



RE-AIM Analysis of a Randomized School-based Nutrition Intervention Among Fourth Grade Classrooms in California

Andrew Larsen, Ph.D.

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Background – Intervention – RE-AIM – Discussion

- School-based programs allow:

1. Early intervention
2. Efficient access to large groups of children



- Multi-component programs tend to be most effective

- Classroom-based activities
- Parental involvement
- Providing food provisions (**e.g., Smarter Lunchrooms; at this year's conference**)

- Not many have been evaluated for overall public impact via RE-AIM

- Effectiveness + dissemination

Intervention

- *Nutrition Pathfinders*, developed by the Dairy Council of California
 - Developed for fourth-graders
 - Aligned with Common Core and National Health Education Standards
 - Free to public schools in California, or for purchase elsewhere



- Materials provided to teachers
 - Teacher’s guide, with instructions and lesson plans
 - Student workbook
 - Family homework
- Theoretical Foundation
 - Social-Cognitive Theory
 - Health Belief Model

Background – Intervention – RE-AIM – Summary

- Multi-component

1. Seven classroom lessons

- Food groups
- Balanced meals and snacks
- Reading food labels
- Estimating serving sizes with hand symbols
- Exercising for 60 minutes a day
- Critical thinking skills
 - Setting goals
 - Analyzing food records

2. Family homework


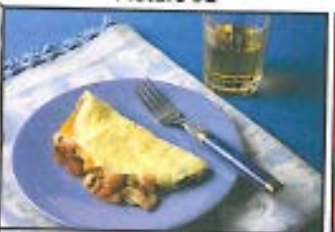
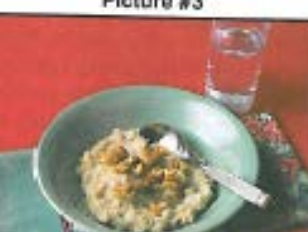
- Extend classroom lessons

Lesson 6 Fuel Up With Breakfast!

Is It Balanced?

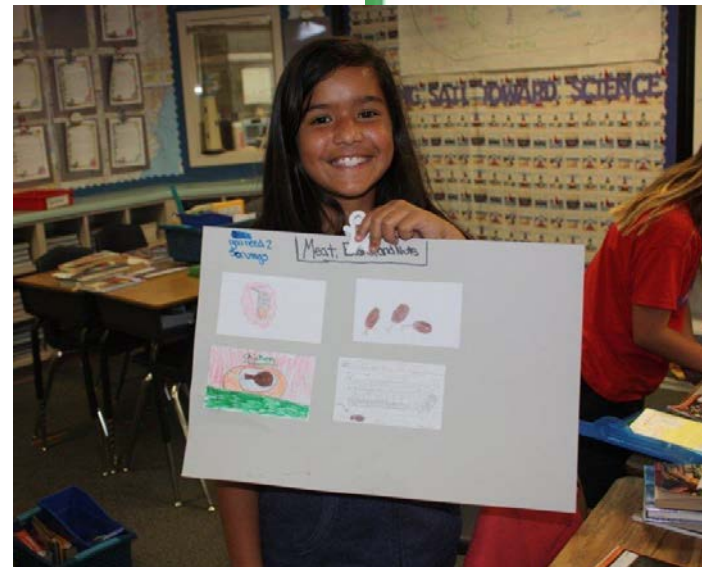
Directions:

1. Review the three breakfast options below.
2. Circle the breakfast that is the best choice, using the "3 out of 5" model as a guide.
3. Answer the question below the pictures. You will need to refer back to the pictures for help.

Picture #1	Picture #2	Picture #3
		
Slice of whole-wheat bread, peanut butter, melon, low-fat yogurt	Omelet (eggs, vegetables, cheese), apple juice	Oatmeal with nuts, water

1. Write two sentences describing why the breakfast you picked was the best choice.

The breakfast was the best choice because it is a balanced meal. This breakfast also is good because of the nutrition.



Design

- Two samples:

- Dissemination sample:

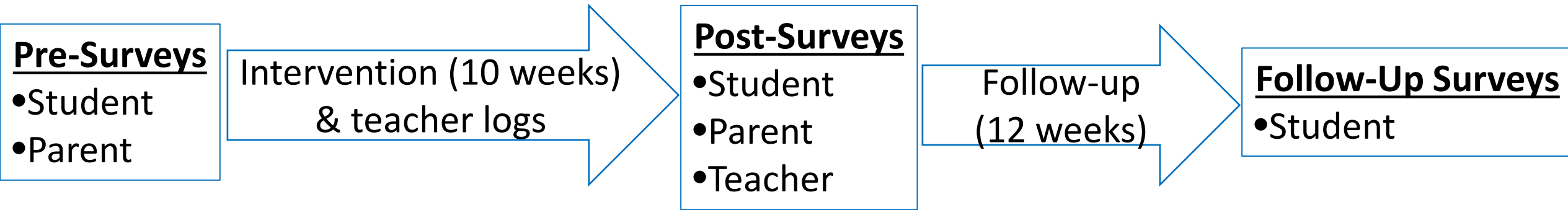
All public school fourth-grade classrooms in CA using materials during the 2011-2012 and 2012-2013 school years

- Evaluation sample:

