has a number of societal and applied implications and thereby addresses issues of applied developmental psychology.

Keywords

awareness of aging; subjective aging; theories of adult development and aging; self-awareness and self-regulation

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Introduction

Subjective constructions of age and aging have been the topic of developmental psychology, psychological aging research, and related areas, such as the social sciences of aging, for over four decades (e.g., Kastenbaum, Derbin, Sabatini, & Artt, 1972; Montepare, 2009; Settersten, 1999). The primary observation has been that individuals reflect on their own development and interpret their aging as they move across the life span. Although calendar age is a reasonable proxy for developmental status early in life, in adolescence individuals start to perceive their calendar age more flexibly in psychological terms and, indeed, frequently feel significantly older than their calendar age (Galambos, Turner, & Tilton-Weaver, 2005; Montepare, 2009). Starting in early and middle adulthood, however, the subjective experience of age takes a different direction and individuals report feeling younger than their calendar age. Indeed, Berntsen and Rubin (2006) have argued that from midlife on, individuals feel about 20% younger than their actual age (see also Montepare, 2009; Westerhof, Barrett, & Steverink, 2003).

Aside from the traditional approach of assessing subjective age by asking a person the question “How old do you feel?” a host of related concepts has been advanced. For example, in recent years, the concept of *self-perceptions of aging* has increasingly stimulated empirical research. To illustrate the importance of self-perceptions of aging, Levy, Slade, Kunkel, and Kasl (2002) provided evidence for the longitudinal association between positive perceptions of aging and extended longevity. Other work has shown substantial positive associations with adults’ health (Wurm, Tesch-Römer, & Tomasik, 2007) and preventive health behaviors (Levy & Myers, 2004; Wurm, Tomasik, & Tesch-Römer, 2010). Conversely, a large body of work documents the robust association between negative age stereotypes and older adults’ maladaptive behavior, such as lower cognitive functioning and poorer functional health—behaviors that are very much associated with the vulnerabilities of old age (Hummert, 2011; Levy, 1996, 2003). In this paper, we build on this extensive background by using the term *Awareness of Aging (AoA)* as a superordinate construct encompassing several related concepts, such as subjective age, age identity, self-perceptions of aging, attitude toward own aging, and awareness of age-related change. Definitions of the key concepts and examples of uni- and multidimensional measures used to assess these concepts are presented in Table 1.

The basic observations from which this paper originates are twofold. First, all of these concepts show robust associations with relevant developmental outcomes across the adult life span and especially for the age range from midlife (i.e., age 40) into old age. For example, feeling younger, reporting more positive perceptions of and attitudes toward one’s own aging, and holding more positive beliefs about aging in general are robust predictors of cognitive and emotional well-being, better functional health, preventive health behavior, disability outcomes, and even mortality (Kleinspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008; Levy, Slade, Kunkel, & Kasl, 2002; Levy, Slade, Murphy, & Gill, 2012; Levy, Slade, May, & Caracciolo, 2006; Westerhof & Barrett, 2005; Wurm, Tesch-Römer, & Tomasik, 2007).

Second, the theoretical distinctness of the concepts underlying this vast body of evidence is not well understood. Indeed, for most of these concepts we have little more than short definitions and an intuitive understanding of the phenomena they are supposed to capture. Although some recent attempts have been made (Diehl & Wahl, 2010; Levy, 2009), a well-defined, coherent, and integrative conceptual framework, however, is mostly missing. This state of affairs is rather unfortunate because lack of conceptual clarity not only hinders future research but also prevents a constructive discussion on AoA at the societal level. Such a discussion, however, is crucial, given the multifaceted challenges accompanying the “graying” of our society.

To be specific, we can think of at least four reasons why an examination of the construct of AoA is a worthwhile and needed endeavor in developmental psychology. First, there is sufficient evidence suggesting that AoA is an integral psychological process or condition of the aging self. As active producers of their development (Brandstädter & Lerner, 1999; Brandstädter & Rothermund, 2002), individuals construct, hold, and reconstruct awareness and knowledge of their own aging process. We propose that this awareness is a form of *self-awareness* and the resulting knowledge can be conceived as a form of *self-knowledge*, similar to other forms of self-knowledge, such as a person’s self-representations (Diehl, 2006; Markus & Herzog, 1991). For this reason, AoA becomes important for understanding the aging self and individuals’ aging-related expectations, goals, actions, and identity processes (Brandstädter & Greve, 1994; Greve & Wentura, 2003; Westerhof, Whitbourne, & Freeman, 2012).

Second, although all major theories of human development refer in one way or another to *subjective experiences* of the developing individual, including experiences related to AoA, they do not spell out the role and the meaning of these experiences explicitly. To the best of our knowledge, none of the established theories that view self-regulatory processes, such as selection, optimization, and compensation (Baltes, Lindenberger, & Staudinger, 2006) or assimilation and accommodation (Brandstädter & Rothermund, 2002), as central to successful aging and late-life adaptation incorporate aspects of AoA explicitly in their theorizing (Diehl & Wahl, 2010). This is rather unfortunate and has resulted in a disconnect between meta-theories of adult development and aging and a body of research which has consistently shown that measures of subjective aging have considerable predictive validity with regard to important outcomes (see Levy et al., 2002; Siegel, Bradley, & Kasl, 2003; Spuling, Miche, Wurm, & Wahl, 2013).

Third, we argue that clarification of the conceptual relations among AoA-related constructs is needed to better understand and synthesize empirical findings, thus facilitating the creation of a more coherent and integrated body of knowledge. For example, is research that measures the construct of subjective age exchangeable with research that assesses self-perceptions of aging? Current evidence with samples in the U.S. and the Netherlands, for example, suggests that ratings of subjective age show only a small association with self-perceptions of aging (Westerhof et al., 2012). Also, future empirical research may profit from conceptual clarifications and synthesis because such endeavors should result in an improved and more precise understanding of the similarities and differences among the related concepts.

Fourth, concepts related to AoA hold the promise to be useful for addressing a number of issues that increasingly challenge aging individuals and societies. For example, a better understanding of the nature of phenomena related to AoA may provide the foundation to develop and validate educational and public health programs that can improve attitudes and expectations toward the aging process in adults of all ages. Such programs may be of particular importance for young and middle-aged adults because research has shown (a) that negative views of aging already exist in younger age groups (Levy, 2003, 2009) and (b) that such negative views in young and middle adulthood are associated with negative health outcomes later in life (Levy et al., 2002). Moreover, such work also could greatly improve our understanding of the antecedents, maintenance and modifiability, and consequences of aging attitudes and expectations, and thereby provide another approach to promote successful aging. Indeed, an AoA-based approach may be needed to complement and strengthen other behaviorally oriented approaches focused on optimizing healthy aging (e.g., promoting physical activity or encouraging a cognitively engaged lifestyle). In brief, AoA-related work may become relevant in the context of prevention and health promotion and may provide the foundation for new approaches to promote healthy and optimal aging.

