

# Consumption of a fermented dairy beverage over four-weeks improves relational memory in healthy young adults

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## Background

- Fermented dairy beverage supplementation has the potential to improve cognitive, microbiota, and metabolic changes associated with gastrointestinal disorders
- The data surrounding healthy populations and probiotic supplementation is limited
- Persons with gastrointestinal disorders have increased prevalence of symptoms of depression and anxiety, however, probiotic supplementation has been found to reduce these symptoms
- Some GI microbiota engage in signaling pathways through the gut-brain axis

## Aim

- This study aimed to understand how fermented dairy consumption over 4-weeks will impact relational memory function, symptoms of depression and anxiety, gut microbiome, and urinary-free cortisol concentrations in healthy young adults

## Demographics

Measure	
Sex, Female/Male	18/8
Age (years)	32.7±6.18
Intelligence Quotient	107.5±19.1
Education, N (%)	
Some College	1 (3.8)
College/University Graduate	10 (38.5)
Master's Degree	14 (53.8)
PhD or Equivalent	1 (3.8)

## Methods

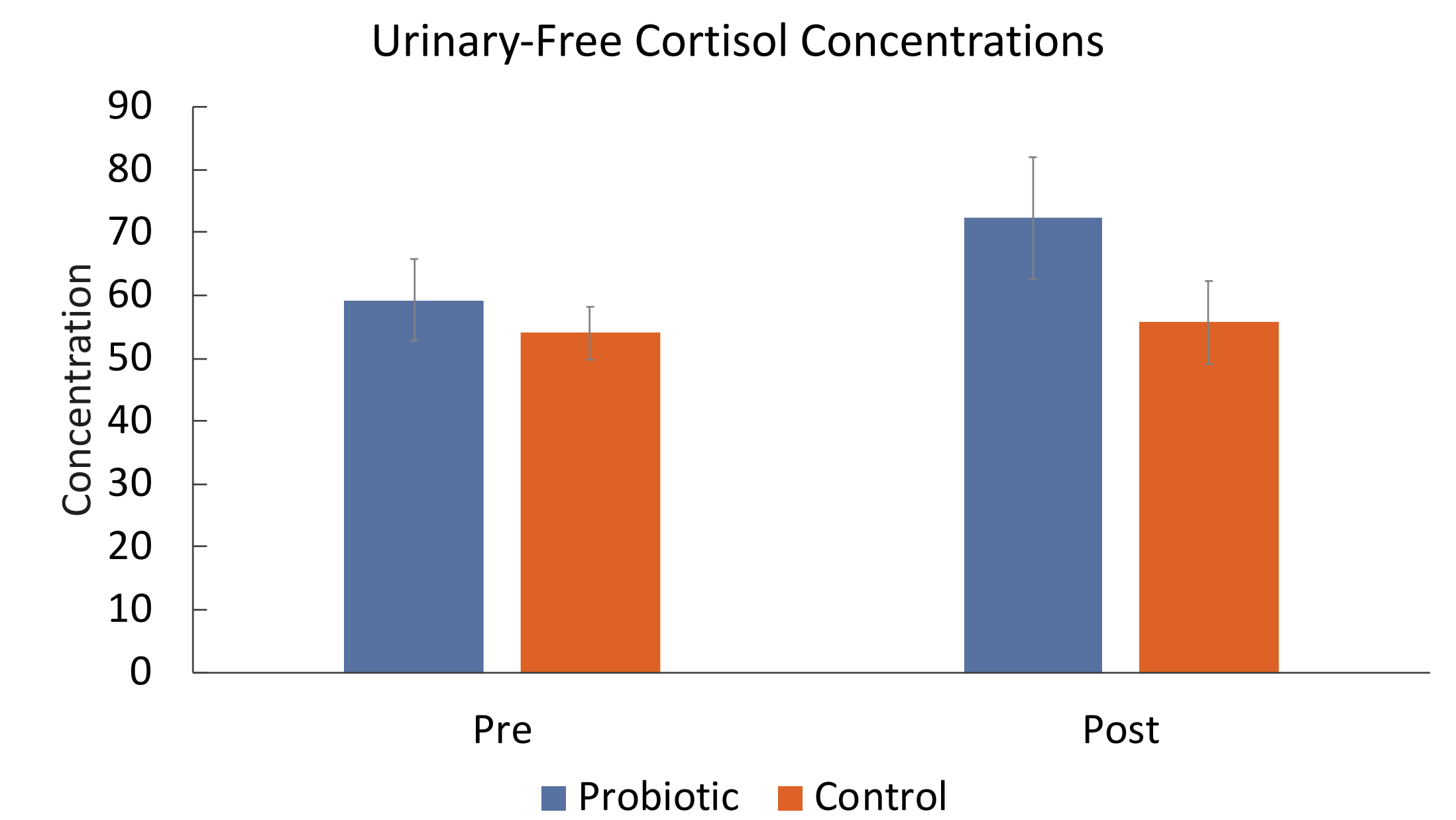
- Urinary-free cortisol concentrations quantified via Enzyme-Linked Immunosorbent Assay
- Symptoms of depression and anxiety assessed using the depression, anxiety, and stress subscale (DASS)
- Relational Memory assessed using a spatial reconstruction task

