

Sex Differences in Executive Functioning in the LEAP! Rx Exercise Study

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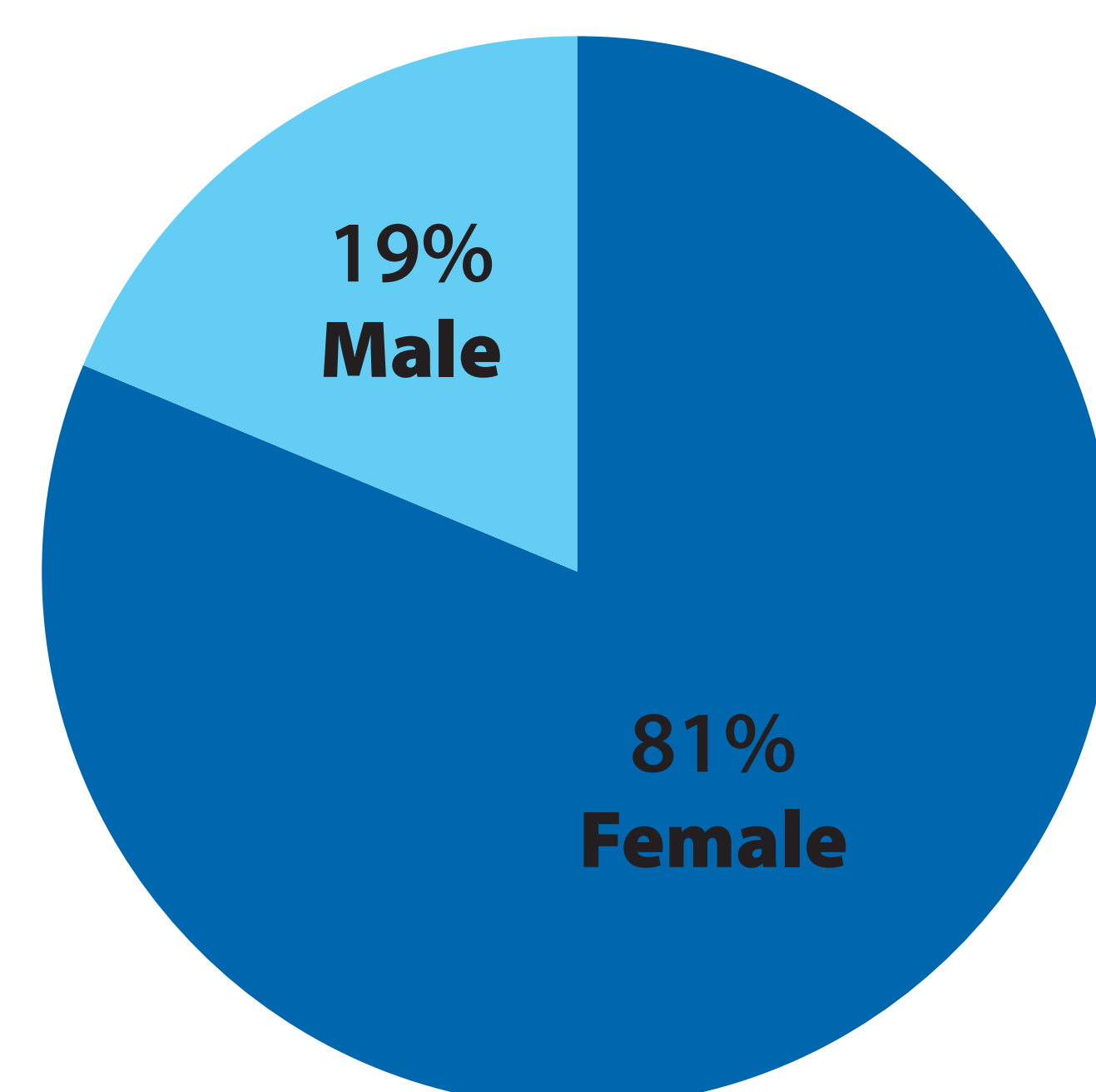
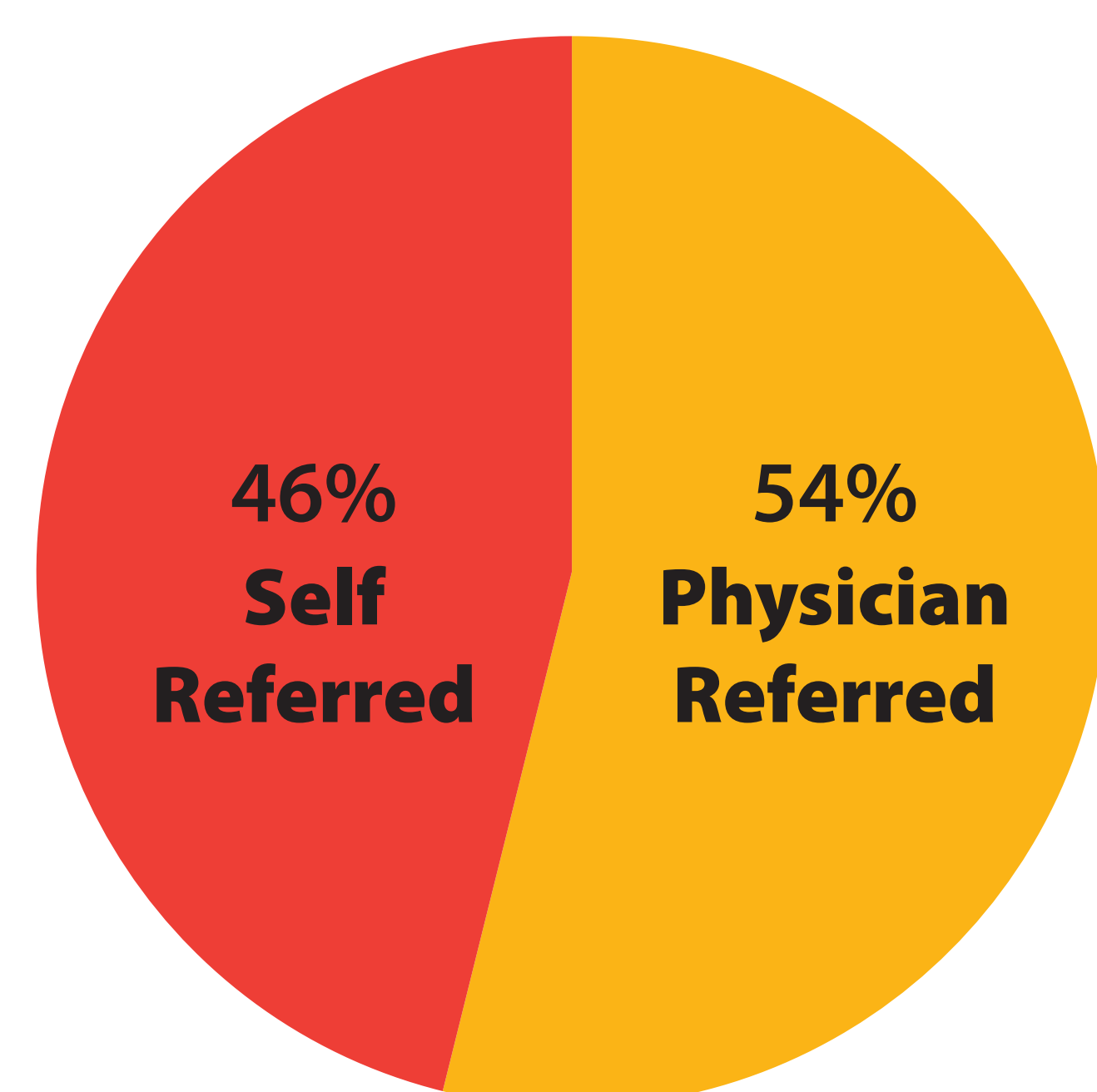
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Background & Objectives