A recent attempt to stimulate the conceptual discussion on AoA was made by Diehl and Wahl (2010) who addressed several issues related to subjective aging, such as the relevance of AoA processes for the aging self, as well as fundamental questions regarding the multi-dimensionality of this construct. In addition, several other authors (Hess, 2006; Hummert, 2011; Montepare, 2009; Westerhof & Tulle, 2007) have offered reviews of different segments of the subjective aging literature on which we draw in our deliberations. Also, a very promising theoretical model related to the development and effects of age stereotypes was proposed by Levy (2009). Levy's model, however, focuses only on the development of age stereotypes and subsequent self-stereotyping. In this conceptual paper, we build on and extend these efforts by focusing on the following four objectives: First, after discussing the major concepts established in the subjective aging literature, our general objective is to advocate for the adoption of the concept of AoA as a meaningful *superordinate construct* with the potential to integrate several lines of research. Second, we intend to show that the construct of AoA is useful in understanding a specific set of processes of adult development and aging, including their meaning and fit within theories of life-span development and aging. Third, this analysis forms the cornerstone for developing an organizing conceptual framework. This framework is proposed with the intention to integrate the major approaches in the area of AoA and to identify future research needs and directions. Fourth, we discuss several applied implications of an improved conceptual understanding of AoA and possible contributions to an applied developmental psychology.¹

Major Concepts Related to Awareness of Aging: Analysis and Comparison

This section reviews key constructs with direct relevance for the understanding of AoA. We focus on the following constructs: subjective age, age identity/age identification, self-

¹This article will not address the many sources of potential variation in AoA, for example, across cultures or along social-structural dimensions, such as gender, race/ethnicity, or social class. Rather, we will focus on basic theoretical issues related to AoA. We believe that such a focus will be in the service of future conceptual treatments and empirical research examining issues of variation explicitly.

perceptions of aging, attitudes toward aging and age stereotypes, and awareness of aging. Although other concepts, such as age norms, age expectations, views of aging, images of aging, age attributions, or fear of aging have also been discussed in the literature and are important in their own right, we decided to focus on these constructs, because they have been most frequently considered in theoretical discussions and been most often investigated in empirical research.

In particular, we directly compare the concepts intensively examined in psychological aging research. Through this comparison, we anticipate to arrive at a more focused and conceptually concise view of the similarities and differences among these concepts. In principle, we view this comparison as similar to demonstrating the *construct validity* of the AoA concept by examining the nomological network in which it is embedded. We use this approach, rather than the multitrait-multimethod approach (Campbell & Fiske, 1959; Eid, Lischetzke, & Nussbeck, 2006), because no study exists in which all of the identified concepts were measured simultaneously. Indeed, one reason for confusion in the subjective aging literature is due to the fact that similar measures are used to assess different concepts (e.g., “How old do you feel?” as a measure of both subjective age and age identity) or different concepts are applied to the same measure (e.g., measures of attitudes towards aging are referred to as self-perceptions of aging).

Specifically, the identified concepts are analyzed and compared with regard to four major criteria.² First, we focus on the theoretical foundation, the semantic connotations, and the conceptual boundaries of each concept. Second, we examine whether the constructs have primarily a person-centered, psychological focus or are rooted in a sociological tradition with an emphasis on social-structural and socio-cultural influences on the human aging process. Third, we examine whether the identified concepts have been conceived as unidimensional or multidimensional constructs; and, fourth, we discuss the extent to which each concept requires the activation of explicit (conscious) mental processes, compared to relying on implicit (pre-conscious) processes. Overall, we suggest that these four criteria or dimensions will allow us to clearer delineate the common and unique features of each of the identified concepts.

Subjective Age

The two most frequently used terms in this area are the terms “subjective age” or “subjective aging.” These terms refer to the simple approach of asking individuals how old they feel or how old they view themselves. A large body of research has shown that the *difference score* between a person’s subjective age and actual chronological age is a reliable and strong predictor of a variety of outcomes, including subjective well-being (Westerhof & Barrett, 2005), health (Spuling et al., 2013), morbidity, and mortality (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009; Uotinen, Rantanen, & Suutama, 2005).³ Specifically, feeling younger in midlife and later adulthood than one’s chronological age is associated with positive outcomes, whereas feeling older than one’s chronological age is associated

²We acknowledge that other criteria, such as empirical utility, can be applied. For the purposes of this conceptual analysis, we believe that the selected criteria address relevant and fundamental features of the discussed constructs.

³It needs to be noted that this difference score is also frequently called age identity rather than subjective age (see next section).

with negative outcomes. In terms of our evaluative dimensions, a simple self-report of how old a person feels focuses on the individual, is unidimensional, and is made (at least to some extent) at a conscious or explicit level.

A multidimensional extension of this approach was first proposed by Kastenbaum et al. (1972) who suggested that subjective age would, at a minimum, consist of two dimensions, namely how old a person looks (i.e., physical/look age) and how old a person feels (i.e., social-emotional/feel age). Additional dimensions proposed by Kastenbaum et al. (1972) were “do age,” “interest age,” and “interpersonal age,” yet these latter dimensions were never firmly established in the literature. Extensions of this multidimensional conception have also been used by other authors who have focused on perceived “mental age” and perceived “physical age” (Uotinen et al., 2005) as dimensions of subjective aging. Other authors have focused on “ideal age” (i.e., the age a person would like to be) as a facet of subjective age (Kaufman & Elder, 2002; Keyes & Westerhof, 2012). Keyes and Westerhof (2012), for example, showed that “felt age” and “ideal age” had different associations with well-being and mental health, supporting the differential validity of these dimensions of subjective age.

Although these latter approaches were developed with propositions of life-span developmental theory in mind (i.e., multidimensionality and multidirectionality of development; Baltes, 1987) and acknowledged that individuals’ aging experiences can be quite different across behavioral domains, the majority of empirical studies have applied the simple unidimensional approach. Overall, this application of the concept has increasingly limited the field of subjective aging research to a very simplistic and restrictive view, and has potentially hindered theoretical and empirical progress.

From the perspective of promoting a more stringent theoretical framework, we believe several observations are warranted when discussing the concept of subjective age. First, the ratings obtained to measure subjective age are very general and lack information regarding the person’s actual aging experiences that underlie his or her ratings. Thus, the ratings tell us very little about why individuals perceive their age the way they do (Montepare, 2009) and what specific age-related experiences may be reflected in their ratings. This point is important, because it is well documented that individuals have *normative aging expectations* (Heckhausen et al., 1989) and it would, therefore, be informative to understand to what extent their ratings are influenced by age norms or by their personal experiences, or a combination of both (Kaufman & Elder, 2002; Settersten, 1999).

Second, subjective age ratings are usually obtained in a completely de-contextualized way and, therefore, ignore important developmental and personal *reference points*. As Montepare (2009) argued, subjective age ratings derive “from a process of anchoring and adjusting ones age in relation to distal and proximal reference points of age” (p. 43). Montepare (2009) provides support for this argument showing that subjective age ratings differ depending on their distance to age-related events, such as birthdays, anniversaries, or reunions, or interpersonal events with individuals from different age groups. Thus, having information with regard to the proximal and distal developmental reference points that individuals use to

anchor their subjective age ratings would be crucial in order to gain a better understanding of the meaning of such ratings.

In summary, the major shortcomings of subjective age ratings are that they are (a) mostly used in a unidimensional fashion to create a difference score between felt age and chronological age; (b) obtained in a mostly de-contextualized fashion; and (c) obtained without reference to individuals' aging expectations or personal aging experiences. Despite these limitations, the predictive validity of these brief ratings has been quite impressive and is most likely the reason why they are so popular among researchers.

Age Identity/Age Identification

Although the terms “age identity” and “subjective age” are often used interchangeably and are operationalized in the same way in the literature (see Schafer & Shippee, 2010), we are treating them as separate concepts for several reasons. First, unlike subjective age, the concept of age identity has its roots in sociology (Kaufman & Elder, 2002) and social identity theory (Tajfel, 1978; Turner, 1984). Given these roots, a person's experience of age and the aging process is primarily viewed on the background of age norms and conceptions of the life course (Neugarten & Hagestad, 1976), age-graded social roles, socioeconomic conditions (Barrett, 2003), and processes of social categorization and identification (Tajfel, 1978; Turner, 1984). Therefore, consistent with Goffman's (1963) definition of identity and consistent with overall sociological and social-psychological theorizing, *age identity* is primarily seen as a person's subjective sense of age based on his or her various social experiences and identification with a particular age group, rather than a consequence of psychological states or physical sensations. Although psychological states or physical sensations are not entirely ruled out as sources of a person's age identity, the sociological perspective gives, by definition, primacy to social experiences, social-structural influences, and identification with groups (e.g., age groups).

Second, although different operationalizations have been used (see Table 1), the approach of assessing age identity has also been somewhat different in that it asks individuals either to think about their *preferred or ideal age* or to name the *age group* with which they most identify or would most desire to belong to. The implicit assumption underlying this approach is that preferred or ideal age, or age group identification, are the driving forces underlying a person's attitudes and behavior with respect to aging-related issues rather than chronological age (see Weiss & Lang, 2012).