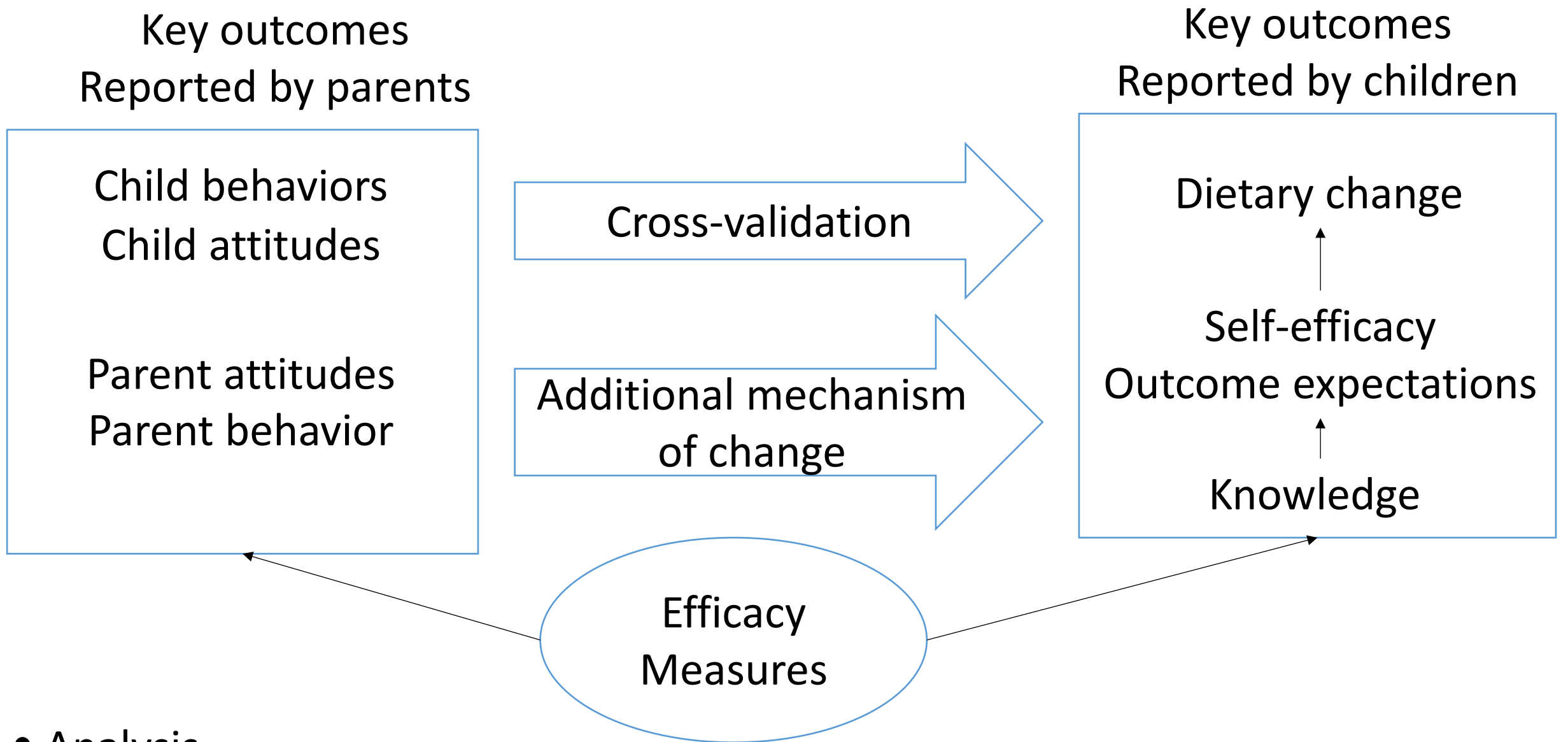
Intervention (27 classrooms) and Control group (20 classrooms) classrooms more closely evaluated



Background – Intervention – RE-AIM – Summary



<u>RE-AIM Component</u>	<u>Evaluation Method</u>
<i>Efficacy</i>	<ul style="list-style-type: none"> • Randomized controlled design • Student surveys (pre, post, follow-up) and parent surveys (pre, post)
<i>Implementation</i>	<ul style="list-style-type: none"> • Classroom observations; Teacher logs and post-surveys; Parent post-surveys
<i>Reach, Adoption, Maintenance</i>	<ul style="list-style-type: none"> • Secondary analysis of Dairy Council records: All 2011-2012 And 2012-2013 Program orders (i.e., Dissemination sample)



