Fourth Age – The Final Years of Adulthood

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With the rapid extension of life in the United States over the past several decades, the Fourth Age has emerged as a relatively normative aging phenomenon. Starting at about age 80 or 85, the Fourth Age includes the last years of adulthood (Blanchard-Fields & Kalinauskas, 2009). The Third Age, spanning the post-employment years of 65 to 80 years and discussed elsewhere, includes many positive aspects to aging in terms relative good health and social engagement (Smith, 2000), functional reserve capacity (Baltes, 1998), knowledge and expertise (Singer, Verhaeghen, Ghisletta, Lindenberger, & Baltes, 2003), and adaptive flexibility in daily living (Riediger, Freund, & Baltes, 2005). The Fourth Age is more accurately characterized as a span of years of biological and functional decline. And, most older adults will experience nonpathological cognitive deterioration or ‘‘*age-related cognitive decline’’* (ARCD), although longitudinal studies bear out important individual differences in both timing and pattern of decline (Mahncke et al., 2006). It is important to bear in mind that the Third Age (65-80 years or young old) and Fourth Age (80+ years, oldest old) are simply phenotype expressions that are dynamic and moving age ranges, themselves subject to considerable variation and evolution. Their historical-cultural contingencies are readily exposed by examining the obvious and significant differences in population aging between developed and developing countries (Baltes & Smith, 2003). Nevertheless, they are useful mechanisms for organizing and discussing longitudinal data related to cognitive aging.

In an article proposing a revised architecture of biological and cultural development across the lifespan consistent with the SOC meta-theory, Baltes (1997) argued very old age is young—that is, a relatively recent evolutionary event—and therefore, beginning in late adulthood and certainly in old age, ontogenic losses outnumber gains, and with age the balance becomes increasingly less positive. At a theoretical level, evolutionary selection operates more vigorously in early adulthood and is of little practical assistance late in life for age-associated loss of biological plasticity (i.e., potential), as in the incidence of *Alzheimer’s disease* and other pathologies. In short, evolution and biology are not good friends of old age. The second broad principle is that there is an age-related increase in the need or demand for culture (psychological, social, material, and knowledge-based resources) in order to generate and maintain high levels of functioning. In this sense culture becomes part of the compensatory strategy of successful aging. The third broad principle is the age-related loss in the effectiveness or efficiency of cultural factors and resources. Conditioned by the negative biological trajectory of the life course, the efficacy of psychological, social, material, and cultural interventions fade with age. In summary, although there continues to be plasticity in the second half of life it is increasingly clear the *scope* of plasticity of the human organism declines with age.

Accumulating evidence reveals, typically, among the oldest of the old the maintenance of functional capacity is more difficult, and they are more likely to be multi-morbid, depressed, less life engaged and happy (Blanchard-Fields & Kalinauskas, 2009), and display a negative trajectory in terms of subjective well-being (i.e., a sense of happiness, of interest in the world, and excitement about what is going on around one) (Smith, 2002; Baltes & Smith, 2003). Adults over 85 years are cognitively disadvantaged in terms of plasticity, complex information processing, certain memory tasks, flexible attention control, and executive functions in connection with frontal lobe integrity. Executive control is not only important for regulating

cognitive activity but it also plays a central role in social functioning, with the potential to disrupt social behavior (Henry, von Hippel & Baynes, 2009). Researchers have linked reduced executive functioning (i.e., frontal and temporal cognitive decline) to off-target verbosity (Ruffman, Murray, Halberstadt, & Taumoepeau, 2010; Pushkar et al., 2000), poor regulation of negative bias toward stigmatized individuals (Krendl, Heatherton & Kensinger, 2009), inappropriate discussion of private events in public settings (von Hippel & Dunlop, 2005), greater difficulty assessing the perspective of another (Bailey & Henry, 2008), general emotion recognition, and accurately recognizing facial expressions (Ruffman, Henry, Livingstone & Phillips, 2008; Isaacowitz et. al, 2007). Von Hippel, Silver, and Lynch (2000) found that losses in inhibitory ability associated with aging led to substantial and seemingly unwanted increases in stereotyping and prejudice. Elderly adults in this study were the most motivated to control their prejudicial reactions but were also the most likely to demonstrate stereotyping and prejudice.

The prevalence of *disabilities*, always age-related, is relatively high with this cohort as well, with 56 percent of the non-institutionalized population over the age of 80 reporting a severe *disability*, and 30 percent needing assistance. Likewise, limitations on ADL are much higher at 85 years and older, specifically difficulty with walking (46 percent), bathing (34 percent), getting in/out of bed or chairs (27 percent), dressing (24 percent), using the toilet (20 percent) and eating (12 percent) (Administration on Aging, 2008). There are also some unique demographic features in the old age mix: an excess of women, higher levels of institutionalization, and greater consumption of medical and personal care services.

Aging across the lifespan entails cognitive decline in a wide variety of ability areas, including perception, memory, abstract reasoning, and spatial orientation with the earliest and most pervasive decline occurring in speed of processing (Kramer & Willis, 2003). It appears now that age-related declines in cognition are largest on tasks that rely on executive control (i.e. scheduling, planning, working memory, multi-tasking and interference control), but these same cognitive processes are also amenable to training. For example, in a study of episodic memory children (aged 9-12) and older adults (aged 65-78) were provided mnemonic training. While both benefited from the training, older learners improved slightly more from strategy instruction, the children profited more from repeated practice. Overall, training gains were greatest for the children even though both groups began the intervention training at equivalent performance levels (Brehmer, Li, Muller, von Oertzen & Lindenberger, 2007). Because certain types of training interventions with the elderly can induce both anatomical and neurophysiological plasticity, the absence of education and training opportunities and other forms of environmental input in late adulthood must be considered contributing factors in functional capacity decline in the Fourth Age (Jäncke, 2009; Erikson, Colcombe, Wadhwa, Bherer, Peterson et al., 2005). Interventions such as aerobic exercise, especially fitness programs combining strength and flexibility and, estrogen replacement, diets high in anti-oxidants, along with training and practice, engaged lifestyle, occupation, expertise (i.e., experience), and education can apparently reduce and even reverse cognitive and neural decline in both rodents and humans (Kramer, Bherer, Colcombe, Dong, & Greenough, 2004). Indeed, a more precise understanding the neural mechanisms, limitations, and biochemistry associated with plasticity in old age has both a practical imperative and immense scientific importance (Hertzog et al., 2009).

All of this serves to remind us of the powerful influence daily experience and culture—language, rituals, nutrition, exercise, relationships, myths, values, religion, work, media exposure—have on our functional cognitive architecture (Donald, 2001; 1991). As with any intensive cognitive activity, from reading to mastering a musical instrument, mental functions are reorganized and, as we now know, anatomical structures adapt to cognitive load demands. But, to what extent can

thought change the structure of matter in the human brain? Or in even broader terms, how can cultural context re-wire the brain and pervasively influence human thought and behavior? While we attempt to more fully understand the neural mechanisms at work within the brain there is little dispute that human experience and cultural context shape not only what we learn but how we learn and can, therefore, positively influence the aging process.

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1. Darwin from http://abduzeedo.com/photoshop-tennis
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