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Does Self-Regulation Mediate the Relation between Mealtime Routines and Children's Reading and Math Skills?

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Background

- Home-based academic practices are related to children's early success in reading and math, and many studies have documented their importance for later achievement (Bus et al., 1995; Hindman & Morrison, 2012; Sénéchal & LeFevre, 2002; Son & Morrison, 2010).

- However, the reasons why non-academic home-based practices, such as routines, influence reading and math are less intuitive, and few studies have attempted to identify potential mediating mechanisms that may explain the links.

- For example, although research shows positive correlations between the frequency of family mealtime routines and children's academic outcomes (C.A.S.A., 2010; Eisenberg, Olson, Neumark-Sztainer, Story, & Bearinger, 2004; Council of Economic Advisors, 2000), we know relatively little about *why* family mealtime routines may influence achievement.

- One explanation for the link is that having stable and predictable routines promotes the development of self-regulatory skills (e.g. planning, waiting, following directions) that help children to succeed in school (e.g. Brody & Flor, 1997; Collins et al., 2000; Morrison & Cooney, 2002). However, no studies have tested this relation.

Current Study

- This study explored self-regulation as a potential mediator of the relation between family mealtime routines in kindergarten and children's reading and math scores in first grade using a nationally representative dataset (Early Childhood Longitudinal Study – Kindergarten Class of 2010-2011; ECLS-K: 2011).

Sample

The sample included 2,940 children participating in the Early Childhood Longitudinal Study, Kindergarten Class of 2010-11 (ECLS-K: 2011), which is a nationally representative study of approximately 18,170 children (Torangeau et al., 2015).

Selection Criteria:
- Asian, Black, Latino, or White
- First-time kindergartners
- Participated in the self-regulation assessment (only 30% of full sample assessed)
- Valid data points on all key variables

Method Continued

Measures

Family mealtime routines index (α = .87)
Average of four questions which asked parents how many days per week (0-7) the family ate breakfast together, had breakfast at a regular time, ate the evening meal together, and had the evening meal at a regular time.

Self-regulation index (α = .80)
Composite of Approaches to Learning (ATL) scale and the self-control subscale of the Social Skills Rating System (SSRS; Gresham & Elliot, 1990). For ATL, teachers reported how often *(1 = never to 4 = very often)* children kept belongings organized, wanted to learn new things, worked independently, adapted to changes in routine, exhibited persistence, paid attention, and followed rules. Self-control scores ranged from 1 - 4, with higher scores indicating that the child exhibited self-control more often.

Reading Assessment (α = .93)
Direct assessment focusing on basic reading skills (e.g. print familiarity, letter recognition, beginning and ending sounds, and recognition of common words).

Mathematics Assessment (α = .93)
Direct assessment of conceptual knowledge, procedural knowledge, and problem solving.

Covariates

- **Home Learning Environment Index (α = .75)**
  Index of home reading, math, and enrichment activities constructed using eleven items selected from the fall parent interview when children were in kindergarten. Parents indicated how often *(1 = never to 4 = every day)*, they told stories, sang songs, helped children with art, asked children to do chores, played games, asked children about nature, built things, played sports, practiced reading and writing numbers, and read picture books with children, and how often *(1 = never to 4 = every day)* children read books at home.

