

# Physical Activity, Cognitive Functioning, and Amyloid-β in Adults with Down Syndrome

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## Introduction

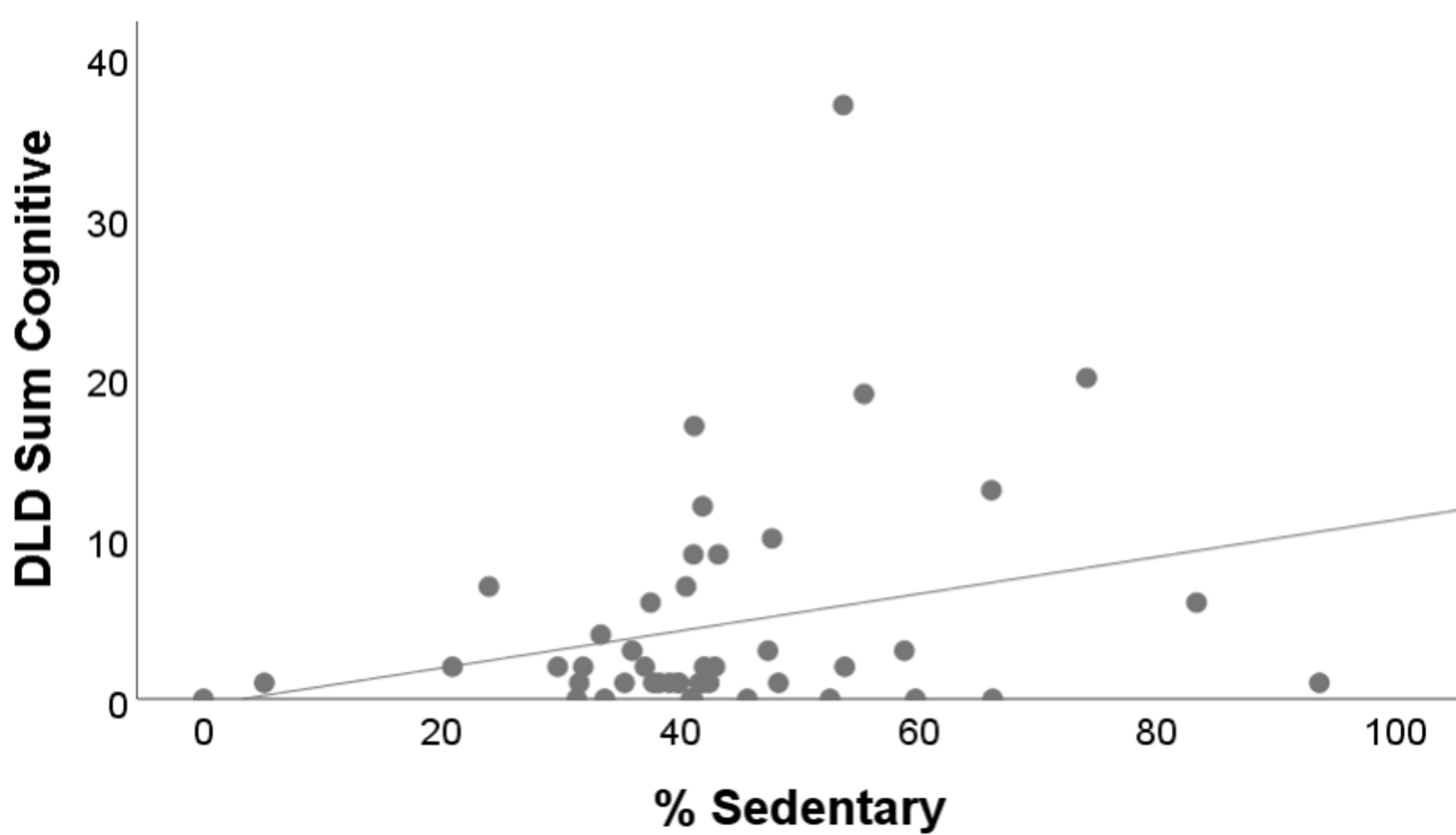
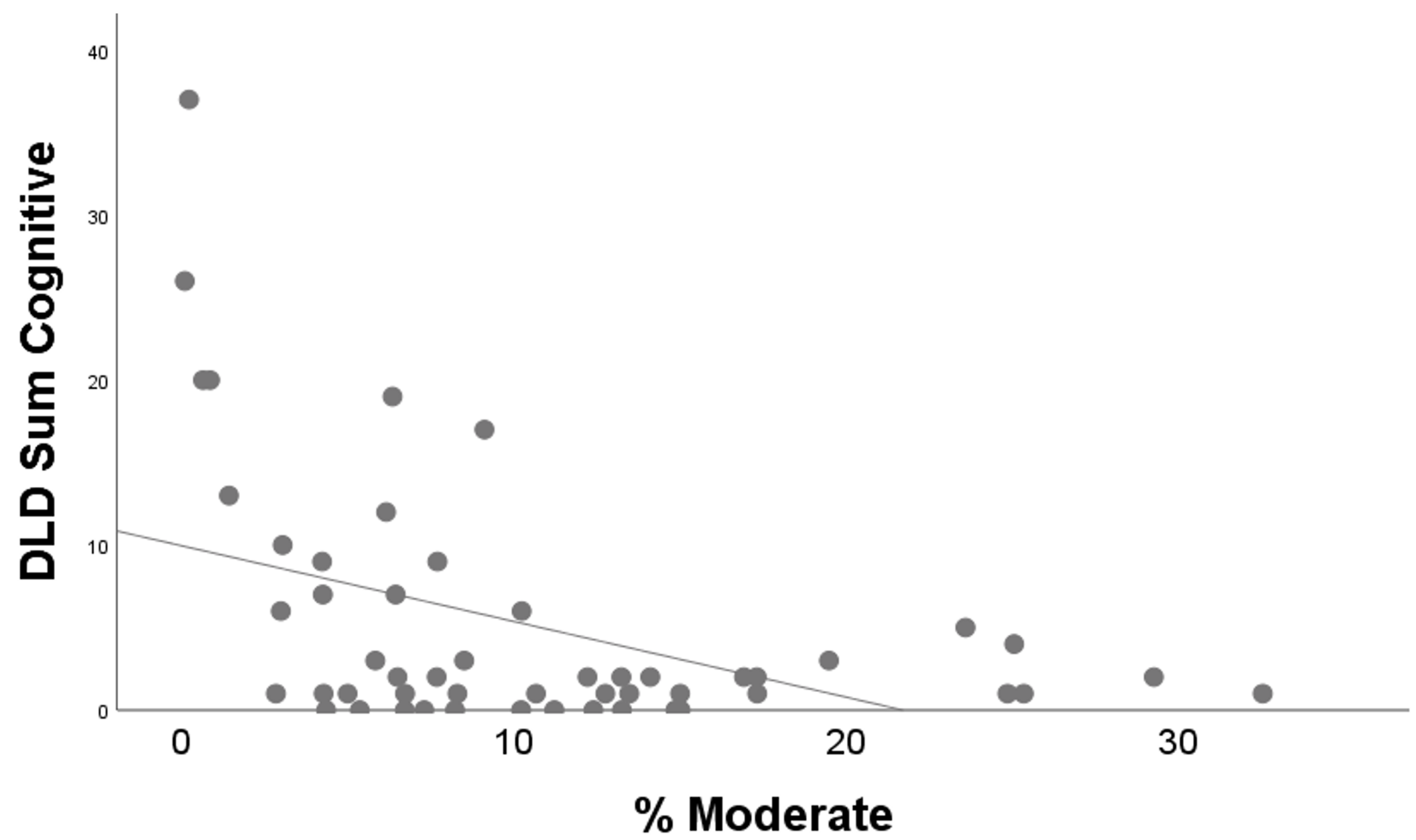
- Adults with Down Syndrome (DS) are at high risk for developing Alzheimer's Disease (AD)
- This high risk is attributed to the overproduction of amyloid beta(Aβ), due to the triplication of the APP gene on chromosome 21
- Despite this genetic risk, there is variability in the age of onset of AD in the DS population
- Modifiable lifestyle factors, such as physical activity, may contribute to this variability.
- The goal of the current study was to examine the association between physical activity, cognitive functioning, and PET Aβ in non-demented adults with DS

