

$p < .001$ ) with only neighborhood safety and social cohesion being inversely associated with K6 ( $\beta = -.15, p < .001$ ). The interaction between ethnicity and neighborhood safety and social cohesion resulted in non-significant associations with K6 scores for all ethnic minority subgroups; however, for African Americans the relationship with psychological distress actually increased significantly ( $\beta = .24, p < .001$ ). Our findings suggest that specific types of social capital may be helpful in remediating psychological distress for certain ethnic minority groups.

#### INCREASED C3 IN THE AGING BRAIN PROMOTES INFLAMMATORY TRANSITION IN ENDOTHELIAL CELLS

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Innate immunity has been implicated in normal aging, and age-related disease. The connection between age-related neuroinflammation and change in brain vasculature prior to disease onset remains poorly understood. The complement pathway is an established mediator of neuroinflammation, and increased complement C3 is seen in the aging brain. Thus, we asked whether C3 can promote changes in brain vasculature. We found age dependent increase of brain C3 levels in C57BL/6J mice. Furthermore, we found an increase in expression of adhesion molecule VCAM-1 in endothelial cells (ECs) of the cortex and hippocampus, which was rescued in aged C3a receptor null (C3ar1<sup>-/-</sup>) mice and aged C3a receptor (C3aR) antagonist treated mice. We confirmed these results by qPCR analysis for Vcam1 in sorted ECs. Human brain microvascular endothelial cells (HBMECs) treated with C3a showed increased expression of VCAM-1, but not other adhesion molecules. Sorted ECs from C3ar1<sup>-/-</sup> mice challenged with LPS confirmed these findings. Furthermore, C3aR signaling in ECs showed increased blood-brain barrier (BBB) permeability using trans-endothelial electrical resistance (TEER), and BBB impermeable dye injections. HBMECs treated with C3a revealed mis-localization of VE-Cadherin, followed by reduction in protein level when analyzed by immunofluorescence, which promotes increased barrier permeability. As a functional consequence of VCAM-1 expression and increased BBB permeability we found aged mouse brains have increased peripheral lymphocyte (CD45<sup>+</sup>/CD11b<sup>-</sup>) infiltration, which was reduced in a C3aR dependent manner. In conclusion, our work suggests there is a strong relationship between C3 expression and vascular C3aR contributing to a functional transition in endothelial cells during aging.

#### RETURNING THE FAVOR: EXPECTATIONS OF CAREGIVING RECIPROCITY AND DEPRESSIVE SYMPTOMS AMONG GRANDPARENTS

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This study draws upon social capital and intergenerational reciprocity concepts to better understand how grandparents' depressive symptoms are related to their provision of grandchild care, within the context of their expectations regarding adult children reciprocating caregiving needs in the future. Analyses used the 2014 Health and Retirement Study

dataset. The sample consisted of 9,612 grandparents, 2,595 of whom were providing grandchild care. Linear regression models were used to analyze how depressive symptoms were influenced by grandchild care provision and expectations of future care from adult children. Future care is measured as expectations from (1) any adult child, and (2) from the same adult child for whom the older parent provides grandchild care. Provision of grandchild care was not significantly related to grandparents' number of depressive symptoms. Among grandparents who provided grandchild care, both expecting any adult child and expecting the same adult child were associated with reporting fewer depressive symptoms. Expecting any adult child to provide future care showed a stronger effect than expecting the same adult child to provide future care. The results suggest that expectations of general reciprocity within the family system, rather than specific dyadic reciprocity, may be more important for a caregiving grandparent's emotional well-being. Providing grandchild care while expecting future care from adult children can indicate a sense of social capital within an intergenerational family system. Expecting support reciprocity from adult children may be a protective factor that allows caregiving grandparents to feel more secure about their future care needs, and consequently, less depressed.

#### HIPPOCAMPAL GLUTAMATE MODULATION DURING MEMORY ENCODING: ASSOCIATION WITH AGE AND SUBFIELD VOLUMES

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Hippocampal glutamatergic activity plays a pivotal role in memory consolidation, including the ability to form novel associations that declines with age. To test whether glutamatergic dysfunction may underpin age-related memory declines, we examined in vivo age differences in hippocampal glutamate modulation during encoding of associations, and its relationship with hippocampal subfield volumes. Proton functional magnetic resonance spectroscopy was performed on 32 young (25.1±2.8 years; 18 females) and 16 older (65.9±2.7 years; 7 females) adults to measure changes in hippocampal (randomly assigned right or left) glutamate during an object-location paired association learning task (with 12 cycles of encoding-retrieval epochs). Volumes of the dentate gyrus&CA3, CA1, subiculum, and entorhinal cortex were manually measured from T2-weighted MRI images. Memory performance differed between the age-groups [F(1, 46)=8.56,  $p < .01$ ], with the older attaining a lower asymptote [t(46)=2.93,  $p < .05$ ] compared to the younger. Age differences in glutamate were observed only during encoding (age-group x epoch: F(3,137)=5.28,  $p < .01$ ), and varied over the epochs. Young adults showed increased glutamate during the first four encoding epochs of each cycle, with levels remaining high thereafter. Old adults evidenced a decrease in glutamate during the first four epochs, and a slow, sustained ramping-up afterwards. Including both age-groups, the maximum change in glutamate, calculated using the maximum and minimum levels during encoding, was positively associated with CA1 [F(2,39)=4.28,  $p < .05$ ] and the dentate gyrus&CA3 volume [F(2,39)=4.4,  $p < .05$ ], after correcting

for multiple comparisons. Glutamate modulation specific to encoding may underlie age-related memory declines and be related to selected hippocampal subfield volumes.

