

Dr. Teresa Seeman, PhD

Psychosocial Factors & Health

Her earliest research focused on the question of whether and how social environmental factors, especially social relationships, were related to health risks over the life course along with the role of individual psychological characteristics such as self-esteem, self-efficacy and perceptions of generativity. Her work in this area has documented the impact of social relationships on coronary artery disease, cognitive aging (b) and mortality (c). More recently they have explored interventions to generativity (1c) and psychological well-being (1d). As a result, there is growing interest in (a) including social assessments when evaluating health risks and (b) developing better resources and interventions to reduce health risks associated with relative social isolation and/or problematic social relationships.

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Seeman TE, Berkman LF, Kohout F, LaCroix A, Glynn R, Blazer D. Intercommunity variations in the association between social ties and mortality in the elderly: A comparative analysis of three communities. *Annals of Epidemiology*, 1993, 3:325-335. PMID:8275207

Gruenewald TL, Liao D, **Seeman TE**. Contributing to Others, Contributing to Oneself: Perceptions of Generativity and Health in Later Life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 2012; 67(6): 660-5. PMID: PMC3478723

Seeman T, Merkin SS, Goldwater D, Cole SW. Intergenerational mentoring, eudaimonic well-being and gene regulation in older adults: A pilot study. *Psychoneuroendocrinology*. 2020 Jan;111:104468. doi: 10.1016/j.psyneuen.2019.104468. Epub 2019 Sep 27. PubMed PMID: 31589939.

Biological Mediators

In the 1990's, Dr. Seeman became interested in elucidating the biological pathways hypothesized to link social influences to health and pursued post-doctoral training in neuroendocrinology. Work resulting from this new area of expertise examined the role of the social environment in patterns of age-related change in physiological regulation (2a-2d). More recently, her work has focused on efforts to increase the integration of a wide range of biological assessments into major population studies, including Mid-Life in the US (MIDUS), Coronary Artery Risk Development in Young Adults (CARDIA) and MESA (2c, 2d) in order to examine the role of such biological factors in mediating social effects on a range of major outcomes of aging. As a result of this work, there is significantly greater available biological data to support more extensive research to understanding how life experiences impact health via their influences on biological pathways. Evidence resulting from such research can help to direct efforts to implement more effective programs and policies to reduce health disparities.

Seeman TE, McEwen BS. Impact of Social Environment Characteristics on Neuroendocrine Regulation. *Psychosomatic Medicine* 58:459-471, 1996. PMID:8902897

Seeman TE, McEwen BS, Rowe JW, Singer BH. Allostatic load as a marker of cumulative biological risk: MacArthur Studies of Successful Aging. *Proc Nat Acad Sci USA* 98(8):4770-4775, 2001. PMID: PMC31909

Carroll JE, Gruenewald T, Taylor SE, Janicki-Deverts D, Matthews K, **Seeman T**. Childhood abuse, Parental Warmth, and Adult Multi-System Biological Risk in the CARDIA Study. *Proc Natl Acad Sci USA*. 2013 Oct 5; 110(42):17149-53. PMID: PMC3800991

Merkin SS, Karlamangla A, Elashoff D, Grogan T, **Seeman T**. Change in cardiometabolic score and incidence of cardiovascular disease: the Multi-Ethnic Study of Atherosclerosis. *Ann Epidemiol*, 25(12):912-7, 2015. PMID: PMC4688229

Allostatic Load

Her interest in the multiple biological pathways through which social factors appear to impact health led her to an early interest in the concept of multi-systems physiological aging (i.e., allostatic load [AL]). In 1993, Dr. Seeman led the first empirical work on AL. Since then, she has led projects testing alternative measurement models for AL (3a). Her work has also included analyses testing hypothesized relationships between AL and subsequent health risks which has documented significant links between greater AL and incident/recurrent cardiovascular events, along with risks for decline in cognitive and physical function and greater mortality (3b). More recently, they have explored more sophisticated methods of operationalizing allostatic load (3c, 3d). This work has stimulated a growing interest in AL (and other related multi-systems approaches to health) with resulting growth in the range of research on AL and its predictors and consequences.

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Buckwalter JG, Castellani B, McEwen B, Karlamangla AS, Rizzo AA, John B, O'Donnell K, **Seeman T**. Allostatic Load as a Complex Clinical Construct: A Case-Based Computational Modeling Approach. *Complexity*. 2016 Sep-Oct;21(Suppl 1):291-306. PMID: PMC4167677

Wiley JF, Gruenewald TL, Karlamangla AS, **Seeman TE**. Modeling Multisystem Physiological Dysregulation. *Psychosomatic Medicine*. 2016 Apr;78(3):290-301. PMID: PMC4844860

Social Disadvantage and Allostatic Load

More recently, Dr. Seeman has completed several projects examining relationships between various aspects of socio-economic and socio-relational disadvantage in childhood and adulthood in relation to AL. This work has documented the independent negative impacts of both early life economic and socio-emotional disadvantage as well as similar types of disadvantages later in adulthood (4a-d). Growing evidence linking both early and later life economic and social disadvantage to AL has stimulated awareness and interest in both early and later life interventions to reduce health disparities traditionally associated with exposure to greater economic and social

disadvantage over the life course. Related to the latter, she is the lead PI on a new NIA-funded Research Network on Early Adversity & Later Life Reversibility.

Gruenewald TL, Karlamangla AS, Hu P, Merkin SS, Crandall C, Koretz B, **Seeman TE**. History of Socioeconomic Disadvantage and Allostatic Load in Later Life. *Soc Sci Med*, 74(1):75-83, 2012. PMID: PMC3264490

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Merkin SS, Karlamangla A, Roux AV, Shrager S, **Seeman TE**. Life course socioeconomic status and longitudinal accumulation of allostatic load in adulthood: Multi-Ethnic Study of Atherosclerosis. *Am J Public Health*. 2014 Apr;104(4):e48-55. doi:10.2105/AJPH.2013.301841. Epub 2014 Feb 13. PubMed PMID: 24524526; PubMed Central PMCID: PMC4025706.