

FALL 2023

VIRGINIA COGNITIVE AGING PROJCT (VCAP)

EXCITING NEWS FROM THE COGNITIVE AGING LAB!

We are thrilled to share some exciting updates from the Virginia Cognitive Aging Project! Currently, we are embarking on a new study in aging and are fortunate to have the opportunity to assess a small group of 50 returning participants! Our primary focus is to delve into the intricate dynamics of memory as it relates to aging, specifically exploring how individuals retrieve newly learned information under different conditions. Moreover, we are keen on understanding the potential impact of COVID-19 on participants' lives and cognition. By examining this aspect, we hope to gain insights into the challenges faced and resilience demonstrated by individuals like yourself. Your valuable contributions will aid us in advancing our understanding of cognitive aging and its various facets.

Newsletter Highlights

News from the Lab

Meet the Research Team

Updating Contact Information

Partnership Announcement

Recent Findings

Understanding the Long-Term Impacts of COVID-19



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MEET OUR CURRENT RESEARCH TEAM!

A group of Principal Investigators have been integral members of the Virginia Cognitive Aging Project (VCAP) since the retirement of Prof. Salthouse in 2019.



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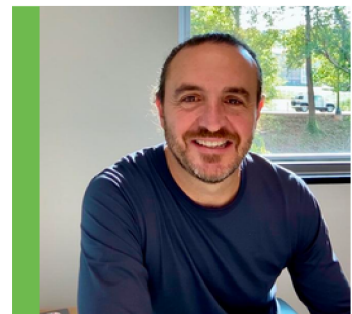
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We also want to highlight the outstanding efforts of our research assistant team, who have assessed the group of participants recruited for this year's study. With their expertise, professionalism, and compassionate approach, our research assistants have fostered a welcoming and comfortable environment for our participants.



From left to right: Jessica Grob, Bridget Lee, Ipshi Khan, and Julia Elise Reichle

UPDATING PARTICIPANTS' CONTACT INFORMATION: STAY CONNECTED WITH US!

At the Virginia Cognitive Aging Project (VCAP), we value the ongoing engagement and participation of our research participants. To ensure that we can keep you informed about our latest studies and maintain accurate records, **we are in the process of updating your contact information.**

In the coming months, you can expect to hear from us via email or phone. We kindly request your assistance in providing any necessary updates to your **address, phone number, and your interest in participating in future studies.** Your cooperation in this matter will enable us to continue delivering relevant information and opportunities tailored to your preferences. We understand that your time is valuable, and we appreciate your willingness to help us keep our records up to date. Rest assured that all the information you provide will be handled with the utmost confidentiality and used solely for research-related purposes.

**Collaboration
with the Brain
Institute at
the UVA
School of
Medicine!**

The Virginia Cognitive Aging Project (VCAP) is embarking on a partnership with the Brain Institute at the UVA School of Medicine for future studies. This collaboration promises to enhance our research capabilities and provide new insights into the fascinating field of cognitive aging.

HOT TOPICS: RECENT FINDINGS ABOUT AGING...

Can A Blood Test Reveal Your Brain's Health? (by Bridget Lee)

Have you ever wondered how your behaviors and environment affect the way your genes work? Well, the study of epigenetics does just that! Recent advances in epigenetics have led to the development of blood-based DNA tests that help calculate the age that someone is operating at biologically and physically, which may be different from their chronological age. These blood tests are called epigenetic clocks, and they aid in the ability to estimate health and lifespan. However, we do not know much about their ability to predict neuron degeneration during the aging process.

VCAP researchers **James P. Morris and Jason Druzgal** focused on a specific epigenetic clock, or blood test, that is highly predictive of cardiovascular health conditions such as time-to-heart disease, high blood pressure, and diabetes. **The researchers were curious to see if a blood test that predicts cardiovascular health could predict brain health as well.** Therefore, they used MRI scans to examine the brains of participants over 60 years old for evidence of cellular degeneration. More specifically, they investigated brain lesions associated with cognitive decline over a 2-year period.

Thanks to your participation, this innovative study was the first to establish an association between measures of cardiovascular health and brain health! **The researchers found that the blood test that predicts cardiovascular health can also predict neuron deterioration over multiple years.** Therefore, it may be useful for predicting an individual's trajectory of age-related neuron decline. Something as simple as a blood test may be crucial in identifying people who may be at risk of brain or cognitive problems in the future.

Can Depression Predict Memory Loss Over Time? (by Ipshi Khan)

With increased depression rates, researchers have gained an understanding of its harmful impacts on one's well-being, social relations, and overall quality of life. However, the long-term impact of this illness, particularly in association with memory loss, is yet to be thoroughly understood. To examine this relationship, researchers working with the VCAP researcher **Dr. Mariana Teles in collaboration with Dr. Dinging Shi conducted a study to further understand the association between high depressive symptoms and low memory performance.**

This study included a population of 2057 older adults, ranging from 60 to 99 years old. It was conducted over 10 years, with the participants' memory and depressive symptoms being assessed at five different time points within that period. Researchers analyzed the data collected to understand if depression predicts memory over time, or vice-versa. Additionally, they examined if there was a mutual relationship between these two variables over time instead.

