Background Paper

NIA – BBCSS Expert Meeting

Motivation and Aging: Toward the Next Generation of Behavioral Interventions

June 18-19, 2012

Washington, D.C.

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Purpose of the Meeting:

Successful aging is a life-long process, whose foundations are laid in childhood, and whose maintenance requires continued purposeful goal pursuit in social, economic, and health domains into midlife and beyond. Many aging individuals maintain high motivation autonomy, energetic pursuit of social engagement, and conscientious financial planning and maintenance of self-care and care of others into very old age. Older adults build on rich life experience and possess increased appreciation of their own priorities and strengths, both of which may confer facility in maintaining a positive developmental course into very old age. However, some individuals, whether due to individual vulnerability factors or to life circumstances, fail to sustain successful trajectories of aging. For these individuals, failures of self-regulation, often beginning early in the life course, cumulate over time, resulting in poor health and socioeconomic outcomes and putting individuals at risk of premature disability and dependence on health and social welfare systems. These forms of dependence also confer a loss of opportunity for further purposeful goal pursuit and social engagement, which can result in decreased sense of purpose, increased social isolation and loneliness, and declines in autonomy. The purpose of this expert meeting is to explore how a contemporary understanding of motivation, and of interventions designed to harness individuals' motivations, values, and goals to support adaptive outcomes, can help us understand the differences between individuals who succumb to these problems over the course

of adult development and those who resist them. Specifically, this meeting is designed to explore the possibilities for the development of motivation-based interventions for midlife and older adults in domains related to achievement/autonomy, social engagement, and behavioral self-regulation related to both health behaviors and financial security.

The meeting brings together individuals with expertise in behavioral interventions, motivation theory, aging and life course development, and personality psychology to collaboratively deliberate what the field can learn from successful interventions to increase motivation and sustain adaptive trajectories of health and functioning into late life. We have invited experts whose motivationally-informed interventions have been successfully implemented in younger age groups, or in contexts (families, workplaces, community institutions) that hold the potential of reaching a large number of individuals. We have also invited life span and aging experts who can further the discussion of the application of these motivational approaches to intervention in midlife and older age, by identifying the unique strengths of midlife and older adults that might be exploited for these purposes, and suggesting which life mid-late life behavioral domains and contexts are most suited for translation into program of research on enhancing motivation.

We will examine novel interventions that have successfully changed behavior by changing motivation. Here we highlight interventions in the domain of achievement and behavioral self-control that involve the following mechanisms: priming motivation, goal re-framing, making goals explicit, removing barriers to goals, and using social and affective reinforcers of motivation. For interventions that are successful, one would like to be able to assess whether they change behavior by changing motives or traits in ways that the behavior is likely to be maintained.

By promoting discussion aimed at harnessing what we know about how motivation changes over the life course, and how one can harness motivation in the service of adaptive life goals, this meeting will help us plan systematic encouragement of innovative research on novel interventions that maximize striving for autonomy, engagement and conscientiousness in midlife and older age. The NIA will use the discussions from this meeting to plan strategies for advancing evidence-based behavioral interventions to support sustained motivation for health

behavior maintenance, social engagement, and financial independence for middle aged and older adults.

Background

Challenges of an Aging Society

As the global population ages, changing demographic trends raise questions about how society will respond to increasing numbers of older persons. Increased life expectancy, particularly in developed countries, combined with an ever-growing number of older people, challenges societies to begin to think creatively about how to sustain healthy independence and productivity of their citizens into very old age. Several challenges seem particularly salient. First, in many countries, traditional expectations about retirement in the early to mid-60s are now being challenged by concerns about the adequacy of retirement income and the uncertain stability of national pension programs to support a growing number of retirees who are living longer. Data from 2009 suggest that the average male retiree in an OECD country can be expected to live for an additional 18 post-retirement years (*Global Health and Aging*, NIA/WHO, 2011). As a consequence, societies are becoming increasingly motivated to identify opportunities for maintaining older adults' participation in the workforce and in other productive social roles. In addition, there is preliminary evidence that departure from the workforce is associated with premature cognitive decline, perhaps a result of reduced social and intellectual stimulation (Rohwedder & Willis, 2010), suggesting that there may be substantial health costs associated with early retirement.

