(4086) Navigating Uncertainty: Age- and ADRD-related Differences in Explore-Exploit Tradeoffs Across Gambling and Navigation

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INTRODUCTION

Decision-making requires balancing exploration (seeking new options) and exploitation (relying on familiar ones).

People balance this tradeoff during navigation when using:

- **Place-based strategies:** Flexible *shortcut* taking.
- **Response-based strategies:** Habitual following of the *learned route*.

Aging is associated with a shift from exploration to exploitation.

Aim 1: Investigate age-related differences in exploration across gambling and navigation.

Aim 2: Examine the impact of aging on navigation performance (e.g., goals found) and confidence.

METHODS

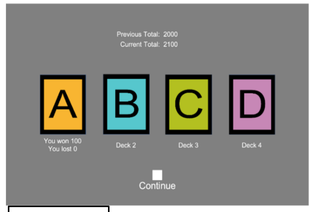
Participants

	Older		Younger	
	Female	Male	Female	Male
N	23	15	111	35
Mean	70.61	71.87	19.56	19.36
SD	8.36	5.21	1.37	1.01

- Older Adult data collection is ongoing.
- Subjective Cognitive Decline (SCD) group data collection is beginning.

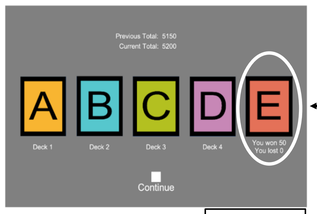
Gambling Task

Iowa Gambling Task (IGT)[6]



100 trials

Novel IGT



60 trials

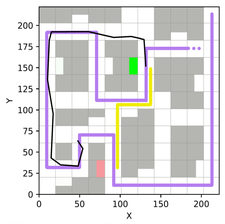
A new deck is presented. Will subjects choose to explore it?

Navigation Task

Dual Solution Paradigm (DSP)[7,8,9]

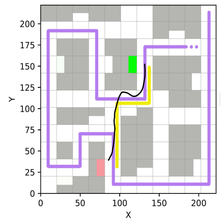
Response Strategy

Following familiar route



Place Strategy

Taking shortcuts



Path taken

Available shortcut

Familiar route

A shortcut is available. Will subjects choose to explore it?

Explore

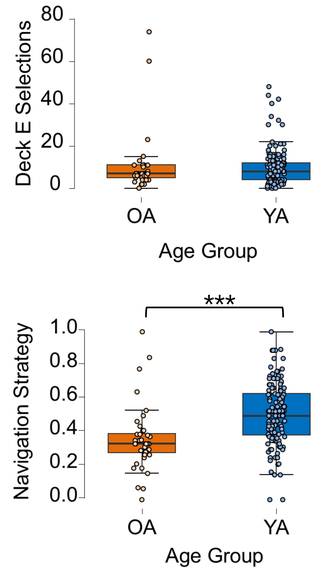
Exploit

Or will they continue to follow the route they know?

Additional Control Measures

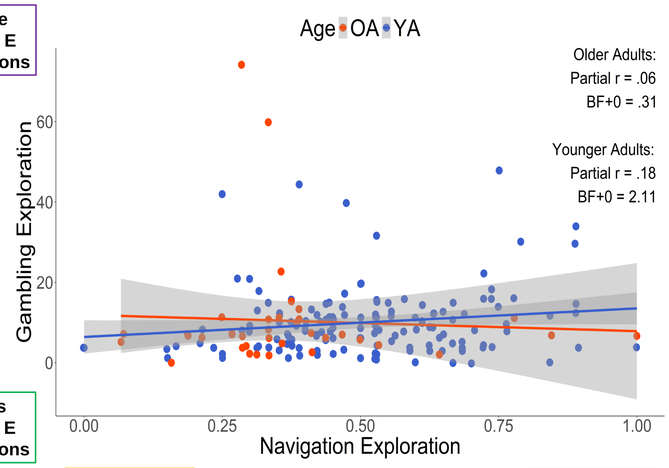
- Virtual Silcton[10] (spatial ability control)
- Go/NoGo[11] (decision-making control)

RESULTS



More Deck E selections

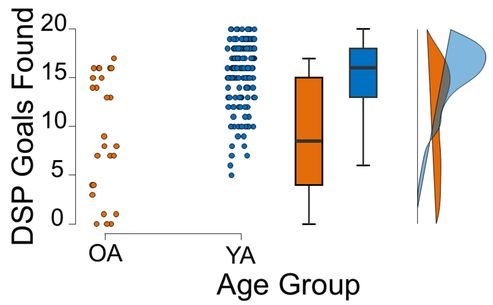
Less Deck E selections

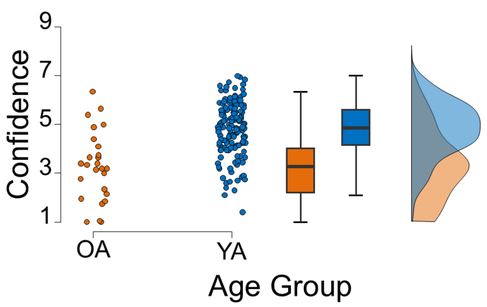


Response Strategy ⟷ Place Strategy

<u>Aim 1:</u> Greater flexibility and exploration across gambling and navigation tasks for younger (r = .18) than older(r = .06) adults.

<u>Aim 2:</u> Younger adults are more successful at reaching the goal ($BF_{10} > 100$) and have higher confidence ($BF_{10} > 100$) than older adults when navigating.





DISCUSSION

Aim 1

- Younger adults demonstrate domain-general exploration across gambling and navigation tasks.
- Older adults show weaker and domain-specific exploration tendencies, suggesting age-related declines in flexibility.

Aim 2

- Younger adults outperform older adults during navigation.
- Navigation confidence declines significantly with age.

Implication

- Aging reduces exploration tendencies and navigational flexibility, shifting strategies toward exploitation.

Future Directions

- Investigate neural mechanisms driving age-related exploration shifts.
- Explore the role of cognitive decline in risk tolerance (SCD group).
- Develop interventions that encourage flexible navigation in older age.

ACKNOWLEDGEMENTS

This research was supported by the Scientific Research Network on Decision Neuroscience and Aging (SRNDNA; NIH R24AG076847-01, EP), UF Center for Behavioral Economic Health Research (CBEHR14950070, EP), NIH (K01AG070333-01, SMW), and the Florida Department of Health Ed & Ethel Moore Alzheimer's Disease Research Program (Grant 21A09, SMW).

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