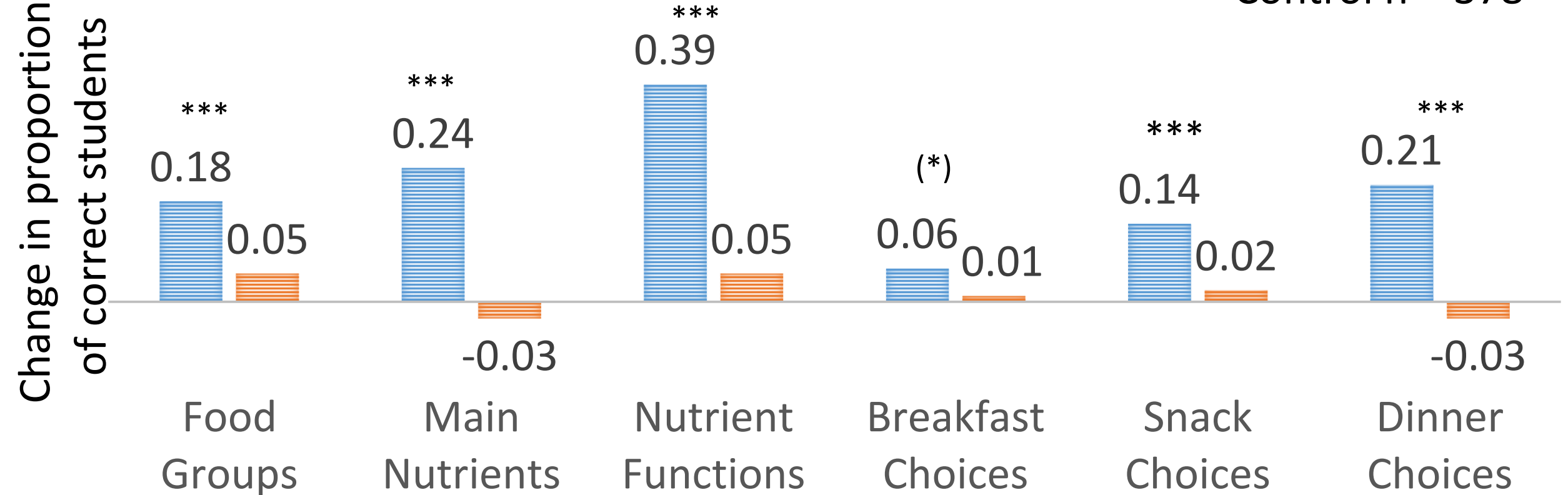
- Analysis

- Hierarchical linear modeling, controlling for children clustered in classrooms
- Full information maximum likelihood for missing data