At the same time, working against these positive trends in life expectancy, we see a number of alarming health trends, all contributing to an increasing societal burden of chronic non-communicable diseases (NIA/WHO, 2011). Recent data from the Centers for Disease Control indicate that chronic diseases account for five out of the six leading causes of death among midlife adults aged 45 to 64, with cancer and heart disease alone accounting for over 50% of deaths (*Health, United States, 2010*, CDC/NCHS, 2011). Currently, in the United States, 60% of adults age 65 and older suffer from hypertension, and 27% from diabetes. Trends in health behaviors (smoking, diet, exercise, etc.) associated with such preventable causes of death also suggest alarmingly low levels of self-control among a large proportion of Americans. For

example, obesity rates have been climbing in all age groups over the past several decades, while numbers of cigarette smokers in all adult age groups has remained stable for the past 10 years. And though the percentage of midlife and older adults participating in some form of exercise has increased slightly over the last decade, the percentage of adults getting adequate amounts of exercise remains quite low (18.5% of men in the 45-65 age group, and only 11.8% among men over 65, with percentages for women lower still) (*Health, United States, 2010*, CDC/NCHS, 2011). These statistics suggest either very low levels of motivation or very high rates of failures of self-control among midlife adults in critical health behavior domains. If these become habitual or engrained, chronic illness is likely to result. Chronic diseases in turn may lead to dependency; to declines in well-being, self-efficacy and sense of control; to increasing burden on families and health systems; and to substantial costs in terms of the quality of family relationships and participation in active social roles.

In developed nations, increasing numbers of older persons are living alone. While this often reflects individuals' desire for independent living, there is also a risk of social isolation among older adults who find themselves with mobility limitations due to disability or impaired health. Data from the 2005 US Census indicate that older adults who live alone are more likely to be living in poverty than their married counterparts. This is particularly true of women in minority groups (*65+ the United States:2005,* He et al., 2005). In addition, 43 % of individuals age 75 and older who have some form of physical limitation such as a mobility impairment, are living alone (He et al., 2005). Being socially isolated increases the risk of experiencing feelings of loneliness. Such feelings are not only psychologically distressing, they are also associated with serious health consequences including increased anxiety and vigilance, heightened systolic blood pressure, sleep disturbances, depression, and mortality (Cacioppo et al., 2011; Luo et al., 2012).

The *National Institute on Aging* (NIA) has been a leading funder of research documenting these emerging demographic trends, as well as the associations between these behavioral, social and psychological factors and the health and well-being of mid-life and older adults. A primary NIA research goal is to develop and disseminate information about interventions to reduce disease and disability and improve life-long health and well-being. This includes developing strategies to improve the quality of life of older people and to encourage their productive engagement in society for the benefit of the population as a whole. With this aspect of the NIA mission in mind,

and informed by an understanding of the demographic, social, and behavioral challenges confronting an aging society, we seek to explore whether some of the most successful interventions for sustaining individuals on adaptive life-long trajectories of aging may be those that harness individuals' motivation for independence, productive engagement, and social connectedness.

Why focus on motivation?

Prior Recommendations

The 2006 NRC report *When I'm 64* (National Research Council, 2006) reviewed the literature on motivation and aging and concluded that older people can be strongly motivated to change, and can even be more "successful" in making changes permanent, depending on a variety of factors including whether the reward for change includes emotional satisfaction. The report called for additional research in two areas: *The first focused on individual motivation to initiate and maintain change*, and examination of age-related changes or age differences in self-regulatory and related processes required to support these behaviors. It acknowledged that the role of self-efficacy beliefs, attitudes toward aging, social relationships, persuasion, preferences, and self-regulatory abilities in motivating and maintaining positive behavior change have not been well-researched from a life course perspective. *The second focused on approaches to motivate and influence change in others*, including persuasive messages and environmental manipulations such as in behavioral economics that support adaptive change and maintenance of that change, perhaps by changing motivation.

Critically, for interventions to promote behavior change, the report encouraged research on behavior change *linking basic science with intervention approaches*, in order to better specify both processes and outcomes related to change. This requires research that specifies and detects the basic psychological and behavioral processes that regulate and drive individuals' motivation to change. Precise identification and measurement of these processes and outcomes is critical for building and testing life-span theories about the role of motivation in driving positive behavior change.

