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Biobehavioral aspects of health and aging among people of Mexican-origin

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Abstract

There is a growing interest in developing a deeper level of understanding of the complex phenomena that make up the aging process. Efforts to pursue questions using a multivariate and ecologically valid approaches that include biological and behavioral factors have led to significant advances in our knowledge. This special issue presents a collection of papers that represent this “biobehavioral” perspective. Little is known concerning the biobehavioral aspects of Hispanic health and there is a dearth of systematic study of how individual biological factors interact with the environmental and cultural factors to affect health outcomes among the swiftly growing older population of Mexican origin, a subgroup of older minorities that exhibits unique morbidity and mortality patterns. The group of papers here represents important contributions to understanding the health consequences in later life for individuals of Mexican descent and addresses several areas of interest including but not limited to diabetes, cognitive impairment, metabolic syndrome, frailty, socio-economic status and contextual factors that impact health. The papers presented here use interesting and useful transdisciplinary approaches that increase our knowledge of health processes in older people of Mexican descent. This special issue also provides excellent examples of the critical linkages between biological variables broadly defined and traditional social stratification, social inequalities, and social justice and the ways in which they interact. The papers taken together suggest that the processes involved in aging and health are complex, particularly in people of Mexican descent, and requires the understanding of mechanisms at multiple causes and levels of analysis.

Introduction

The term “biobehavioral” has become the descriptor of choice to refer to the broad domain of research that encompasses biological underpinnings of behavior or behavioral implications for biological phenotypes (Whitfield, 2010a). This broad conceptualization reflects a growing interest in a deeper level of understanding of how complex phenomena, including the aging process, can be understood in an ecologically valid and multivariate fashion. The approach is based on the growing realization that all higher order processes reflect complex interactions among biological and social factors at multiple levels. Biobehavioral inquiries are now a widely accepted approach to improving our understanding of age related aspects of health and disease and the determinants of late life health outcomes.

The potential complexity of the interaction of behavioral and biological factors is compounded by the consideration of culture (Crimmins & Seaman, 2005).

The papers in this special issue represent important contributions to understanding the health consequences in later life for individuals of Mexican descent. The findings presented here can help inform public health interventions related to disease prevention which will help promote healthful aging in Mexico and the United States.

The premise for this special issue comes from the lectures given as part of the third installment of the international Conference Series on Aging in the Americas (CAA): “Biobehavioral Underpinnings and Social Interaction on Hispanic Health” convened from September 15 to 17, 2009 at the University of Texas at Austin. The CAA is funded by a grant from the National Institute on Aging (R13- AG029767-01A2; PI: Jacqueline Angel). In this special issue, we propose to address several areas of interest including but not limited to diabetes, cognitive impairment, metabolic syndrome, frailty, socio-economic status and contextual factors that impact health.

Concepts and Terms

A ‘biobehavioral framework’ is a concept that is gaining popularity to represent interdisciplinary research on the multitude of interactive roles that biological, psychological, sociocultural, psychological, and environmental factors play in the promotion, prevention, management, treatment of health and related outcomes. It has become a well used term at the National Institutes of Health in part from the work of the Office of Behavioral and Social Science Research whose mission is to focus greater attention on behavioral and social science issues related to health. The term also represents how social and behavioral factors exert their force on biological, physiological, and genetic processes and structures. The term is thus by nature, broad and encompassing of many disciplines and areas of inquiry but represents an important change in scientific approaches to understanding the etiology, precipitating factors, and course of complex diseases. This is in contrast to a unidimensional and reductionist approach toward understanding aging among racial and ethnic minorities, which has been the standard. One might ask what the advantage of such an approach is over more conventional methods and approaches. Single-discipline research has been very successful at identifying behavioral, social and biological factors that impact health. However, the processes examined that have implications for health are linked (Anderson, 1998). There have been several informative articles on how these factors are interdependent and conceptually traverse levels of analysis (Anderson, 1998, Cacioppo & Berntson, 1992; Churchland & Sejnowski, 1988). Cacioppo and Berntson (1992). Traversing levels of analysis allows us to inform, refine and specify inferences across levels which lead to more comprehensive theories of complex processes that make up disease and health status.

While there is much to be gained from interdisciplinary approaches and traversing levels of analysis, few have addressed these perspectives for aging and this is especially the case for the study of older people of Mexican origin. A recent volume of the *Annual Review of Gerontology and Geriatrics* addressed aging from a biobehavioral perspective (see Whitfield, 2010b) but does not include examples or applications for the study of Hispanic aging or Hispanic subgroups of national origin (e.g., Mexican descent) specifically.