Third, several authors have argued that conceptions of subjective and ideal age and, hence, age identity are universal in nature because age norms (Barak, 2009) and age expectations are fairly consistent across cultures (Löckenhoff et al., 2009). Fourth, authors who use the term “age identity” also assume that a person's perceived age is a defining feature of his or her *personal* and *social identity*. As such, age identity may behave like a person's overall identity and individuals may re-evaluate and re-construct their notions of age and aging as they move through the life course (Kaufman & Elder, 2002; Sherman, 1994). Indeed, research by Weiss and Lang (2009) showed that older adults engaged flexibly in age-group or generation identification in order to maintain a positive self-view and to protect their self-concept against the effects of negative age stereotypes. In another study, Weiss and Lang

(2012) showed that age-group dissociation (i.e., weaker age-group identification) was significantly stronger when adults were exposed to negative age stereotypes. Additional evidence in support of the notion of age identity as an aspect of personal identity is provided by research on adults' possible selves which show distinct age differences in content and meaning (Cross & Markus, 1991). In summary, in terms of our evaluative dimensions the concepts of age identity or age identification are (a) rooted in sociological and social-psychological perspectives of aging; (b) most frequently assessed in a unidimensional fashion; and (c) individuals' self-reports are assumed to reflect explicit, conscious processes that take into account cultural age norms and age-graded social roles (Neugarten & Hagestad, 1976; Shanahan & Elder, 2002), and age-group identification as a core aspect of a person's social identity (Tajfel, 1978).

Several authors have examined age identity from a multidimensional perspective. Kaufman and Elder (2002), for example, examined 5 dimensions of age identity, including felt age, other age (i.e., the age "other people think you are"), desired age (i.e., the age you would like to be), desired longevity (i.e., "to what age do you hope to live to?"), and perceived old age ("at what age does the average man or woman become old?"). These authors found that the different age identification ratings deviated in different ways from actual chronological age and also showed different associations with chronological age. Overall, Kaufman and Elder (2002) concluded that personal age identities seem to change as individuals age and that individuals may strategically adjust their age identities to feel differently about themselves (see also Greve & Wentura, 2003; Weiss & Lang, 2009, 2012). Thus, age identities may, to some extent, serve compensating and self-enhancing purposes for aging individuals (see also Greve & Wentura, 2003; Sherman, 1994; Weiss & Lang, 2009).

In summary, although the term "age identity" is often used in the same way as the term "subjective age," we believe that both its theoretical origins and operationalization call for a differentiation. In particular, most research on age identity ignores the notion of multidimensionality and neglects the self-perceptions and processes of meaning making that give rise to changes in age identity as part of an individual's personal and social identity (Kaufman & Elder, 2002; Tajfel, 1978). Moreover, recent research suggests that adults may switch from an age-group identity to a generational identity to strategically avoid negative age stereotypes and protect their positive self-views (see Weiss & Lang, 2009, 2012).

Self-Perceptions of Aging

In recent years, the term "self-perceptions of aging" has been increasingly used to refer to adults' subjective aging experiences (Kleinspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008; Kotter-Grühn et al., 2009; Kotter-Grühn & Hess, 2012). The use of this new term points to a number of recent developments. First, authors who use the term "self-perceptions of aging" (or "self-views of aging") acknowledge that subjective aging is a *multidimensional construct*. Empirical support for the notion of multidimensionality comes from both qualitative and quantitative studies. For example, Keller, Leventhal, and Larson (1989) conducted in-depth interviews with adults aged 50 to 80 years and identified five major dimensions of positive and negative aging experiences. These five dimensions were aging as: (1) a natural and gradual process; (2) a period of life evaluation, philosophical reflection,

or increased wisdom and maturity; (3) a period of increased freedom, new interests, and fewer demands; (4) a period of physical health difficulties and health concerns; and (5) a period of losses, including interpersonal and job-related losses (Keller et al., 1989). Similarly, factor-analytic research by Steverink, Westerhof, Bode, and Dittmann-Kohli (2001) on a nationally representative sample of German adults between the age of 40 and 85 identified three dimensions of personal experiences of aging. Two dimensions captured individuals' perceptions related to physical declines and social losses. The third dimension captured aspects of continued growth, reflecting adults' perceptions that their growing older was associated not only with losses but also with gains and further development. In conclusion, although these two studies employed quite different methods, their findings strongly support a multidimensional conceptualization of adults' self-perceptions of aging, including both positive and negative age-related experiences (see also Wurm, Tesch-Römer, & Tomasik, 2007).

Second, the use of the term "self-perceptions of aging" has also become more prevalent in the literature because research on the related constructs of *aging expectations* and *aging stereotypes* has shown that they are multidimensional. For instance, Heckhausen, Dixon, and Baltes (1989) showed that young, middle-aged, and older adults had very similar expectations and beliefs regarding the occurrence of gains and losses in different behavioral domains throughout adulthood. In particular, developmental gains and losses were expected to occur to some extent across the entire adult life span, but in different ways in different behavioral domains. Moreover, gains were expected to be outnumbered by developmental losses in advanced old age (i.e., age 85 and older). Similarly, research on aging stereotypes has shown that positive and negative stereotypes of old people co-exist and vary by behavioral domain (Hummert, 2011; Kite, Stockdale, Whitley, & Johnson, 2005; Kornadt & Rothermund, 2011).

Third, the increased use of the term "self-perceptions of aging" also reflects researchers' interest in going beyond simple subjective age ratings to understand the *self-knowledge*, the *actual aging experiences*, and the *psychological processes* that underlie the predictive power of individuals' age ratings. In this sense, work in this area has been influenced by research on age stereotypes which has shown that age-related stereotypes and general views of aging develop already early in the life span and become increasingly connected with actual experiences during the adult years (Levy, 2009). Thus, the assumption is that subjective age ratings are rooted in individuals' actual experiences and reflect how they subjectively experience and process the effects of advancing chronological age on their physical, psychological, and social functioning. As such, individuals' answers to fairly simple questions (e.g., "How old do you feel?") seem to arise from *tacit knowledge* (Cianciolo, Matthew, Sternberg, & Wagner, 2006) or *metacognitive knowledge* (Hertzog & Hulstsch, 2002). Given the impressive predictive validity of these fairly simple ratings it would, therefore, be helpful to gain a better understanding of how this tacit self-knowledge is acquired, shaped, and internalized in everyday life.

Two important clarifications are in order here. First, we want to be clear in stating that we view self-perceptions of aging as being a constituent component of AoA. Specifically, we would like to argue that self-perceptions and actual experiences, such as the feedback from

others or the subjective experience of altered performance, give rise to a person's overall AoA and that this awareness is more than the sum of the individual self-perceptions. Second, although our description may create the impression that individuals actively keep an "accurate record" of their aging-related experiences, we rather assume that many subjective aging experiences are processed at a *pre-conscious, implicit level* (Wilson & Dunn, 2004). However, we also assume that details about the occurrence, meaning, and impact of the actual aging-related experiences can be consciously retrieved and made explicit in a facilitating context (e.g., under guided probing from an investigator).

In summary, the term "self-perceptions of aging" is a fairly recent addition to the vocabulary of the subjective aging literature and focuses on the varied perceptions and experiences that create individuals' subjective aging experiences. Self-perceptions of aging are anchored in the personal experiences of the individual, are multidimensional in nature, and are processed at a pre-conscious, implicit level with the potential to be consciously and explicitly expressed if a conducive context is provided. Thus, we suggest that self-perceptions of aging are the foundation upon which retrievable knowledge about one's own aging process is based. Furthermore, we postulate that this knowledge is organized in a similar fashion as other self-knowledge (e.g., in terms of valence, centrality, self-relevance, etc.) and can be conceived as a form of tacit or metacognitive knowledge. Finally, we suggest that self-perceptions of aging, although already existent in young adulthood, become increasingly self-relevant in midlife (e.g., around age 40–50) and affect outcomes in later adulthood, including behaviors that have an impact on health, well-being, and longevity (Levy, 2003, 2009).