The Need for Research on Mid-late Life Motivation for Behavior Change

It has become increasingly clear that distinct patterns of thoughts, feelings and behaviors become established early in life and become self-perpetuating, with quite a long reach into adulthood and older age. This awareness, coupled with the recognition of the persistent challenges of motivating individuals to adopt productive behaviors, suggests a need to take a closer look at the psychological and social factors that determine motivation to persist toward valued goals or change course when goals become maladaptive or inappropriate. Poor behavioral patterns that impact aging outcomes frequently become established in midlife, wreaking havoc on later life health and economic wellbeing. As outlined above, midlife failures in self-control around health behaviors (such as medical self-care, diet and exercise) and financial decision making (such as retirement savings), especially if they become habitual, can have disastrous long-term outcomes for aging individuals. Habitual patterns of thought and behavior can block or undermine individuals' motivation for health promoting behavior, for social engagement, or for achievement in educational or occupational domains. Premature disability or exit from the workforce can put individuals at risk for self-perpetuating cycles of social disengagement and debilitating loneliness. Inability to enact goals due to social or contextual barriers, real or perceived, can restrict individuals' capacity for pursuing activities related to health promotion and productive social engagement.

Motivation as a Core Principle in Theories of Psychological Aging

An appreciation of how motivation develops and changes over the life course in these various life domains will be important for furthering and intervention research agenda. Several theories of psychological aging hold motivation to be a central driver of life course change in behavioral and psychological function. In general, older adults are viewed as selectively devoting cognitive resources to promote important goals, such as maintaining emotional equilibrium, social harmony, or satisfactory levels of social and role functioning. These theories posit that older age is characterized by a distinct set of motives that contrast sharply with the goals important for earlier phases of life (Carstensen et al., 1999; Heckhausen et al., 2010; Charles, 2010). They are grounded in an appreciation of the adaptive, life course-typical tasks individuals face at various stages of development. For example, as individuals develop into adulthood, increased responsibilities may require them to forego immediate gratification in order to achieve long-term

goals. In young adulthood to midlife, developing a social and occupational identity and managing the multiple responsibilities of family and career take priority. But as individuals enter older age, maintaining positive emotional well-being and quality social relationships become primary goals (Carstensen, 2006). Accumulating evidence suggests that older adults are generally more conscientious (Lucas & Donnellan, 2009; McCrae et al., 1999), more adept at managing social conflicts and sustaining quality social relationships (Luong et al., 2011), and more successful at maintaining emotional equilibrium and psychological well-being (Stone et al., 2010; Carstensen et al., 2011), than their younger counterparts. Life course approaches also emphasize how life stages and life transitions shape the context for the expression of these motives, and address the impact of historical period and other contextual and social factors on how these processes unfold over time to shape trajectories of health and behavior (Shanahan et al., in press). Current theories of motivation also emphasize the role of feelings and reward in maintaining goal-directed behavior (Sheldon, 2011). Research on age-related changes in affective experience and emotional goals has not been deeply considered within this framework and merits exploration. Overall, the accumulated body of work on psychological aging suggests the potential for motivational interventions to leverage a rich and unique set of psychological resources possessed by many older individuals, and to exploit what is known about those who age well in considering how to aid those whose trajectories are less optimal.

Individual, Social, and Contextual Influences on Motivation

One leading psychological theory of motivation, self-determination theory (Deci & Ryan, 2012), posits a core set of motives that drive human behavior, including a drive for competence/achievement in some domain, for physical integrity and psychological autonomy, and for some form of social connectedness/relatedness. It is well-appreciated that these motives are expressed differently across individuals, contexts and cultures, although such variation is not typically explored from a life-span perspective. Thus, there is much we do not know about where along the developmental trajectory individual variation in motivation manifests, or at which junctures it is especially malleable, and by what factors. For example, at what life stages do factors such as socioeconomic position or cultural/historical context, situational factors like incentives and barriers, or discrete life events and transitions have stronger effects on motivation? And how do these factors interact with individual differences in intrinsic or extrinsic

motivation to pursue goals for occupational or academic achievement, social affiliation, material acquisition, physical achievement, or moral behavior? Such issues may be especially relevant when considering interventions targeted at mid-life and older individuals, who bring with them a long history of successful and failed goal pursuits in these domains.