- Executive functioning declines with age and is critical in maintaining independence in older adulthood.
- Female's executive functioning tends to decline more rapidly than male's.
- Previous research suggests aerobic exercise benefits executive functioning.
- Females age 65+ tend to be more sedentary and engage in less physical activity than age-matched males and being sedentary can have a greater negative impact on cognition in females than males.
- Thus, increasing physical activity may have a greater impact on cognition in females than in males.
- The literature reveals mixed findings concerning whether sex moderates the cognitive benefit of exercise.
- We hypothesized that males and females would differ in executive function in response to the LEAP! Rx exercise intervention.

Participants

Characteristic	Frequency (n)	%
Race		
White/Caucasian	186	84.93%
Black/African American	26	11.87%
Hispanic/Latinx	4	1.83%
Education		
< College degree	3	1.36%
College graduate	12	5.49%
Post graduate degree	204	93.15%
Age		
Mean	72.28	Range
		65-83



Methods

LEAP! Rx Exercise Intervention

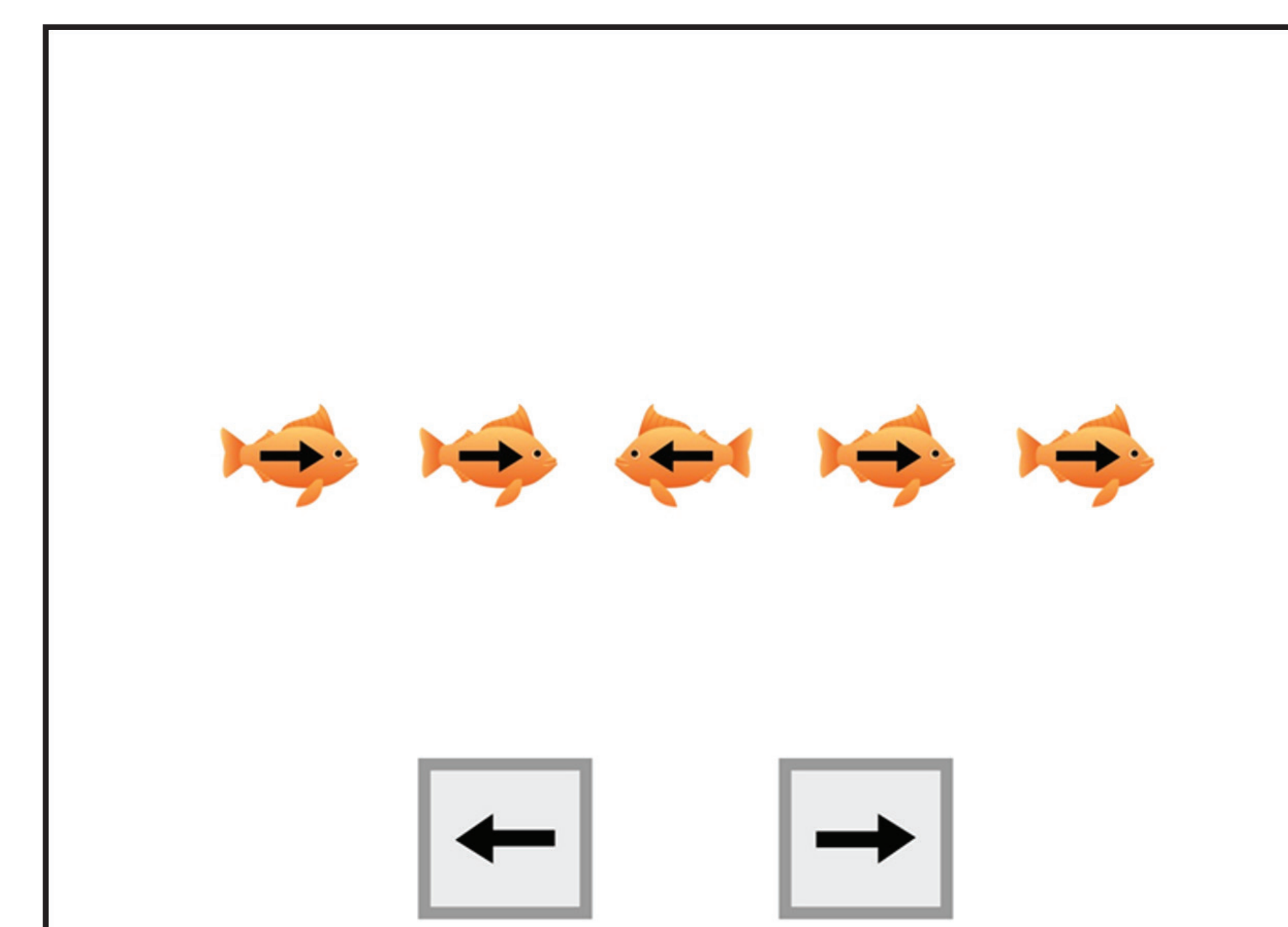
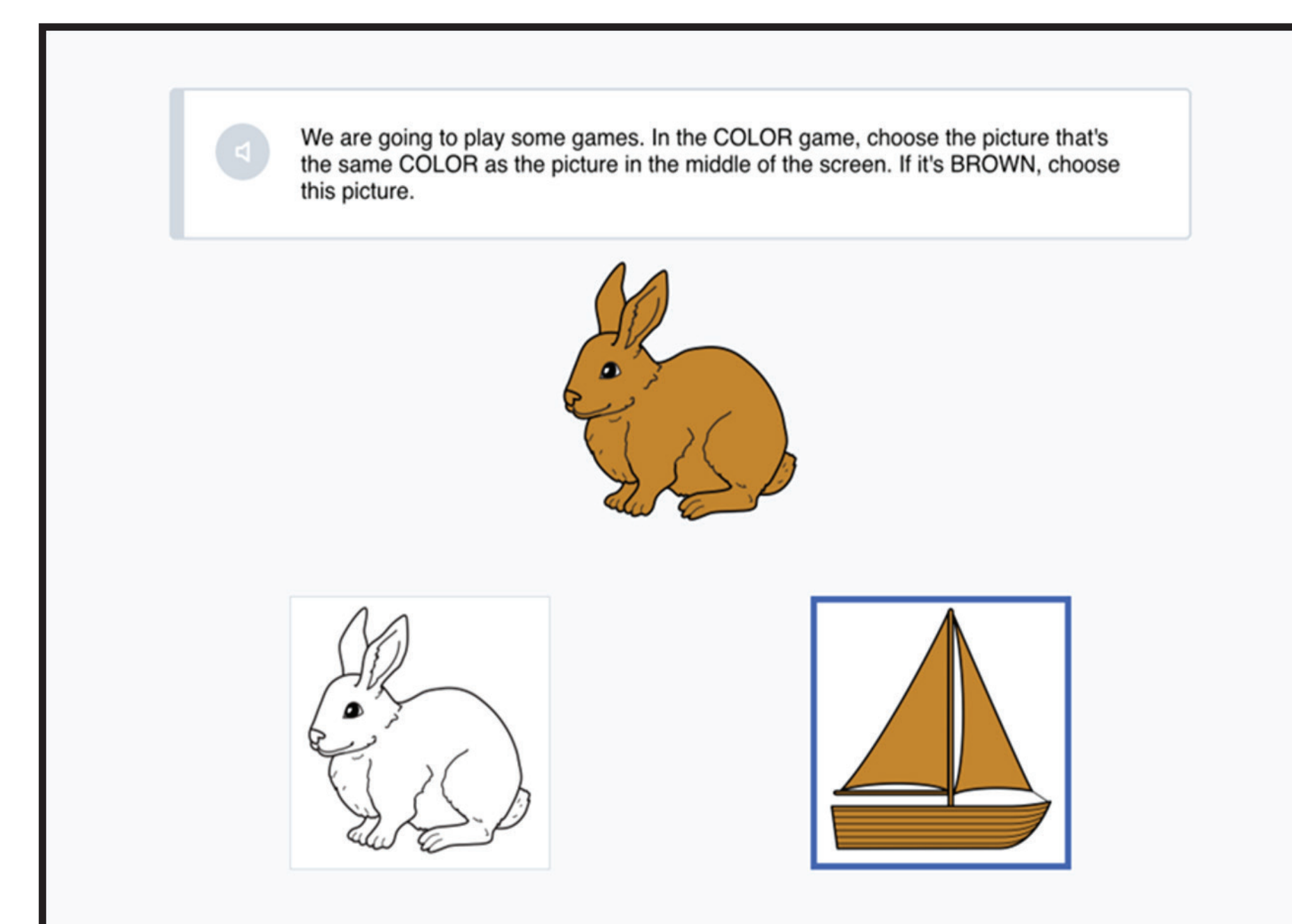
- 12-Week Empowerment Phase: regular supervised aerobic exercise (twice per week, Weeks 1-6, then once per week, encouraged to perform resistance exercises twice a week)
- 40-Week Lifestyle Phase: coaches encouraged adherence to exercise program with less frequent coaching support visits
- Monthly Alzheimer's prevention education classes