Pre-Post Knowledge Changes

Intervention Control

Intervention n = 543
Control n = 378

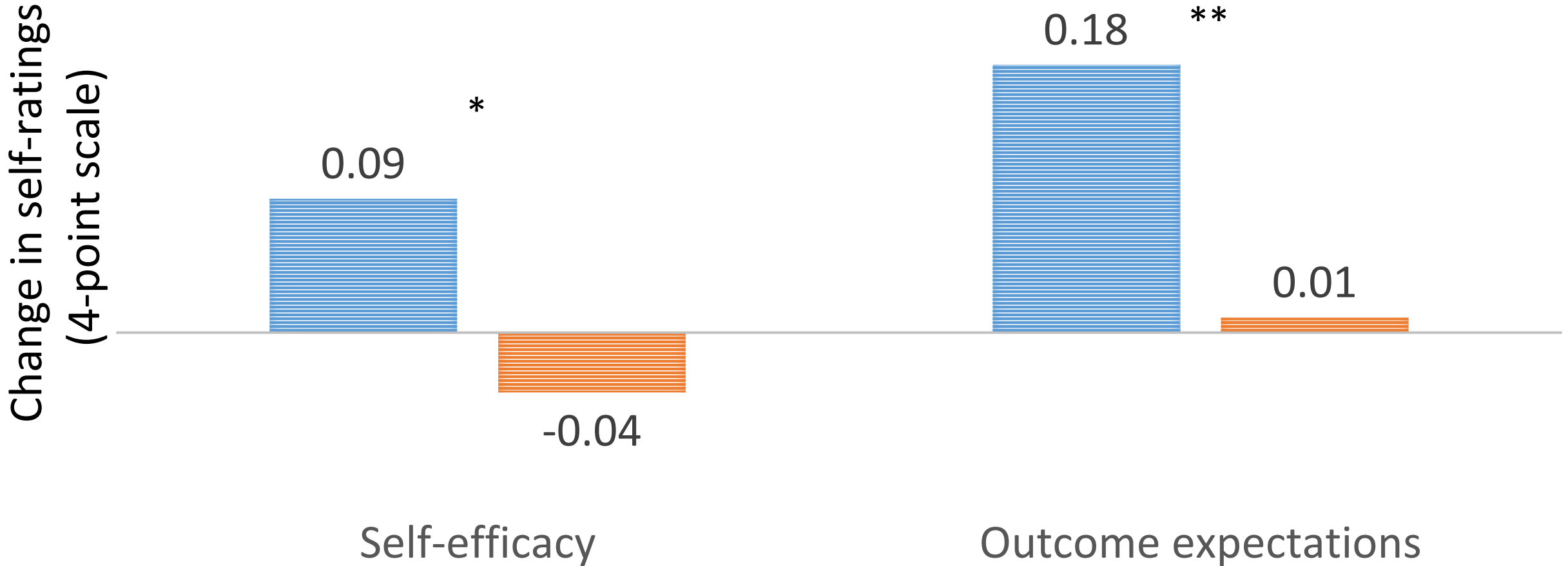


*** p < .001
** p < .010
* p < .050
(*) p < .100

Pre-Post Socio-Cognitive Changes

Intervention Control

Intervention n = 543
Control n = 378



** p < .010

* p < .050

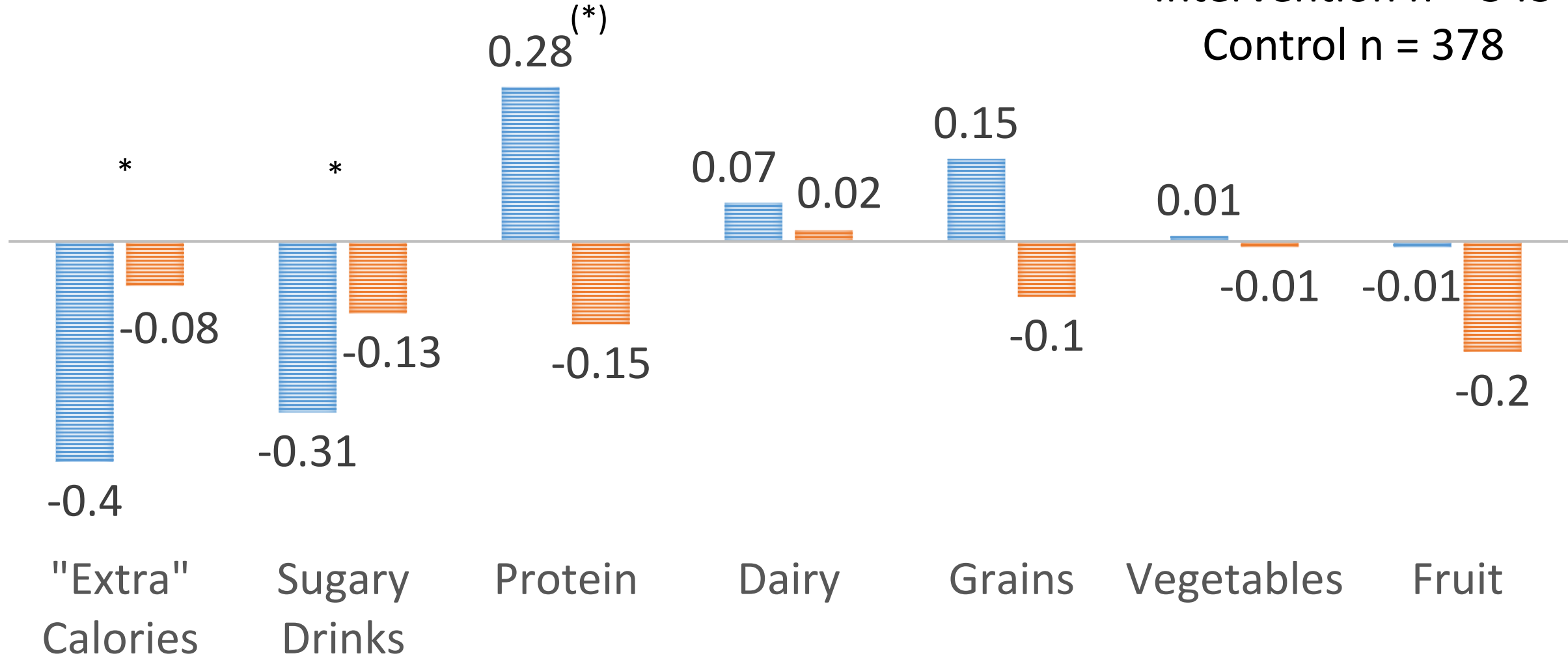
Pre-Post Dietary Intake Changes

