

The Discourse of Aging

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Historical and epistemological developments contribute to and reinforce the underlying framework that categorizes antiaging discourse and healthy aging discourse. This discourse creates the question “Can we live longer or better?” and encompasses issues of quality versus quantity, dependency versus autonomy, and risk versus benefit. By positing this discourse as a dichotomous tension, the development can be traced through the examination of select examples of influential studies in the field of aging. For nursing, the risk of these continued oppositions is potential oversimplification that may limit discernment of the complexities of care of older adults. Through understanding of the evolution and imposition of this dichotomizing discourse, nursing can provide older adult care within the reality of the aging experience, and develop frameworks, theories, and multidisciplinary discursive practice to optimize nursing care in the real-world spaces that exist between antiaging and healthy aging boundaries.

Key words: *aging, aging theory, antiaging, healthy aging.*

THIS ARTICLE situates the discourse of aging within a dichotomous framework that can be described as exclusive categories of antiaging and healthy aging. At the very root, this dichotomy could be posed as a contrast of quality versus quantity, and framed within the question of living longer or living better. The purpose of this article was the exploration of the evolution and imposition of dichotomous discourse through historically representational examples of aging theory and epistemological development, and subsequent implications for the discipline of nursing.

Aging is inevitable and ubiquitous. Although everyone does it, semblance of universality fades when explanation begins. Characteristics of aging between individu-

als are as differentiating as characteristics that shape physical appearance. Individual aging is multidimensional and includes biological and developmental processes that reflect complexities of genetic and environmental influence.¹

Biological, psychological, and social sciences contribute to the study of aging; each with inherent assumptions and resulting definitions. Theory development has occurred to a greater or lesser extent in each discipline, and increased accessibility to data from both social and biological data has contributed to an increasing focus on multidisciplinary research.² However, there are examples where lack of consensus on constructs that define concepts of aging impedes both definition and evaluation of aging study.³ Some research aims are to slow or reverse aging by considering the lifespan as alterable; others are to improve functionality and health within a static lifespan.

Situating the discourse of aging within a dichotomy of extension or improvement imposes a consistency of categorization. Although superficially similarly oriented, the categories exist as contrasts in outcomes and implications, and core differences reside in dynamics of the lifespan, perhaps contributing to overall difficulty in establishing an

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inclusive and foundational epistemology for aging study and care practices.

DEVELOPMENT OF THE LANGUAGE OF AGING

Thinking about aging has been evident since recorded history began, and probably before. Although paleopathologists study prehistoric disease, injury, and causes of mortality, we can only speculate how prehistoric nomadic humans thought about aging. Perhaps the concept of age was embedded somewhere within the dichotomy between life and death. We know little more about subsequent thought when humans began to establish a sense of place. As ancient advanced civilizations developed, their explanatory system for health, including aging in some capacity, involved superstition and disease was treated by combinations of natural plant remedy and magical appeasement of demons or gods.⁵ Three early systems of medicine, ayurvedic, Chinese, and Greek, considered relationships of balance and energy between body and mind, and body and environment.⁶

It is within the Greek foundations that Western medicine, general philosophy, and the subsequent philosophy of aging is rooted. The biomedical theory of aging can be attributed to Hippocratic thought linking 4 categories of body fluids, or humors, to corresponding temperament, that could also be linked to the 4 elements of the universe. Stages of life were interpreted as various combinations of heat, light, and moisture, and old age corresponded to a pessimistic contradiction of cold, dry, and damp.⁷ Aristotle's contemplations of the meaning of growing old conveyed distinction between the transcendental capacity for life and the fleeting nature of experiences. An explanation of aging attributed to Aristotle proposes that "the life and times of man are determined by the revolutions of the heavens and the kind of complexion within the individual."^{7(p13)} The separation of "life" and "time" and subsequent explanation propose a dichotomous relation-

ship appropriate in Aristotelian logic of mechanical order and internal essence.⁸

In his history of geriatrics, Morley⁹ describes medieval thought on aging through the example of Roger Bacon. Bacon, a 13th-century Franciscan Friar was an experimenter and lecturer as a Master at Oxford, and like his contemporary, Thomas Aquinas, attempted to acceptably merge rationalist thought and theological dogma.⁸ According to Morley,⁹ Bacon suggested that "old age could be warded off with eating a controlled diet, proper rest, exercise, moderation in lifestyle, good hygiene, and inhaling the breath of a young virgin."^(p1132) With presumptive interpretation, there is implication of antiaging; age as something to avoid, and young breath as a means of prevention.