There are several levels of analysis in biobehavioral health research which will be covered in this issue. Anderson (1998) offers one way of categorizing the various levels of analysis in biobehavioral health research. The elements of his conceptualization include five different levels: social/environmental, behavioral/psychological, organ system, cellular, and molecular. These levels interact in several ways. One way is by ‘parallel causation’ in which each level contains factors that account for a particular health condition but no level alone

completely accounts for the outcome. Another way these levels operate is by 'the corollary of proximity.' This corollary suggests that examining the interactions between variables at adjacent levels will be less complex than those between non-adjacent levels (Anderson, 1998). This is because elements in intervening levels create additional synergies or causal inputs to the interactions across the non-adjacent levels. Furthermore, Anderson notes that reciprocal causation and convergent causation are also possible. As the name suggests, reciprocal causation occurs when one level causes a change in another which in turn changes the initial level. This action causes some health outcome. Convergent causation occurs when the presence of factors or causal agents at multiple levels increase the likelihood of a health outcome. The factors at each level converge to produce some health outcome.

In this issue, we have arguably addressed topics at each of these levels and traversed these levels. There are examples of traversing behavioral/psychological and molecular factors in the paper by Gonzalez and colleagues. There are also some excellent examples of traversing behavioral/social and organ system levels in the paper on cognition by Arango and colleagues and the paper by Beltran-Sanchez and colleagues. Admittedly, we include nothing that demonstrates an exemplar of traversing cellular and molecular. We do, however, have several examples of traversing social/environmental and behavioral/psychological in the contributions by Crimmins and her co-authors, Montes de Oca Zavala and colleagues, Herrera and colleagues, Mendes de Leon and colleagues and in the paper by Aranda. While there is no way to cover all the issues across the levels, our goal for this special volume is to stimulate thinking about how biobehavioral perspectives help to accurately account for complex phenomena relative to Hispanic aging and in particular those related to individuals of Mexican ancestry.

In addition to the recent gains in understanding how biology, behavioral and social factors impact complex health conditions and diseases in later life, our ability to conduct research on these issues has advanced from new technology which allows the ability to conduct biological, biomedical, and biotechnology analyses with smaller samples, more accurately, in shorter amounts of time, and in a portable fashion. Biobehavioral perspectives on aging are complex and often less than straight forward than most traditional approaches. Some of the interactions across levels of analysis are extremely complex and require observation of factors at one point in time but often also over time. The study of aging as a process includes time explicitly or implicitly in any interpretation of findings about the human condition in later life. Thus in addition to the levels of analysis discussed earlier, we also consider life course and life span issues of how these interactions between levels ultimately impact individual health. Clearly, human biology can inform our understanding of the social aspects of aging in new and novel ways. One must, however, avoid attributing health outcomes to biological factors that have to do primarily with important pathways linking social structures and health (Angel & Angel, 2006; Ham-Chande, Palloni, & Wong, 2009).

Application to Hispanic Aging: Immigration and Acculturation

While more research using a transdisciplinary perspective is needed, there are some previous examples examining centrally important factors related to immigration processes for understanding the biobehavioral influences on Hispanic (Mexican-origin) health and mortality (e.g., Angel & Angel, 1992; Angel, Buckley, & Finch, 2001; Angel, Angel, Díaz, & Bonazzo, 2010; Crimmins, Kim, Alley, Karlamangla, & Seeman, 2007; González et al., 2009; Markides & Eschbach, 2005; Moayad, Balcazar, Pedregón, Velasco, & Bayona, 2006; Peek, Cutchin, Salinas, et al., 2010; Vega & Amaro, 1994; Vega, Zimmerman, Warheit, Apospori, & Gil, 1993). An abundance of research show a favorable health advantage among Mexican immigrants compared to the native born despite their low levels of education and income (e.g., Palloni & Arias, 2004). But, immigration status is not a single

risk category (Angel et al. 2010). Recent studies show that the immigrant health advantage wanes across a range of biobehavioral markers, such as allostatic load (Peek, Cutchin, Salinas et al. 2010). The Hispanic (mostly Mexican-origin) immigrant mortality studies are compelling (Crimmins & Vasunilashorn, 2011). However, the evidence for various health outcomes is inconclusive. In this issue, we begin to address this gap in the literature by presenting state-of-the-art research demonstrating the effects of the Hispanic epidemiologic paradox on late adult Mexican-origin health in the U.S. Taken altogether the papers describe both 1) the complex relationship between the social aspects of health of aging individuals of Mexican descent and their interactions with genetic endowment and 2) how the specific risk factors for poor health are associated with immigration and acculturation. Furthermore, these examples and the papers in this special issue offer valuable insight to be gained from a biobehavioral perspective in the study of the etiology and to establish strategies for prevention of chronic illness in Mexican origin people.

Summary

The papers in this special issue make it clear that there are interesting and useful transdisciplinary approaches that increase our knowledge of health processes in older people of Mexican descent. Developing explanations of processes involved in health is complex, particularly in people of Mexican descent, and requires the understanding of causes at multiple levels of analysis (biological, psychological, social, and political). The papers here also inform us that as we gain awareness of the important biological influences in the aging processes, future research should not neglect conceptualizing the critical linkages between traditional social stratification, social inequalities, and social justice and the ways in which they interact for advancing the field of healthful aging.

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