Early-developing personality traits and other dispositional factors, including conscientiousness, self-control, optimism, planfulness, risk-taking, and grit are associated with motivation and engagement in goal pursuits and may have long-term impacts on whether one ages successfully or poorly. Across the developmental trajectory, these dispositions interact with individual differences in psychosocial stress exposure, affect, and coping/self-regulatory processes to impact how one experiences feedback from goal pursuits and integrates these to shape future behaviors. Research is needed to better understand how these response styles become embedded, develop or change over the life course.

It is also important to think of motivation as more than an intra-individual phenomenon. Just as relevant to successful aging as individual traits are motives for social participation, social engagement, and mastery and competence in threatening social relationships. Positioned in this way, motivation becomes a concept accounting for persistence, creativity and effectiveness in key social challenges of aging: with an ill spouse, an insensitive physician, daily encounters with stereotyping younger people, with care settings, financial advisers and adult children. Work on how individuals' social goals and behaviors change in response to psychosocial stress, and how the quality of social relationships serves as a source of motivation offer perspectives on how the micro social context shapes motivation.

At the macro level, demographic factors such as education, income, occupational status, geographical location, and social and economic policies governing access to education and healthcare, or competition and cooperation in the work- and marketplace, can influence or constrain individuals' opportunities for goal pursuit. To the degree that these factors are malleable, they can themselves become targets for intervention. To the degree that they are not, they become important contextual considerations when tailoring intervention strategies to different sub-groups in society.

Consideration of these life stage-specific, individual difference, and contextual influences on motivation will be critical in informing the appropriate design of interventions to promote autonomy, achievement, social engagement, and behavioral self-control for any given life stage. In addition, if multiple adaptive behaviors arise from a set of common core motives, this raises the intriguing possibility that by targeting individuals' basic motives, values, and goals, one has to potential to influence a wide range of adaptive behaviors.

A number of specific research questions present themselves as a result of these considerations. For example, can changes in specific behaviors such as health self-care or financial planning effect consequent change in underlying and more general response styles of self-control? If so, might such underlying changes not only prevent relapse in these domains, but also transfer to other life spheres? To what extent are midlife and older individuals more responsive to interventions that focus on their behavior or to interventions that focus on changing their social milieu (e.g. marital or social systems interventions)? Are there some older individuals that are especially responsive to motivational interventions and others that are particularly resistant, and if so what are the sources of these differences? Are there optimal junctures in midlife or old age, or optimal contexts in which to provide behavioral interventions for these age groups? Are there some groups or life domains better suited to interventions targeted at changing/eliciting individual motivation, and others better-suited to interventions targeted at changing situational constraints on goals? Can these two approaches be successfully combined?

Potential Intervention Targets: Loneliness, Dependence, Failures of Self-control

As a starting point, we have chosen to frame our discussion around three risk factors or challenges that can derail successful aging: loneliness, dependence, and failures of self-control. These risk clusters are defined by three attributes: 1) each represents highly correlated clusters of recurring and persistent attitudes and behaviors often, but not always, with origins early in the life span; 2) each risk cluster has a wide range of unfavorable cognitive, emotional and health outcomes; 3) there is preliminary evidence suggesting the malleability of critical components in each cluster later in the life course even if the cluster may have heritable components as well as origins in adverse fetal or childhood experience. Moreover, each

cluster has an important mix of two components. The first is a distinctive, persistent and encompassing experience of demoralization that frames both perception and action. Second, each cluster can also be defined by a distinctive moment-to-moment pattern of maladaptive thoughts, feelings, perceptions and behavior. A "demoralizing frame" is a self-organizing experience of one's place in the social world that reflects serious impairments in motivation and the absence of tractable, positive goals. Within each cluster there is a conceptual antonym: a positive goal or framework that, if restored, might be an important part of prevention, intervention and rehabilitation.

These risk clusters are inviting targets for intervention because even modest improvements might have an impact on a broad range of problems that face us as we age. This is because the risk cluster, by definition, has a nodal position: it precedes a broad range of adjustment patterns and has a proven causal role in their etiology and maintenance. As a result an intervention strategy that focuses on a ***risk cluster*** rather than a ***specific behavior*** should, if widely disseminated, have a notable impact on regional or national indices of public health. It is an important matter of empirical research as to whether all elements of a risk cluster need to be specific targets of intervention or whether focusing on one might have salutary effect on others. See for example the work of Tony Tang: pharmacotherapy was successful not only in reducing depression in his study but also--in many cases--reduced the underlying personality risk factor, neuroticism; where it did so relapse was prevented (Tang, et al., 2009).