During the Renaissance, people began to believe that they could increase both length and quality of life through controlling vital energy; thought to be a function of moderation in all things. The earlier antiaging work of Bacon, can be compared with the work of Cornaro, an Italian Nobleman and rationalist whose mid-16th century experimentation caused him to reason that through the elimination of disease one could hope for an old age of both contentment and potential.¹⁰ Rather than "warding off" age, the philosophy extended to include lengthening life by "warding off" the disease and disability of age, placing the emphasis on improving aging.

Following the Renaissance, science during the period of the Enlightenment gained authority as a way of rational explanation of both man and nature, giving rise to positivism.¹¹

Through the 18th century, positivistic epistemological foundations supported the empirical focus of the study of aging. The improvement of aging, although likely termed with negative connotations of problems of aging, continued to be studied through investigation of effects, or what was caused by aging. Dubious experimentation occurred: an extreme example is the use of prisoners to test the grafting of both human and then animal testes as a treatment for "rejuvenation."¹⁰

It was unlikely during this era of prison history that much concern was expended on whether prisoners were aging successfully, and even more unlikely of any thought of reciprocal societal effect. Personal meaning of rejuvenation was not considered, but rather observable effects on individuals provided the measurement. In the biological sciences, through the early 19th century this epistemology persisted as scientists continued to link age to specific physiologic changes that were considered pathologic. The language categorized age as a disease in opposition to health, and compelled scientists to look for treatment.

DEVELOPMENT OF AGING THEORY

The 19th century is considered to be the turning point in the study of aging because of refinement of statistical techniques attributed to Adolphe Quetelet, the introduction of new technology such as x ray technique, and increased sophistication of medical practice intervention.¹² New knowledge, positivistic in its discovery, led to the construction of meaning of physiologic aging, and the beginnings of early biological theory development.

An example of an early biological theory is Elie Metchnikoff's 1908 theory of digestive tract microbes, which were thought to contribute to the morbid nature of age.¹² Although psychosocial theories were less developed, Ignatz Nascher challenged the pathophysiologic models of aging by separating disease from age and suggested that age should be considered from cross-disciplinary and comprehensive perspectives.¹²

Metchnikoff was interested in extending life, and the use of the descriptive term "morbid nature" implies the relationship of age to death. Nascher's work regards age as a distinct period that can be improved, and although that distinction positively initiated the identification of gerontology as a separate field of study, the descriptive language created a clear division of the aged and aging from society.¹² This can be thought of as an initial step in

the process of constructing the aged as "the elderly," in discreet categorization. Hacking¹³ posits that categorizing and labeling creates a new way of being, both as a human, and as a subject of medical and social scientific knowledge that did not exist in previous times.

Post-World War II scientific progress and public interest was fueled by achievements made through research and development efforts during the war. Popular science journals capitalizing on the perception of public demand for information regarding postwar technology were anxious to take advantage of industrial advertising money. The journal, *Scientific American*, reinvented itself from a scientific journal to one dedicated to conveying the significance of science to the general public.¹⁴ In addition, the relative economic stability and realization of benefits associated with the Social Security system that had been instituted prior to the war fueled the positivistic empirical research focusing on the biological study of aging that continued for the next 20 years. To justify allocation of public funds, it was deemed necessary to chronologically identify those who were aging and to prove need by an association with disease and dysfunction, again creating the dichotomy of age in opposition to health.

Most biological study of aging consisted of antiaging research investigating cause. An example is the hypothesis of free oxygen radicals thought to form as part of the metabolic response to radiation exposure and contributing to the cause of aging through tissue damage and resulting disease.¹⁵ In 1958, The Free Radical Theory of Aging was proposed by Denham Harmon. Ongoing research led to subsequent theory development, the Oxidative Stress Theory of Aging, which proposed that an imbalance of various oxidative substances exist during "normal" physiologic conditions but increase during aging causing loss of cellular function.¹⁵ One study referring to free radicals as "a rusting agent" creates a visual image of the perception.¹⁶

In 1961, Leonard Hayflick's watershed research on predetermined cellular fidelity limitations initiated comparisons of programmed

aging theories to theories of cellular mutations and accumulated damage.¹⁷ Questions of reversal versus modification, and molecular aging versus organismal aging continued the dichotomy in aging research language.