Attitudes toward Aging and Age Stereotypes

A concept with a long-standing history in aging research is the construct of "attitudes toward aging" (Bennett & Eckman, 1973). Attitudes toward aging refer to both societal as well as individual attitudes and include affective, cognitive, and evaluative components of behavior toward older adults as an age group and toward the process of aging as a personal experience (Hess, 2006). Bennett and Eckman (1973) already pointed out in their review of the early literature that attitudes toward aging are considered critical for older people's adjustment and survival, contribute to their adaptive and maladaptive behaviors, and reinforce how individuals in younger age groups view and approach their own aging process. This description is still valid today and a more recent review by Hess (2006) reiterated that negative attitudes toward older adults are quite pervasive, and that older adults' views of their own behavior often reflect the societal beliefs and stereotypes about aging (see also Levy, 2009). Thus, attitudes toward aging are often linked to *age stereotypes* (Hummert, 2011) and, like age stereotypes, primarily convey the negative aspects of growing old (see Kite et al., 2005; Hess, 2006).

There are other similarities between attitudes toward aging and age stereotypes (e.g., they are both based on cultural images of aging and are developed from early childhood on), which often lead researchers to use these terms interchangeably. Following the established social-psychological distinction (Banaji & Heiphetz, 2010), we consider age stereotypes to be a specific subset of aging-related attitudes and beliefs, namely those attitudes and beliefs

that often, but not exclusively so, give rise to prejudice and discrimination (e.g., ageism and ageist behavior; Levy, 2003). However, there is another important feature that aging-related attitudes and stereotypes have in common. This feature refers to the fact that both are multidimensional and over the course of the adult life span, both aging attitudes and age stereotypes become increasingly *self-relevant* (Kornadt & Rothermund, 2011; Levy, 2009). Thus, individuals may internalize self-relevant attitudes and stereotypes so that they increasingly also affect (mostly unknowingly) their actual aging experiences and behavior. From this perspective, aging attitudes and age stereotypes may exert similar effects on individuals' behaviors and may shape how they perceive and experience their own aging process (Kornadt & Rothermund, 2011; Mock & Eibach, 2011).

Although attitudes toward aging exist within individuals' social environment (Hess, 2006), here we focus on individuals' *attitudes toward their own aging*. Attitudes toward one's own aging have also been referred to as *self-related attitudes* (Hess, 2006) to indicate the focus of the attitudes and the fact that they affect individuals' own behavior. Self-related attitudes of aging have extensively been studied in the area of memory performance and numerous studies have shown that older adults have more negative views about their memory than younger or middle-aged adults (Hertzog & Hultsch, 2000; Hess, 2006). Moreover, these negative views also apply to older adults' beliefs of self-efficacy and control over their memory performance. In contrast to this evidence, however, several studies have shown that the complexity of adults' expectations and views on gains and losses across the adult life span increased with age (Heckhausen et al., 1989; Heckhausen & Krueger, 1993). Also, several studies have shown that older adults who have more positive attitudes about their own aging tend to perform better on memory tasks (Levy, 1996; Levy & Langer, 1994), are more likely to engage in positive life styles (Levy & Myers, 2004), show less decline in disablement processes (Levy, Slade, Murphy, & Gill, 2012), and live longer (Levy, Slade, Kunkel & Kasl, 2002).

The findings from the latter studies suggest that attitudes toward one's own aging do not necessarily have to be negative, but can also focus on positive aspects of the aging process, such as personal growth, increase in experience, or personal accomplishments (see Wurm, Tomasik, & Tesch-Römer, 2010). Adoption of such a view leads to the conclusion that attitudes toward own aging, similar to age stereotypes (Hummert, 2011; Kornadt & Rothermund, 2011), should be conceived as *multidimensional* and should be assessed using multidimensional measures (see Table 1 for examples of measures). Empirical studies, however, have examined attitudes toward own aging mostly as a unidimensional construct, with the predominant measure being the "Attitudes Towards Own Aging" subscale from the Philadelphia Geriatric Center Morale Scale (Lawton, 1975). Research with the Attitudes towards own Aging scale has consistently shown that a negative attitude tends to be associated with poorer subjective health, lower life satisfaction, and other indicators of poorer functioning. Moreover, studies using this measure as a marker of self-perceptions of aging have documented that negative self-perceptions of aging earlier in the adult life span were associated with shorter longevity, whereas positive self-perceptions were associated with greater longevity (Levy et al., 2002).

In summary, attitudes toward aging have a social basis and reflect a person's past experiences within specific social, cultural, and historical contexts. Although attitudes toward aging can be stated explicitly by individuals, they usually—like age stereotypes—operate implicitly and tend to affect a person's behavior in many areas of functioning, including the cognitive and interpersonal domain. Reviews of the attitudes toward aging literature (Kite et al., 2005; Hess, 2006) suggest that the construct should be conceived as multidimensional in nature, but only few measures exist to assess its different dimensions. Also, attitudes toward aging have a great deal of similarity with age stereotypes and often these terms are used interchangeably (Hess, 2006). In part, this may be due to the fact that both constructs reflect the strong impact of social, cultural, and historical influences on individuals' attitudes, beliefs, and expectations regarding the aging process (Levy, 2009).

Awareness of Age-Related Change

A recent contribution to the subjective aging literature is the concept of *awareness of age-related change (AARC)* which was introduced by Diehl and Wahl (2010).⁴ Building on the existing literature on subjective aging, Diehl and Wahl (2010) developed this concept with the intention to stimulate the discussion on the psychological processes and mechanisms that underlie the subjective age ratings that have dominated the literature to date. That is, they were intrigued by the robust predictive validity of the rather simple subjective age ratings, yet wanted to go beyond these ratings and develop a framework that would help to elucidate the antecedents, correlates, and processes that influence individuals' awareness of their own age, and the consequences that result from individuals' awareness of age-related changes.

Diehl and Wahl (2010) defined AARC as “all those experiences that make a person aware that his or her behavior, level of performance, or ways of experiencing his or her life have changed as a consequence of having grown older (i.e., increased chronological age)” (p. 340). Two aspects of this definition are noteworthy. First, Diehl and Wahl (2010) wanted to be explicit that a person's AARC is based on his or her *perceptions* of changed behavior, performance, or reflected experiences. Second, in perceiving and reflecting about such changes it is essential that the individual attributes them to his or her *increased chronological age* and not to any other conditions (e.g., changes in health status or living conditions).⁵

By proposing the concept of AARC, Diehl and Wahl (2010) took into account several recent developments in the area of subjective aging research. First, they acknowledged that most of the concepts that have guided recent work in this area (e.g., self-perceptions of aging, attitudes toward aging, age stereotypes) are *multidimensional constructs*. Yet, most of the time they are treated as unidimensional constructs. This is particularly apparent when one

⁴It is important to distinguish Awareness of Age-Related Change (AARC) from Awareness of Aging (AoA). Specifically, AARC focuses on individuals' awareness of *changes* due to having grown older, whereas AoA, as defined in this article, refers to a person's general understanding of his or her aging process. Hence, we locate AARC theoretically at the same level as the other constructs (e.g., subjective age or age identity) that we discuss in this article and see it as a key component of AoA.