There is undoubtedly a considerable overlap among these clusters. This schema is intended as an heuristic to formulate effective public health strategies for successful aging that aim at increasingly well-specified mechanisms underlying spirals of decay of adaptive function. It acknowledges that risk factors are bundled together and cannot, in practicality, be addressed singly. The bundling process, according to this idea, occurs across a broad span of development and yields identifiable and distinctive clusters. For example, poor self-control in childhood (indexed in many studies of early development as low conscientiousness) leads to early school drop-out, tendency to addiction, impaired career development and adult relationships and poor self-care (Hagger-Johnson & Whiteman, 2007; S. E. Hampson & Goldberg, 2006; Sarah E. Hampson, Goldberg, Vogt, & Dubanoski, 2007; Kern, Friedman, Martin, Reynolds, & Luong, 2009; Shackelford, Besser, & Goetz, 2008). When we encounter

people at mid-life or later the early roots of this cluster are of theoretical interest but the task of intervention become how to loosen the knots that bind these elements together.

With these principles in mind, three risk clusters seem of critical importance in considering life course trajectories of aging:

Impulsivity, poor self-monitoring and control, and an inability to recognize or meet the expectations of others are part of a set of maladaptive tactical skills that interact reciprocally with overall demoralization about a promising personal future. The conceptual antonym of this form of demoralization is an optimistic hope for a future worth planning for. Many of the traits associated with conscientiousness and intrinsic achievement motivation follow from this view of self in the world. Unmitigated, this risk cluster leads to a downward spiral. Consequences include poor health and impaired self-care in many areas: obesity, noncompliance with medical regimens and undependable work performance.

Loneliness, isolation, avoidance, suspicion, poor social communication, low empathy for others is often couched within a demoralizing frame of insecure attachment (relations are undependable because they are unreliable, unpredictable, or anxiety provoking) and poorly articulated social roles. The conceptual antonym is a secure attachment style across most relationships as well as a pattern of sustained, extroverted, and effective engagement with others including a personal style that is generally attractive to others. The loneliness cluster reflects impaired motivation for social contact. Consequences include affective disorders, loss of immunocompetence, a range of medical disorders and accelerated senescence (Bernardon, Babb, Hakim-Larson, & Gragg, 2011; Cacioppo, Hawkley, & Thisted, 2010; Shankar, McMunn, Banks, & Steptoe, 2011) (Thurston & Kubzansky, 2009; VanderWeele, Hawkley, Thisted, & Cacioppo, 2011; Wei, Russell, & Zakalik, 2005; Whisman, 2010).

Dependence is part of a risk cluster that includes self-perceptions of vulnerability, low self-efficacy, and requiring the help of a powerful other (see Bornstein, 2011, for a review). It must be emphasized that research on aging, as well as research on younger individuals has attempted to delineate various forms of adaptive dependency as well forms of maladaptive, dysfunctional attachment that may masquerade as autonomy (Fiori, Consedine, & Magai,

2008) (Denckla, Mancini, Bornstein, & Bonanno, 2011). The concept of this risk cluster is centered on dysfunctional dependence, whether it is an expression of a long-term personality trait or an undermining, patronizing social environment (Baltes, Neumann, & Zank, 1994) (Chambless, Bryan, Aiken, Steketee, & Hooley, 2001; E. B. Ryan, Kennaley, Pratt, & Shumovich, 2000; R. M. Ryan & Deci, 2000). An encompassing demoralization is organized by a sense of personal weakness, ineffectiveness, and even danger, and a constant seeking, at times very aggressively, of support and approval of others. Consequences include adverse transitions at retirement, challenging and exhausting demands on others, particularly family members, and premature retreat into systems of protective care.