When considering the language of this biological research in terms of the positivist underpinning supporting the empiricist methodology of laboratory testing and bench science, the dichotomous language serves as a method of enhancing the public's expectation of truth, and the perception that it could be found through objective research. It also strongly equates aging with disease and dysfunction. Findings that contrast aging to normal physiologic function continued to cast an interpretation of aging as an abnormality.

Social sciences also investigated human complexities of aging by looking for causation and prediction, but began to focus less on demarcation and more on approximation constructed from context and experience. During the 1950s and 1960s, research was vigorously conducted as part of the University of Chicago's Committee on Human Development. In an effort to give students education in research and theory development, methodologically rigorous field work experiences were conducted.¹⁸ As a result, in 1961, Disengagement theory was developed from a cross-sectional survey, and proposed that aging resulted in a natural process of behavioral and psychological withdrawal related to the inevitability of death.¹⁹

Disengagement theory, although pointed to as an early example of explicit theory development in social gerontology, is also criticized because of its attempt to explain both macro- and microlevel phenomena without sufficient supporting data.¹² The structuralist epistemology of the theory can be identified in the hypothesized underlying universal principle of withdrawal in anticipation of death, and the theory postulates that describe the consistencies of individual behavior. The study of behavior without regard to the personal meaning was pointed to as limitations in the usefulness of the theory. Critics urged that future exploration and theory develop-

ment should stem from a phenomenological approach in which meaning could be derived from a multidimensional perspective.²⁰

The language of disengagement theory postulates describes individual behaviors with implications that there are better or worse disengagement practices, placing this theory uneasily into the healthy aging category. This normative theory posits that aging is accompanied by decrements in knowledge and skill, referred to as ego changes and that success in an industrialized society is based on those attributes. It further elaborates on the value of age grading as a way of ensuring the young are enabled to assume authority.¹² The implications are manifested in terms of loss that contrasts the losses of individual interaction to values and norms of society.¹⁸ The language establishes a dichotomy between young and old, by implying that inevitable instability in old age is detrimental to society. The use of dichotomous language in aging research creates an impression of irreconcilability by presenting the population as either not old or old.

AGING OF THE BABY BOOMERS

The 1970 census caused economic concerns when demographic statistics indicated an impending imbalance in the workforce, and identified population groups that would be economically dependent. This biggest population group was the projected number of older adults and the imbalance identified as the dependency ratio.¹⁹ Political scientists were either optimistic or worried that this aging "baby boomer" cohort, because of formative socialization during the intense political atmosphere of the 1960s, may be more prone to activism in aging.¹⁹ Size alone of the baby boomer cohort created impact, and the relative affluence and history of conspicuous consumption added influence.

Baby boomers see themselves as aging differently than previous generations, and implicit within that perception is that it is better than the way that their parents aged or are aging.²¹ As a result, much of the resulting

biological research has centered on the investigation of whether age-related changes can be influenced by intervention. The question of when those interventions should occur is of importance to the baby boomers that are generally contextually situated to buy in. Cardiac, pulmonary, musculoskeletal, and cognitive processes receive much attention because the empirical research indicates they can be affected by “proactive” intervention.²²

Biological research in aging is predicated on values and assumptions of science, and accompanying belief in the power of science to “solve” aging as a problem. The tendency to conceive of aging as a causal or mechanistic process that can be reduced to its constituent parts is because of the underlying epistemology of biological research in aging and is bolstered by the baby boomer cohort’s belief in science that may have been established during their formative adolescent learning years. The language generally signifies empirical health status data as indicators of the relationship between decrease and increase in function and resulting dependence or independence in care. The embedded message is that there is an “age-related” potential of preservation or loss.

