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The New Gerontology: Implications and Strategies for an Aging Society

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An important component of much work in our field over the past couple decades has been a focus on the positive aspects of aging and terms such as robust aging, productive aging and successful aging have become commonplace.

As we approach the challenge to enhance the likelihood of successful aging, it is important to consider carefully what it is we are hoping to achieve. I participated in a decade long effort focused on successful aging supported by the MacArthur Foundation. That group adopted a three part definition including reductions in age-related disease and disabilities, maintenance of physical and mental function and, lastly, engagement in life. Let's look at each of these components.

Minimizing the impact of disease and disability is a critical element of Successful Aging and we have learned a great deal regarding the prevention and effective treatment of pathological age-related disorders. For instance, progress in the management of cardiovascular disease has contributed importantly to increases in life expectancy in this country, and now we are making important progress in the management of cancer as well. But major challenges persist, including Alzheimer's disease, and more generally our clinical capacity now and in the future to handle the diseases and disabilities experienced by older persons.

Beyond avoiding disease and disability, the second important component of Successful Aging is maintenance of physical and mental function. This requires reducing the impact of age-related non pathological changes in our brains, muscles, bones, joints, immune system, lungs, hearts, kidneys, and so forth. These changes are not diseases but they influence the onset, course and response to treatment of age-related diseases. We term these non-pathologic age-related changes, previously thought to be inevitable, senescence. Recent exciting research findings indicate that exercise, both aerobic and resistance, can help to maintain excellent physical function late in life and that exercising ones brain with mental activities such as playing bridge, reading, playing a musical instrument or attending the annual meeting of the GSA, can limit the progression of senescence. Going further, basic research findings on the effects of interventions ranging from caloric restriction to the effects of genetic alterations or specific agents such as resveratrol have shown promise in slowing age-related processes in a number of experimental models.

Combining these first two elements, the avoidance or reduction of disease and disability on one hand and stemming the tide of senescence on the other, yields an exciting prospect of previously unimagined numbers of fit older persons. It seems to approach the eighth day of creation.

But truly Successful Aging requires more than just surviving and being fit. Social context is important as is continued engagement which includes productive activities and effective involvement with other people and with organizations. This is the antithesis of the earlier prominent notion that the main task of old age is disengagement. The challenge for us is to understand the prerequisites for engagement and to create conditions that will foster it for our rapidly aging society.

With respect to social context, findings from the English Longitudinal Study of Aging show that how we age is dependent on socio economic conditions and is importantly mediated by our degree of autonomy. These findings do not stand alone. They represent part of an important emerging literature on the impact of social factors on Successful Aging.

Beyond the important and interest work on the relation of social context and class to aging, we are also learning about the relation of social integration and support to Successful Aging and have even gained some insights into the biological pathways which mediate these effects.

Numerous studies have yielded a set of core durable findings regarding the connection between social relations and health in older people. One consistent conclusion is that isolation is a powerful risk factor for poor health and reduced longevity. This theme emerges from prospective studies of large populations in Alameda County, CA, Evans County, GA, Tecumseh, MI, as well as Gothenberg, Sweden, and Eastern Finland. Specific findings include the observations that married people live longer than those not married and members of church and secular organizations live longer than individuals without such affiliations.

Beyond the negative effects of isolation, increased social integration and social support have consistently been found to have direct positive effects on health. Greater social integration is associated with better physical and mental outcomes. In a study of men and women over the age of 60 years, Garfein and Herzog found the best predictors of "robust aging" - an index of overall well being that includes productive activities, emotional and mental status and functional level, were frequency of visits with friends and the frequency of attending meetings. The more meaningful the contributions, the greater the benefit. Individuals who attend religious meetings do better than those who simply say they are religious but do not attend, and active participation is associated with greater health benefits than mere attendance. In addition, social support has been shown to act as a buffer against the negative effects of stress such as an acute illness.