These risk clusters are intended to serve as a fulcrum for systematic epidemiology (much of it doable on existing data sets), exploration of malleable mechanisms, and public health-oriented intervention trials designed for the individual, for social systems (especially the family), or for policy implementation or change. Each cluster embeds a distinctive personality trait as well as a motivational system. Genetic influences and early developmental experience, including severely adverse ones, are likely to play a notable role in the development and identification of these risk clusters. As such, they must be considered from a life-span perspective. Importantly for our discussion, when we meet individuals in mid-life, these motivational frames may already be well-established, having been subject to repeated environmental and self-reinforcement. However, there are also a number later life-stage specific transitions that may serve as demoralizing triggers that shift individuals into self-control failures, isolation and dependence. These include increasing work/family demands, retirement, bereavement, and onset of illness or disability. Our hope is that by considering how to approach these three challenges of aging from a motivational framework, building on an appreciation both of individual differences and of age-specific strengths and vulnerabilities, new insights will emerge suggesting novel intervention approaches for our aging population.

Baltes, M. M., Neumann, E.-M., & Zank, S. (1994). Maintenance and rehabilitation of independence in old age: An intervention program for staff. *Psychology and Aging, 9*(2), 179-188.

Bernardon, S., Babb, K. A., Hakim-Larson, J., & Gragg, M. (2011). Loneliness, attachment, and the perception and use of social support in university students. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement, 43*(1), 40-51.

Bornstein, R.F. (2011). An interactionist perspective on interpersonal dependency. *Current Directions in Psychological Science. 20*: 124. DOI: 10.1177/0963721411403121

Cacioppo, J. T., Hawkley, L. C., & Thisted, R. A. (2010). Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychology and Aging, 25*(2), 453-463.

Cacioppo JT, Hawkley LC, Norman GJ, Berntson GG. (2011). Social isolation. Ann N Y Acad Sci. 2011 Aug;1231:17-22. doi: 10.1111/j.1749-6632.2011.06028.x. Epub 2011 Jun 8. Review.

Carstensen L.L., Isaacowitz D.M., Charles S.T. (1999). Taking time seriously. A theory of socioemotional selectivity. A*merican Psychologist, 54*(3):165-81. Review.

Carstensen L.L. (2006). The influence of a sense of time on human development. *Science, 312*(5782):1913-5.

Carstensen L.L., Turan B., Scheibe S., Ram N., Ersner-Hershfield H., Samanez-Larkin G.R., Brooks K.P., Nesselroade J.R. (2011) Emotional experience improves with age: evidence based on over 10 years of experience sampling. *Psychology and Aging, 26* (1):21-33.

Chambless, D. L., Bryan, A. D., Aiken, L. S., Steketee, G., & Hooley, J. M. (2001). Predicting expressed emotion: A study with families of obsessive-compulsive and agoraphobic outpatients. *Journal of Family Psychology, 15*(2), 225-240.

Charles, S.T. (2010). Strength and vulnerability integration: a model of emotional well-being across adulthood. *Psychological Bulletin, 136*(6):1068-91.

Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In R. M. Ryan (Ed.), Oxford handbook of human motivation (pp. 85-107). Oxford, UK: Oxford University Press.

Denckla, C. A., Mancini, A. D., Bornstein, R. F., & Bonanno, G. A. (2011). Adaptive and maladaptive dependency in bereavement: Distinguishing prolonged and resolved grief trajectories. *Personality and Individual Differences, 51*(8), 1012-1017.

Fiori, K., Consedine, N., & Magai, C. (2008). The adaptive and maladaptive faces of dependency in later life: Links to physical and psychological health outcomes. *Aging & Mental Health, 12*(6), 700-712.

Hagger-Johnson, G. E., & Whiteman, M. C. (2007). Conscientiousness facets and health behaviors: A latent variable modeling approach. *Personality and Individual Differences, 43*(5), 1235-1245.

Hampson, S. E., & Goldberg, L. R. (2006). A first large cohort study of personality trait stability over the 40 years between elementary school and midlife. *Journal of Personality and Social Psychology, 91*(4), 763-779.

Hampson, S. E., Goldberg, L. R., Vogt, T. M., & Dubanoski, J. P. (2007). Mechanisms by Which Childhood Personality Traits Influence Adult Health Status: Educational Attainment and Healthy Behaviors. [References]. *Health Psychology, 26*(1), 121-125.

He, Wan, Manisha Sengupta, Victoria A. Velkoff, and Kimberly A. DeBarros, U.S. Census Bureau, Current Population Reports, P23-209, *65+ in the United States: 2005*, U.S. Government Printing Office,Washington,DC,2005.

Heckhausen J, Wrosch C, Schulz R. (2010). A motivational theory of life-span development. *Psychological Review, 117*(1):32-60. Review.