The results of this study were interesting! **The data analysis depicted that higher levels of depression predicted a higher, more rapid decline in memory loss. Those with higher levels of positive effect (lower depressive symptoms) displayed better performance in memory.** This study overlapped with other studies examining these variables, showing that higher initial levels of depression strongly impact an individual's memory by causing it to decline more rapidly.

The contribution of thousands of research participants engaged in the project enriched the ongoing debate of depression and reduced cognitive abilities and gave us insight into preventative measures we can take!

Is Computational Modeling the Future of Cognitive Aging Research? (by Jessica Grob)

Due to the multifaceted nature of cognitive aging, it is often difficult for researchers to pinpoint specific causes or mechanisms of observed trends. **Two researchers from the VCAP, Dr. Per Sederberg and Dr. Kevin Darby**, have explored computational modeling as a possible solution to this dilemma. Computational models are a series of algorithms used to simulate and analyze complex systems. **The use of computational models for studying cognitive aging is very promising as it eliminates room for interpretation found in popular verbal theories, and it impels researchers to mathematically support their ideas.** In this study, a computational model was used to provide a mathematically transparent explanation for the mechanism that underlies associative recognition tasks.

Eighty-two young adults and fifty-two healthy older adults were shown paired images of everyday objects. The images were shown again either in their initial pairings or recombined. Participants were asked to identify if the images being shown were the original pair or if they were a new combination of images. How quickly and accurately participants responded was measured.

Researchers found that older adults were slower and less accurate in determining if the paired images were a “new” or “old” combination when compared to young adults. While reaction time and accuracy are key measures, they do not tell the full story. Many factors impact how quickly and accurately a participant responds to the stimuli presented. One factor, for example, is “**familiarity**”. If the same paired images were presented twice in a row, the participant would be more familiar with this pairing and, therefore, more likely to respond “old”. Another factor is “**nondecision time**”, an estimate of how long a participant needs to perceive a stimulus and physically respond. **Generally, researchers found that older adults have lower familiarity and longer nondecision time.** Using parameters, a computational model accounts for factors like “familiarity”, “nondecision time”, and so much more to provide a more complete representation of cognitive processes affected by aging. Specifically, **this study’s use of computational modeling suggests that differences in prediction error learning between age groups could be the underlying cause for performance differences in the associative recognition task.** This is just scratching the surface of the many potential benefits using computational models can have on furthering our understanding and research of cognitive aging.

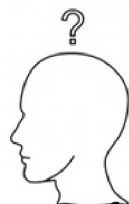
Memory Complaints vs. Reality: Does Our Perception Really Reflect Reality? (by Elise Reichle)

As we age, it is common to experience changes in our memory. Some individuals may notice differences and complain about their memory not being as sharp, known as subjective memory complaints. Do these complaints reflect the actual state of our memory, as measured by objective memory tests? **Dr. Mariana Teles and Dr. Dingjing Shi** conducted a study involving older adults aged 60 to 99 years to investigate the relationship between memory complaints and actual memory performance. The study took place over ten years, with participants assessed at five-time points. Three dimensions of SMC were examined - Frequency of Forgetting, Seriousness of Forgetting, and Retrospective Memory. "Frequency of Forgetting" reflects how often individuals believe they forget things. The "Seriousness of Forgetting" scale reflects how disruptive participants found memory lapses to be in their day-to-day lives. The "Retrospective Memory" scale reflects whether individuals believed their memory functioning improved or worsened over time.

Retrospective Memory
"Has my memory gotten better or worse?"

Seriousness of Forgetting
"Does forgetting things disrupt my life?"

Frequency Of Forgetting
"How often do I forget things?"



The findings are fascinating! Some aspects of memory complaints, like how often individuals forgot things and how disruptive these memory lapses were, predicted changes in objective memory performance. However, in terms of whether an individual believed their memory improved or worsened over time, objective memory performance does not predict these self-perceived changes. The study also examined the influence of depressive symptoms and education as third variables. Interestingly, depressive symptoms emerged as the most significant factor affecting memory self-reports. Researchers also observed that individuals with higher education levels reported memory performance more accurately.

Subjective memory complaints can serve as important markers of potential memory issues, but they may not always perfectly reflect objective memory decline. This study has important implications for the early detection of cognitive changes and may guide interventions to maintain cognitive health.

Thank you to all the participants who contributed to this important research! You are a crucial part in our journey towards uncovering the nature of memory and aging.

UNDERSTANDING THE LONG-TERM IMPACTS OF COVID-19: YOUR PARTICIPATION MATTERS!

In light of the potential long-term impacts of COVID-19 on various aspects of your life, including well-being, social interactions, and cognitive functioning, **we kindly request your participation in an online survey that will be sent out to all participants' email addresses. The survey, which can also be completed via a phone call, aims to gather valuable information on the potential impact of COVID-19 infections and the severity of symptoms on your overall well-being and cognitive functioning.**

All information you provide will be treated with the utmost confidentiality and used strictly for research purposes.

**THANK
YOU!**

We cannot express enough how grateful we are to have the opportunity to work with such kind and motivated individuals like yourselves. Every interaction with our participants has always been a delightful experience for our research team. Your willingness to participate and contribute to the advancement of scientific knowledge is highly appreciated!