Impact of Kindness Curriculum Training on Children's Cognitive & Academic Performance

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Earlier Work with Preschoolers Using Mindfulness-Based Curricula

- Kim and Colleagues (2020) focused on social and emotional skills:
  - Examined the effectiveness of the OpenMind program in **Korean preschoolers** (ages 3-5).
    - A **mindfulness-based** social emotional program targeting preschoolers aged 3 to 5 over a school year.
    - Looked at improvement in teacher-reported **social and emotional skills.**
  - Children who received the OpenMind intervention:
    - Showed **significant improvement in prosocial behavior and emotional regulation, & greater resilience**.
    - However, this study *did not* measure impact on cognitive or academic skills.
  - In the **Kindness Project**, not only did we look at social and emotional impact, but we also directly measured the impact of mindfulness training on children's cognitive skills and teacher-reported academic performance. A few other studies also included measures of cognitive impact.

Earlier Work Using a Mindfulness Based Curriculum

Viglas and Perlman (2018) included measures of cognitive self-regulation:

- Examined the effectiveness of the **Mindful Schools program**, a curriculum designed for **K-12 classrooms that involved 20-minute lessons, delivered 3 times a week, for 6 weeks.**
  - This study looked at **kindergarteners (4-6 years)**, specifically children who struggled with self-regulation or displayed hyperactive behaviors.
- Mindful Schools intervention results showed:
  - Children who were **more hyperactive benefited more** from the mindfulness based intervention than those children in the control group.
    - Children who had previous **difficulties with self-regulatory cognitive skills** made great strides in self-regulation related to controlling their conduct, controlling hyperactive behavior, & handling problems with peers.

Earlier Mindfulness Work with Preschoolers: Two Other Studies Including Cognitive Impact

Thierry and colleagues (2016) measured the impact of mindfulness training on children's cognitive skills (executive function & literacy).

- They tested the effectiveness of the MindUp curriculum (15 mindfulness-based lessons, each 20-30 minutes) in a 3-year longitudinal study of Pre-K and kindergarten (3-6 years) children.
- Children who received the mindfulness program improved significantly on the **working memory** and **plan/organize** scales of BRIEF-P, as well as obtaining higher literacy scores than children in the control group.
- Children in the MindUp program also significantly improved in their **language and vocabulary** skills compared to children in the control group.
- Note that all measures were teacher-reported and not direct measures of children

Zelazo et al. (2018) examined the impact of mindfulness training on preschoolers' executive function and literacy skills.

- Children (4-5 years) from lower-income families participated in Mindfulness training, Literacy Training, or a Control group.
- Mindfulness training involved 30 small-group sessions over 6 weeks focused on reflection and stress reduction presented in game-based activities.
- Mindfulness and Reflection Training led to the greatest improvement in executive function skills, such as better sustained attention and verbal self-regulation. Mindfulness practices were also helpful in reducing children's stress.
- They concluded that the most meaningful effects of the mindfulness programming became more visible after training concluded, suggesting that it takes time for the children to practice and establish the skills they acquired in the mindfulness training.

Earlier Work Using the *Kindness Curriculum* with Young Children

The Kindness Project for preschool children was based on a study by
Flook, Goldberg, Pinger, & Davidson (2015)

- **Flook et al. (2015) Study Design:**
  - Sample of **68 preschool children** (4-5 years old) in a public school setting.
  - **Randomly assigned** by classroom to Kindness Curriculum (KC) Intervention group or Control group.
  - KC group participated in the **12 week mindfulness-based Kindness Curriculum training**
    - **Taught by experienced mindfulness instructors** as opposed to regular classroom teachers.
  - Looked at the impact of Kindness Curriculum training on:
    - **Executive function (i.e., cognitive flexibility and inhibitory control)**
    - **Self-regulation**
    - **Prosocial behavior**

Findings of the Flook & Colleagues 2015 Study

- Children who received the Kindness Curriculum (KC) showed **greater improvement** in **teacher-reported social competence** (TSC) in the areas of **prosocial behavior, emotional regulation,** and their **total scores** than those in the Control group**.**
- **Children in the KC Group** also had **higher report card grades** in the areas of approaches to learning, health and physical development, and social-emotional development.
- On the **Sharing task**, the **control group demonstrated more selfish behavior**, keeping more stickers for themselves over time, than did the KC group.
- The **KC Group** also showed **modest positive effects** (effect sizes favoring the KC group) in **cognitive flexibility** (Card Sort task) and **delay of gratification** compared to the Control Group.
- The **Kindness Curriculum** appeared to be **particularly beneficial** for **children with lower baseline functioning** (i.e., started out with lower social competence & lower executive functioning) as they showed **greater improvement in social competence over time** compared to those in the control group.

Our Kindness Project: Comparisons to the Flook & Colleagues (2015) Study

- Our **Kindness Project** was based on the study by **Flook & colleagues:**
  - We used many of the same outcome measures: Sharing, Social Competence, Executive Function measures (Card Sort & Flanker Task), and School Grades.
  - We added measures of: Social Self-Efficacy, Physical Self-Regulation, Empathy Skills, Social-Emotional Competency (ASQ-SE), School Success Skills (TS-Gold), & Mindfulness Skills.
  - Their Mindfulness Coaches trained our Coaches & our teachers in June 2018.
- **We expanded their work in 3 important ways:**
  - A **larger, more diverse sample of over 225 children, more than 50% from lower income and non-White families.**
  - **Younger children, preschoolers (3-4 years)** were included in addition to **4K (4-5 years) children.**
  - We worked with **Healthy Minds Innovation** & employed their mindfulness coaches to train our **classroom teachers** to implement the Kindness Curriculum (KC) → a "**train the teacher model,"** instead of using the mindfulness coaches to implement the KC.
    - The goal of the "train the teacher model" was to make the Kindness Curriculum available more broadly & support the teachers through their development of personal mindfulness practices & mindful teaching skills.
    - Their Mindfulness Coaches and ours offered ongoing support to teachers in their implementation of the KC & in their personal mindfulness practices.

Introduction

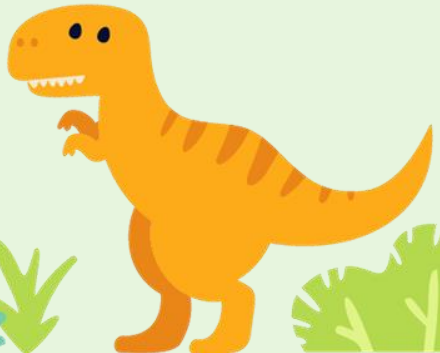
The Kindness Curriculum (2017), developed by the Center for Healthy Minds at the University of Wisconsin-Madison, teaches young children (aged 3-5 years old) mindfulness skills, which have been shown to improve children's cognitive and academic skills. Studies have specifically examined the positive impact that mindfulness programs, such as the Kindness Curriculum, have on children's resilience, emotional regulation, prosocial behavior, cognitive skills and self regulation skills.

Using multiple measures completed by children, teachers, and parents, we studied the impact of mindfulness programming on children's social and cognitive skills across a school year. Few studies have included direct measures of young children in both social and cognitive areas. This report focuses on the impact of the Kindness Curriculum on **children's cognitive skills** including:

- **Cognitive flexibility**
- **Executive functioning skills**
- **Academic achievement**
- **Ability to focus their attention**

Topics

- Introduction
- Research Questions
- Study Design
- Kindness Curriculum
- Demographics
- Measures
- Explanation of Outcome Measures & Findings
- Discussion of Results
- Future Implications



Research Questions

Primary Questions:

1. What are the benefits of the mindfulness-based ***Kindness Curriculum?***
   - Does the Curriculum contribute to improving children's **social skills?**
   - Does the Curriculum contribute to improving **cognitive & academic skills?**
2. Is the ***Kindness Curriculum*** effective in both ***preschool (3-4 years)*** *and* ***4K (4-5 years) classrooms?***
3. Is participation in the Kindness Curriculum particularly beneficial to ***children from lower income families?***
4. Does the Curriculum provide measurable benefits beyond what already occurs in classrooms using a strong social-emotional learning curriculum?

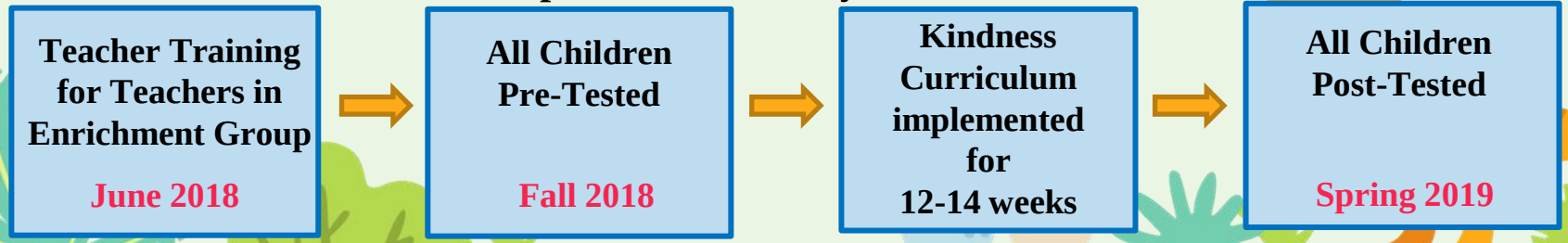
Practical Questions & Logistics:

1. Do teachers find the Kindness Curriculum useful personally & in their classrooms?
2. Can the Curriculum be cost-effectively implemented in preschool & 4K classrooms?
3. Does the Kindness Curriculum provide teachers with additional tools to support the positive development of all children?

Study Design –Year 1: 2018 - 2019

Goal: Using random assignment, classrooms were either placed in the Kindness Curriculum (KC) Enrichment group or in the control group (programming as usual) to measure the effectiveness of the mindfulness-based Kindness Curriculum for preschool and 4K children.

- Randomized by classroom; 10 assigned to **Kindness Curriculum (KC) Enrichment** because some teachers taught both am & pm 4K; 6 classes assigned to **Control Group.**
- Teachers assigned to KC enrichment received training **June 2018**; Teachers assigned to the Control Group received training in **June 2019**.
- **There were four main phases in the study:**



Study Design: Phase Descriptions

Teacher Training – Over two weeks in June 2018

- Teachers participated in 26 hours of mindfulness and Kindness Curriculum (KC) training led by Mindfulness coaches focused on personal mindfulness practices, mindful teaching, & teaching the KC.
- Coaches encouraged and supported teachers in developing their personal and teaching mindfulness practices, though the teachers were not allowed to start the Kindness Curriculum until November.

Pre-Testing of Children: September & October 2018 (about 6 weeks)

- In September & October 2018, college-student researchers individually assessed children on six measures: cognitive flexibility & attention (DCCST & Flanker tasks), physical self-regulation (Balance Beam), Mindfulness, Social Self-Efficacy, & a Sharing task. Teachers & parents reported on children's social & cognitive skills. ***All children, KC Enrichment group & Control Group, were assessed.***

Teachers Implement the Kindness Curriculum (KC) in classroom: About 12-14 weeks

- The curriculum began in November 2018 going through 24 lessons total over 12 weeks. Each lesson is about 20 -30 minutes. Teachers encouraged to break-up lessons as needed to meet the needs in their classrooms.
- Teachers completed reflection measures about how each lesson went. Teachers finished teaching the curriculum in February of 2019. Teachers were encouraged to reinforce mindfulness practices regularly.

Post-Testing of Children: March & April 2019 (about 6 weeks)

- In March, 2019, teachers & parents reported on children's social & cognitive skills.
- In March & April 2019, student researchers re-assessed all children on all 6 measures.

Participating Agencies: Randomization by Classroom

16 Total Classrooms

Bridges' Child Enrichment Center
Two Preschool Classrooms

- 1 KC Enrichment
- 1 Control

Four 4K Classrooms (am & pm)

- 2 KC Enrichment
- 2 Control

Note: same teachers teach am & pm

UW-Oshkosh Head Start, CELC
Two Preschool Classrooms

- 1 KC Enrichment
- 1 Control

Four 4K Classrooms

- 2 KC Enrichment
- 2 Control

Appleton Even-Start Family Literacy

- Morning Classroom → KC Enrichment
- Afternoon Classroom → KC Enrichment

Note: same teachers teach am & pm

Children's Center, UWO Fox Cities
Two Preschool Classrooms

→ KC Enrichment

Note: teachers teach in both rooms

Children in the KC Enrichment group were taught the Kindness Curriculum for 12-14 weeks

The Mindfulness-based Kindness Curriculum for Preschoolers - Healthy Minds Innovation (2017)

Available at https://centerhealthyminds.org/join-the-movement/sign-up-to-receive-the-kindness-curriculum.

This Project trained classroom teachers to implement the Kindness Curriculum (i.e., Train the Trainer Model)

8 Themes, each with 3 lessons

Theme 1: Mindful Bodies & Planting Seeds of Kindness

Theme 2: I Feel Emotions on the Inside

Theme 3: How I Feel on the Inside, Shows on the Outside

Theme 4: Taking Care of Strong Emotions on the Inside & Outside

Theme 5: Calming & Working Out Problems

Theme 6: Gratitude

Theme 7: All People Depend on Each Other & The Earth

Theme 8: Gratitude & Caring for Our World & Wrap Up

The Kindness Curriculum Themes Are Designed Around these A to G Principles

Attention. Children learn that what they focus on is a choice. Through focusing attention on a variety of *external* sensations (the sound of a bell) & *internal* sensations (feeling happy or sad), children learn they can direct their attention & maintain focus.

Breath & Body. Children learn to use their breath to cultivate peace & quiet. The children rest on their backs with a stuffed toy on their belly. The toy provides an object to "rock to sleep" with the breath, while the breathing calms the body.

Caring. Children learn to think about how others are feeling & cultivate kindness. Children experience books that teach about struggles & brainstorm ways to help—even if just offering a smile.