⁵It is noteworthy that in this conceptualization it is not relevant whether and to what extent the perceived changes are associated with or caused by objectively assessed age-related changes. The important point is that the person makes the subjective attribution of age relatedness. Having stated this, we want to emphasize that we do not want to imply that the association between objectively assessed changes and subjectively perceived changes can or should be dismissed. Indeed, we advocate that the strengths and nature of this association should be a focus of inquiry in its own right.

examines the existing measurement instruments, which are almost exclusively unidimensional scales. Second, to assume that individuals develop an AARC also seemed reasonable based on the findings that adults of different ages have well-defined *expectations* and *beliefs* about age-related gains and losses associated with different ages and life stages (Heckhausen et al., 1989). These expectations and beliefs are based on culturally shared age norms (Kaufman & Elder, 2002; Neugarten & Hagestad, 1976; Settersten, 1999), but they also reflect individuals' unique personal experiences as they grow older. Third, Diehl and Wahl (2010) also wanted to take into account that most recent reviews of the literature have emphasized that self-perceptions of aging include both positive and negative aspects of the aging process. In part, this notion acknowledges that individuals do not age in an entirely passive way, but actively influence the way they grow older. Thus, the AARC concept was introduced to take into account action-theoretical conceptualizations of human development, highlighting individuals' active role in shaping and reflectively monitoring their own development (Brandstädter & Rothermund, 2002).

Based on their review of the literature, Diehl and Wahl (2010) proposed that AARC should be studied in five behavioral domains. These domains were proposed both as the sources for experiences that create individuals' sense of AARC and the areas in which the phenomenon of AARC can be most fruitfully studied. Thus, Diehl and Wahl (2010) provided evidence and argued that any assessment of AARC should focus on the following five domains as *core domains* of adults' subjective aging experiences: (1) health and physical functioning; (2) cognitive functioning; (3) interpersonal relationships; (4) social-cognitive and social emotional functioning; and (5) lifestyle and engagement. Furthermore, they proposed a heuristic model, outlining antecedents, processes, and outcomes of AARC (see Diehl & Wahl, 2010, Figure 1). This model was presented with the intention of serving as a conceptual framework that could inform and stimulate future theorizing and research.

In summary, if this new concept is examined in terms of the evaluative dimensions that we have applied to the different constructs, then AARC is clearly conceived as a construct that is tied to individual psychological processes, namely subjective perceptions of change. Although these perceptions cannot be seen as completely independent from cultural and social influences, Diehl and Wahl (2010) emphasize the individuality of the experiences that create AARC. Furthermore, the conceptualization of AARC was greatly influenced by the life-span developmental principles of multidimensionality and multidirectionality (Baltes, 1987) and emphasizes the self-reflective capacity of the individual (Brandstädter & Rothermund, 2002). Although certain aspects of AARC may, during early stages of cognitive processing, be pre-conscious and implicit, Diehl and Wahl (2010) assume that most AARC-related cognitions will at some point lead to a subjective aging experience, resulting in a conscious and explicit awareness of the own age. For this reason, AARC has the potential to become a vehicle for interventions and for promoting attitudes and behaviors that can optimize individuals' capacity and chances to age successfully.

Synthesis

A synthesis of the main points of our conceptual analysis is shown in Table 2. As can be seen in Table 2, the overall situation regarding the discussed AoA-related constructs is

heterogeneous in a number of ways. First, although based on our analysis most concepts seem to be rooted in person-focused research traditions, it is important to acknowledge the role of the socio-cultural context and socio-cultural forces, such as the age structuring of the life course, age norms and cultural age stereotypes, in shaping individuals' AoA (Kaufman & Elder, 2002; Settersten, 1999). The influence of these socio-cultural forces is most emphasized in the constructs of age identity or age identification, aging attitudes, and age stereotypes. The main conclusion that can be drawn from this analysis is that AoA-related constructs include both individuals' idiosyncratic psychological experiences as well as socio-cultural and social influences that are at work during the process of socialization and development.

Second, Table 2 also shows that both uni- and multidimensional approaches have been adopted in research on AoA (see also Table 1 for examples of measures). In general, we are inclined to argue that both approaches are useful and have their place and purpose. On the one hand, a considerable body of research has shown that capturing all of a person's cognitive-social-affective experiences of AoA in one dimension, even in one single item (typically a subjective age assessment), parsimoniously predicts important outcomes (e.g., Kotter-Grühn et al., 2009; Uotinen et al., 2005; Westerhof & Barrett, 2005). On the other hand, relying exclusively on a unidimensional approach also seems limited for conceptual as well as empirical reasons. Above all, assessing subjective aging in a unidimensional way ignores insights into the multidimensionality and multidirectionality of life-span development (Baltes, Lindenberger, & Staudinger, 2006) and evidence that multiple criteria are necessary to determine whether a person ages successfully (Baltes & Baltes, 1990). Furthermore, possible differential relations between different dimensions of AoA and major developmental outcomes, such as well-being, health, or mortality, cannot be addressed with sufficient detail if unidimensional scales are applied. In contrast, applying measures that assess adults' AoA validly in multiple behavioral domains and along multiple dimensions permits researchers the creation of individual *aging awareness and need profiles* for diagnostic and intervention purposes. Using such a profile approach is similar to established practices in clinical psychology and medical diagnostics and provides the detailed information needed for intervention and translational research.

Finally, our analysis also suggests that AoA operates on both the pre-conscious (Levy, 1996) as well as the conscious level of information processing (Steverink et al., 2001). This insight is important, because it suggests that different concepts related to AoA may exert their impact on behavior in different ways and at various points of processes of self-regulation. Indeed, we believe that in people's everyday lives most experiences that give rise to AoA occur, at least initially, at a pre-conscious level and additional conditions are necessary (e.g., repeated occurrence, experience of limitations, social feedback) to bring these experiences to the level of conscious information processing. That individuals can give reliable reports on their experiences of feeling older has been shown in a daily diary study with a sample of older adults (Miche, Wahl, Diehl, Oswald, Kaspar, & Kolb, in press) and is important with regard to intervention research. Specifically, research that draws on AoA-related processes to alter adults' behavior with the objective to promote successful aging may focus both on pre-conscious/implicit or on conscious/explicit processes to achieve these goals. Overall, we

suggest that the effects of interventions to promote optimal aging will only have a lasting effect if individuals develop an *explicit understanding* of their aging process and take *active control* in terms of planning and acting toward achieving a good life in later adulthood (Brandstädter & Lerner, 1999; Lerner & Busch-Rossnagel, 1981; Zarit, 2009).

Life-Span Theories of Human Development and Awareness of Aging

We start this discussion with the assumption that it is essential for life-span theories of human development to consider the interplay of objective age-related changes and AoA-related processes. In particular, both calendar age and AoA-related subjective processes may have facilitating or constraining effects on a person's development and on resulting developmental outcomes, similar to processes outlined by Higgins (1998) in his Regulatory Focus Theory.

Adult Development as a Sequence of Developmental Tasks and Crises

Prominent models of human development, such as Erikson's (1950) theory of "eight ages of man" or Havighurst's (1972) concept of the life course as an ordered succession of developmental tasks, have not explicitly incorporated any AoA-related processes in their theorizing. However, given the previous discussion of AoA-related concepts, we would like to argue that being confronted with a developmental task or the challenges of a developmental stage or transition (e.g., committing to an intimate relationship, raising children, or investing in professional development) necessarily involves considerations about and reflections related to a person's calendar age and the role of age-structured life events (Neugarten, 1969). Indeed, a person's perception and interpretation of his or her objective chronological age may alert him or her to the fact that it is high time to deal with the respective developmental task and that a developmental deadline is imminent (Heckhausen, Wrosch, & Fleeson, 2001; Neugarten & Hagestad, 1976; Wrosch & Heckhausen, 2005). For example, the physical changes that mark the beginning of puberty are important objective indicators for adolescents, making them aware of their own maturation and growth, and hence of new developmental tasks that need to be addressed. Similarly, graduating from high school and starting college is an important normative marker of having reached a certain age and of entering a new stage of life. Thus, the common finding that adolescents and young adults tend to feel older than they actually are (Montepare, 2009) may be seen as a form of anticipatory socialization that points toward possible future selves, goals, and privileges (e.g., legal age to drive a car or to drink alcohol). If we adopt such a view, then the conclusion that AoA may, in combination with objective age-related events, serve the function to motivate, direct, and guide future development (i.e., a directive function) seems very plausible.