Intervention Control

Intervention n = 543

Control n = 378

Change in daily intake



*p < .050

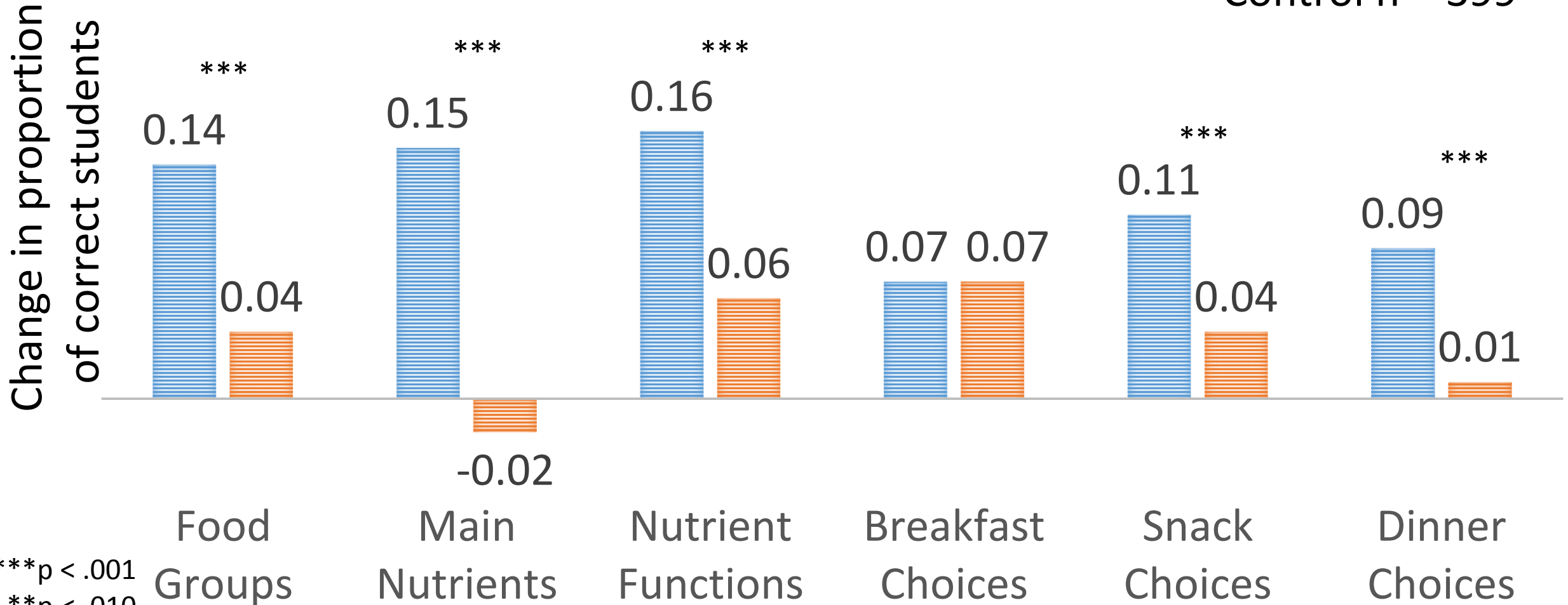
(*)p < .100

Pre-Follow up Knowledge Changes

Intervention n = 532

Control n = 399

Intervention Control



*** p < .001
** p < .010
* p < .050
(*) p < .100

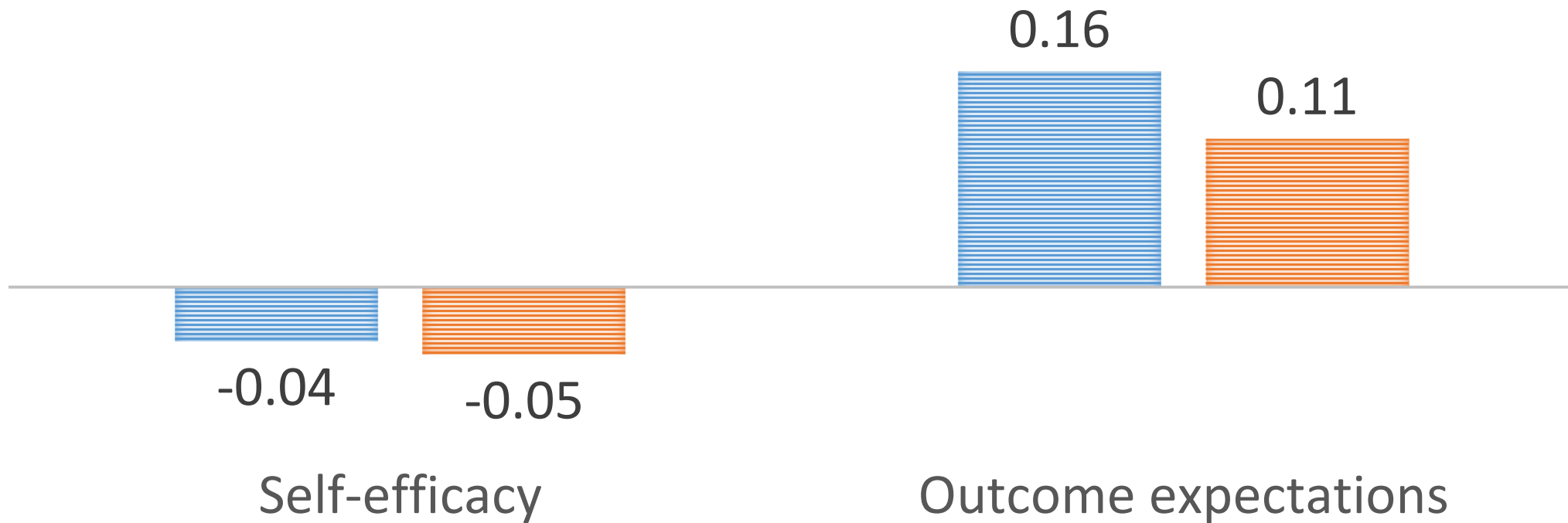