- **Demographics**
  Child gender, child age, speaking a non-English language at home, center-based child care, race/ethnicity and socioeconomic status.
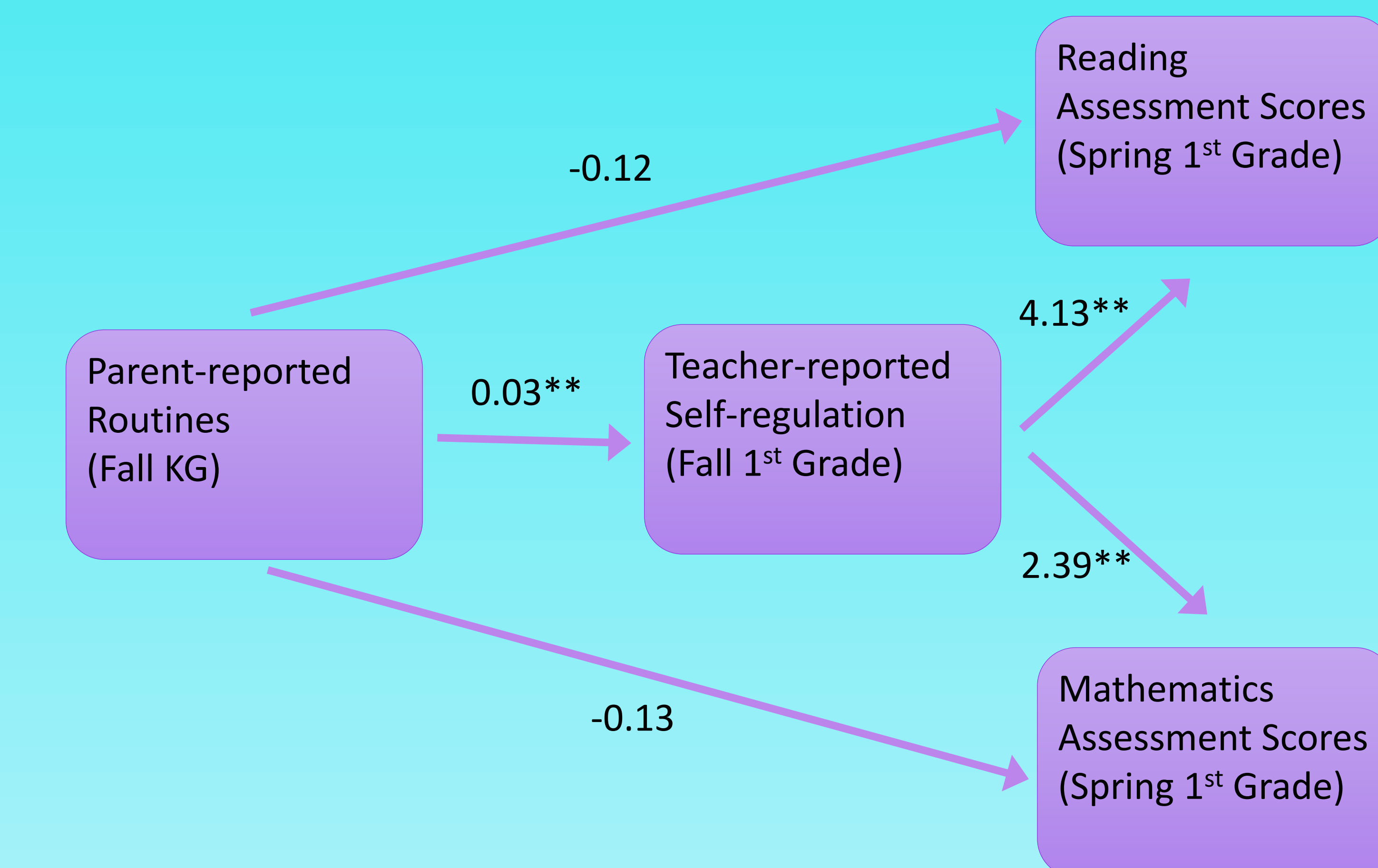
Results

Descriptive Statistics
- The final analytic sample of children was approximately 47% White, 35% Latino, 9% Black, and 8% Asian. This is somewhat similar to the racial/ethnic concentrations reported by the U.S. census (61% White, 17% Latino, 13% Black, 6% Asian; U.S. Census Bureau, 2015).
- Similar percentages of girls (48%) and boys (52%).
- 3% of children reportedly spoke a language other than English at home. Roughly 15% of children in the sample reportedly attended center-based care.

Key Variables	N	M or %	SD	Min	Max
Family Mealtime Routines	2,940	2.93	0.47	0.00	7.00
Self-Regulation	2,940	3.15	0.58	1.00	4.00
1st Grade Reading Scores	2,940	69.96	13.18	26.39	94.84
1st Grade Math Scores	2,940	63.11	13.23	17.01	93.68

Note. Descriptive statistics based on unweighted data.

Results Continued

Mediation Model

Parent-reported Routines (Fall KG) → Teacher-reported Self-regulation (Fall 1st Grade): 0.03**
Teacher-reported Self-regulation → Reading Assessment Scores (Spring 1st Grade): 4.13**
Teacher-reported Self-regulation → Mathematics Assessment Scores (Spring 1st Grade): 2.39**
Parent-reported Routines → Reading Assessment Scores: -0.12
Parent-reported Routines → Mathematics Assessment Scores: -0.13

Note. Direct and indirect influences on children's reading and mathematics scores from kindergarten to 1st grade. Unstandardized coefficients are shown. Child age and gender were included as covariates for self-regulation. Non-parental child care, child race/ethnicity, home learning environment, SES, non-English language spoken at home, child age, and child gender, as well as kindergarten fall reading or math scores, were included as covariates for first grade reading and/or math scores.

Model Fit
- Fair; RMSEA = .15, SRMR = .06 (Hu & Bentler, 1999). It explained 6% of the variance in self-regulation, 40% of the variance in reading skills, and 54% of the variance in math skills.

Indirect Effects
- Self-regulation significantly mediated the relation between mealtime routines and children's reading (ab = 0.12, $p < .001$, 95% bootstrap CI: 0.06 to 0.17) and the relation between mealtime routines and math scores (ab =0.07, $p < .001$, 95% bootstrap CI: 0.04 to 0.10).

Discussion

- Having frequent family mealtimes together at regular times in kindergarten may have positive effects on children's self-regulation, and in turn, their math and reading outcomes in first grade

- Finding ways to help families develop routines that fit their unique circumstances may be an effective way to increase school readiness.

- However, more research must be conducted to understand which types of routines have the greatest impact on self-regulation and academic outcomes.