Psychological Development in Adulthood: Cognition, Emotions, and Personality

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Since the beginning of time, people have searched for the secrets of living long, meaningful, and prosperous lives. Sometimes, this search involves looking younger; in the 16th century, Juan Ponce de León, for example, went to Florida to search for the fountain of youth. Other times, the quest is for healthy longevity—living to very old age without significant disease. Aubrey de Grey, a biomedical scientist who specializes in aging and divides his time between Cambridge University in the United Kingdom and a non-profit organization for fighting aging in Mountain View, California, has proposed that research shows that aging is a disease that can be cured and advances in biological technology will soon allow people to live very long, healthy lives (de Grey, 2017). Are Aubrey de Grey and other scientists correct that in the near future, we will 'cure' aging assure future generations healthy longevity?

In this chapter, we focus on psychological processes during adult development and aging, and in particular, individual differences in healthy longevity. What are common fears and stereotypes about aging? What can we do to live long and prosper, that is, *age successfully* (see Rowe & Kahn, 1997), retaining our cognitive functioning, being free of disease and disability, being happy, and having close, supportive relationships and optimism about the future? Because the scientific literature addressing these questions is large, we focus on three aspects of successful aging: personal beliefs and stereotypes, cognition and intelligence, and the links between emotions, personality, and well-being. We begin with a discussion of why life expectancy has increased dramatically since the early 20th century. We then review research on

the roles of beliefs, stereotypes, and perceptions of control in successful aging. A section on cognition and intellectual functioning follows. We conclude with evidence of the links between personality, emotion, cognition, and physical and mental health.

How do we Discover the Biology and Lifestyle Secrets for a Long Life?

Celebrating a 100th birthday used to be so rare that individuals were featured on national TV shows such as *Good Morning America*. Today, a growing generation of centenarians around the world are the focus of ongoing longitudinal studies of successful aging. These include David Snowdown's (1997) *Nun Study*, Leonard Poon and colleague's *The Centenarian Study* (1992), Thomas Perl's *The New England Centenarian Study*, Paul Baltes' *The Berlin Aging Study* (2001), and Makoto Suzuki and others' *The Okinawa Centenarian Study* (1985). These studies have revealed common patterns in centenarians: genetics, exercise, diet, social networks, and continued interest in the world and learning. These "secrets" to longevity and successful aging are big business—in any magazine, website, or newspaper you will find ads for beauty products and medications that promise to make you feel and look young. While many of these offers are not based on science, some are based on careful research on genes, biological processes, people's habits and relationships, and the link between the ways people cope with stress and their physical and mental health.

One of the first longitudinal studies of successful aging was David Snowdon's (1997) *Nun Study*, which began in 1986 in Mankato, Minnesota. Snowdown eventually recruited 700 nuns, gave them psychological tests of cognitive functioning, physical and mental health, and interviewed them about their lifestyles and relationships. The research team also read the nuns' journals, which some had kept since adolescence, to find out how their early life experiences influenced how well they were aging. For example, many of the nuns had grown up during the

Great Depression in the U.S. that started in 1929 with the stock market crash, struggled with poverty, and did not graduate from high school, while others grew up in wealthier homes, travelled, went to college, and had good jobs before becoming nuns. Because the nuns agreed to donate their brains to the study, the researchers carefully analyzed their brains to look for clues about individual differences in aging well. Sister Mary, the most famous nun in the study, died at the age of 101. Prior to her death, she was still active in the garden and the convent, was mentally sharp, physically healthy, and had a close network of friends amongst the nuns and regular visitors to the convent. What made her famous is that her brain told a different story: Sister Mary's brain contained a large number of neurofibrillary tangles and plaques that should have resulted in very advanced Alzheimer's-type dementia, and yet, she showed none of the signs of having this dreaded disease. Snowdown's findings, which have been widely publicized, provided many cues about individual differences in aging. and have helped doctors and others encourage young, middle aged, and old adults to make changes in their lives to offset the symptoms of feared diseases such as Alzheimer's dementia by exercising regularly, eating more healthily, becoming life-long learners, finding hobbies, and getting involved in their communities.