Pre-Follow up Socio-Cognitive Changes

Intervention Control

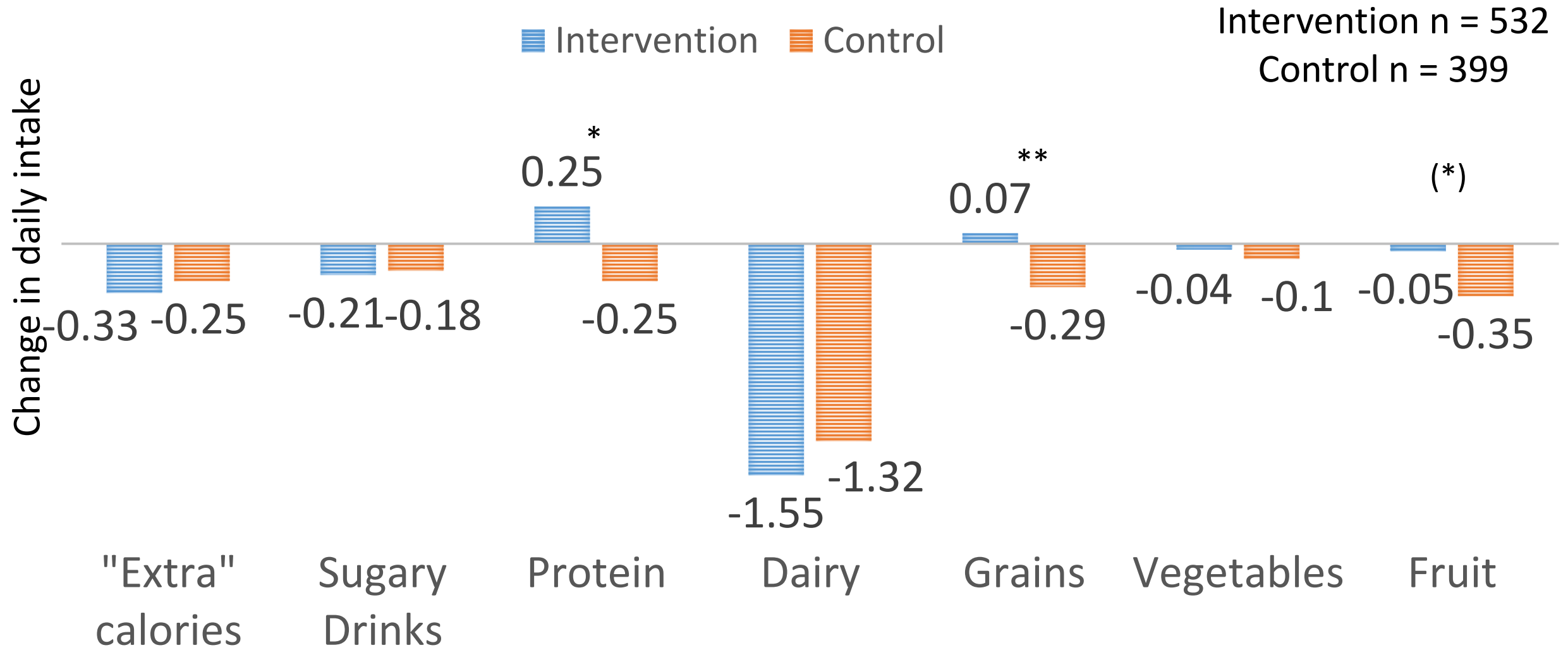
Intervention n = 532

Control n = 399

Change in self-ratings
(5-point scale)



Pre-Follow up Dietary Intake Changes



*** p < .001

** p < .010

* p < .050

(*) p < .100

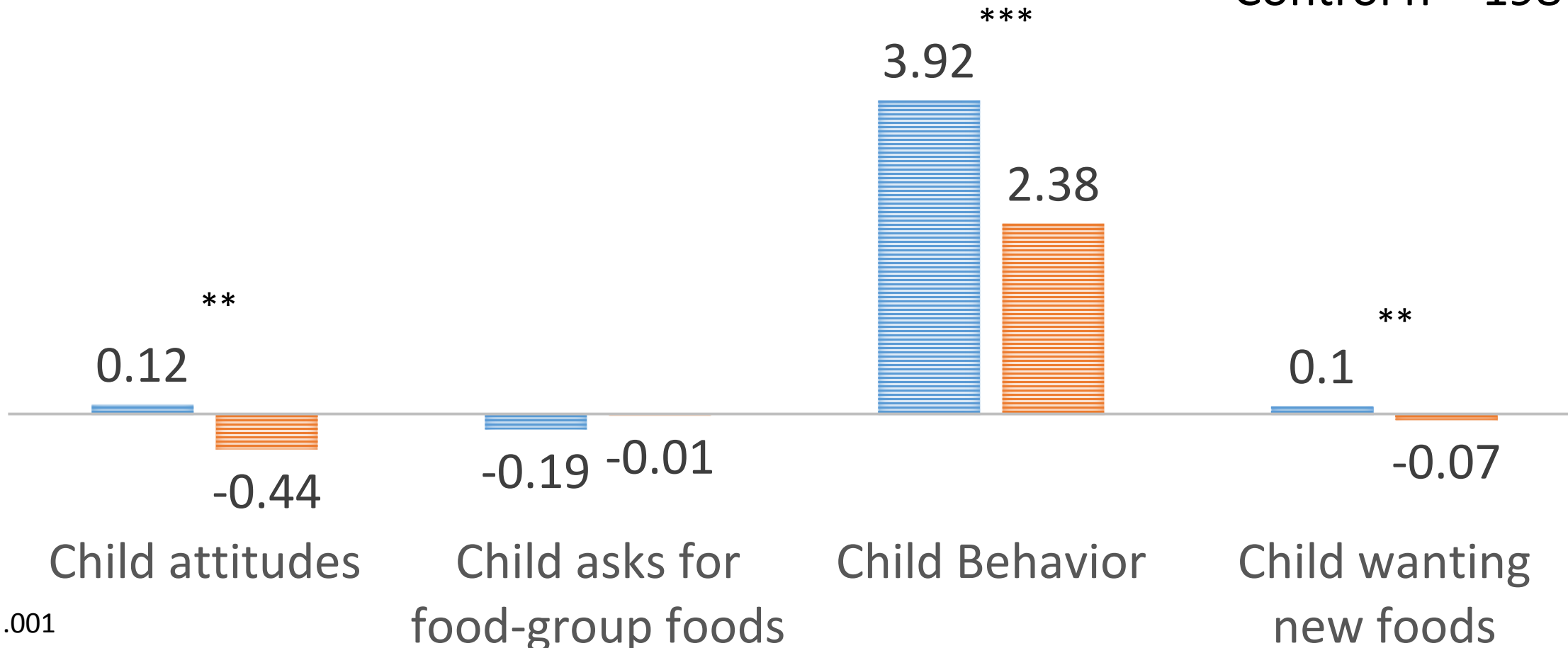
Pre-Post Parent Reported Child Attitudes and Behaviors