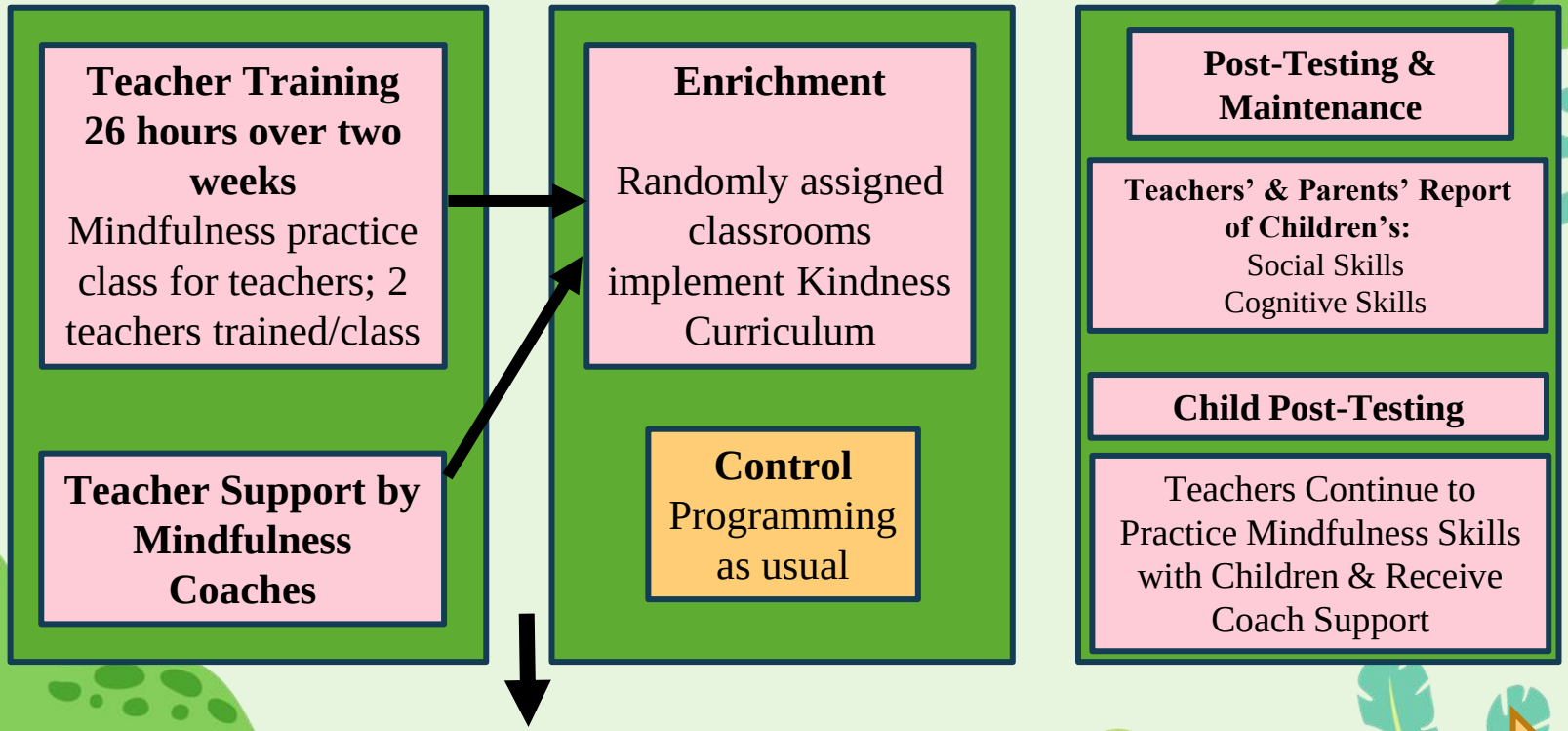
Depending on other people. We emphasize that everyone supports & is supported by others. Children learn to see themselves as helpers & begin to develop gratitude for the kindness of others.

Emotions. Teachers & children take turns pretending to be mad, sad, happy or surprised, guessing which emotion was expressed, & talking about what that emotion feels like in the body.

Forgiveness. Young children can be particularly hard on themselves – and others – and we teach them that everyone makes mistakes. Children learn to forgive themselves & others.

Gratitude. Children learn to recognize the kind acts that other people do for them. Then, they talk about being thankful to those people for how they help us.

Study Design: 272 Children 10 KC Enrichment classrooms
Overview 6 Control classrooms



Pre-Testing Fall 2018: All Children Assessed & Teacher Reports

Child Demographics

*SES Categories based on the eligibility for free/reduced lunch		Time 1 (Fall)		Time 2 (Spring)		Overall
		Kindness Enrichment	Control	Kindness Enrichment	Control	
Overall		143 (59.8%)	96 (40.2%)	150 (61%)	96 (39%)	259
Gender	Female	70 (29.29%)	41 (17.15%)	74 (30.08%)	43 (17.48%)	140 (54%)
	Male	73 (30.54%)	55 (23.01%)	76 (30.89%)	53 (21.54%)	119 (46%)
SES*	Lower Income	90 (37.66%)	71 (29.71%)	89 (36.18%)	70 (28.46%)	169 (65.3%)
	Higher Income	53 (22.18%)	25 (10.46%)	61 (24.80%)	26 (10.57%)	90 (34.8%)
Age Group	<48 Months	50 (20.92%)	27 (11.30%)	61 (24.80%)	29 (11.79%)	94 (36.3%)
	4-5 Years	93 (38.91%)	69 (28.87%)	89 (36.18%)	67 (27.24%)	165 (63.7%)
Ethnicity	Non-White	70 (29.29%)	66 (27.62%)	72 (29.27%)	66 (26.83%)	148 (57.1%)
	• Black	16 (6.69%)	13 (5.44%)	16 (6.50%)	14 (5.69%)	35 (13.5%)
	• Latinx	23 (9.62%)	36 (15.06%)	24 (9.76%)	35 (14.23%)	61 (23.6%)
	• Asian	21 (8.79%)	7 (2.93%)	21 (8.54%)	6 (2.44%)	30 (11.6%)
	• Other/Mixed	10 (4.18%)	10 (4.18%)	11 (4.47%)	11 (4.47%)	22 (8.5%)
	White	73 (30.54%)	30 (12.55%)	78 (31.71%)	30 (12.20%)	111 (42.9)

Measures Used in this Report

Measure	Measure Description	Completed By	Subscales & Number of Items
Dimensional Change Card Sort	The DCCS measures children's cognitive flexibility, a core aspect of executive function.	**Child**	Practice Trials (8), Color Matching (5), Shape matching (5), & Mixed Color & Shape (15-30)
Flanker	The Flanker task measures children's inhibitory control, another core aspect of executive function.	**Child**	Practice Trials (4), Fish Congruent (12), Fish Incongruent (8), Arrow Congruent (12), & Arrow Incongruent (8)
BRIEF-P	The BRIEF-P (Behavior Rating Inventory of Executive Function) measures problems with executive functioning.	**Teacher**	Inhibition (16), Shift (10), Emotional Control (10), Working Memory (17), Plan/Organize (10), & Total Score (63)
TS-Gold	TS-Gold measures students' developmental & school readiness skills.	**Teacher**	Social-Emotional (9), Physical (5), Language (8), Cognitive (9), Literacy (16), Mathematics (12), & Overall (59)
Report Cards	Report Cards assess children's academic achievement & school progress.	**Teacher**	Social emotional, Language, Mathematics, Health & Physical
Impact on Classroom	This questionnaire measures the impact of the Kindness Curriculum in each classroom.	**Teacher**	8 rating scale & open-ended questions on curricular impact & coaching support

Comparisons of Improvement by Group

χ^2= Chi Square

MEASURE	SUBSCALE/INDEX	FINDINGS Number & Percentage of Children who Improved		
DCCS	Overall % Correct	KC Enrichment Group: n = 136 Improved: 99 (73.9%)	Control: n = 90 Improved: 63 (70.0%)	χ^2 = .41, *p* = .525
Flanker	Fish Score	KC Enrichment Group: n = 131 Improved: 84 (64.1%)	Control: n = 85 Improved: 56 (65.9%)	χ^2 = .07, *p* = .791
	Arrow Score	KC Enrichment Group: n = 31 Improved: 23 (74.2%)	Control: n = 14 Improved: 8 (57.1%)	χ2 = 1.31, p = .307
BRIEF-P	Working Memory Score	KC Enrichment Group: n = 136 Improved: 70 (51.5%)	Control: n = 94 Improved: 40 (42.6%))	χ^2 = 1.77, *p* = .184
	Plan/Organize Score	KC Enrichment Group: n = 136 Improved: 68 (50%)	Control: n = 94 Improved: 41 (43.6%)	χ^2 = .91, *p* = .351
	Emergent Metacognition Index Score	KC Enrichment Group: n = 136 Improved: 75 (55.1%)	Control: n = 94 Improved: 42 (44.7%)	χ^2 = 2.44, *p* = .140

Comparisons of Improvement by Group

*p ≤ 0.05; ***p ≤ 0.001

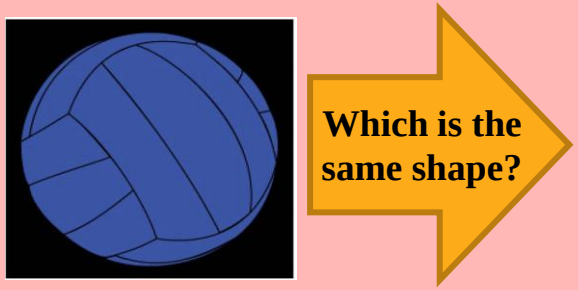
MEASURE	SUBSCALE/INDEX	FINDINGS Number & Percentage of Children who Improved		χ^2= Chi Square
TS Gold	Language Average	KC Enrichment Group: n = 112 Improved: 109 (97.3%)	Control: n = 85 Improved: 78 (91.8%)	$\chi^2 = 3.10$, $p = .078$
	Cognitive Average	KC Enrichment Group: n =111 Improved: 110 (99.1%)	Control: n = 85 Improved: 75 (88.2%)	$\chi^2 = 10.72$, $p = .001$***
	Mathematics Average	KC Enrichment Group: n =112 108 (96.4%)	Control: n = 85 Improved: 77 (90.6%)	$\chi^2 = 2.88$, $p = .090$
	Overall Average	KC Enrichment Group: n = 112 Improved: 111 (99.1%)	Control: n = 85 Improved: 81 (95.3%)	$\chi^2 = 2.84$, $p = .092$
Report Cards	Social Emotional Average	KC Enrichment Group: n = 90 Improved: 82 (91.1%)	Control: n = 62 Improved: 50 (80.6%)	$\chi^2 = 3.52$, $p = .086$
	Language Average	KC Enrichment Group: n = 90 Improved: 89 (98.9%)	Control: n = 62 Improved: 60 (96.8%)	$\chi^2 = .85$, $p = .587$
	Mathematics Average	KC Enrichment Group: n = 90 Improved: 82 (91.1%)	Control: n = 62 Improved: 51 (82.3%)	$\chi^2 = 2.63$, $p = .135$
	Physical, Health, & Developmental Average	KC Enrichment Group: n = 90 Improved: 78 (86.7%)	Control: n = 62 Improved: 53 (85.5%)	$\chi^2 = .04$, $p = 1.00$

Sample Card Sort Question

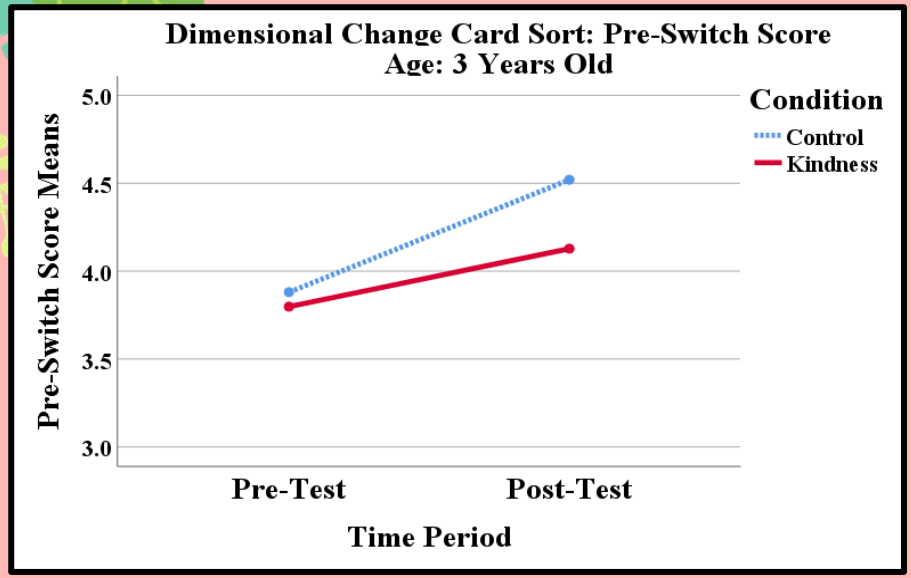
In the first set of trials, children are provided a picture and then asked to match the **color** of the picture with two other provided pictures.

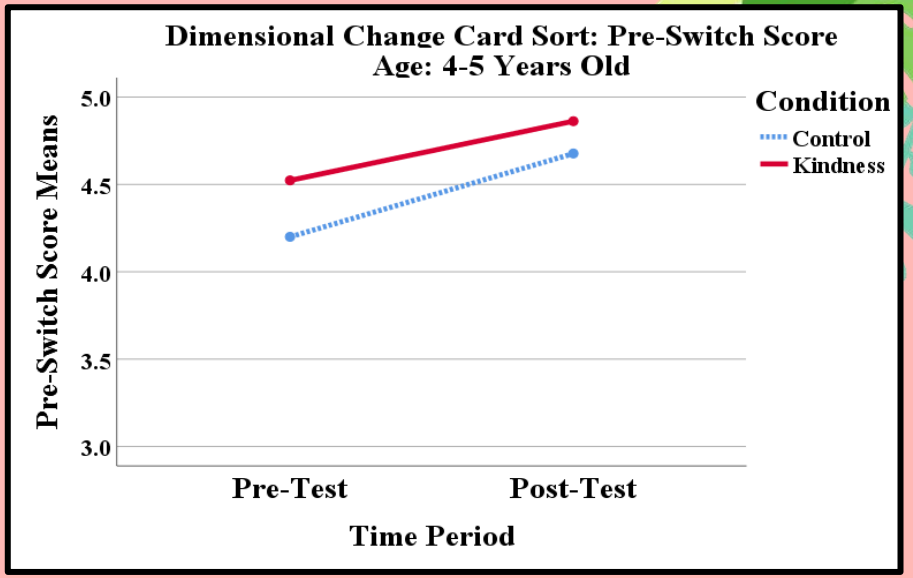
In the second set of trials, children are asked to match the **shape** of a picture with two provided pictures.