Advances in research on genetic sequencing and about the roles of stress, illness, diet, and relationships on aging have increased our understanding about why some groups and families are healthier and longer-lived than others. For example, Amish communities in the U.S. have simple, predictable lives and close, supportive communities that reduce stress (Kluger, 2018) and Okinawans in Japan have healthy diets that inspired people to increase their consumption of deep sea fish rich in Omega-3 acids, vegetables, fruits, and grains (Wilcox, Wilcox, He, Curb, & Suzuki, 2006). In contrast, families in Antoquia, Colombia, share a

particular genetic marker and develop early onset Alzheimer's (Stix, 2015). Other research shows that young adults who eat a lot of fast food can become overweight and are at risk of developing high blood pressure, heart problems, and diabetes type II (Micha, Peñalvo, et al., 2017). Let's now take a closer look at how the ways in which we think about ourselves and the world influence aging.

How do Stereotypes affect Adults' Performance?

Stereotypes are expectations and beliefs we hold about people based on social categories. We all belong to numerous social categories such as age, gender, race/ethnicity, religion, political preference, etc. Stereotypes develop in early childhood, once children's brains have developed enough to enable them to both classify themselves and others into perceived social categories such as age, gender, and ethnicity (Bigler & Liben, 2007). We learn stereotypes through personal experiences, stories from others, and media exposure (Allport, 1954). Once stereotypes exist in our minds, their activation is automatic and difficult to change (Bargh, Chen, & Burrows, 1996).

Stereotypes are oversimplified generalizations that can be both positive and negative. For example, while the elderly can be perceived as wise because of their lived experience (a positive attribute), they can, at the same time, be viewed as cranky and impatient (negative attributes). Simply being aware of stereotypes about our social groups, regardless of whether be believe them or not, can have long-lasting social, emotional, and cognitive consequences. These effects can seriously impact our lives, including influencing our social behavior. For example, as we age, we might believe that young people find us uninteresting and cranky. As a result, we may refrain from activities that include children, adolescents, and younger adults or feel anxious just being around young people. This anxiety is part of stereotype threat.

Stereotype threat occurs when our knowledge of negative stereotypes about our social groups impairs our (usually good) performance and causes us to confirm the negative stereotype (Steele & Aronson, 1995). In the original study, African American students who were told that they were going to take an exam that would show how competent African Americans were in math performed more poorly than students who were given the test without this comment. This occurred because hearing about evaluation caused students to remember the negative stereotype that African American students don't perform well in math.

The original finding, that activating a negative stereotype decreases performance, has been found in different social groups and in various situations. For example, research has shown that stereotypes that older workers cannot learn new skills, especially technology-based skills, are detrimental to their performance with technology (Posthuma & Campion, 2007). One study found that bosses who thought that men were better leaders than women consistently gave men more positive work evaluations (London & Poplawski, 1976). Stereotyped thinking can even affect people's interpretation of crimes (Bodenhausen & Wyer, 1985). Teachers, for example, might assume that ethnic minority students in the school were responsible for the theft of computers, or an eyewitness might misremember the race of the purse snatcher. These important consequences motivated researchers to investigate how to reduce stereotypic thinking.

Studies suggest that stereotypic thinking may be decreased by consciously replacing stereotypes through reflection, intentionally rejecting negative representations, and being exposed to counter-stereotypic role models (Di Bella & Crisp, 2016). In other words, these automatic oversimplifications about others may be overcome with thoughtful effort and positive experiences. However, as we age, stereotypic thinking becomes harder to resist because brain changes may keep us from being able to suppress those automatic activations of stereotypes or

accept any counterevidence for them. Studies indicate that older adults want to avoid stereotypes more than younger adults (Von Hippel, Silver, & Lynch, 2000). Unfortunately, aging can cause their brains to lose inhibitory control, resulting in an increase of stereotypic thinking and prejudicial behavior (Radvansky, Copeland, & von Hippel, 2010). Acknowledging the brain changes of later adulthood also gives insight into our feelings of control and lack thereof.