Aside from this *directive function*, AoA may also play a key role in defining developmental goals themselves. For example, Erikson's developmental goal of achieving ego integrity in old age rests on the assumption that self-perceived discrepancies between desired age and objective age need to be resolved so that one's age and life can be accepted without reservations and regrets. In addition, ego integrity requires positive perceptions of and attitudes toward one's own aging, as well as an awareness of age-related change that strikes a balance between losses and gains.

In conclusion, although Erikson and Havighurst argued that successive developmental stages emerge out of the biological maturation of the organism in interaction with social and societal forces, AoA-related concepts seem to play an important role in connecting the developing self with developmental tasks and stages. In doing so, individuals' awareness of their own age and aging intricately contributes to goal and task engagement as well as goal and task achievement. Moreover, AoA processes may also be at the root of important life-stage specific developmental processes, such as generative behavior or the striving for ego integrity (Erikson, 1950; Neugarten, 1969).

Models of Developmental Regulation across the Life Span

The potential influence of AoA-related processes on adult development may even be conceived broader if one considers other models of life-span development, such as Heckhausen and Schulz' (1995) life-span theory of control or Brandtstädter's idea of life-span development as the increasing tendency to engage in accommodation over assimilation (Brandtstädter & Renner, 1990; Brandtstädter & Rothermund, 2002). With regard to these models, processes of AoA may play an important role in explaining the switching from one action mode to another and may explain why individuals engage in secondary control processes or accommodative strategies instead of primary control and assimilative strategies (e.g., when becoming aware of declining performance or of shrinking resources). For example, it seems reasonable to predict that individuals who feel younger, possess more positive perceptions of and more positive attitudes toward their own aging, and show an awareness of age-related gains (instead of losses) will stay longer in primary control and assimilative modes compared to individuals who show less favorable AoA. This may even be the case in situations where objective losses or declines are ongoing. However, there also may be critical thresholds at which aging views that are too positive may no longer pay off and may result in maladaptive behaviors and outcomes. These are scenarios in which individuals unrealistically overstretch their sense of primary control or assimilative potential and may subsequently be more likely to experience depressive symptoms or, as Erikson put it, feelings of frustration and despair. On the other hand, individuals who are overly critical of their own aging in terms of AoA-related processes (e.g., holding mostly negative views of aging despite objectively age-appropriate performance; being preoccupied with age-related losses) may switch too early to secondary control or accommodative modes and, in doing so, may underutilize their existing developmental reserve capacity. In this scenario, individuals are at risk for prematurely foreclosing opportunities for continued growth and development (see also Higgins, 1998).

Similar observations also apply to the widely discussed meta-model of *selective optimization with compensation* (SOC model; Baltes & Baltes, 1990). Although Baltes and Baltes (1990) view selective optimization with compensation as a developmental dynamic that operates across the entire life span, they do not explicate any connections to AoA-related constructs. It seems, however, very reasonable to assume that AoA-related experiences become relevant for selection as well as compensation processes, and that subjective aging experiences have an effect on the optimization of behavior via these processes. Specifically, AoA processes that are positive in nature may lead to more *elective selections* and may possibly motivate the activation of reserve capacities to either maintain certain levels of functioning or to

promote further growth. On the other hand, negatively framed AoA processes may trigger *loss-based selections* even in older individuals who objectively still may have rich resources at their disposal. Similarly, more negative AoA processes may also motivate “off-time” compensatory behaviors, such as the premature reliance on the help of others, thereby increasing the likelihood for dependency, overprotection, and loss of competencies due to disuse (Baltes & Wahl, 1996). A recent study by Wurm, Warner, Ziegelmann, Wolff, and Schüz (2013) examined the association between self-perceptions of aging and SOC strategy use, showing that the occurrence of a serious health event predicted the increased use of SOC strategies that promoted a healthy lifestyle, which, in turn, predicted better self-rated health and life satisfaction. This effect, however, was moderated by negative self-perceptions of aging. That is, in the case of a serious health event, the perception that aging is associated with physical losses resulted in less use of SOC strategies. These findings contribute to a better understanding of the underlying mechanisms of self-perceptions of aging on health by showing that negative self-perceptions of aging might impair behavioral strategies that are important for maintaining a healthy lifestyle.

Indeed, the concept of compensation, in general, seems to rest to a good extent on the subjective awareness of loss and individuals’ recognition of age-related changes. Several authors have argued that it is difficult to determine when a specific behavior is compensatory in nature rather than being an automatized or habitual response. Salthouse (1991), for example, argued that the conclusion that an observed behavior is compensatory in nature requires that a person has become aware of a deficit or a deviation from a desirable standard of performance and, hence, wants to counteract the perceived change. Salthouse (1991) challenged cognitive aging researchers to document that individuals have an awareness of falling below a self- or other-defined standard of performance in order to reliably draw the conclusion that their behavior was motivated by compensatory efforts. Like Salthouse (1991), we also advocate for the inclusion of AoA-related processes in considerations of compensatory behaviors and considerations related to the selective optimization of behavior.

Finally, AoA-related processes may also have implications for Carstensen’s (e.g., 2006) socio-emotional selectivity theory (SST), which postulates that it is a person’s future time perspective and not his or her objective calendar age that motivates development and the selection of social goals across the life span. Specifically, SST postulates that when the future time perspective becomes shorter, as is typically the case with increasing age, then individuals invest more time and energy into close relationships and in activities that promote positive emotions. The key point of this argument is that this happens as a result of a shorter future time perspective and not as a result of a higher age, thus, putting the emphasis on the construct of future time perspective. In addition to calendar age and future time perspective, we would like to argue that AoA represents another important time-related construct that should be considered in this context.⁶ Specifically, we would like to argue that the incorporation of AoA-related processes in this kind of research may help to elucidate the

⁶For illustration purposes, we intentionally focus on AoA-related processes as another time-related phenomenon. However, we clearly acknowledge that other time metrics, such as distance-to-death or time in a developmental state, are meaningful and should be examined.

effects of calendar age and future time perspective in a more detailed way. For example, it seems reasonable to assume that future time perspective and AoA may not operate independently, but that aging awareness may modify the effect of future time perspective, or vice versa. Thus, it seems reasonable to ask to what extent future time perspective has the same effect on individuals who feel much younger than their actual age and who experience their aging as mostly positive compared to individuals who display the opposite pattern. One may even assume a direct association between AoA-related processes and future time perspective, because feeling younger or perceiving gains as one ages may directly translate into a more positive and more extended future time perspective. This argument is supported by our ongoing research (Diehl, Wahl, Brothers, & Miche, 2013) in which we have examined the associations between gain- and loss-focused AoA and future time perspective. Data from two independent studies in Germany and the U.S. have shown that loss-focused AoA was associated with a more limited future time perspective ($r = -.53$ and $r = -.56$, respectively, $p < .001$), whereas gain-focused AoA was associated with a more expansive future time perspective in the U.S. sample only ($r = .13$, $p < .01$). In sum, we believe that incorporating AoA-related processes into the interplay between actual age and future time perspective may help to elucidate some of the core components of SST and may lead to new empirical tests and conceptual refinements.

In summary, in this section we have put forward arguments for considering the theoretical and empirical connections between processes of AoA and the key propositions of the most prominent psychological theories of adult development and aging. Although we do not claim to have examined all possible connections, we believe that we have put forward several compelling arguments why these theories could benefit from the explicit integration of AoA as a construct representing a key process of adult development.