Social science study in relation to the chronologic aging of the boomer cohort takes a more contextual approach; however, some experts attribute this to an increase in attention to methodology and design sophistication rather than theory development reflective of epistemological change.²³ An underlying and perhaps undermining reliance on positivist methodology and the perception of objective truth has impeded attempts at creating formal theories, and as Cole²⁴ states, “this methodology contains a profound bias against subjectivity and cultural forms of representations which resists quantification.”(p8342)

The effect of the baby boomer cohort on the study of aging necessarily adds discussion of the rise of antiaging medicine. Antiaging and healthy aging research is not to be confused with antiaging medicine, which is the terminology associated with the multibillion

dollar antiaging industry that promotes aging as a treatable disease. Inflammatory language in the literature could be interpreted as a reflection of the contentiousness that mainstream science feels toward the antiaging industry. Terms such as quackery, charlatanism, pseudoscience, and hucksterism abound.

Mainstream science raises issues of fraud, ethical and safety violations, and contempt for the older adult propagated by the philosophy of antiaging medicine. That industry accuses mainstream science of unresponsiveness to societal pressures, outdated traditionalist practices, and naiveté in ignoring what they refer to as the foreseeable future.

The increased competition for research funding has added fuel to the fire. Mainstream scientists must compete more vigorously with each other for limited funds and research is heavily regulated. The antiaging industry takes advantage of very light regulation that allows fantastic claims to be made, almost unlimited marketing access with the use of the Internet, and huge profits from the marketing of aging “cures” to the emotionally and financially receptive baby boomer population.²⁵

MOVING TOWARD A REALITY OF AGING

Before the year 2000, 3 noted gerontologists were asked to comment on the past and future of aging research, as social science research reached the 50-year mark. Their observations included (1) little epistemological consistency; (2) lack of broad theory development leading to empirical research with little gain of coherent knowledge; (3) social change and cultural meaning given too little significance; (4) little multidisciplinary research and few publication outlets; and (5) scholarship limited to empirical research.^{23,24,26}

An admittedly limited and indiscriminate progress check on current gerontology literature indicates wide-ranging research topics. In the January 2012 edition of *The Journals of Gerontology: Psychological Sciences*, topics include personality predictors of health outcomes, memory and inductive reasoning

training, gaze behaviors and fall risk, and neighborhood characteristics in relation to disability.²⁷ Framed within the improvement of aging, these examples include contextual perspective, significant historical relationships, and address changing social structure. Empirical methodology is clearly described in all; theoretical foundations are generally evident within the literature review.²⁷

The biological study of aging continues to move forward in positivist empirical methodology. In reviewing the April 2012 issue of *The Journals of Gerontology: Biological Sciences*, research topics of study include the relationship between physical activity and metabolic syndrome, age-related changes in heart function, and factors that influence vascular aging.²⁸ All are examples of antiaging, and the design and methodology imply cause and effect.

Additional examples of progress are identified in other areas of study by gerontology experts. In discussion regarding genetic effects on aging, a scientist posits that a common language of description is needed to accommodate understanding across disciplines. In this instance, conflict in interpretation between mechanistic reductionist philosophies and evolutionary integrative philosophies are described.²⁹ Another progressive example is provided by a sociologist who describes the use of feminist epistemology to describe how “feminist gerontology” is used to understand health issues of old men, and how they are situated in relation to power, privilege, and social inequality.³⁰

RHETORIC OF AGING LANGUAGE

Dichotomous language exists in current aging research and antiaging medicine rhetoric, and is propelled by immediate access to information. A quick search on the Internet using the search term antiaging medicine results in pages of marketing sites with product descriptions that promise to defy, halt, or reverse age. Products are marketed as “longevity aids” and “the fountain of youth” and one

even exhorts you to “be beautiful by being young.” Using the search term antiaging research results in many of the same Internet marketing sites. The addition of the filter word “scholar” results in mainstream science reports with much less attention-grabbing rhetoric. Close inspection of the descriptions, however, yield terms that could be similarly interpreted: “longevity medicine,” “antiaging therapy,” and “diseases of aging” are examples. The dichotomous language describing efforts to cure aging or improve aging exists regardless of its origin and despite its intent.