How Do Personal Control Beliefs Influence Everyday Problem Solving?

Our sense of how much we can influence life events is known as *personal control beliefs* (PCBs). PCBs include the concepts of *locus of control* (Rotter, 1966) and *agency* (Bandura, 1997). *Locus of control* refers to whether we attribute the cause of events to internal, (i.e., personal) or external (i.e., environmental) factors (Weiner, 1986). *Agency* is our sense that we have control over life events. For example, if Roshanda has an internal locus of control and got a job she really wanted, she will make the attribution that she got it because of something she did, such as preparing well for the interview. However, if Tamisha, has an external locus of control, she will think she didn't get the job because of factors out of her control, such as the interviewer wanted to hire younger person. Thus, having an internal locus of control is consistent with having high PCBs.

PCBs affect our health and mental well-being. People with a low sense of control are more likely to experience negative emotions such as anger, anxiety, and mental health issues, such as depression (Ross & Mirowsky, 2013). In contrast, those with a high level of PCBs tend to experience positive outcomes. It is important to remember that PBCs can vary depending on context and level of actual control. For example, in situations where individuals have low control, such as being a passenger in a car during a snow storm, people with high PCBs experience higher levels of stress than those with low PCBs (Agrigoroaei, Polito, Lee, Kranz-

Graham, Seeman, & Lachman, 2013). Interestingly, high PCBs have been found to reduce the emotional reactions to social stress in older, but not younger, adults (Neupert, Almeida, & Charles, 2007). Overall, younger adults have higher PCBs than middle-aged adults, and for adults in midlife, PCBs are positively associated with their cognitive performance (Soederberg Miller, & Lachman, 2000) and coping with negative life events (Jopp & Schmitt, 2010). In a famous study, Langer and Rodin (1976) showed that giving older adults living in nursing home the responsibility for taking care of a plant increased their PCBs and reduced their depression relative to a control group. This finding has led to other changes in nursing homes that improve the residents' well-being, such as participating in decisions about activities or menus.

Across the lifespan, PCBs have a powerful effect on our physical and mental health. For example, PBCs reduce work-related stress in young and old adults (Neupert et al., 2017). In old age, people with a high level of PCBs are more likely to experience psychological well-being, such as having a positive self-concept, life satisfaction, low levels of depression, and low death anxiety (Wiest, Schüz, & Wurm, 2013). Older adults with PCBs also tend to retain memory, physical function, and even medication adherence (Milte, Luszcz, Ratcliffe, Masters, & Crotty, 2015). Clearly, in most contexts, maintaining a strong sense of personal control in one's life provides both psychological and physical benefits.

How does Cognitive Development Influence Problem Solving and Well-being?

Stereotypes and PCBs are aspects of *social cognition*, our knowledge and expectations about people. Due to increases in *reflective judgement*, social cognition becomes more complex during adulthood. Reflective judgment is the ability to make reasonable, knowledge-based decisions, even when issues are complex, ill-structured, and have no certain correct solutions (Kitchener & Fischer, 1990). Learning to make reflective judgments is an important cognitive

advancement because we are faced with numerous ill-structured dilemmas throughout our lives. For example, 25-year-old Lucy is deciding between going back to school to pursue a graduate degree or travel around the world. Alternatively, Rita, 45-years-old, is choosing between changing companies or starting a new career, even though this means she would have to take a pay cut. Meanwhile, 65-year-old Julian is retiring and unsure whether he wants to leave the community he has lived in all his life and move closer to his children. None of these situations have a clear-cut solution with absolute correctness. Although reflective judgment is associated with performance on intelligence (IQ tests), it requires more than just intelligence or test performance. Creativity and knowledge about people and social interactions and the human condition are defining characteristics of wisdom (Baltes & Staudinger, 2003)

The *Reflective Judgment Model* is based on the work of numerous scholars from the 1930s through the 1980s (Kitchener & King, 1981). It has seven increasingly higher-level stages of knowledge and judgment, in which the early stages act as foundations for later ones. Each level contains several stages, and each stage is more complex than the preceding stage. Stages are made up of both unique characteristics as well as characteristics from previous stages (e.g., Level One contains Stages 1 through 3; Stage 3 includes characteristics of both Stage 2 and new ones from Stage 3). Although the time spent at each stage may differ, the sequence itself does not vary, which is a key assumption of stage theories.