There are two major forms of social support, one, emotional support, involves direct expressions of affection, esteem or respect and has been found to be especially important in studies of Successful Aging. The second, instrumental support, involves hands on assistance with chores such as cleaning, shopping, or providing transportation. This type of support may be less helpful and can even be counter productive as the “goodness of fit” of instrumental support is a very important consideration. No single type of support is effective for all people and all situations, unneeded or unwanted support, though well intentioned, can backfire and cause more harm than good by reducing an individual’s independence and his/her self esteem. To optimize Successful Aging one must assess the needs of the individual in a given situation to determine the type and amount of support that is needed. In addition, it is important to recognize that the benefits of support go both ways – there are benefits for both the recipient and the provider.

What is it about social support and engagement that is health promotive? What do we know about the physiologic mechanisms of these very significant and consistent effects?

Many of the findings I will now report have been generated by the MacArthur Foundation’s Research Network on Successful Aging. The core effort of the network was a prospective study of over 1100 community dwelling high functioning men and women aged 70 – 79 years at the study’s outset. I am relying in this discussion on a continuing series analyses, some very recent, led by my colleague, Teresa Seeman, of UCLA.

An early clue from these studies was the finding that individuals receiving the greatest emotional support had higher physical performance than their counterparts and also exhibited lower levels of epinephrine, norepinephrine and cortisol, markers well documented to be associated with stress and risk of adverse health consequences.

An important factor which subsequently emerged in studies by Seeman and Burt Singer and Bruce McEwen regarding the biological mechanisms of successful aging is allostatic load. Allostatic load is a measure of the cumulative physiologic toll exacted on the body over time by efforts to adapt to life’s experiences. This factor is operationally measured by the sum of ten parameters reflecting physiological activity in the hypothalamic-pituitary-adrenal axis, the sympathetic nervous system, the cardiovascular system, and metabolic processes related to glucose homeostasis. Thus the specific components of allostatic load include measures of systolic and diastolic blood pressure, total and HDL cholesterol, hemoglobin A1C, cortisol, norepinephrine, epinephrine, waist/hip ratio and DHEA-S. Allostatic load is predicted by socio-economic status and is strongly inversely related to educational level and degree of social integration. In 7 year follow-up of the MacArthur study population, allostatic load was a significant

predictor of mortality, decline in physical and cognitive function and increased risk of cardiovascular disease, independent of baseline health status, and socio-demographic characteristics.

Another specific aspect of social engagement that was a particular focus of the MacArthur Successful Aging studies was volunteerism. Specifically, in a cross-sectional analysis, there was a highly statistically significant positive stepwise or “dose response” relation between the number of hours of volunteer activity and the level of physical function or cognitive function. This positive ‘dose-response’ relationship for volunteerism was also found for psychosocial measures including the number of monthly contacts with friends, feeling useful, and, importantly, a sense of self-efficacy.

We consider these self-efficacy findings to be especially important as initial MacArthur work identified self-efficacy as a key predictor of successful aging and longitudinal analyses indicate that self-efficacy is an important predictor of subsequent changes in health status. Elderly individuals with high self-efficacy are significantly less likely to exhibit decline in cognitive function. In addition, those whose self-efficacy is low are twice as likely to become physically disabled.

Stimulated by these cross-sectional findings but mindful of their limited utility in defining casual relationships, we conducted a longitudinal analysis, categorizing individuals regarding their volunteerism over a four year period. Of those who volunteered at the onset, later discontinuation of their volunteer efforts was associated with greater declines in self-efficacy than those who continued to volunteer. In addition, with respect to self-efficacy, 70 year olds who took up volunteering during the study period resembled continuous volunteers much more than those who had quit.

In additional longer-term prospective analyses, study participants who were involved in volunteer activities were found, over a seven year follow up, to be much less likely to develop mobility impairment or to die than non-volunteers. Consistent volunteerism over time was associated with actual increases in physical function.

I noted that in our cross-sectional analysis, increased volunteerism was associated with a greater feeling of being useful to others. This observation has also been pursued further in a longitudinal analysis. MacArthur Successful Aging study participants who reported frequently feeling useful to others were less likely, when compared to those who rarely, if ever, felt useful to others, to exhibit declines in physical function or to die over both a three year and seven year follow-up period. These findings were independent of socio-demographic, health status or behavioral factors.