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

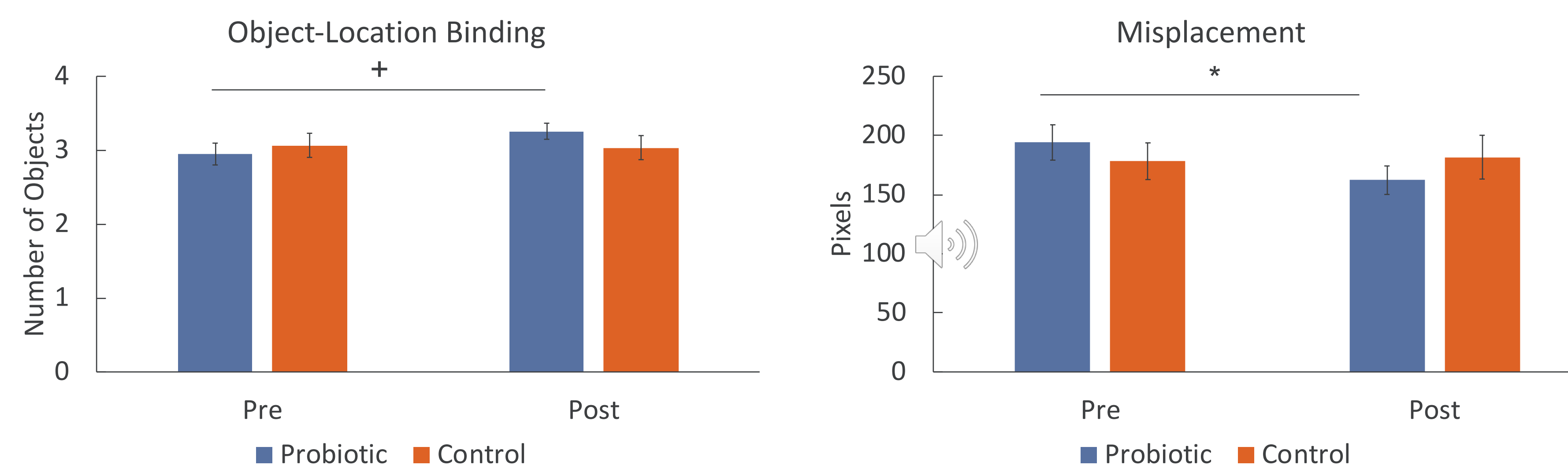
## Study Design



## Cortisol Results

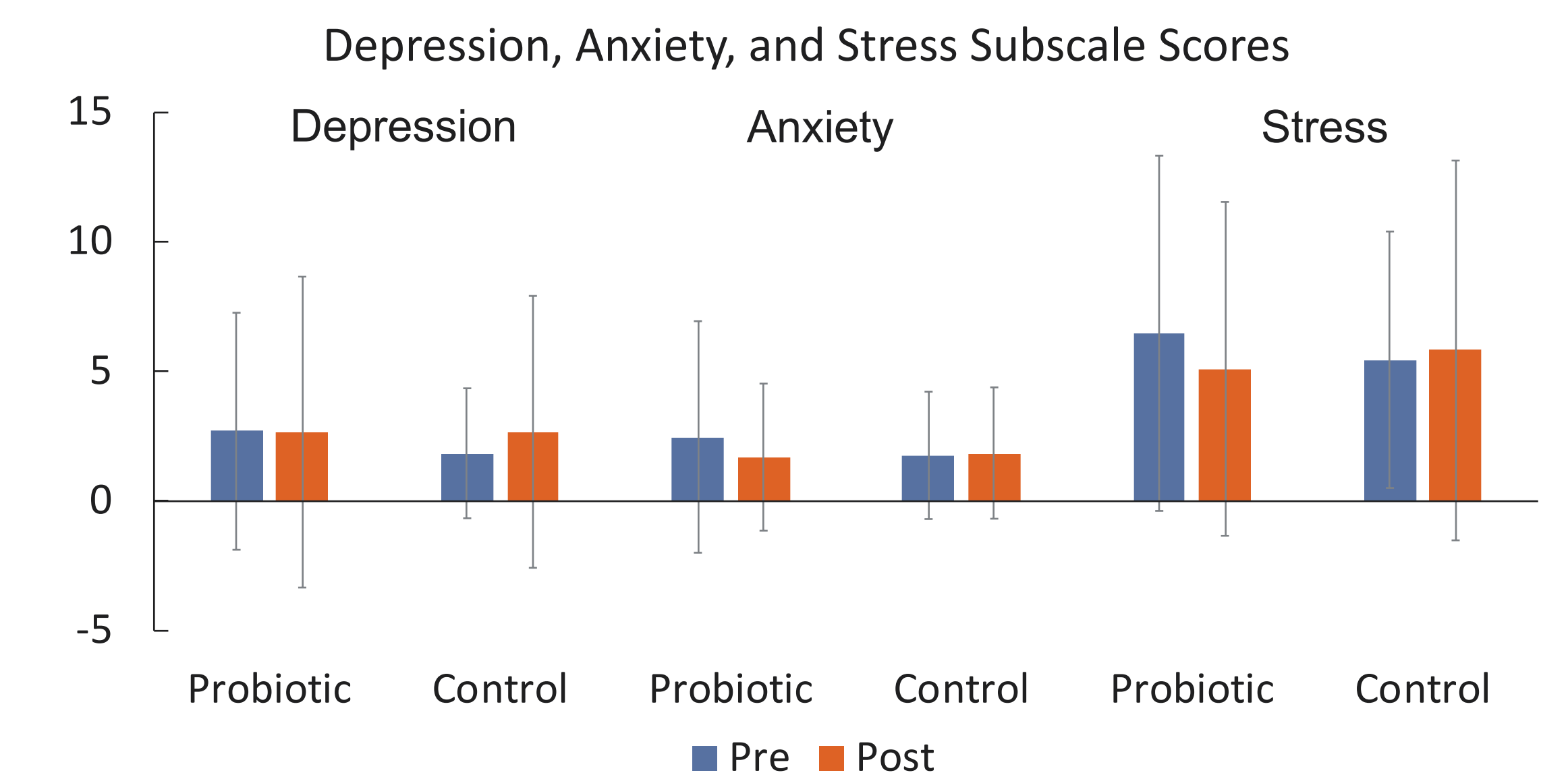


## Relational Memory Results



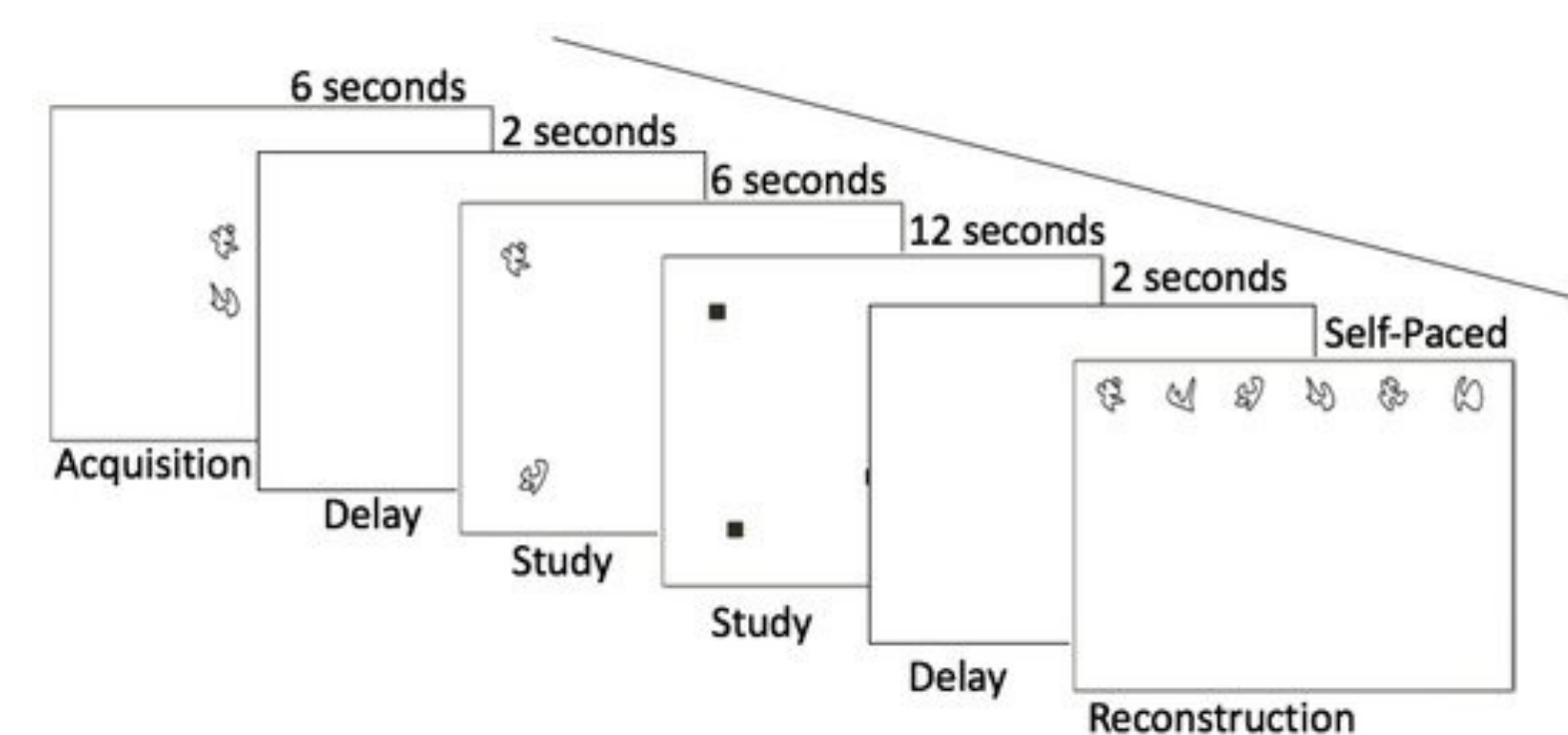
+p<0.065, \*p<0.05

## DASS Results

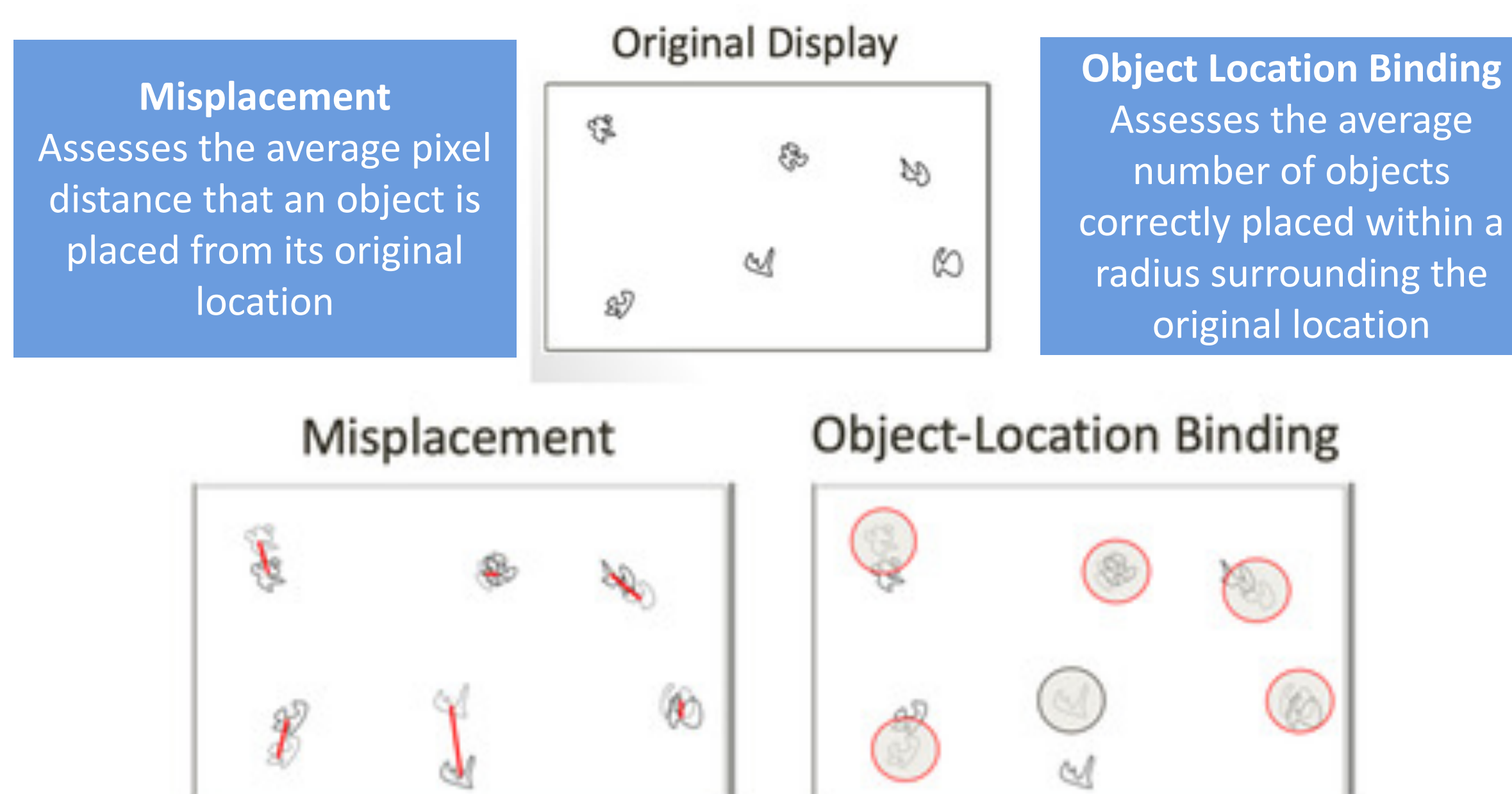