Level One (Stages 1-3) involves a simple belief system in which knowledge is certain and comes from either personal experience or figures of authority. Stage 1 is characteristic of young children, e.g., "I know it's true because I saw it myself," or, "My mother told me so." Most high school students fall between Stage 2 and Stage 3, (King & Kitchener, 2002, 2004) e.g., "I don't know, but one of my teachers knows the answer."

Level Two (Stages 4 and 5) represents quasi-reflective thinking, in which individuals start to perceive knowledge as subjective and understand that it can be uncertain and abstract. The majority of college students are between Stage 3 and Stage 4 (King & Kitchener, 2004), e.g., "I don't have my mind made up totally, but I see your point of view. I can go one way or the other." Often, the transition between Level Two and Three occurs with a triggering event in which previous knowledge is challenged by conflicting information and individuals must consider alternative perspectives or explanations. Going to college, getting married, joining the military, or moving to another country can serve as triggering events because they put us in contexts with new people with different ideas and beliefs. Graduate students usually have reasoning abilities above Stage 5 because their growing expertise in their field and professional development makes them aware that scientific 'facts' can be wrong.

Level Three (Stages 6 and 7) represents reflective thinking. Here, individuals can clearly analyze and come to defensible conclusions about ill-structured, complex problems. Moreover, they can evaluate complex claims and appreciate the importance of context in constructing understanding. Adults transition between Level Two and Level Three when they experience cognitive dissonance (discomfort) when others ask them to justify their beliefs with evidence. Level Three thinking is often needed to select our occupation, especially now that we are living longer and will probably have more than one career in our lives.

How Can We Choose an Occupation that Fits our Personalities and Interests?

Choosing a career is one of the major life decisions we make as adults. In 1979, the *National Longitudinal Survey of Youth* started following a nationally representative group of thousands of individuals born in the early 1960s and continued to follow up with them every few years (Moore, Pedlow, Krishnamurty, Wolter, & Chicago, 2000). Results showed that on

average, adults under 50 have held 12 different jobs, with most of these job changes being in early adulthood, between 18 and 24. Globalization and new technology have increased people's choices of occupation, how to carry out their jobs (e.g., in an office or telecommuting from home), and who can access these job opportunities. An entire industry, career counseling, is built upon the idea that there are experts who can help individuals make good job choices.

Parents play an important role in people's career choices and development (Saleem, Mian, Saleem, & Rao, 2014). Parents' occupations have both direct and indirect influences on the career choices of their children. Directly, children can observe the effects of their parents' occupations through their parents' job satisfaction and their families' social status. Moreover, parents convey gender role beliefs through their occupations and attitudes towards their traditional or non-traditional roles (Evans & Diekman, 2009). Parents also play a key role in helping their children develop career optimism and are their children's first career advisors.

During high school or in college, you may have taken a career interest inventory that gave you some ideas of what careers fit your personality or skills. There are many career interest inventories available, including the *RIASEC* (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) hexagonal model (Holland, 1959, 1997), and the 11-dimension model of Career Decision Making Profiles (*CDMP*) (Gati, Landman, Davidovitch, Asulin-Peretz, & Gadassi, 2010). However, knowing one's interests is not enough to ensure career satisfaction. Career selection theories, such as the *person–environment (P–E)* fit model (Tinsley, 2000) and *Social Cognitive Career Theory* (Lent, Brown, & Hackett, 2002) agree that long-term job satisfaction requires compatibility between the individual characteristics (e.g., interests, cognitive ability, skills, and career goals) and the job environmental context (i.e., job requirements, colleague interaction, relationship with superiors, and company culture). Thus, one

strategy for career selection is to take multiple interest inventory questionnaires along with a

personality test and skills assessment to have a good sense of occupations that would best

encompass your personality style, skills, interests, and goals.