In the third set, "**mixed**" trials, children are provided a picture, but they are asked to match either by color or by shape.



Dimensional Change Card Sort: Pre-Switch Scores Varied with Age

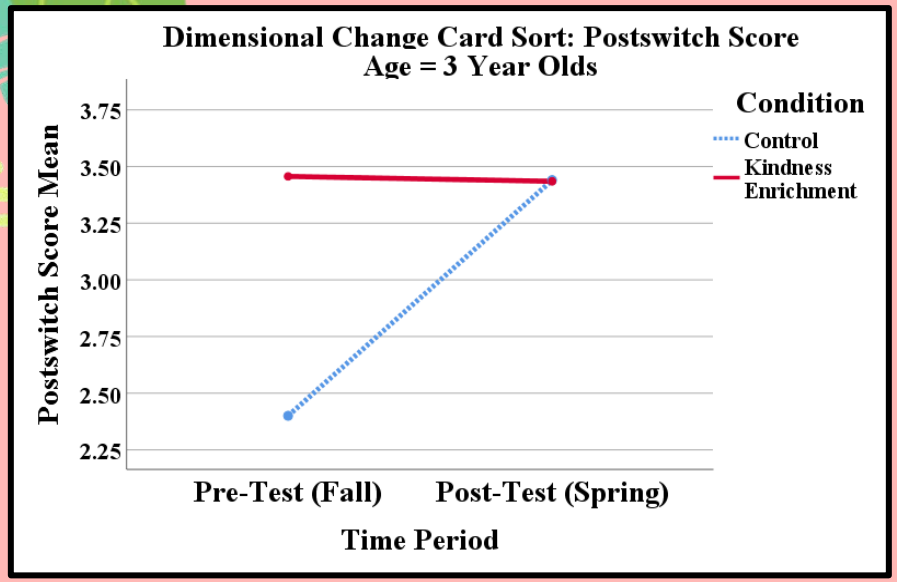


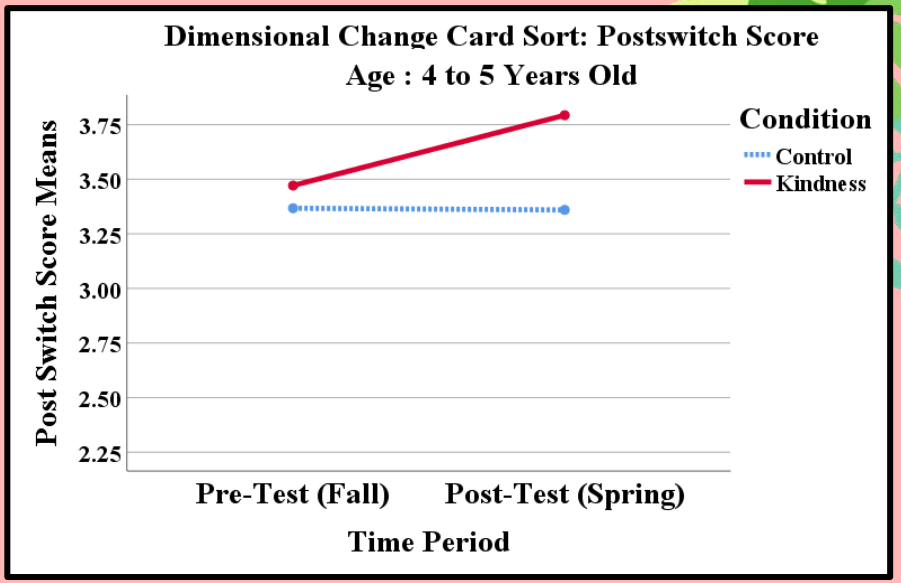


Main Effect Time: $F(1, 220) = 22.59$, $p < .001$
ME Age: $F(1, 220) = 13.05$, $p < .001$
Age x Condition: $F(1, 220) = 3.36$, $p = .068$

The impact of mindfulness training was greatest for older children. Older children in the Kindness group had higher **Pre-Switch Scores**, meaning they correctly solved more problems about color matching, in comparison to the Control group. Among younger children, the Control group improved more. All groups improved over time.

Dimensional Change Card Sort: Post-Switch Scores Varied with Age





Main Effect Time: $F(1, 218) = 3.52$, $p = .062$
ME Condition: $F(1, 220) = 3.45$, $p = .065$
Time x Condition x Age: $F(1, 218) = 3.84$, $p = .051$

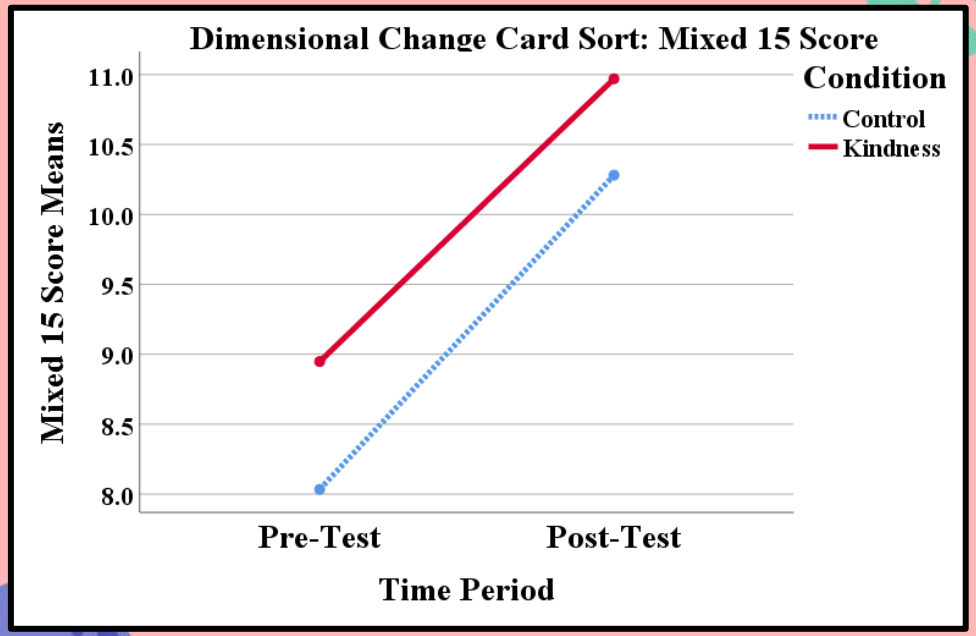
The impact of the Kindness Curriculum was most prominent for older children on **Post-Switch Scores** (i.e., they improved on the number of shape matching problems solved correctly). Younger children who received the KC began the year at a significantly higher point than younger children in the Control group.

Dimensional Change Card Sort: Mixed Problems

Outcome: "Mixed" Problems --harder because matching by both Color & Shape is required

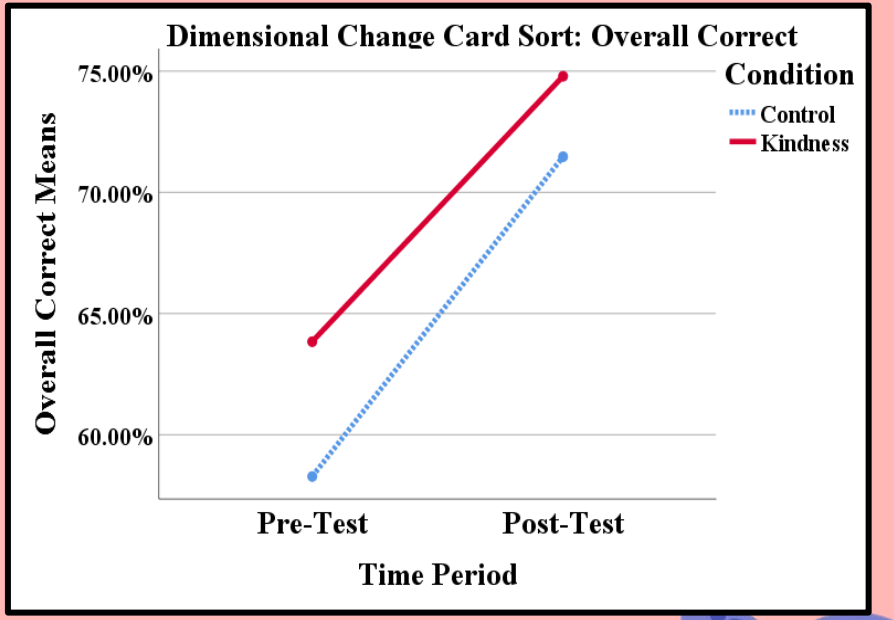
The Kindness Curriculum had a notable impact on children for **Mixed Problems**, where children have to switch between matching by color and shape. Children in the Kindness group successfully solved more problems than children in the Control group. Both groups improved over time.

Main Effect Time: $F(1, 220) = 48.02$, $p < .001$
ME Condition: $F(1, 220) = 2.89$, $p = .091$



Dimensional Change Card Sort: Overall Percent Correct

Outcome: Overall Percent Correct on all Trials Combined

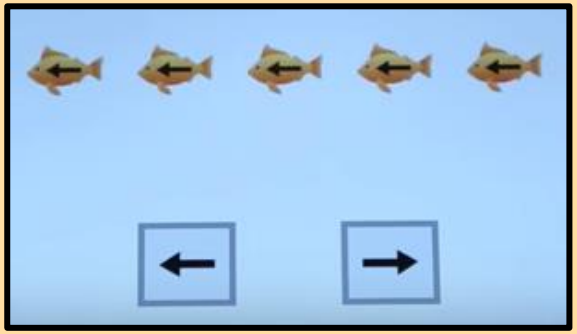


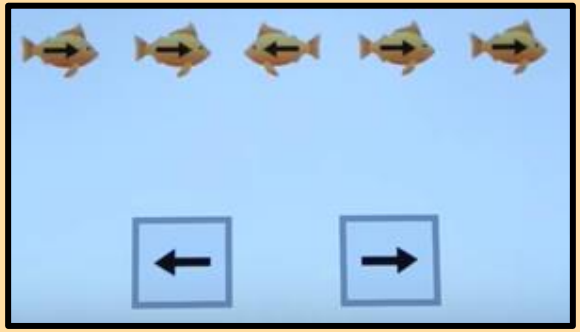
Children in the Kindness Group got a higher **Overall Percentage of Card Sort problems correct** as compared to children in the Control group. Additionally, both groups improved over time.

Main Effect Time: $F(1, 190) = 35.32$, $p < .001$
ME Condition: $F(1, 222) = 3.39$, $p = .067$

Sample Flanker Problem

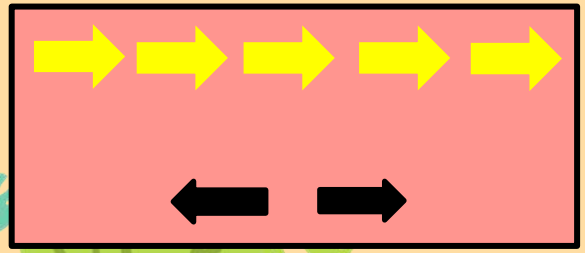
- Children are provided with a series of five fish & asked to choose which direction the ***middle fish*** is facing. The fish surrounding the middle fish are either facing in the ***same direction*** or in the ***opposite direction.***

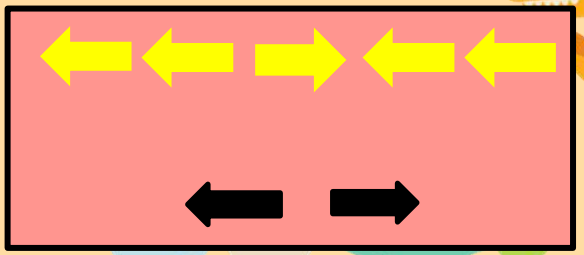




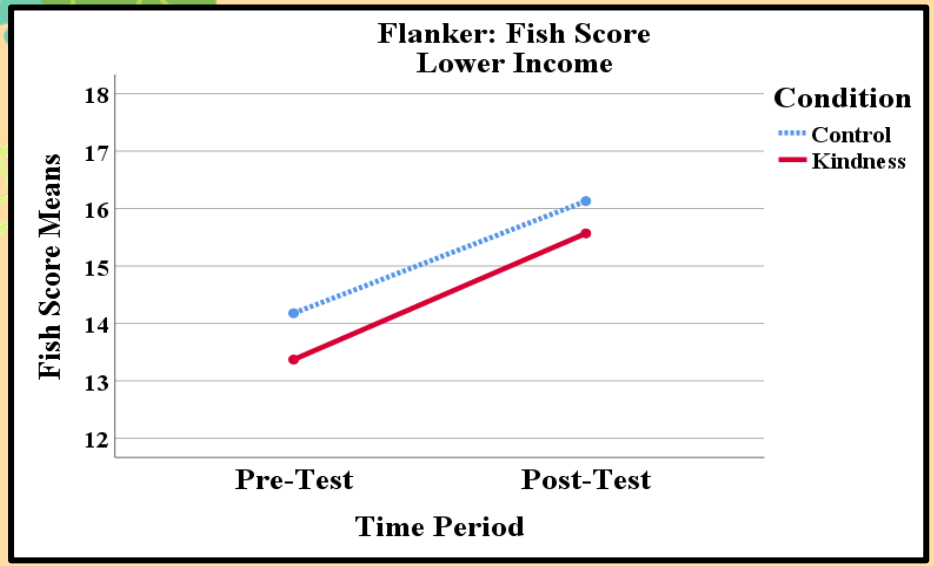
The Flanker Task measures *inhibitory control* – mentally controlling an impulsive response.