Control Condition

- Educational information on benefits of a healthy lifestyle at baseline
- Randomized to a "waitlist" to begin exercise training

Both Groups

- We randomized 219 older adults to the LEAP! Rx exercise intervention (N = 110) or a control group (N = 109)
- Executive functioning measures completed at baseline, week 12, and week 52 using Dimensional Card Sort Change test and Flanker Inhibitory Control test (NIH Toolbox Version 2)

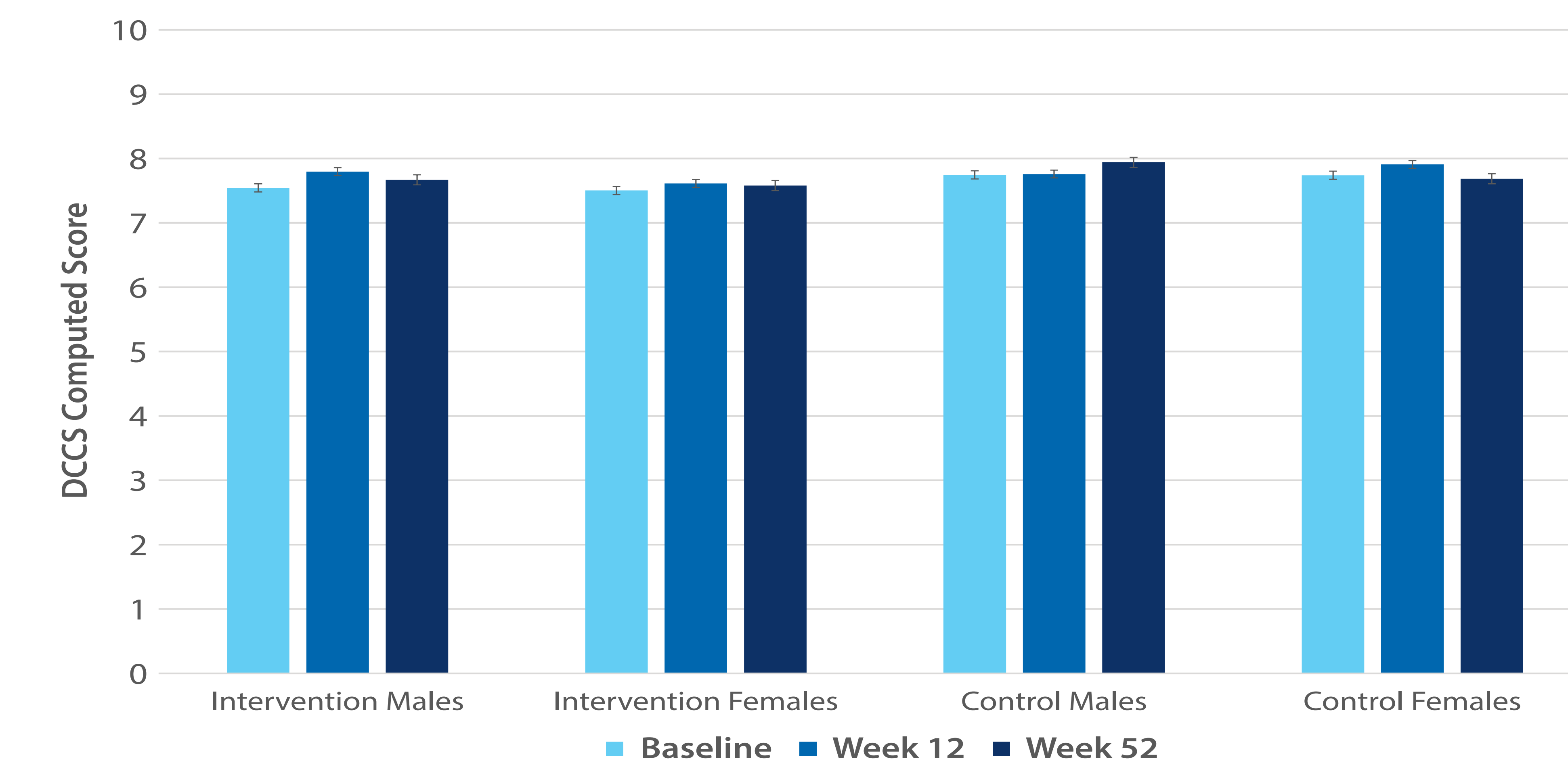


Results

Analysis

- 2x2 repeated measures ANOVAs analyzing the effects of sex (male vs. female) and group (intervention vs. control) on Flanker and DCCS computed scores across Baseline, 12 weeks, and 52 weeks, controlling for age and education

	DCCS ANOVA			Flanker ANOVA		
	df	F	p	df	F	p
Group	1	1.54	.22	1	.60	.44
Sex	1	0.13	.72	1	.17	.68
Time	2	1.40	.25	2	1.08	.34
Group x Sex x Time	2	2.20	.11	2	1.72	.18



Conclusions

- Previous results in this sample showed that although the intervention group significantly improved in cardiorespiratory fitness compared to the control group, the intervention did not appear to influence overall cognitive performance.
- Executive functioning scores had a ceiling effect, limiting our ability to detect improvements.
- Future research should include more challenging tests of executive function to investigate mechanisms by which exercise may improve executive function, such as cardiorespiratory fitness or intervention adherence.
- Our project contributes to examinations of individual characteristics most likely to benefit from exercise.

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