The findings regarding volunteerism lead to a discussion of an exciting model for enhancing productive activity in old age -- the Experience Corps. This national

movement to provide opportunities for voluntary activity in old age, the brain child of John Gardner, former Secretary of Health Education and Welfare, has been established in several cities across the country. Recently Professor Linda Fried, Chief of Geriatrics at Johns Hopkins, and her colleagues conducted an initial one-year pilot evaluation of the Experience Corps efforts in the Baltimore public school system. They divided six public elementary schools into three control and three experimental sites and randomly assigned 148 generally low income older volunteers, mostly African American women ranging in age from 60-86 to either an experimental or control setting. It is significant that this effort attracted large numbers of minority volunteers, as these groups have historically been less likely to participate in volunteerism and, given the widespread significant racial and ethnic disparities in health care and health status in our country, this group certainly has much to potentially gain. The experimental subjects were paid a modest stipend for their participation and were trained in team building, problem solving and helping teachers and were assigned to work in the areas of literacy and cooperative play for students in K-3rd grade. The control group were volunteers randomly assigned to a group told they would be enrolled in a future program. After a year the experimental group displayed very substantial gains in physical and mental function as contrasted with the control group who displayed the declines expected in such a population.

In addition to these important findings regarding physical and cognitive function, the Experience Corps volunteers also exhibited interesting gains in social and psychologic functioning. For instance, the volunteers showed a net gain in number of reported social ties over the year whereas the controls showed a decrease, a statistically significant difference. Other findings that were encouraging but did not reach statistical significance were found in measures including “the number of people who would check up on you if you were sick” and “the proportion of individuals who feel they need more support from others.”

With regard to psychological functioning, participants showed gains across the board in the seemingly all-important variable of self-efficacy as well as generativity while controls showed declines.

The success of the pilot program can also be seen in the fact that 98% of volunteers were satisfied with the experience, 82% plan to stay with the program for two or more years, and that 100% of participants reported very positive views on questions regarding whether their efforts are helping the children in the future.

In addition to the benefits to themselves, the volunteers made an important contribution to the learning of young children and the quality of public education. Students in Experience Corps classrooms demonstrated significant improvements in verbal ability and readings scores and fewer behavioral problems.

Based on these exciting findings from the one-year pilot, the City of Baltimore is planning to extend the Experience Corps across the city school system, and Dr. Fried and her colleagues are planning a critically important five year randomized trial of the program's effect on elder health and function.

Taken together, the MacArthur studies and the Experience Corps provide encouraging and provocative findings regarding volunteerism which is just one facet of engagement, the third leg of the three legged stool of Successful Aging . They demonstrate the potentialities of old age and the readiness of older men and women to live fully and actively. They suggest the dramatic potential of social interventions to induce beneficial effects on physical, mental and social function in older persons and at the same time provide meaningful roles for them. We are learning that structured changes that increase the availabilities of productive activities and increase individuals' engagement with life will predictably enhance their self esteem, reduce their risk of disease and disability and enhance Successful Aging.

Now is the time for much broader based efforts to provide this structured social context. Now is the time to further study and replicate programs such as the Experience Corps widely.

We must ask a final question. More agile brains, for what? Stronger, quicker muscles, for what? Added years of healthy life, for what? Our society has a structural lag—we have not kept up with the science—longevity has not been accompanied by societal adaptation. We have not developed approaches to incorporate older individuals effectively in our society and to give them meaningful roles. We need to begin right now integrating the social and behavioral sciences with our medical and biological advances to develop those roles, we must take advantage of the wisdom and the potential productivity and contributions of older individuals by engaging them more effectively in our society. By doing this we will enhance their Successful Aging, for such social and productive activities are themselves beneficial, while aiding society at the same time.

I foresee a future in which an aging society provides that supportive context which enhances the conditions for older persons to age successfully, and in doing so, become even greater assets for our society.

I do not believe this is a pipe dream. I am not a dreamer. Rather, it is a realistic glimpse into the future. There are many exciting opportunities before us. In the many interfaces of health care with our broader society none can be more exciting, and more full of promise than this new gerontology.

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