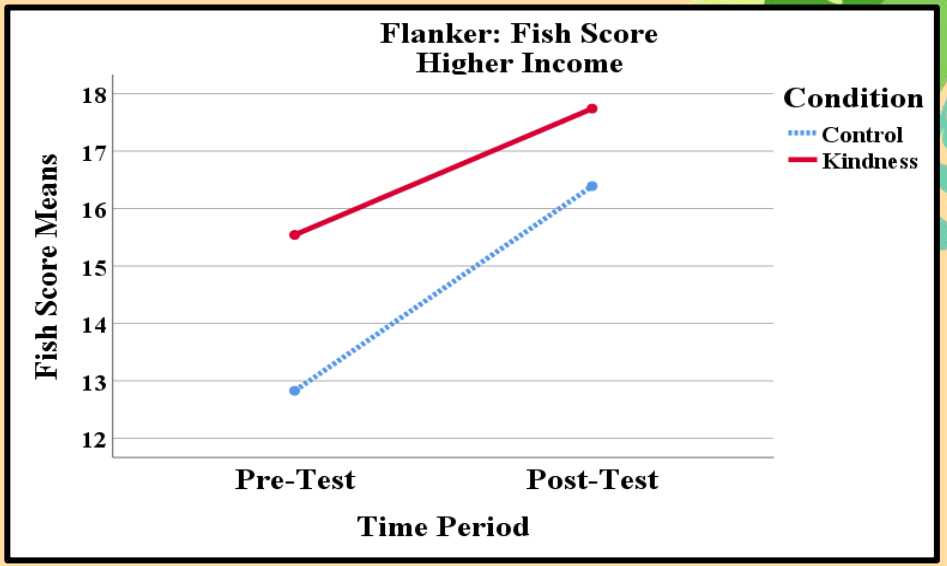
- If children are successful with the fish trials, they then proceed to the **arrow trials** where arrows are either facing in the ***same direction*** or in the ***opposite direction.***





Flanker Results: Fish Problems Varied with Socio-Economic Status





Main Effect Time: $F(1, 214) = 63.36$, $p < .001$
Condition x SES: $F(1, 212) = 6.17$, $p = .014$

The Kindness Curriculum led to greater improvement in **Inhibitory Control on Fish Problems** for children from higher income families; the Kindness group correctly solved more problems about the direction the fish were facing. Lower income children's results did not vary significantly with condition. All groups improved over time regardless of condition.

Measures: BRIEF-P

Teachers reported on children's ***problem behaviors*** in specific areas of **executive function** skills. This measure was developed specifically for preschoolers (Giola et al., 2003).

The questions were rated on the following scale:

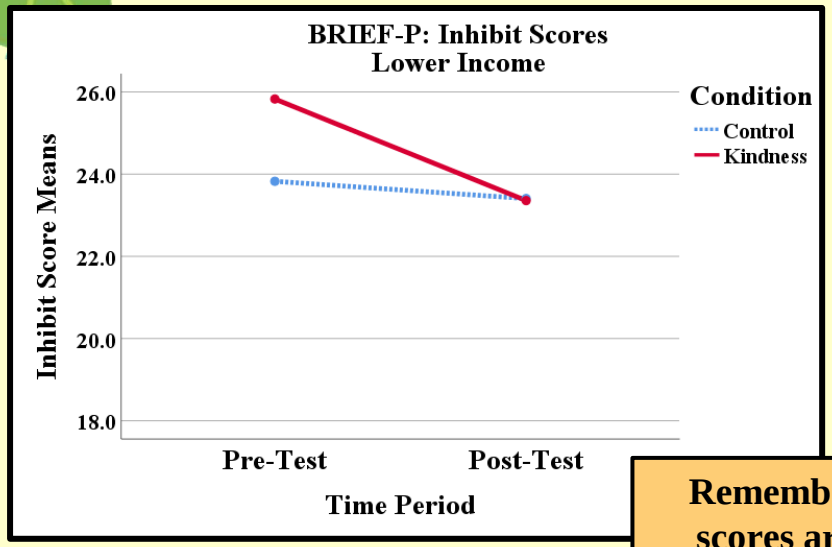
Never	Sometimes	Always

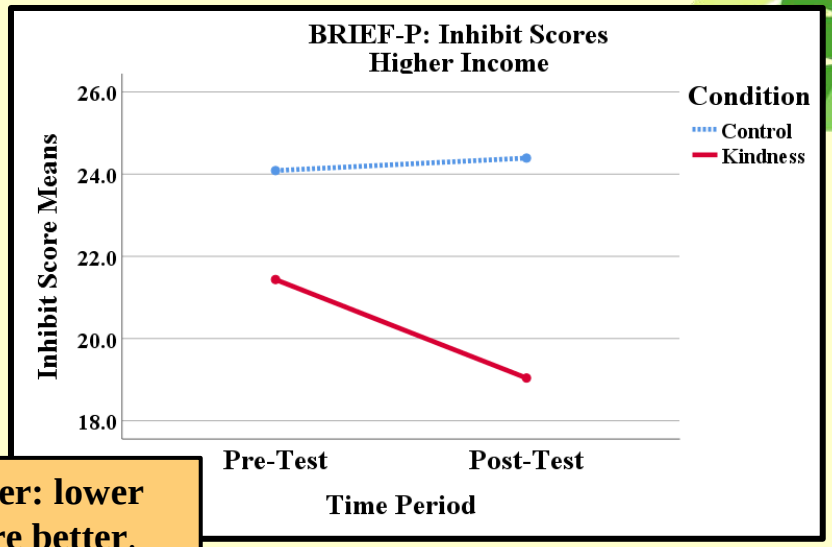
Example Statements:

- **Inhibitory Self-Control Subscale**:
  Has trouble inhibiting behavior or resisting acting on impulse.
- **Shift Subscale**:
  Struggles to shift flexibly as the situation demands.
- **Working Memory Subscale** :
  Has trouble remembering or holding information in mind to complete an activity.
- **Plan/Organize Subscale** :
  Has trouble following instructions or planning appropriate steps to complete a task.
- **Emotional Control Subscale** :
  Has trouble modulating emotions; may react too strongly to minor events.

***Lower scores indicate fewer problems & therefore reflect better executive function skills.**

BRIEF-P Results: Inhibitory Scores Varied with Socioeconomic Status



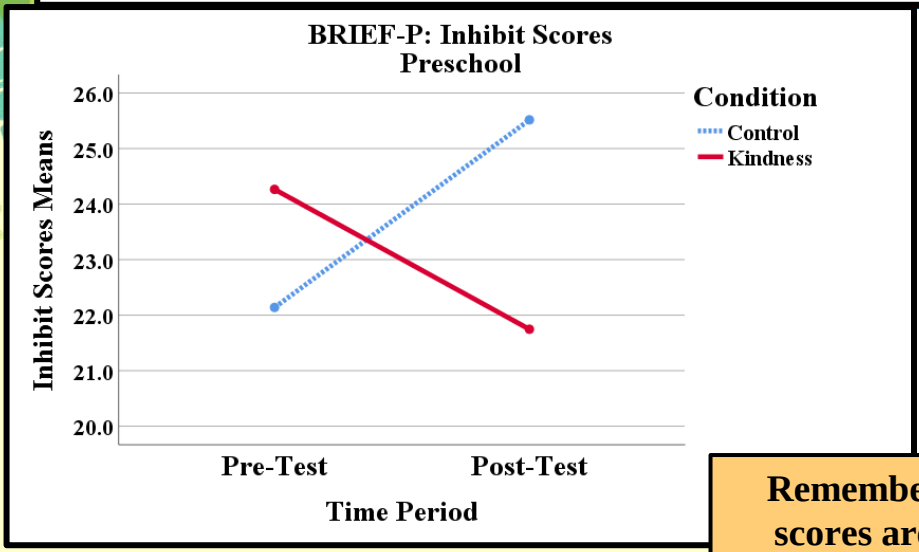


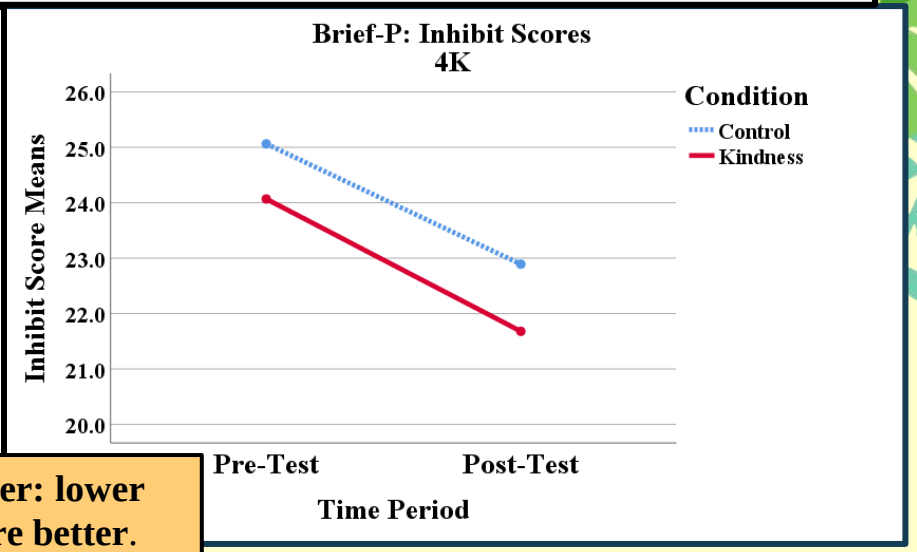
Remember: lower scores are better.

Main Effect Time: $F(1, 224) = 2.74$, $p = .099$
SES x Condition: $F(1, 224) = 4.59$; $p = .033$

The Kindness Curriculum was effective for children from both lower- and higher-income families for **Inhibitory Self-Control,** a child's ability to modulate their behavior and impulses. Lower SES children who received the Kindness Curriculum improved significantly over time, while lower SES children in the Control group did not. Higher income children in the Kindness group started stronger and improved over time, while those in the Control group did not.

BRIEF-P Results: Inhibitory Scores Varied with Preschool or 4K



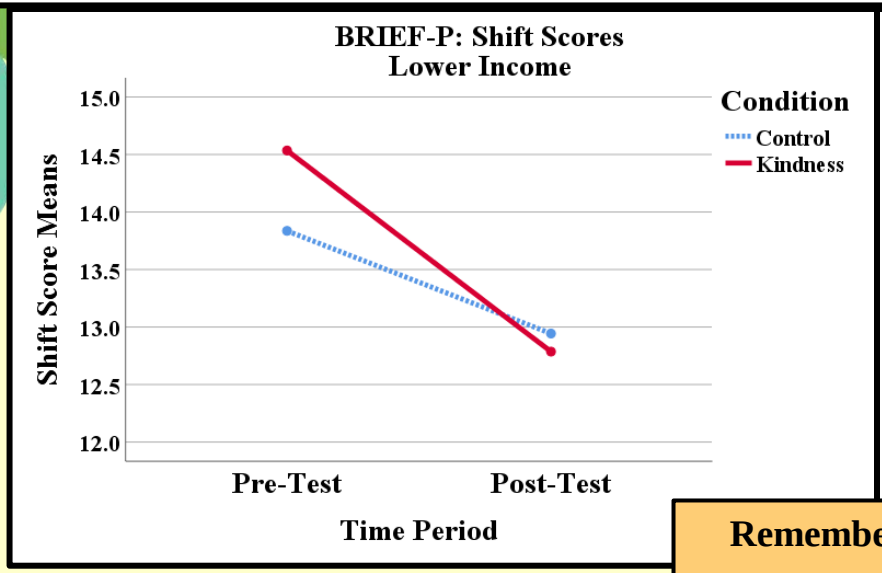


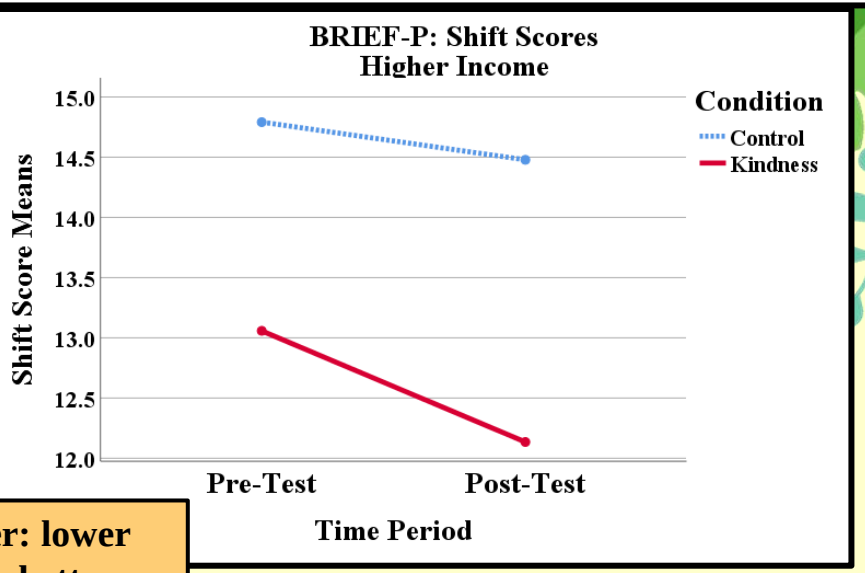
Remember: lower scores are better.

Time x Condition: $F(1, 225) = 4.63$, $p = .032$
Time x Pre/4K: $F(1, 225) = 3.64$, $p = .058$
Time x Cond x Pre/4K: $F(1, 225) = 4.00$, $p = .047$

Preschoolers in the Kindness group improved significantly in **Inhibitory Self-Control** compared to preschoolers in the Control group who displayed more difficulties in modulating their behavior over time**.** Children in 4K classes improved over time, with children who received the KC starting and ending the year with fewer difficulties than the Control group.