Intervention Control

Intervention n = 342

Control n = 198

Change in Parent Reports



***p < .001

**p < .010

*p < .050

(*)p < .100

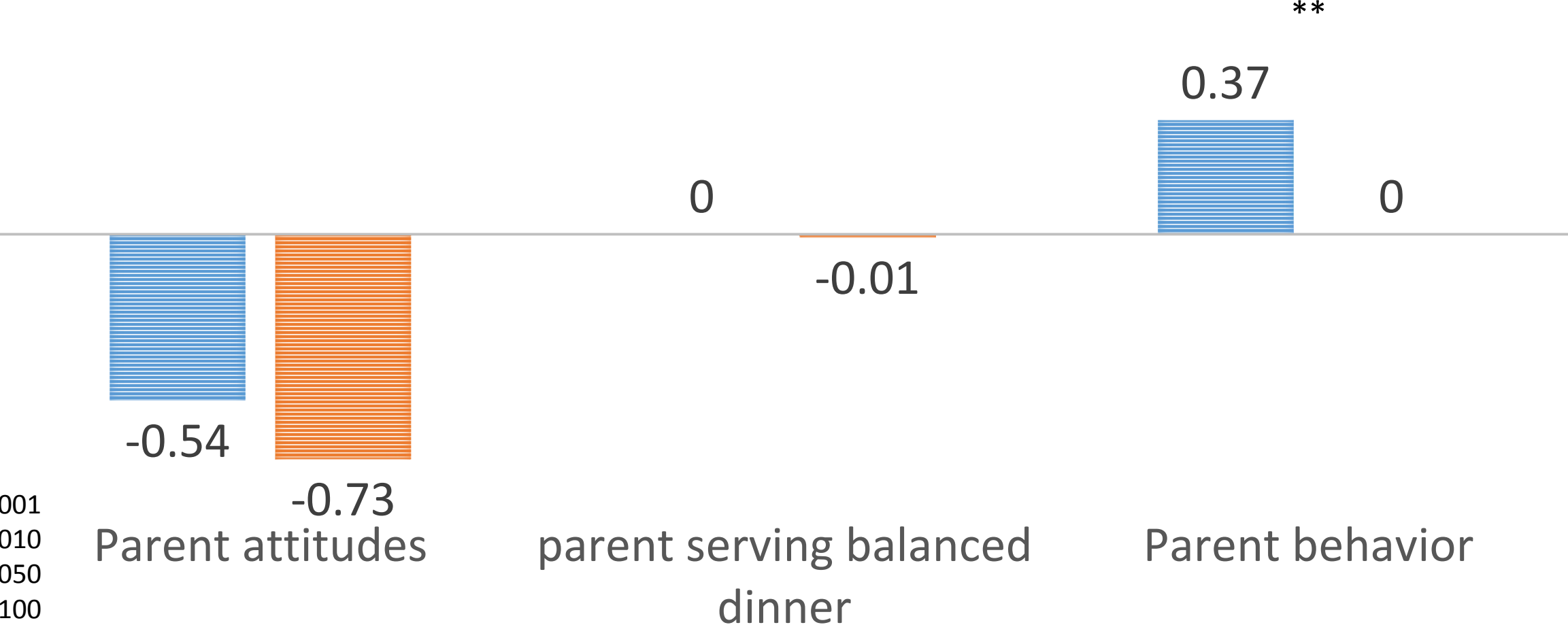
Pre-Post Parent Attitude and Behavior Changes

Intervention n = 342

Control n = 198

Intervention Control

Change in Parent Reports



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(*)p < .100

Implementation

Teacher surveys; parent surveys; classroom observations

- Teacher Surveys (24 / 27 teachers completed)
 - Teachers presenting all seven lessons: 89%
 - Teachers presenting all lesson material: 71%
 - Teachers not altering lesson material: 75%
 - Lessons taught in one session: 85%
 - Teachers assigning family homework: 96%
 - Students generally very attentive: 63%

Food Survey

These questions are about the food you ate
the choice that best describes the number of

1. Yesterday, how many times did you eat any type of meat such as chicken, turkey, hamburger, or ham?



- None
- 1 time
- 2 times
- 3 or more times

2. Yesterday, how many times did you eat any type of eggs such as scrambled, hard-boiled, or sunny-side up?



- None
- 1 time
- 2 times
- 3 or more times

Implementation

- Parent survey:

- Did children do the homework? 84% yes
- Did children work with a parent? 59% yes

- Classroom observation:

- Lesson material covered: 80%
- “Many students were participating:” 80% of the time

Nutrient Knowledge

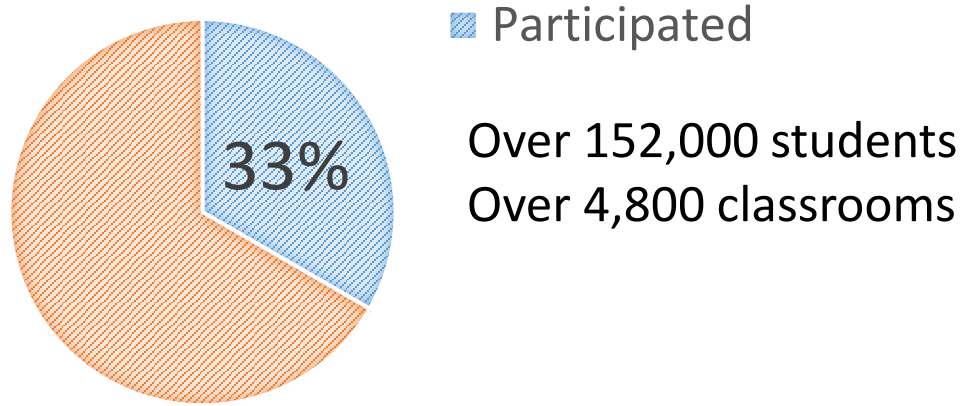


42. Vitamin C:	Energy	Healthy skin and eyes	Heal the body	Strong bones and teeth	Strong muscles
43. Calcium:	Energy	Healthy skin and eyes	Heal the body	Strong bones and teeth	Strong muscles