Kern, M. L., Friedman, H. S., Martin, L. R., Reynolds, C. A., & Luong, G. (2009). Conscientiousness, career success, and longevity: A lifespan analysis. *Annals of Behavioral Medicine, 37*(2), 154-163.

Lucas RE, Donnellan MB. (2009). Age differences in personality: evidence from a nationally representative Australian sample. *Developmental Psychology, 45*(5):1353-63.

Luo Y, Hawkley LC, Waite LJ, **Cacioppo** JT. (2012). Loneliness, health, and mortality in old age: a national longitudinal study. *Soc Sci Med.* 2012 Mar;74(6):907-14. Epub 2012 Jan 25.

Luong G., Charles S.T., Fingerman K.L. (2011). Better With Age: Social Relationships Across Adulthood. *J Soc Pers Relat., 28*(1):9-23.

McCrae, R.R., Costa, P.T. Jr., Pedroso de Lima, M., Simões, A., Ostendorf, F., Angleitner, A., Marusić, I., Bratko, D., Caprara, G.V., Barbaranelli, C., Chae, J.H., Piedmont, R.L. (1999). Age differences in personality across the adult life span: parallels in five cultures. *Developmental Psychology, 35*(2):466-77.

National Center for Health Statistics. *Health, United States, 2010: With Special Feature on Death and Dying.* Hyattsville, MD. 2011.

National Institute on Aging/World Health Organization (2011). *Global Health and Aging*. NIH Publication no. 11-7737, October 2011.

National Research Council. (2006). *When I'm 64.* Committee on Aging Frontiers in Social Psychology, Personality, and Adult Developmental Psychology. Laura L. Carstensen and Christine R. Hartel, Editors. Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Rohwedder S, Willis RJ. (2010). Mental Retirement. J Econ Perspect. 2010 Winter;24(1):119-138.

Ryan, E. B., Kennaley, D. E., Pratt, M. W., & Shumovich, M. A. (2000). Evaluations by staff, residents, and community seniors of patronizing speech in the nursing home: Impact of passive, assertive, or humorous responses. *Psychology and Aging, 15*(2), 272-285.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Shackelford, T. K., Besser, A., & Goetz, A. T. (2008). *Personality, martial satisfaction, and probability of marital infidelity*: Individual Differences Research Vol 6(1) Mar 2008, 13-25.

Shankar, A., McMunn, A., Banks, J., & Steptoe, A. (2011). Loneliness, social isolation, and behavioral and biological health indicators in older adults. *Health Psychology, 30*(4), 377-385.

Shannahan, M.J., Hill, P.L., Roberts, B.W., Eccles, J., & Friedman, H. S. (in press). Conscientiousness and Health Across the Life Course. *Developmental Psychology: Special Issue on Aging.*

Sheldon KM. (2011). Integrating behavioral-motive and experiential-requirement perspectives on psychological needs: a two process model. *Psychological Review, 118*(4):552-69.

Stone AA, Schwartz JE, Broderick JE, Deaton A. (2010). A snapshot of the age distribution of psychological well-being in the United States. *Proc Natl Acad Sci U S A, 107*(22):9985-90.

Tang, T. Z., DeRubeis, R. J., Hollon, S. D., Amsterdam, J., Shelton, R., & Schalet, B. (2009). Personality change during depression treatment: A placebo-controlled trial. *Archives of General Psychiatry, 66*(12), 1322-1330.

Thurston, R. C., & Kubzansky, L. D. (2009). Women, loneliness, and incident coronary heart disease. *Psychosomatic Medicine, 71*(8), 836-842.

VanderWeele, T. J., Hawkley, L. C., Thisted, R. A., & Cacioppo, J. T. (2011). A marginal structural model analysis for loneliness: Implications for intervention trials and clinical practice. *Journal of Consulting and Clinical Psychology, 79*(2), 225-235.

Wei, M., Russell, D. W., & Zakalik, R. A. (2005). Adult Attachment, Social Self-Efficacy, Self-Disclosure, Loneliness, and Subsequent Depression for Freshman College Students: A Longitudinal Study. *Journal of Counseling Psychology, 52*(4), 602-614.

Whisman, M. A. (2010). Loneliness and the metabolic syndrome in a population-based sample of middle-aged and older adults. *Health Psychology, 29*(5), 550-554.