BRIEF-P Results: Shift Scores Varied with Socioeconomic Status



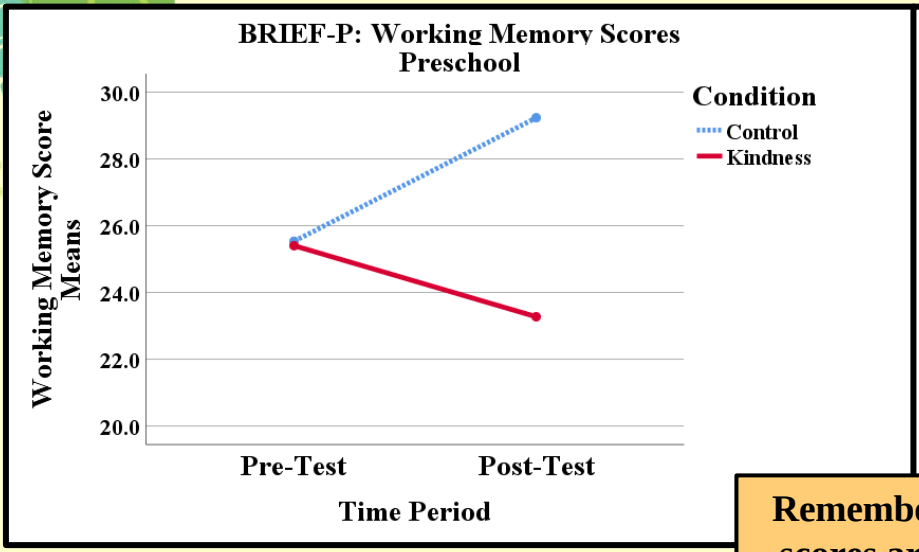


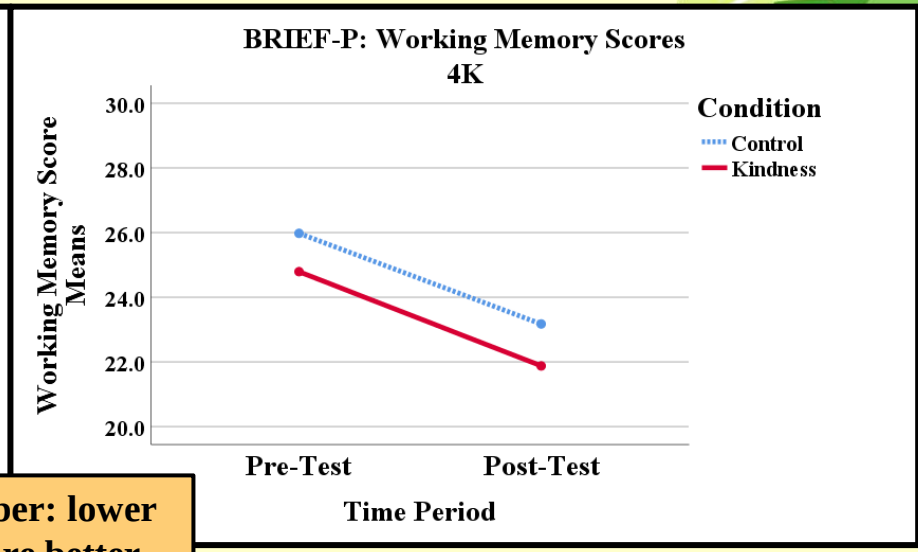
Remember: lower scores are better.

Main Effect Time: $F(1, 225) = 6.48$, $p = .012$
SES x Condition: $F(1,225) = 3.72$, $p = .055$

The impact of the Kindness Curriculum on **Shift Scores** was most striking **for lower-income income children who improved significantly after receiving the Curriculum.** Shift Scores reflect the ability to shift problem-solving strategies flexibly when the situation calls for it. Higher SES children in the Kindness group started with stronger shift skills than those in the Control group and improved more over time than the Control group.

BRIEF-P Results: Working Memory Varied with Preschool or 4K



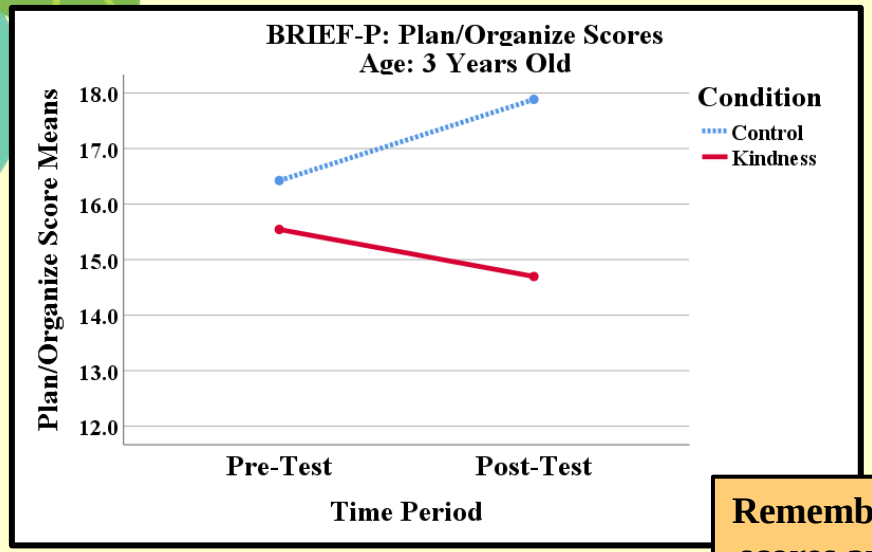


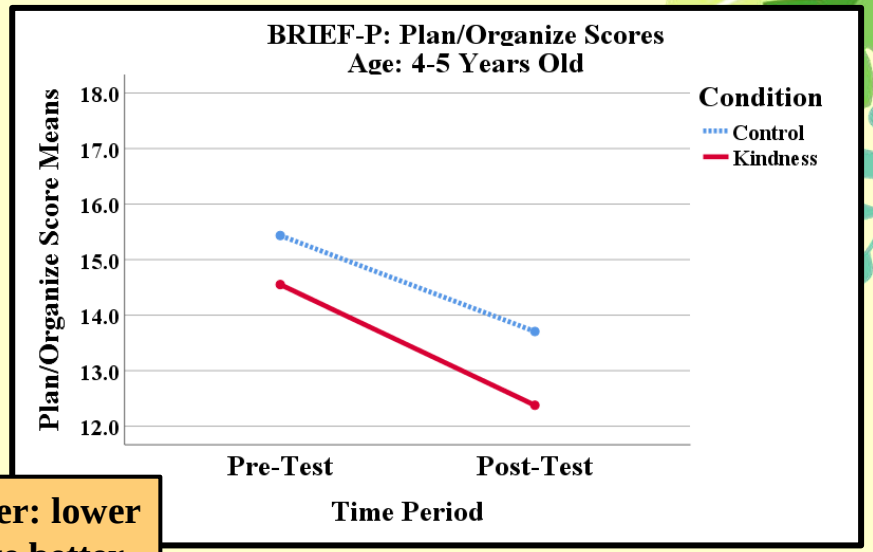
Remember: lower scores are better.

Time x Condition: $F(1, 226) = 4.32$, $p = .039$
Time x Pre/4K: $F(1, 226) = 6.51$, $p = .011$
Main Effect Condition: $F(1, 226) = 3.72$, $p = .055$
ME Pre vs 4K: $F(1, 226) = 2.94$, $p = .088$
Condition x Time x Pre/4K: $F(1, 226) = 4.01$, $p = .047$

The impact of the Kindness Curriculum was notable for both Preschoolers (3-4 years) and 4K children on **Working Memory,** or the ability to hold critical information in the mind. Preschoolers who were taught the KC improved over time, whereas those in the Control group struggled more over time. Control group children in 4K did improve, but not to the level of those in the Kindness group.

BRIEF-P Results: Plan/Organize Scores Varied with Age



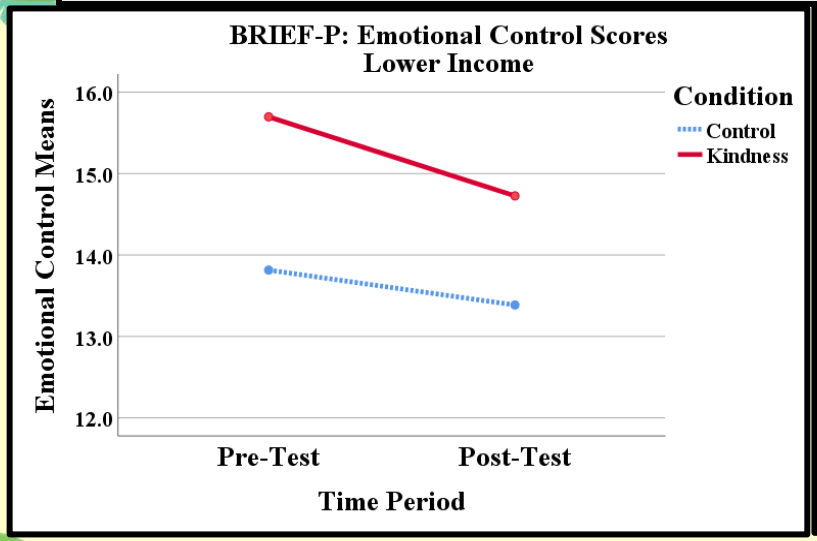


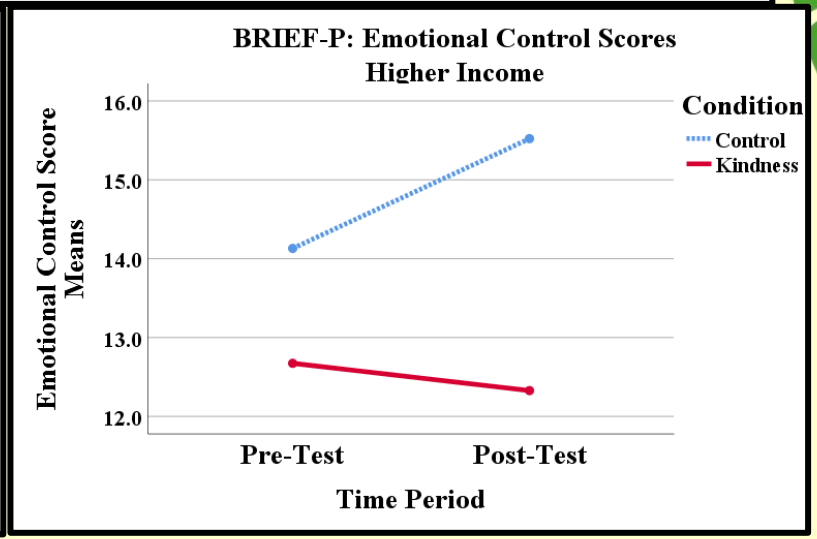
Remember: lower scores are better.

Main Effect Time: $F(1, 226) = 3.88$, $p = .004$
Time x Age: $F(1, 226) = 7.31$, $p = .007$
Time x Condition: $F(1, 226) = 12.72$, $p = .100$
ME Condition: $F(1, 226) = 5.73$, $p = .017$
ME Age: $F(1, 226) = 10.45$, $p = .001$

The impact of the Kindness Curriculum was notable for both younger (3 year olds) and older (4-5 years) children on **Plan & Organize Scores,** which measures the ability to plan ahead and manage resources effectively. Younger children who were taught the KC improved over time, whereas those in the Control group did not. Older children in the Control group did improve, but not to the level of those in the Kindness group.

BRIEF-P Results: Emotional Control Scores Varied with Socioeconomic Status





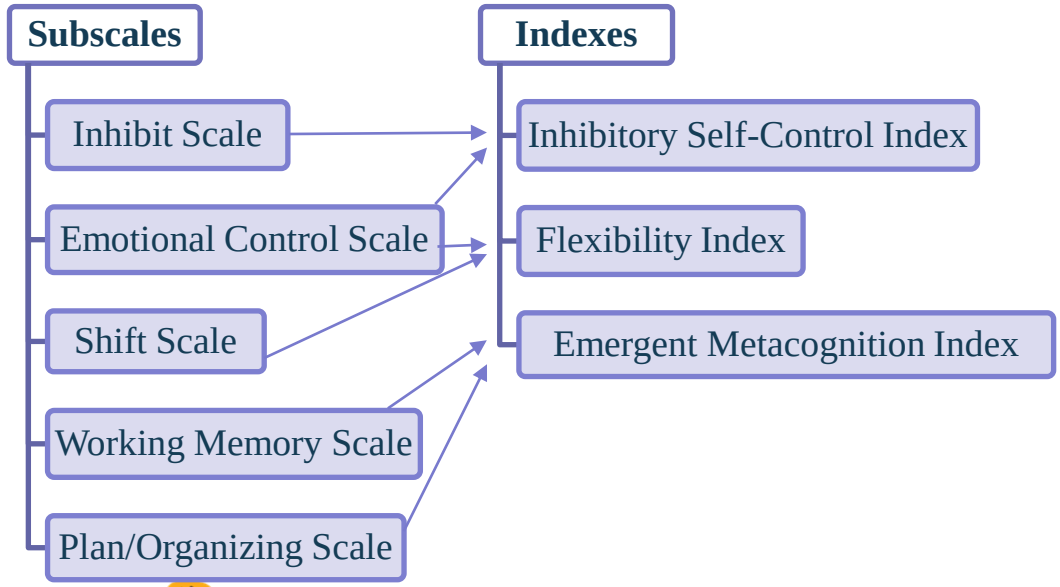
Remember: lower scores are better.

SES x Condition: $F(1,225) = 8.32$, $p = .004$

Higher income children in the Kindness Group showed better **Emotional Control** (i.e., the ability to modulate and control their emotional responses) overall than children in the Control group who experienced more problems over time. In contrast, Control group children from lower SES families showed better Emotional Control than those in the Kindness group, though children in the Kindness group improved over time.