The purpose of the dichotomy in the antiaging industry is evident in light of business projections that suggest the US antiaging products market will reach more than \$114 billion by 2015.³¹ It is obvious that there are millions willing to spend money to “fight” aging, but the lines of battle are less clear in mainstream science. Competitive funding may spur some of the language choice, however, in light of the implications for health care, other questions of purpose arise.

In the study of aging, dichotomous language permits definition of “us” and “them” and is enhanced by perceived threat. Current literature is replete with statistics and dire projections of the burden that the increasing older population will bring. The metaphoric town crier has warned that the aging are coming, and there is preparation for the onslaught. Aging population statistics in combination with those that predict a continuing lack of an adequate health care system have compelled professional, public, and private entities to invest significant resources and effort over many years. However, when it is “us” preparing for “them,” preparation is based on the meaning of aging defined by those in power, and by what they have and are willing to offer. Dichotomy serves as a method of maintaining the separation that can be described as between antiaging and healthy aging discourse. Examining this dichotomous language and what motivates its use helps in understanding for whom the effect is intended and who stands to receive potential benefit.

AGING LANGUAGE IN THE 21st CENTURY

There are multiple versions of aging at the beginning of the 21st century that are reflective of the dynamics of socioeconomics and cultural shifts. Chronologic age and retirement are no longer necessarily connected, changing both social structure and definitions for self-identification. New dichotomizing terminology that identifies substrata of older adults has emerged with the young-old separated from the old-old, and the frail-old defined by decline and dependence. The continuing presence of dichotomous language in aging research establishes oppositional relationships in logistical, economical, and ethical questions regarding aging and implications are often a comparison of contradictions. Survival advantage and compression of morbidity are terms that have surfaced in biological sciences with stark clarity and continue to reproduce oppositions like quantity versus quality, dependency versus autonomy, and risk versus benefit. The risk of these continued oppositions is that they may oversimplify complicated processes, resulting in oversight of important possibilities that may not fit neatly within the opposing boundaries.

In some instances, the interpretation of aging is a manipulation of perception and the function of the dichotomy is realized in application. Senior discounts, and Golden Age passes are enjoyed by millions of older adults. However, accompanying rules and contextual restrictions often strategically serve the intent of those making the offer, and that strategy is well planned. Using exhaustive market analysis, business experts have long been exhorting marketers and advertisers to take advantage of the potential economic significance as a need “to take the older adult population seriously.”^{32(p40)} Although age-dependent benefits are generally considered in positive terms, they can also serve to identify a population subset with discretionary funds that offer potential for capitalization by others.

Dichotomous relationships can be perpetuated through selective acknowledgement of

the population and examples can be seen in nursing education. Workforce need projections indicate an increasing demand for adequately prepared nurses to care for the dramatically increasing population of aging patients.^{32,33} Rather than emphasizing the fact that nursing is likely to include care of older adults, it is more likely to be minimized. A study investigating the portrayal of geriatric nursing to incoming students, found that only 4% of the 11 000 images reviewed on college of nursing Web sites, portrayed older adults.³⁴ This potentially misleading representation may devalue care of the aging population. Once in school, nursing students are paradoxically exposed to older adult nursing care through curriculum manipulation that may include insertion of isolated content or stand-alone geriatric courses often offered in terms of special population care, creating a dichotomy between geriatric nursing language and that of general nursing concepts. Workforce and health care need projections indicate that geriatric nursing should be taught not as a specialty, but as the standard of care.³⁵

NURSING AND THE AGING DISCOURSE

Nursing-led research was notably absent in the review of general gerontology research literature. However, when the search included the term nursing, results from nursing specific journals indicated that active research in the study of aging is occurring. The absence of nursing from the general aging study literature base is noteworthy in light of gerontology expert concerns over the lack of multidisciplinary efforts to create a coherent and unifying theoretical framework from which to study aging.^{23,24,26}

Nurses make up the largest component of the health care workforce, and considering that the majority of practice will be in the care of older adults, nursing is in a position to become the authoritative expert. To that end, nursing needs to develop a cohesive nursing theory that provides a model of care for older adults. A study reviewed 17 major nursing theories developed between

the early 1960s to the 1990s to evaluate their application for geriatric nursing. All the theories had a developmental perspective of aging, but none specifically described development in relation to aging. Most of the theorists reported influence of existential and phenomenological theories from other disciplines, but none utilized existing aging theories. None of the theories provided guidance for care of the older adult.³⁶ Nursing should be instrumental in the development of unifying theory of aging care both as a demonstration of professional commitment to society, and responsiveness in leading the provision of culturally relevant care.