Outlining an Integrated Conceptual Framework for Awareness of Aging: Implications for Future Research

Building on the conceptual reasoning presented by Diehl and Wahl (2010), we are outlining here a *heuristic model* (see Figure 1) that positions the superordinate construct of AoA in the context of life-span developmental processes and incorporates the conclusions from our conceptual analyses. We are also proposing this model with the intention to situate AoA within the broad context of adult development and aging. Rather than knowing that there are associations among a number of developmentally relevant concepts, it is ultimately important to know how and under which conditions these associations are brought about. Thus, this model is intended to serve two purposes: (1) To serve as a *heuristic framework* that can guide and stimulate new research; and (2) as a model that can produce *testable hypotheses* and predictions. As Figure 1 shows, the model rests on the basic assumption that the different constructs that are indicative of AoA need to be understood against the backdrop of individuals' actual chronological age and objective age-related changes over time (Circle #1). In the current model, we are conceptualizing AoA explicitly as a self-process (see box in the bottom center). That is, we propose that AoA is a form of *self-related awareness* that can range from pre-conscious/ implicit to conscious/explicit knowledge. Moreover, we assume that this self-related awareness results in a form of *self-knowledge*

that is similar to other forms of self-knowledge, such as a person's self-concept (Diehl, Youngblade, Hay, & Chui, 2011). Indeed, we postulate that AoA-related knowledge will, especially in later adulthood, become an integral part of a person's self-concept and identity.

As our conceptual analyses suggest, we are placing the constructs of subjective age, age identity, self-perceptions of aging, and AARC at the conscious/explicit end of the awareness continuum (Circle #2), whereas attitudes toward aging and age stereotypes are placed at the pre-conscious/implicit end (Circle #3). We also postulate that these different constructs are interlinked with each other (Circle #4). Although some emerging theories suggest that age stereotypes are so pervasive and strong that they will eventually become self-relevant in one way or another (Levy, 2009), current evidence to support this hypothesis is fairly limited (Rothermund & Brandtstädter, 2003). Indeed, this points to important needs for future research. For example, an important objective for future research would be to describe and explain the exact *mechanisms* and *pathways* by which attitudes toward aging and age stereotypes influence and shape adults' subjective age, self-perceptions of aging, and AARC. The solid and dashed arrows in our model indicate that we assume that the influences are stronger from the pre-conscious (i.e., solid arrow) to the conscious side, rather than the other way around (i.e., dashed arrow). This assumption, however, needs to be further examined via both experimental and quasi-experimental studies. For example, priming studies that manipulate both the level of conscious processing as well as the age-related relevance and valence of the processed materials may help to shed further light into the consciousness issue (see Greve & Wentura, 2003). Furthermore, data from well-designed and representative surveys that have incorporated measures of self-perceptions of aging into their measurement batteries may be helpful in addressing both issues of causality (Spuling et al., 2013) as well as issues of mechanisms and pathways of effects (Wurm et al., 2013).

As Figure 1 further shows, we are placing AoA in the context of several developmentally relevant forces of influence, such as psychological resources (Circle #5), socio-economic resources (Circle #6), long-term developmental influences (Circle #7), and socio-cultural influences (Circle #8). We assume that psychological resources, such as a person's behavioral competence, styles of coping and emotion regulation, cognitive functioning, and personality, have primarily an effect on the conscious/explicit expressions of AoA. The same is assumed with regard to the effects of socio-economic resources, such as level of education, socio-economic status, or material/financial assets. Our reasoning underlying this assumption is that more explicit AoA very likely draws on appraisal processes that take objective life circumstances, such as material resources and personal skills and abilities into account, and are also influenced by individual difference variables, such as personality traits. In our research validating a multidimensional questionnaire to assess AARC, for example, we find consistent significant correlations with the big five personality traits (e.g., positive association between neuroticism and loss-related AoA; positive association between extraversion and gain-related AoA; Wahl, Konieczny, & Diehl, 2013). Interestingly, these associations tend to be stronger for loss-related awareness of aging compared to gain-related awareness (Wahl et al., 2013; Diehl et al., 2013).

In contrast, we propose that socio-cultural influences, such as cultural images of aging, age norms or age expectations, and long-term developmental influences, such as a person's developmental history in early life, life events and lifetime experiences, exert their effects primarily on the more pre-conscious/implicit facets of AoA. This assumption seems reasonable because most theories of aging attitudes and age stereotypes postulate that aging-related attitudes and stereotypes are acquired from early on in life, that they are "learned" and internalized in implicit ways, and that they exert their influence mostly on a pre-conscious level (Levy, 2003, 2008). For obvious reasons, our model postulates that long-term developmental influences (Circles #11 and #13) and socio-economic resources (Circles #12 and #15) are also associated with self-regulatory processes in development and influence long-term developmental outcomes.⁷

A new focus in our model is the inherent connection of AoA with self-regulatory processes in (Circle #9) and outcomes of human development (Circle #10). In addition, self-regulation may have a direct impact on developmental outcomes (Circle #14). As we reasoned earlier, we view AoA as a basic "ingredient" of any self-regulatory process in adult development and aging, albeit that the exact functions and mechanisms by which AoA motivates and affects the self-regulation of behavior and development are currently not well understood. However, we believe that we have provided good reasons for the explicit inclusion of AoA-related concepts into the overall theories of human development and into future empirical work.

Societal and Applied Implications

In the final section of this article, we briefly want to address a few societal and applied implications related to the AoA construct. Indeed, we believe that this is an area, in which applied developmental psychology may put its theories and methodologies to good use to address pressing real-world problems. In terms of the societal implications it is obvious that the aging of the population, and especially the aging of the baby boom cohorts (i.e., birth cohorts 1946–1964), poses a number of challenges (e.g., how to meet the health care needs of a growing number of older adults) that are unprecedented in human history. For example, recent policy debates have focused on whether federal entitlement programs, such as the Social Security Program or the Medicare Program, will remain viable when the baby boomers become eligible to claim their benefits (Kotlikoff & Burns, 2005). Based on our earlier discussions, we believe that these policy debates also raise, in essence, the following questions: How can we convince individuals to take greater responsibility for their own aging and for adopting behaviors that optimize their chances to age successfully? How can we motivate individuals already at a younger age do adopt and cultivate health-promoting behaviors that also will increase their chances that they grow old in a healthy way?

We believe that these and similar questions will increasingly become relevant for *public health initiatives* and that the promotion of successful aging will ultimately become a public

⁷We intentionally specify the associations between these sources of influence and self-regulatory processes as bidirectional. For example, long-term developmental influences determine the type and style of self-regulatory behaviors, but self-regulatory behaviors also shape long-term developmental influences. Similarly, socio-economic resources may impact self-regulatory behaviors, but self-regulatory behaviors may also affect the type and nature of socio-economic resources.

health priority (National Institute on Aging, 2011). For example, public health data indicate that if the onset of dementia of the Alzheimer's type can be delayed in the population by 5 years, the prevalence of the disease would decline by one half (Brookmeyer, Gray, & Kawas, 1998). Such a delay would not only result in major savings in health care costs for our society but also in extended quality of life for millions of individuals (Baltes & Smith, 2003). We believe that based on existing research (Levy et al., 2002; Levy et al., 2012) intervention programs targeting middle-aged and older adults' negative self-perceptions of aging hold potentially great promise as a major avenue to promote successful aging. Specifically, such programs should focus on middle-aged and older adults' age stereotypes and personal awareness of aging and should change the mostly negative age stereotypes (Meisner, 2012) through psycho-educational and behavioral interventions (Sarkisian, Prohaska, Davis, & Weiner, 2007). We also believe that such programs would potentially complement and strengthen other intervention approaches, such as programs that focus on increasing adults' level of physical activity (King, 2001) or level of cognitive engagement (Willis et al., 2006).

Furthermore, it is well-documented that negative self-perceptions of aging and negative age stereotypes are associated with a host of negative outcomes (Levy, 2003, 2009). As a consequence, it seems reasonable to assume that mostly negative AoA undermines older adults' motivation to actively participate in intervention and rehabilitation efforts, thus, affecting the efficacy of such efforts. Therefore, we would predict that adults who perceive and experience their own aging as mostly negative would be less likely to take advantage of restorative or compensatory intervention programs and may put themselves at greater risk for negative outcomes in a number of behavioral domains. Research in the area of meta-cognition and aging, for example, has shown that older adults who hold negative attitudes toward their own aging, as assessed in terms of lower self-efficacy expectations, tend to benefit less from cognitive training activities compared to individuals who have a more positive attitude (West & Hastings, 2011). Moreover, these individuals are also less likely to practice the trained mental exercises and strategies in everyday life, thus, undermining the transfer of intervention effects from the laboratory to real-life contexts. Given such findings, it seems reasonable to consider the content and nature of individuals' AoA themselves an important intervention target. We suggest, therefore, that assessing individuals' AoA as a regular procedure in clinical programs will help to optimize the outcomes of expensive intervention and rehabilitation programs and will increase the likelihood that intervention-induced improvements are maintained longer.