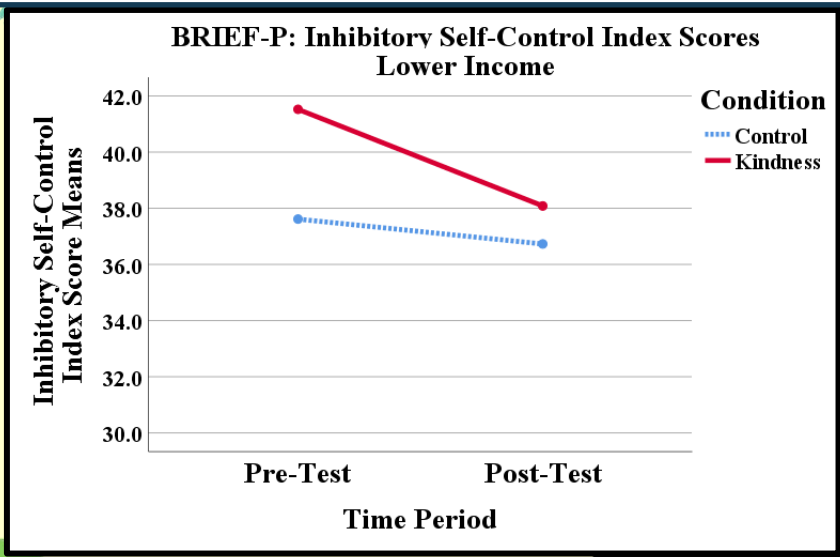
Behavior Rating Inventory of Executive Function—Preschool Version (BRIEF-P)
The BRIEF-P also has three indexes & an Overall Composite Score

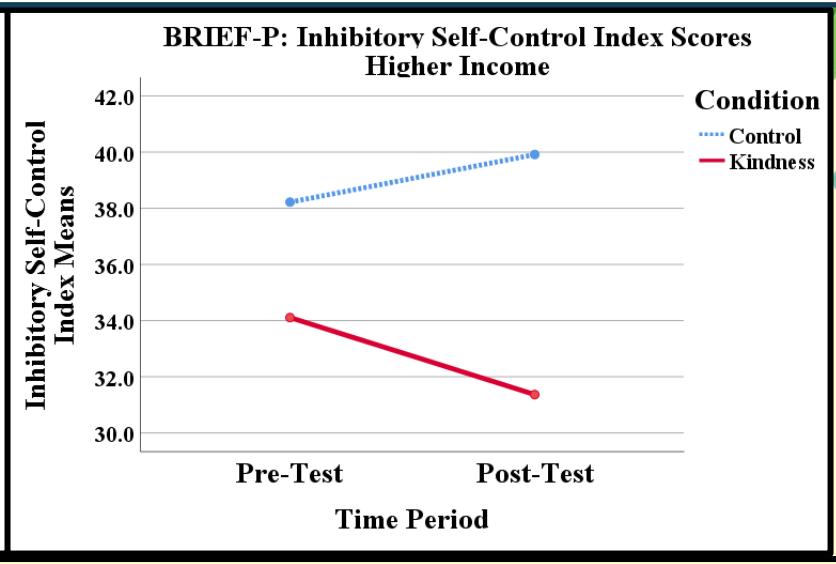
The **Global Executive Composite** Combines all 5 Subscales



Higher scores indicate a difficulty for the child in one or more areas

BRIEF-P Results: Inhibitory Self-Control Index Scores Varied with Socioeconomic Status



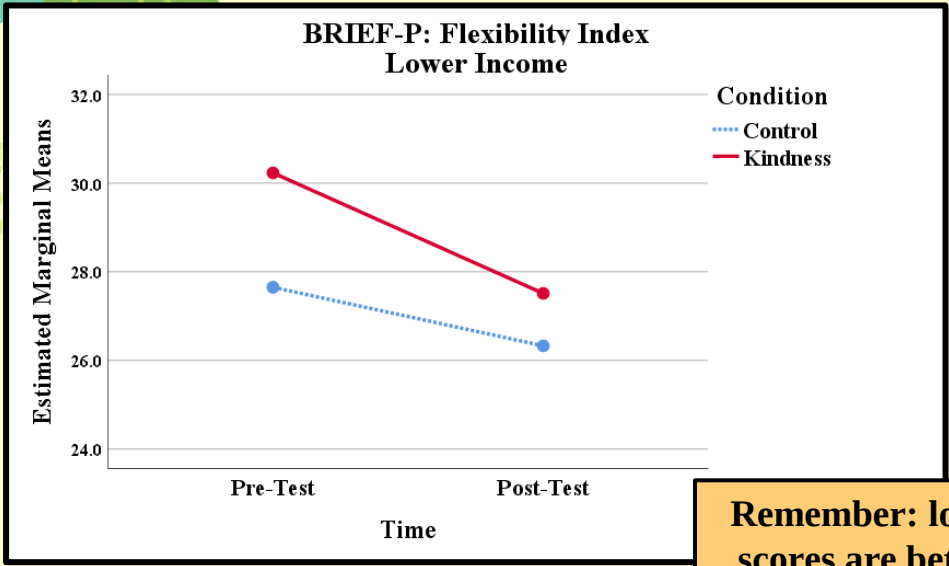


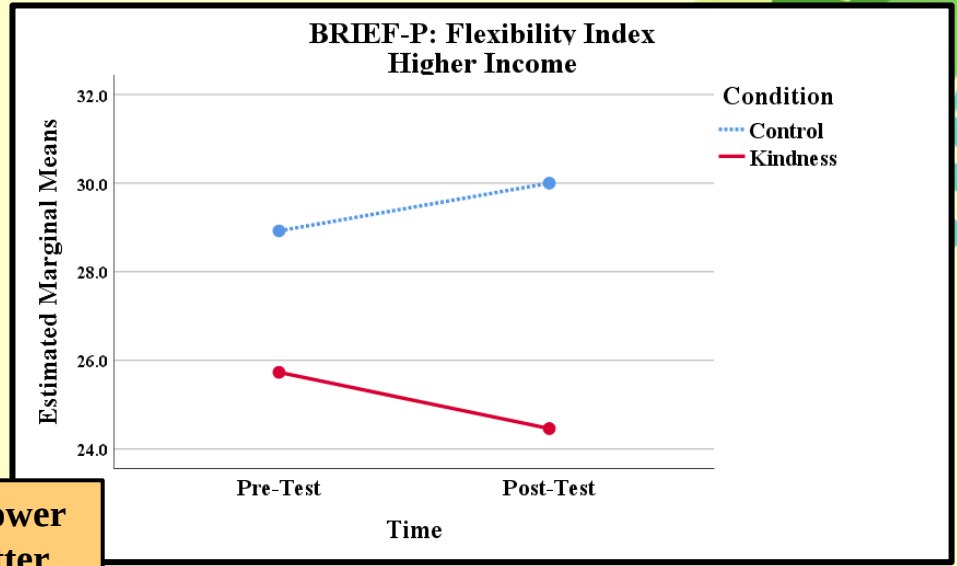
Remember: lower scores are better.

SES x Condition: $F(1, 225) = 6.81$, $p = .010$

The impact of the Kindness Curriculum was striking for children from both higher & lower income families on the **Inhibitory Self Control Index,** a child's ability to modulate themselves emotionally & behaviorally. High SES children who received the Curriculum started and ended the year at a better point then high SES children in the Control group. Low SES children who received the Curriculum started with more difficulties, but improved over time while low SES children in the Control group did not.

BRIEF-P Results: Flexibility Index Varied with Socioeconomic Status



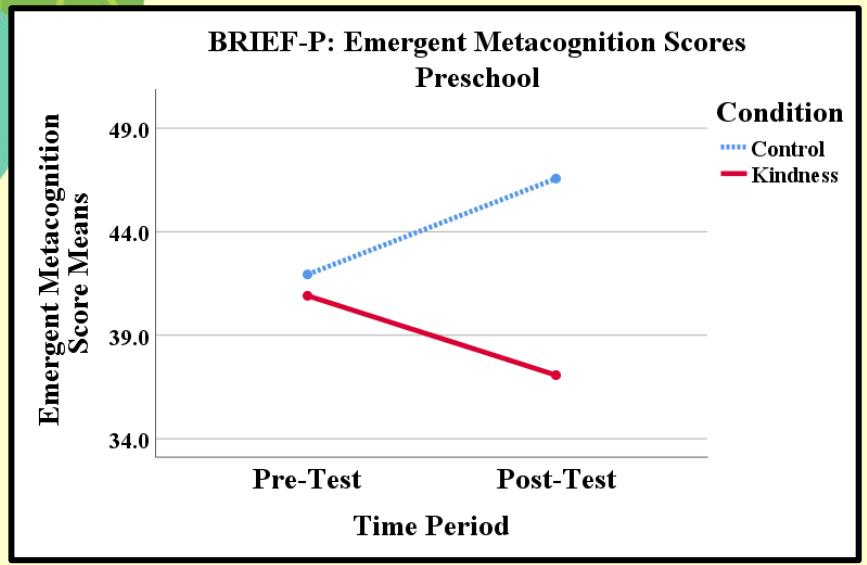


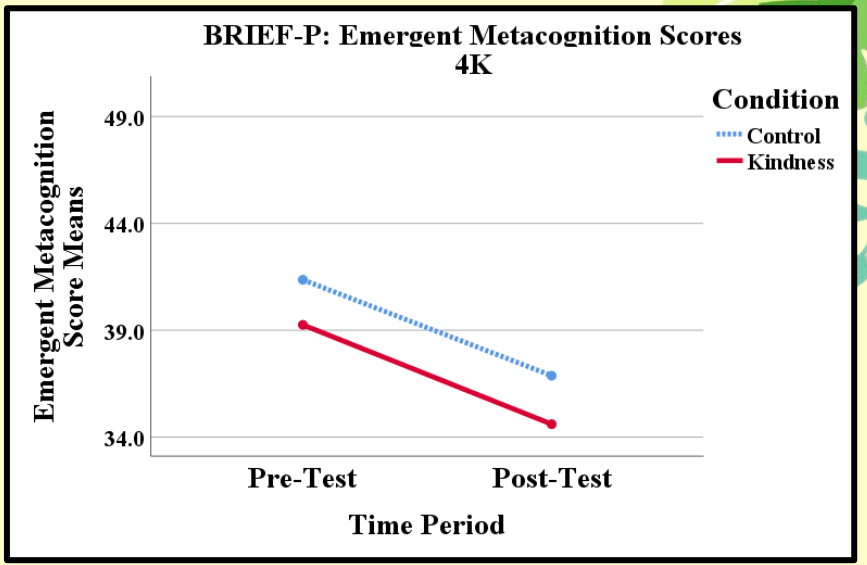
Remember: lower scores are better.

SES x Condition: $F(1, 225) = 6.84$, $p = .010$

The Kindness Curriculum was beneficial for children from **lower income** families on the **Flexibility Index**, the ability to modulate emotions & react flexibly to challenges. That is, they started the year with more problems in this area and improved after receiving the Curriculum. Higher income children in the Kindness group also benefitted; they started with stronger flexibility scores than those in the Control group and improved, whereas those in the Control group did not.

BRIEF-P Results: Emergent Metacognition Index Varied by Age Group



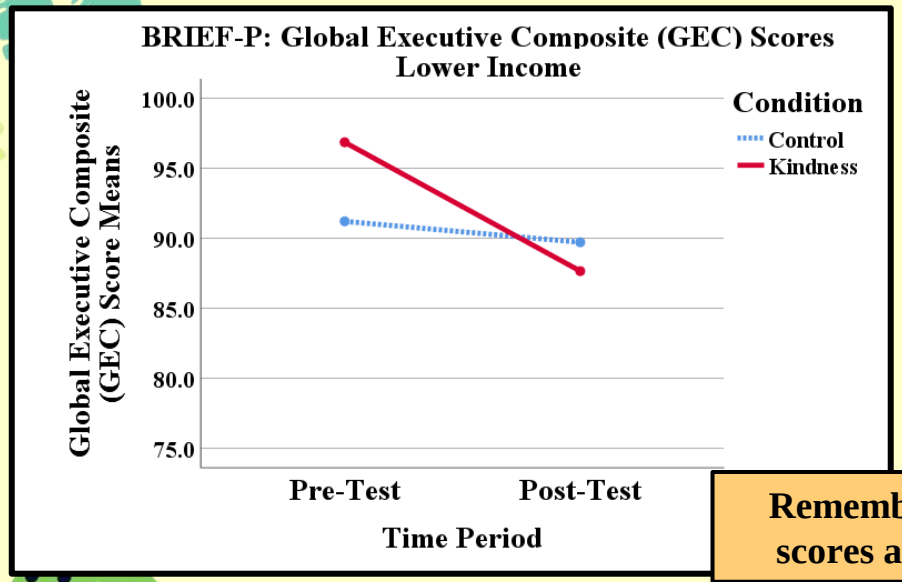


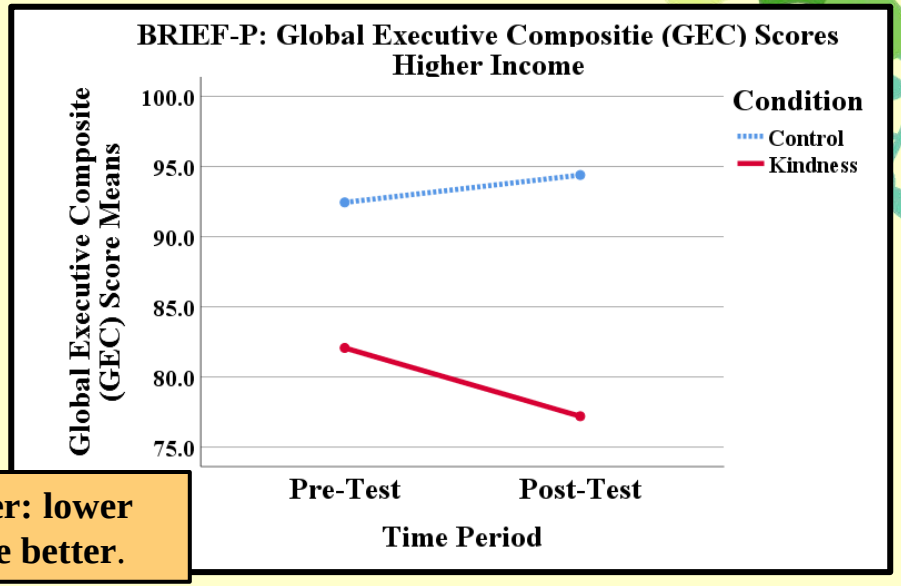
Remember: lower scores are better.