#### PURPOSE AND NUMBER OF CHRONIC HEALTH CONDITIONS AMONG OLDER ADULTS

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An overwhelming three-quarters of persons age 65 and over have multiple chronic health conditions (Gerteis et al., 2014). With a growing population of older adults, understanding the factors that predict health and reduce the risk of chronic disease is critical. Recent evidence finds that a high sense of purpose- "the belief that one's life is purposeful and meaningful" (Ryff & Keyes, 1995, p. 720)- is associated with positive health outcomes among older adults. This study investigated the association between purpose and number of chronic conditions among older adults, and whether the relationship depended on age. The study included 6148 older adults (mean age=83.8) who participated in a larger study on wellness. Participants completed a survey that included a measure of sense of purpose and questions about chronic health conditions. Data were analyzed controlling for demographics, optimism, pessimism, social contact, BMI, physical activity, and smoking. Lower levels of purpose were significantly associated with higher numbers of chronic conditions. There was a significant interaction between purpose and age, such that relatively younger older adults with high levels of purpose had fewer chronic conditions. There was no relationship between purpose and number of chronic conditions for the oldest adult participants. The results add new findings to the body of research that demonstrates that sense of purpose is associated with chronic disease. As sense of purpose is modifiable, interventions that increase purpose among older adults, with an emphasis on the youngest-old, should be developed and implemented.

#### TRANSITION TO A MORE EVEN DISTRIBUTION OF PROTEIN INTAKE IS ASSOCIATED WITH ENHANCED FAT LOSS IN OBESE OLDER ADULTS

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Background: Optimization of intentional weight loss in obese older adults, through preferential fat mass reduction, is challenging, as the concomitant lean mass loss may exacerbate sarcopenia. Here, we assessed whether changes in within-day protein intake distribution are related to improvements in body composition in overweight/obese older adults during a hypocaloric and exercise intervention. Methods: Thirty-six community-dwelling, overweight-to-obese (BMI 28.0-39.9 kg/m<sup>2</sup>), sedentary older adults (aged 70.6±6.1 years) were randomized into either physical activity plus successful aging health education (PA+SA; n=15) or physical activity plus weight loss (PA+WL; n=21) programs. Body composition (by CT and DXA) and dietary intake (by three-day food records) were determined at baseline, 6-month, and

12-month follow-up visits. Within-day protein distribution was calculated as the coefficient of variation of protein ingested at breakfast [5:00–10:59], lunch [11:00–16:59] and dinner [17:00–1:00]. Secondary analysis was performed to determine associations between changes in protein intake distribution and body composition. Results: In both groups, baseline protein intake was skewed towards dinner. The pattern of protein intake changed towards a more even within-day distribution in PA+WL, but it remained unchanged in PA+SA. Transition towards a more even pattern of protein intake was independently associated with a greater decline in BMI (P<0.05) and abdominal subcutaneous fat (P<0.05) in PA+WL. However, changes in protein CV were not associated with weight loss in PA+SA. Conclusion: Our results show that mealtime distribution of protein intake throughout the day was associated with improved weight and fat loss under hypocaloric diet combined with physical activity.

#### CHILDREN CAREGIVERS' EXPERIENCES OF OLDER ADULTS WITH DEMENTIA IN CARE TRANSITION: A QUALITATIVE SYSTEMATIC REVIEW

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Background/Purpose: Young and adult children have experienced caring for people who have been diagnosed with dementia. Caregiving needs affect family members who become the primary caregivers in care transition from hospital to home. This study aims to synthesize primary qualitative research on the experiences of children caregivers of older adults with dementia. Method: This is a systematic review describing young and adult child caregivers' experiences in caring for patient with dementia in home-based care. Data sources were published literature written in English from CINAHL, Scopus, PubMed, and PsychoINFO (published from January 1976 to October 2018). The thematic synthesis approach was also applied to generate theory generating meta-synthesis research (TGMS). and to describe the process of caring for demented patients by caregivers. Result: Eight primary studies reporting 388 potential studies were included. Four themes emerged: 1) well-being which included encouraging and destructive well-being; 2) role transition which included positive or negative role transformations; 3) caregiver needs which included medical and nursing information or knowledges and health care services/community services; and 4) the challenge of dementia which included symptoms of dementia which were impairing. Conclusion The findings of this meta-synthesis study support evidence of well-being among adult children in caring for people with dementia in transition phases. We present thematic synthesis that could be useful to professionals working with caregivers and patients with dementia. We suggest that research importance should shift towards the development and evaluation of care transitions intervention, especially professionals preparing support after diagnosis.

#### ANGER, LOVE, SADNESS: DO EMOTION WORDS HAVE THE SAME SEMANTIC MEANING ACROSS AGE-GROUPS?

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