Experts in the field of gerontology have identified the need to expand understanding of history, social change, and cultural meaning, and point to critical theory as foundational support for broadening perspective and provoking thought.²³ Nursing, having risen from an initially subordinate position, and with a history of championing the disadvantaged, should embrace the opportunity to establish a strong foundation of critical theory epistemologies that support exposure of oppression, and increase understanding of social inequalities in relation to aging. Nursing can capitalize on their history of research encompassing social and historical concepts and the forward-thinking advice of early researchers to not forsake humanism through a proclivity for empiricism.³⁷ Nursing studies using phenomenological and hermeneutical epistemologies with rigorous methodologies are easily accessed in the literature along with well-designed empirical studies, indicating nursing's broad perspective and holistic stance.

Finally, nursing needs to recognize the implications associated with the continuous use of dichotomous language. However,

there is naiveté in supposing that language could move completely beyond dichotomy; after all if something is not one thing, it has to be something else. Nursing needs to look for ways to advantageously utilize the dichotomy as a framework for comparison in critical theories that look for relationships between commonalities and differences. Feminist theory provides an example of positive use of dichotomous relationships through investigating privilege, oppression, hierarchical power, and systems of inequalities.³⁰

In regard to nursing education, perhaps educators need to listen to the anecdotal language of nursing students, who when asked about career choice outside of geriatric nursing, often say they want to work "where they can make a difference" or "where people get better." It may be that the language of the geriatric nursing education continues to identify age with disease, chronicity, and disability, and counters it to health with comparisons of quality versus quantity and value versus cost. Perhaps it is time to gain a deeper and reciprocal understanding of what students are saying, and what educators hear.

In conclusion, care of older adults may be well served by the nursing profession's willingness to reflexively examine the influence of the boundaries imposed by dichotomous language with thoughtful consideration of the consequences and possibilities. Learning how to move beyond these dichotomizing discourses will bring nursing in line with the reality of aging as human beings actually experience it; and help us develop discursive practices, frameworks, theories, and ways of talking across disciplines that not only account for, but optimize, the real-world spaces that exist between antiaging, healthy aging, and everyday life.

REFERENCES

1. Eaton NR, Krueger RF, South SC, Gruenewald TL, Seeman TE, Roberts BW. Genes, environments, personality, and successful aging: toward a comprehensive developmental model in later life. *J Gerontol A Biol Sci Med Sci*. <http://biomedgerontology.oxfordjournals.org/content/early/2012/03/27/gerona.gls090.full.pdf+htm>. Accessed April 7, 2012.