Main Effect Time: $F(1, 226) = 3.61$, $p = .059$
Time x Condition: $F(1, 226) = 3.87$, $p = .050$
Time x Pre/4K: $F(1, 226) = 5.12$, $p = .025$
ME Condition: $F(1, 226) = 4.64$, $p = .032$
ME Pre/4K: $F(1, 226) = 4.33$, $p = .038$

The Kindness Curriculum was especially beneficial for preschool children's **Emergent Metacognition scores,** which measures their ability to use their working memory in tandem with their abilities to plan. Preschool children in the KC group showed significant improvement over time after receiving the curriculum as compared to children in the Control group. Children in 4K classes improved over time but improvement did not vary with condition.

BRIEF-P Results: Global Executive Composite Scores Varied with Socioeconomic Status



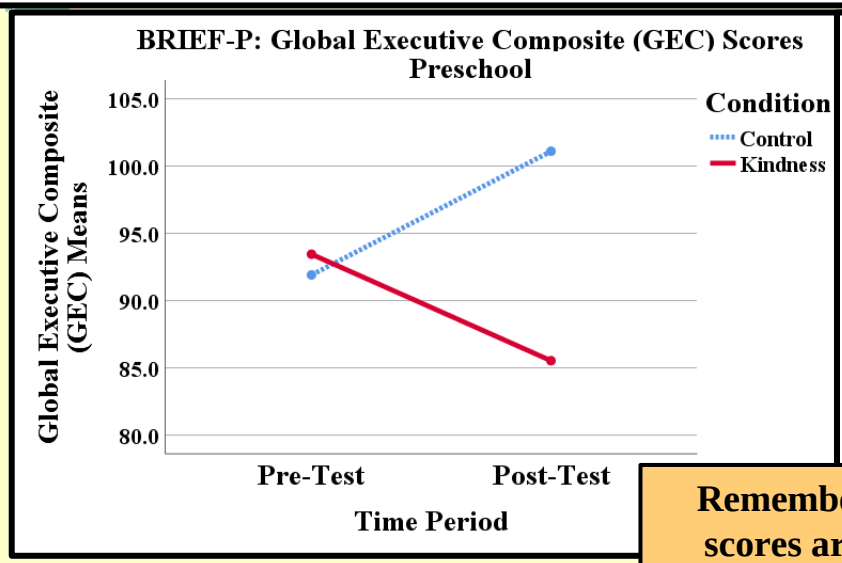


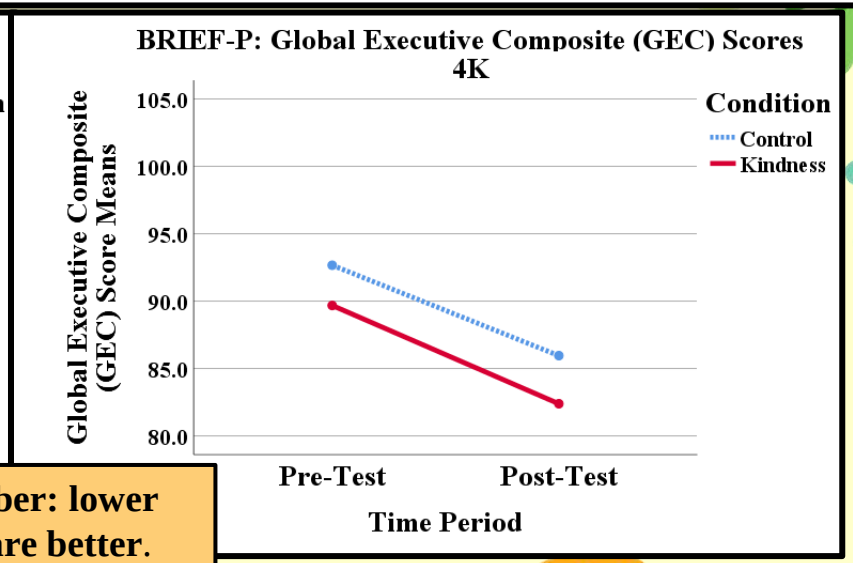
Remember: lower scores are better.

SES x Condition: $F(1, 225) = 4.24$, $p = .041$

The impact of the Kindness Curriculum on the **Global Executive** Composite Score, an overall evaluation of executive function skills, was noteworthy for **lower income children** who improved significantly over time. **Higher income children in the Kindness Group** started stronger than those in the Control group in overall executive function skills, and showed improvement over time, while those in the Control group did not.

BRIEF-P Results: Global Executive Composite Scores Varied in Preschool vs. 4K Classrooms





Remember: lower scores are better.

Time x Condition: $F(1, 226) = 3.42$, $p = .066$
Time x Cond x Pre/4K: $F(1, 226) = 2.98$, $p = .086$

The impact of the Kindness Curriculum on the **Global Executive** Composite Score, an overall evaluation of executive function skills, was most favorable for preschool children. Preschool children showed significant improvement over time after receiving the Curriculum while those in the Control group did not improve. Children in 4K classes improved over time but improvement did not vary with condition.

Measures: Teaching Strategies (TS)-Gold

- Teachers at the CELC completed the TS-Gold in the fall, winter, and spring. This authentic observation-based assessment system is part of the regular assessment done in CELC preschool and 4K classrooms. It measures children's development and academic progress. The Kindness Curriculum ended near the winter assessment.
- Teachers rate 63 skills on a scale of "Not Yet" to "9", and provide observations of the child in the areas of social–emotional, physical, language, and cognitive development, & in the content areas of literacy, mathematics, & English-language acquisition.

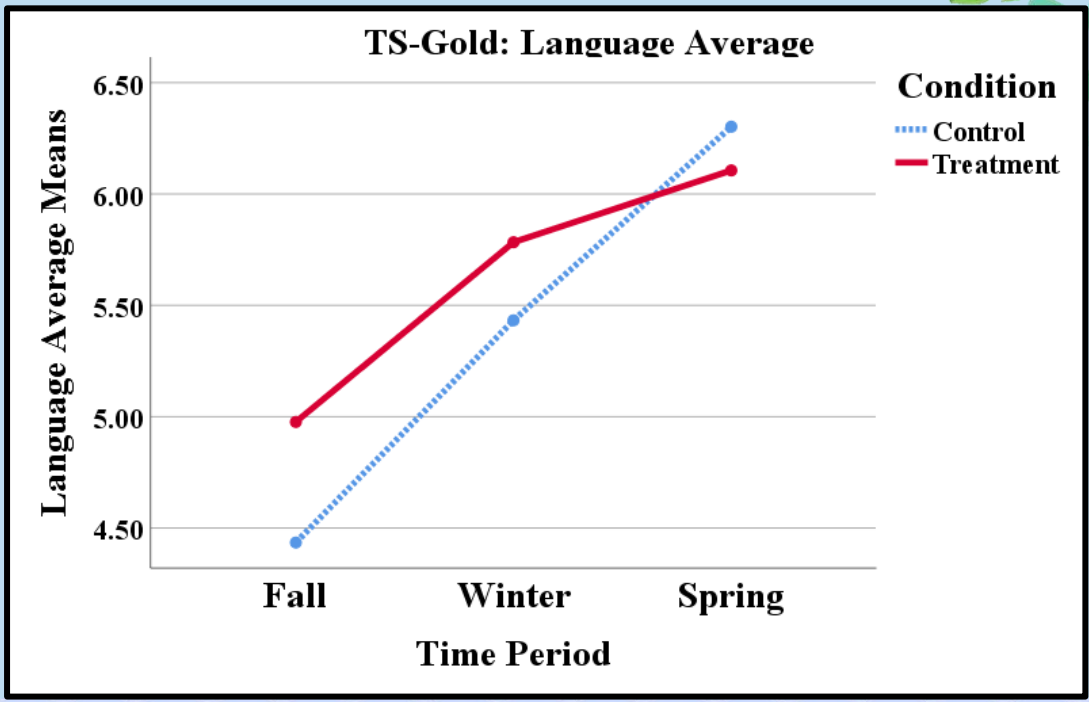
We examined 4 areas which reflect **children's cognitive skills** to assess cognitive and academic improvement:

Measure	Sample Content	Typical Range of Scores for 3 Year Old Children	Typical Range of Scores for 4-5 Year Old Children
Language	Uses an expanding expressive vocabulary. Listens to and understands increasingly complex language.	5-6	6-8
Cognitive	Shows curiosity & motivation. Demonstrates positive approach to learning.	4-5	5-7
Literacy	Notices & discriminates discrete units of sound. Demonstrates emergent writing skills.	2-4	3-6
Mathematics	Understands number concepts & spatial relationships. Demonstrates knowledge of patterns.	3-4	4-7

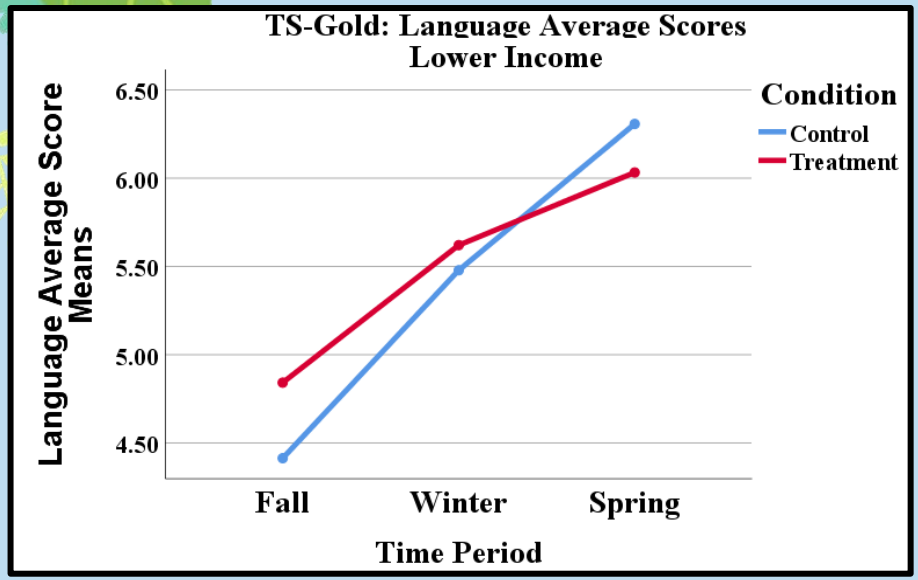
TS-Gold Results: Language Skills Over Time

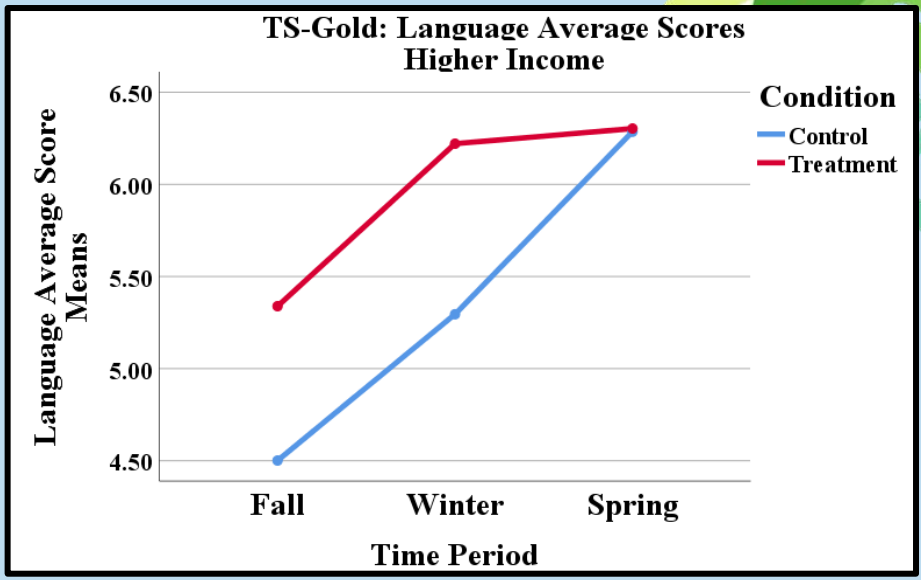
- Children in the Kindness Group showed stronger **language** skills than the Control Group in Fall & in Winter following implementation of the Kindness Curriculum.
- All groups improved over time, and by Spring there were no significant differences between the groups.