How Does Personality, Emotions, Stress, and Coping Affect Successful Aging?

One of the most important discoveries about successful aging is that the amount of stress

we experience and how we cope with it affect our physical and mental health. When we are

stressed, our body uses glucose to give us a boost of energy in what it interprets as a dangerous

situation. This is known as the *fight or flight response*, which means that in a split second, we

have to decide whether to confront the stressor or run from it. For example, if someone is

bullying you, is it best to confront the person or leave the scene? If you are very stressed-out

about an exam, is it better to go and get it over or just stay home and hope to get a make-up

exam? People also differ in how much stress experience in their lives, whether they work best if

stressed, and the effects of stress on their physical and mental health.

People with *Type A* personalities push themselves to achieve, work hard, if they fail a test

try again until they succeed, and work best under deadlines and pressure. These sound like great

qualities to have, but because their bodies are always on 'overdrive' people with Type A

personality are at risk for high blood pressure, heart disease, and often get sick easily. Robert

Sapolsky (2004, 2015), a world-famous psychologist who studies stress in humans and other

primates, has shown that when we are stressed, our bodies produce compounds called

glucocorticoids, which are responsible for energizing the flee or fight response. However,

glucocorticoids can damage the hippocampus in the brain by killing neurons. Because the

hippocampus is the brain center associated with learning, memory, and emotions, glucocorticoids

have been linked to the emotional ups and downs and remembering challenges of Alzheimer's

disease. Our bodies have mechanisms for "mopping up" excess glucocorticoids, but as we age, these processes don't work as well and so our cells and organs become inflamed and less able to fight diseases such as osteoporosis, diabetes type II, and even a common cold. When we experience stress for long periods of time, the "mopping up" process for glucocorticoids also doesn't work as well, so we can become more vulnerable to viruses and other diseases. For example, you might have gotten sick during or after your final exams because you were stressed, didn't get enough sleep, and didn't eat well, three factors that increase your body's production of glucocorticoids.

Stress also affects our DNA. Blackburn, Epel, and Lin (2015) discovered that severe stress, such as that experienced by mothers raising special needs children, frays our telomeres, the ends of DNA that are responsible for controlling how many times a cell can divide, leading to cells to die sooner and aging us. Moreover, Chae et al., (2014) found that prejudice and discrimination is associated with decreased telomere length in African American men, who starting in childhood, report high rates of discrimination at school, work, and the community. Coupled with the inflammation, anxiety, negative emotions, and decrease in PCBs, the stress experienced by African American men has been linked to their higher rates of physical and mental health challenges, such as high blood pressure, cardiovascular disease, and depression and lower life-spans than men from other ethnic groups.

Learning to cope effectively with stress is one of the most important contributors to successful aging and resilience, our belief that we can surmount challenges in our everyday lives. Lazarus and Folkman (1984), who proposed the best-known model of stress and coping, classified coping strategies into two categories, *emotion focused coping*, which involves strategies that make us feel better when stressed, such as talking to a friend or exercising, and

problem focused coping, strategies aimed at eliminating the stressor, such as studying hard for a test, changing jobs, or breaking up with an abusive partner. Although people use both types of coping strategies, older adults use emotion focused strategies more frequently than young adults (Aldwin, Sutton, Chiara, and Spiro, 1996). Importantly, old adults are also less likely than young adults to dwell on negative experiences or their choices, e.g., experiencing 'buyer's remorse' after buying an expensive sports car. In their *Socioemotional Selectivity Theory*, Carstensen, Fung, and Charles (2003) suggest that focusing on positive relationships and emotions is a sign of mature, successful aging. Our coping strategies also depend on whether we think we can solve the problem and eliminate the stressor; for example, if we perceive that the stressor is not under our control, we may feel less stressed if we focus on managing our emotions, such as exercising, drawing a funny cartoon about it, working on a hobby we love, or calling a friend and not on eliminating the stressor. Most of us experience stressful daily hassles, and learning to cope with them effectively will help us live longer, meaningful, healthier, and happier lives.

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