2. Ferraro KF, Shippee TP. Aging and cumulative inequality: how does inequality get under the skin. *Gerontologist*. 2009;49:333-343.
3. McLaughlin SJ, Connell CM, Heeringa SG, Li LW, Scott Roberts J. Successful aging in the United States: prevalence estimates for a national sample of older adults. *J Gerontol B Psychol Sci*. 2010;65:216-226.
4. Rangroo V. The evolution of paediatrics from archaeological times to the mid-nineteenth century and the historical influence on present day practice. *Acta Paediatr*. 2008;97(5):677-683.
5. Subbarayappa BV. The roots of ancient medicine: an historical outline. *J Biosci*. 2001;26(2):135-144.
6. Wren CAB. Aging and identity in pre-modern times. *Res Aging*. 1998;20(1):11-35.
7. Eco U. *In Praise of Saint Thomas. Travels in Hyper Reality*. San Diego, CA: Harcourt Brace; 1983:257-268.
8. Morley JE. A brief history of geriatrics. *J Gerontol A Biol Sci Med Sci*. 2004;59A:1132-1152.
9. Haber C. Life extension and history: the continual search for the fountain of youth. *J Gerontol A Biol Sci Med Sci*. 2004;59A:515-522.
10. Crotty M. Positivism: the march of science. In: *The Foundations of Social Research*. London, England: Sage; 2003:18-41.
11. Bengtson VL, Burgess EO, Parrott TM. Theory, explanation, and a third generation of theoretical development in social gerontology. *J Gerontol B Psychol Sci*. 1997;52B(2):S72-S88.
12. Hacking I. Kinds of people: moving targets. *Proc Br Acad*. 2007;151:285-318.
13. Lewenstein BV. The meaning of "public understanding of science" in the United States after World War II. *Public Underst Sci*. 1992;1(1):45-68.
14. Muller FL, Listgarten MS, Jang Y, Richardson A, Van Remmen H. Trends in oxidative theories. *Free Radical Biol Med*. 2007;43:477-503.
15. Hensley K, Floyd RA. Reactive oxygen species and protein oxidation in aging: a look back, a look ahead. *Arch Biochem Biophys*. 2002;397:377-383.
16. Rae MJ. Anti-aging medicine: fallacies, realities, imperatives. *J Gerontol A Biol Sci Med Sci*. 2005;60A:1223-1227.
17. Achenbaum WA, Bengtson VL. Re-engaging the disengagement theory of aging: on the history and assessment of theory development in gerontology. *Gerontologist*. 1994;34(6):756-763.
18. Cutler NE. Demographic, social, psychological, and political factors in the politics of aging: a foundation for research in "political gerontology." *Am Polit Sci Rev*. 1977;71:1101-1025.
19. Burbank P. Psychosocial theories of aging: a critical evaluation. *Adv Nurs Sci*. 1986;9(1):73-86.
20. Roth EG, Keimig L, Rubinstein RL, et al. Baby boomers in an active adult retirement community: comity interrupted. *Gerontologist*. 2012;52(2):189-198.
21. Hartman-Stein P, Potkanowicz E. Behavioral determinants of healthy aging: good news for the baby boomer generation. *Online J Issues Nurs*. 2003;8(2):6.
22. George LK. The last half-century of aging research and thoughts for the future. *J Gerontol B Psychol Sci*. 1995;50(1):S1-S3.
23. Cole TR. What have we "made" of aging? *J Gerontol B Psychol Sci*. 1995;50B:S341-S343.
24. Dominguez LJ, Barbagallo M, Morley JE. Anti-aging medicine: pitfalls and hopes. *Aging Male*. 2009;12(1):13-30.
25. Marshall VW. The next half-century of aging research and thoughts for the past. *J Gerontol B Psychol Sci*. 1995;50B:S131-S133.
26. *J Gerontol B Psychol Sci*. 2012;67B(1).
27. *J Gerontol A Biol Sci Med Sci*. 2012;67A(4).
28. Lithgow G. Why aging isn't regulated: a lamentation on the use of language in aging literature. *Exp Gerontol*. 2006;41:890-893.
29. Calasanti T. Feminist gerontology and old men. *J Gerontol B Psychol Sci*. 2004;59B:S305-S314.
30. Crary D. Boomers will be spending billions to counter aging. *USA Today News*. August 22, 2011.
31. Roy A, Harwood J. Underrepresented, positively portrayed older adults in television commercials. *J Appl Comm Res*. 1997;25:39-56.
32. Committee on the Future Health Care Workforce for Older Americans, Institute of Medicine. Executive summary. Available at <http://www.nap.edu/catalog/12089.html>. Published 2008. Accessed April 7, 2012.
33. Ellenbecker CH. Preparing the nursing workforce of the future. *Policy, Polit Nurs Pract*. 2010;11(2):115-125.
34. Escobar C, Scotese J, Berman A, et al. Portrayal of nursing to incoming students: results of a national survey of geriatric and pediatric web images on baccalaureate nursing program web sites. *J Prof Nurs*. 2007;23:220-225.
35. US General Accounting Office Subcommittee on Health; Committee on Ways and Means, House of Representatives. Nursing workforce: emerging nurse shortages due to multiple factors. <http://www.gao.gov/archive/2001/d01944.pdf>. Published 2001. Accessed March 5, 2011.
36. Wadensten B. Nursing theory views on how to support the process of aging. *J Adv Nurs*. 2003;42(2):118-124.
37. Gortner S. The history and philosophy of nursing science and research. *Adv Nurs Sci*. 1983;5(2):1-8.