Dissemination

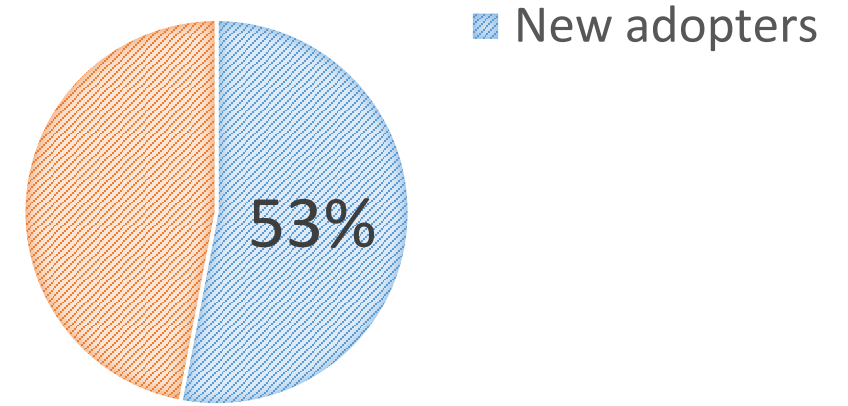
REACH

PERCENT OF PUBLIC-SCHOOL FOURTH-GRADERS PARTICIPATING



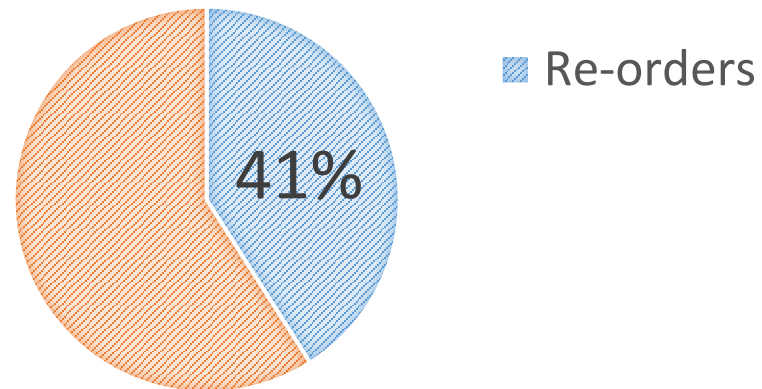
ADOPTION

PERCENT OF NEW ADOPTERS OF THE PROGRAM



MAINTENANCE

TEACHERS RE-ORDERING THE FOLLOWING YEAR



Background – Intervention – RE-AIM – Summary

Efficacy

- Randomized-controlled pre-, Post-, and follow-up study design
 - Largest impact on nutrition knowledge
 - Improved self-efficacy and outcome expectations, but at post-survey only
 - Changes in student dietary intake
 - Reduction of “extra” calories and sugary drinks at post-survey
 - Increase in protein and grains at follow-up
- Improved student nutrition behaviors cross-validated by parent-reports
- Improved parent nutrition behaviors

Implementation

- Teachers and classroom observers reported quality implementation
- Cost per student: \$1.00

Background – Intervention – RE-AIM – Summary

Reach & Adoption

- Wide dissemination
 - Approximately a third of eligible students in CA
 - Nearly half the classrooms were ‘new adopters’

Maintenance

- Knowledge and dietary intake effects observed at follow-up
 - Socio-cognitive changes and “extra” calorie foods and drinks failed to persist through Follow-up period
- ~40% of teachers re-ordered materials
- Could benefit from longer window of measurement...

What I Learned

You always give information on your restaurant's menu so that your guests have all of the facts they need in order to make healthy choices.

Directions:

1. Explain to your guests why your new dinner special on page 19 should be a part of your guests' choice. Be sure to include why it is important to eat a balanced dinner.

The dinner I picked was balance because it had the 5 groups. Some thing that I had was cheese, tomato, letuce, Bread, ham, watermelon, water this things are good.

Conclusions

- The Nutrition Pathfinders program shows promise for moderate public-health impact:
 - Creates changes
 - Disseminated on a wide scale
- School-based programs are valuable
 - They show the capability of making important impacts
 - School-based approaches should continue to be explored

More Questions?

- Published article:
Larsen AL, McArdle JJ, Robertson T, Dunton GF. **RE-AIM analysis of a randomized school-based nutrition intervention among fourth-grade classrooms in California.** Translational Behavioral Medicine: Practice, Policy and Research. In press, January 2015.
- Dairy Council of California website: HealthyEating.org
- Email:
 - Andrew Larsen, PhD: Larsena3@gmail.com
 - Trina Robertson, RD: RobertsonT@dairycouncilofca.org
 - Genevieve Dunton, PhD, MPH: dunton@usc.edu