## Relational Memory Task

### Design



### Error Metrics



## Results

Means± standard deviations for misplacement, object location binding, UFC, and DASS scores.

	Pre-Test	Post-Test	P-value
<b>Treatment</b>			
Misplacement	193.9±73.2	162.1±54.2	0.0033
Object-Location Binding	2.95±0.72	3.25±0.49	0.061
Urinary-Free Cortisol	60.7±33.7	71.8±49.5	0.241
Depression	2.81±4.63	2.92±6.32	0.509
Anxiety	2.58±4.52	1.87±2.97	0.566
Stress	6.73±6.86	5.13±6.77	0.089
<b>Control</b>			
Misplacement	178.1±76.0	181.6±83.3	0.755
Object-Location Binding	3.07±0.78	3.03±0.73	0.640
Urinary-Free Cortisol	55.0±18.1	55.8±32.4	0.649
Depression	1.88±2.56	2.12±4.24	0.582
Anxiety	1.60±2.35	1.60±2.24	0.942
Stress	5.24±4.92	4.84±5.29	0.562

## Future Directions

- Fermented dairy beverage consumption may impact relational memory function in healthy populations
- Probiotic treatment could benefit populations beyond those diagnosed with gastrointestinal disorders
- The gut microbiome may impact relational memory function
- Large-scale crossover studies must be done in order to further validate these results

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