In conclusion, we hope that our conceptual deliberations can enrich and stimulate future research related to AoA and adult development. We also believe that a focus on adults' awareness of aging is very much needed to complement current initiatives to promote behaviors that facilitate successful aging.

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Highlights

- The integrative function of Awareness of Aging (AoA) for subjective aging is shown.
- A systematic comparison and evaluation of concepts related to subjective aging is presented.
- The role of AoA for models of life-span development is elaborated.
- An overarching theoretical framework with AoA as a key construct is outlined.
- Future research needs as well as applied implications for society, research, and clinical practice are discussed.

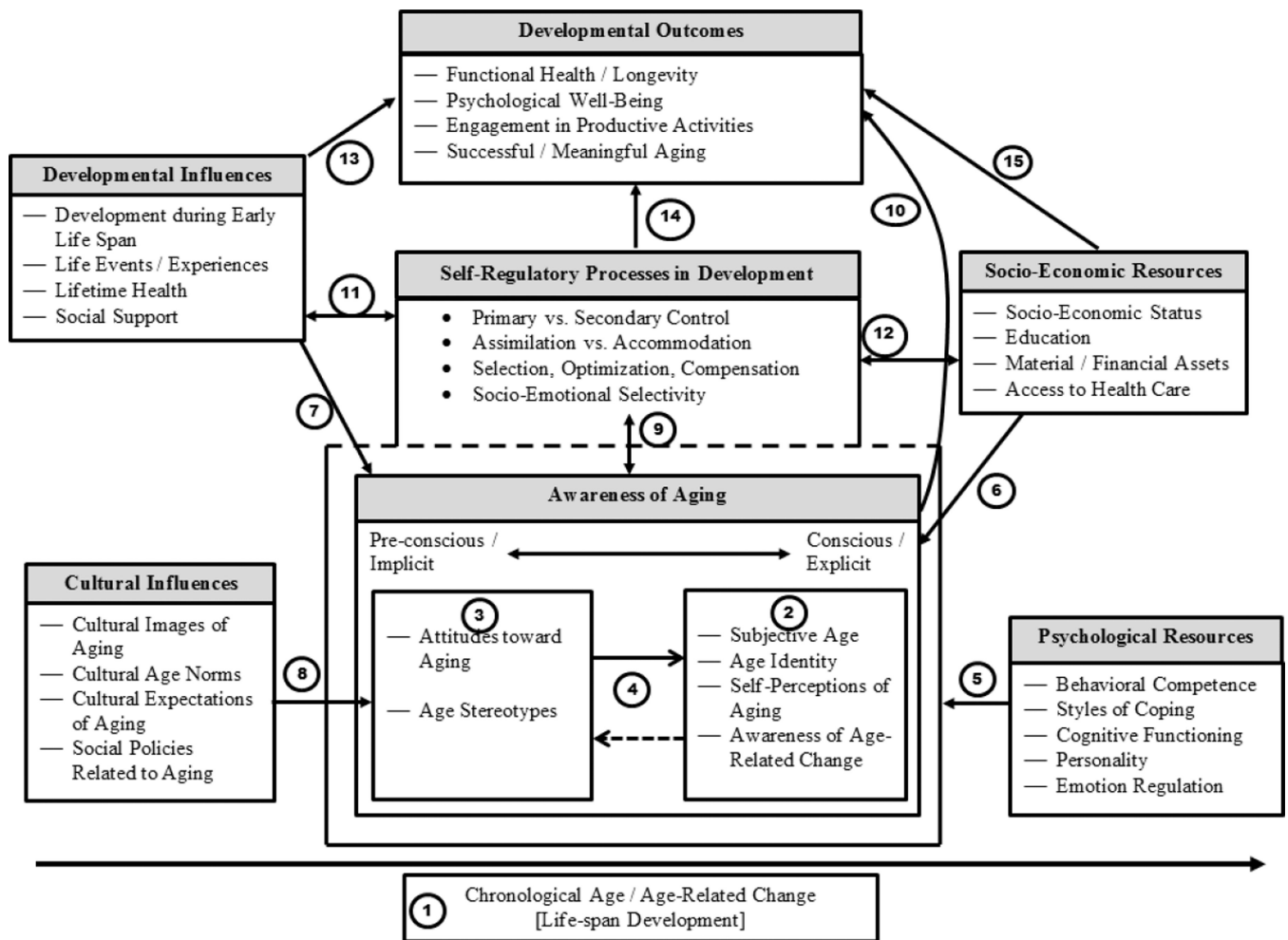


Figure 1. Awareness of Aging (AoA) in the Context of Life-Span Developmental Processes and Outcomes.

Table 1

Definitions of the Key Constructs and Examples of Available Unidimensional and Multidimensional Measures.

Construct	Definition	Unidimensional Measure	Multidimensional Measure
Subjective Age	The age an individual feels like or views him or herself.	Single-item question (“How old do you feel?”; e.g., Barrett, 2003)	Physical/look age & social-emotional/feel age (Kastenbaum et al., 1972)
Age Identity / Age Identification	A person’s subjective sense of age as a consequence of his or her various social experiences, including age-graded social roles, social identifications, conceptions of the life course, and socioeconomic conditions.	Preferred or ideal age, Identification with age group (e.g., Barak, 2009); single-item question (see Barrett, 2003; “How old do you feel?”)	Felt age, other age, desired age, desired longevity, perceived old age (Kaufman & Elder, 2002)
Self-Perceptions of Aging	Self-perceptions of aging are anchored in the personal experiences of the individual, are multidimensional in nature, and are processed at a pre-conscious, implicit level with the potential to be consciously and explicitly expressed if a conducive context is provided.	N/A	AgeCog Scales (Steuerink, Westerhof, Bode, & Dittmann-Kohli, 2001; Wurm, Tesch-Römer, & Tomasik, 2007)
Attitudes toward Aging and Age Stereotypes	Affective, cognitive, and evaluative components of behavior toward older adults as an age group and toward the process of aging as a personal experience (Hess, 2006); includes both societal as well as individual attitudes. Age stereotypes are a specific subset of aging-related attitudes and beliefs, namely those attitudes and beliefs that give rise to prejudice and discrimination (e.g., ageism and ageist behavior; Levy, 2003)	Attitudes toward Aging Subscale of the Philadelphia Geriatric Center Morale Scale (Lawton, 1975)	Attitudes to Ageing Questionnaire (AAQ; Laidlaw et al., 2007) Domain-Based Age Stereotypes (Kornadt & Rothermund, 2011)
Awareness of Age-Related Change (AARC)	“All those experiences that make a person aware that his or her behavior, level of performance, or ways of experiencing his or her life have changed as a consequence of having grown older (i.e., increased chronological age)” (Diehl & Wahl, p. 340).	N/A	AARC Questionnaire (Diehl & Wahl, 2010; Diehl, Wahl, Brothers, & Miche, 2013)

Table 2

Dimensions Applied to the Theoretical Evaluation of the Selected Constructs.

Construct	Research Tradition in Which Construct is Primarily Rooted		Dimensionality of Construct		Primary Processing Mode	
	Individual/Person-Centered Research Traditions	Collective/Socio-Centered Research Traditions	Uni-dimensional	Multi-dimensional	Explicit (Mostly Conscious)	Implicit (Pre-Conscious)
Subjective Age/Subjective Aging	X		X		X	
Age Identity/Age Identification		X	X			X
Self-Perceptions of Aging	X			X	X	
Attitudes Toward Aging/Age Stereotypes	X			X		X
Awareness of Age-Related Change	X			X	X	