## Methods

- 52 non-demented adults with DS, who were part of the Alzheimer Biomarker Consortium in Down Syndrome (ABC-DS)
- Wrist-worn actigraph accelerometer for 7-days
- Half were male (n=26); aged 25 to 55 years (M = 38, SD = 8.4)
- Cognitive functioning was assessed via directly-administered measures
- Participants underwent MRI and PET scans

## Physical Activity and Cognitive Functioning

		Moderate (%)			Sedentary (%)		
		R	Partial R (Age)	Partial R (Age and PPVT)	R	Partial R (Age)	Partial R (Age and PPVT)
Executive Functioning	Cat & Dog Stroop	-0.361**	-0.366*	-0.295	0.331*	0.423**	0.394*
Episodic memory	Rivermead	0.453**	0.269	0.177	-0.348*	-0.291	-0.23
	Free & Cued Recall	0.317*	0.071	-0.032	-0.213	-0.246	-0.186
Verbal Fluency	Verbal Fluency	0.364**	0.262	0.167	-0.197	-0.150	-0.056
Visuospatial	Block Design	0.333*	0.2	0.07	-0.310*	-0.239	-0.158
Motor Planning & Control	Purdue Pegboard	0.458**	0.317*	0.258	-0.114	-0.046	0.023
Dementia	DSME	0.444**	0.257	0.129	-0.291*	-0.172	-0.038
	DLD	-0.459**	-0.286**	-0.188**	0.469**	0.425**	0.407**



Measures: **Cat & Dog stroop**: switch error score. **Rivermead**: total score of Picture Recognition subtest, Rivermead Behavioral Memory test. **Free & Cued Recall**: Summed free + cued recall score. **Verbal Fluency**: NEPSY Verbal Fluency for animals and food/drink (60 seconds). **Block Design** = summed WISC-IV Block Design and Haxby extension. **Purdue Pegboard**: Both hands score. **DSME**: Down syndrome Mental Status Examination Total score method 1. **DLD**: Dementia Questionnaire for People with Learning Disabilities Sum of Cognitive score.

## Results

- Pearson correlations indicated that spending more daytime in sedentary behavior was associated with worse cognitive functioning and more dementia symptoms
- Pearson correlations indicated spending daytime in moderate activity was associated with better cognitive function and less dementia symptoms
- There was not a significant association between sedentary or moderate daytime activity and Aβ

## Discussion

- It is possible that physical activity has a protective effect against declines in cognition with aging in DS
- Future longitudinal analyses are needed to examine the potential time-ordered moderating effect of physical activity on the association between Aβ accumulation and cognitive decline in DS

## References and Funding

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