Main Effect Time: $F(1, 192) = 317.02$, $p < .001$
ME Condition: $F(1, 192) = 3.43$, $p = .066$
Time x Condition: $F(1,192) = 20.41$, $p < .001$



TS-Gold Results: Language Skills Varied with Socioeconomic Status

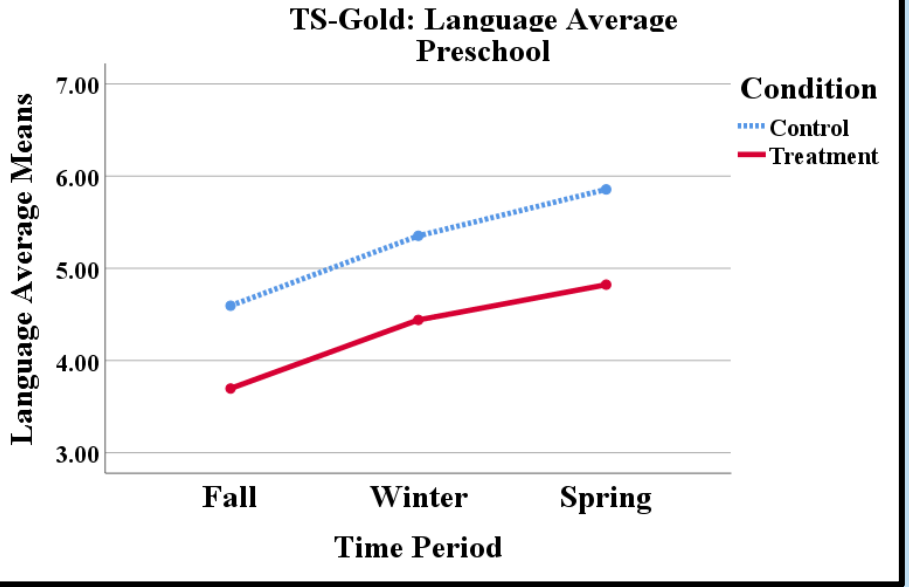


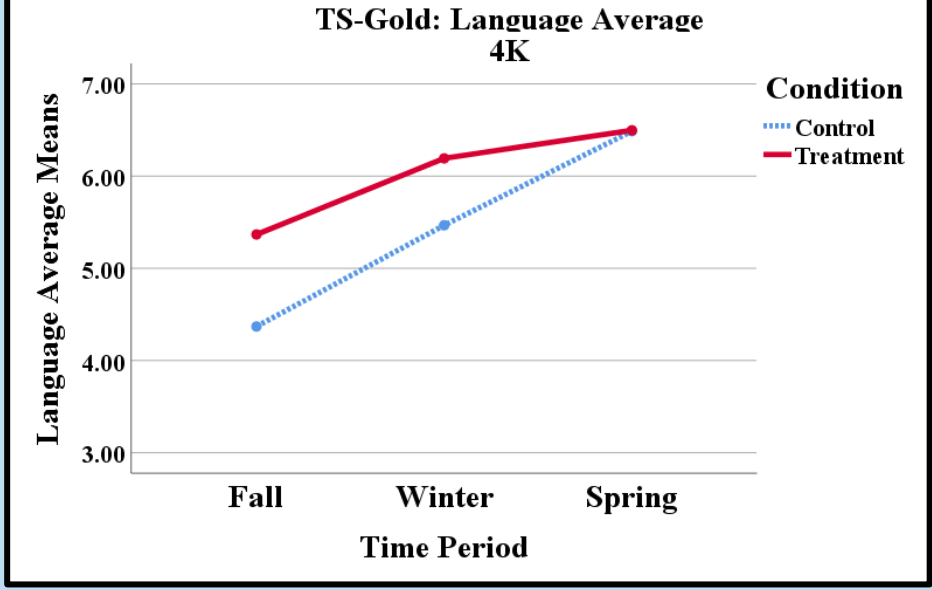


Main Effect Time: $F(1, 192) = 230.32$, $p < .001$
ME Condition: $F(1, 192) = 5.96$, $p = .016$
Time x Condition: $F(1, 188) = 18.32$, $p < .001$
SES x Condition: $F(1,188) = 6.65$, $p = .082$.

The impact of the Kindness Curriculum on **language** skills was most obvious for children from higher income families. The KC was especially effective during its implementation in Fall and Winter, and during this time, children receiving the KC did better than children in the Control group. All groups improved over time.

TS-Gold Results: Language Skills Varied with Preschool or 4K





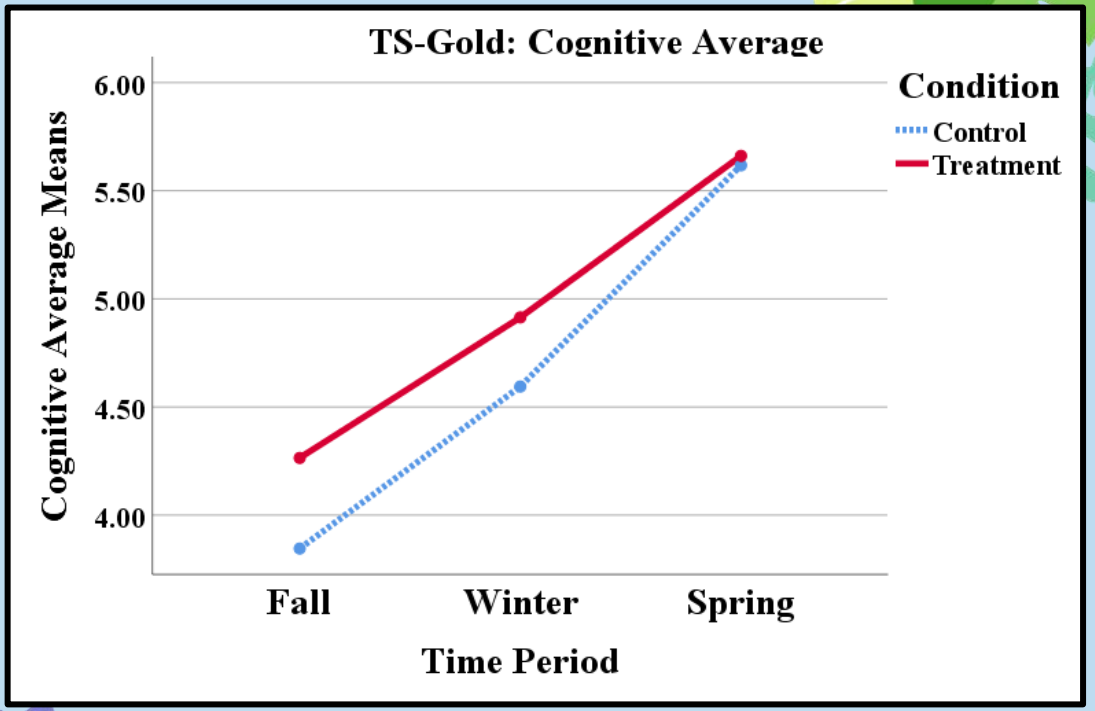
Main Effect Time: $F(1, 192) = 227.32$, $p < .001$
Time x Pre vs 4K: $F(1, 192) = 5.24$, $p = .006$
Time x Condition: $F(1, 192) = 9.63$, $p < .001$
Condition x Pre vs 4K: $F(1, 192) = 47.16$, $p < .001$
ME Preschool/4K: $F(1, 192) = 71.06$, $p < .001$
Time x Condition x Preschool/4K: $F(1, 192) = 5.38$, $p = .005$

- The Kindness Curriculum was effective for 4K children's **language skills.**
- 4K children who were taught the KC did better than 4K children in the Control group, while the Control group did better in preschool rooms.
- All groups improved over time.

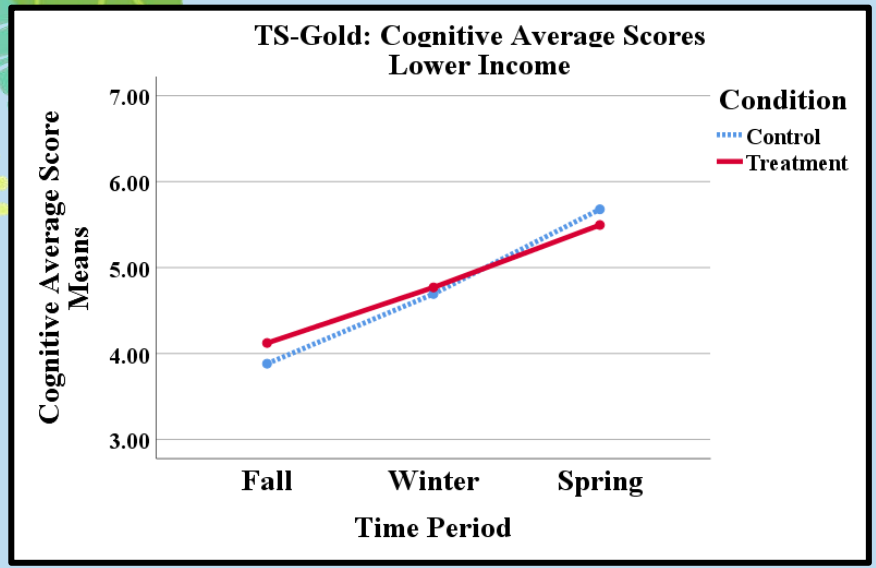
TS-Gold Results: Cognitive Skills Over Time

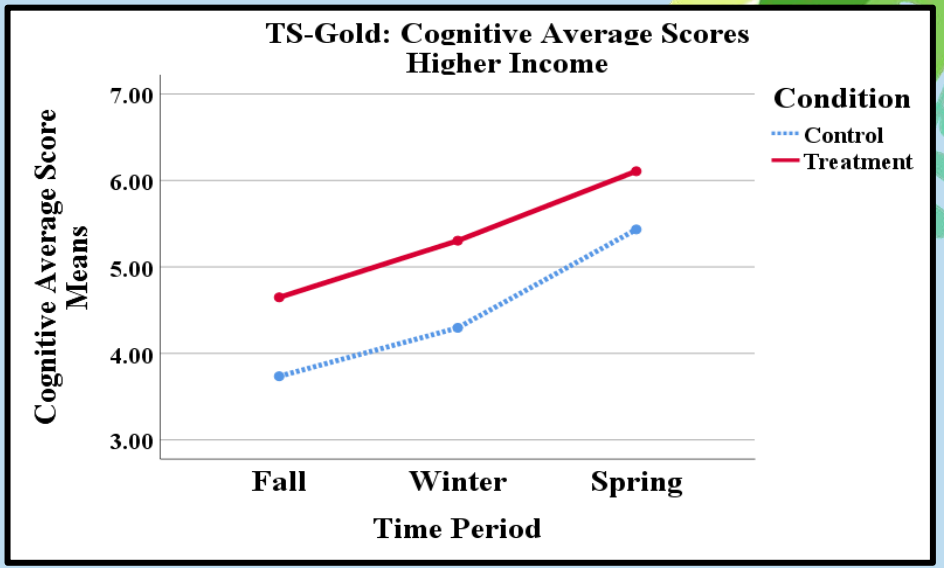
Children receiving the Kindness Curriculum demonstrated better **cognitive** skills than children who were in the Control group. The KC was especially effective during fall and winter, while it was being implemented. Both groups improved over time, and by spring no condition differences existed.

Main Effect Time: $F(1, 192) = 369.22$, $p < .001$
ME Condition: $F(1, 192) = 5.62$, $p = .019$
Time x Condition: $F(1,192) = 5.55$, $p = .004$



TS-Gold Results: Cognitive Skills Varied with Socioeconomic Status

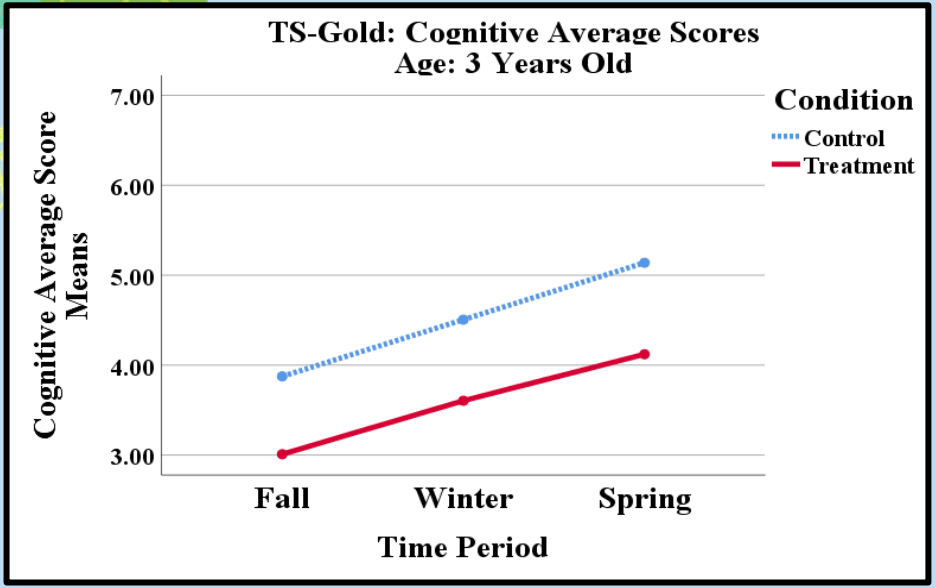


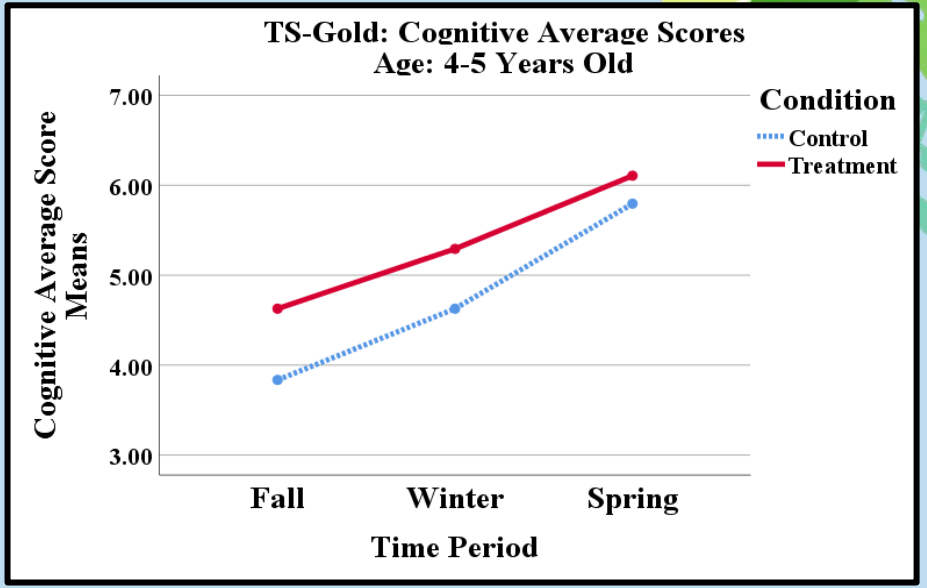


Main Effect Time: $F(1, 192) = 280.49$, $p < .001$
ME Condition: $F(1, 192) = 13.91$, $p < .001$
Time x Condition: $F(1, 192) = 3.69$, $p = .026$
SES x Condition: $F(1, 192) = 11.33$, $p = .001$

Higher SES children who were taught the KC showed stronger cognitive skills than higher SES children in the Control group. There were no condition differences among lower income children, though all groups showed improvement over time.

TS-Gold Results: Cognitive Skills Varied with Age

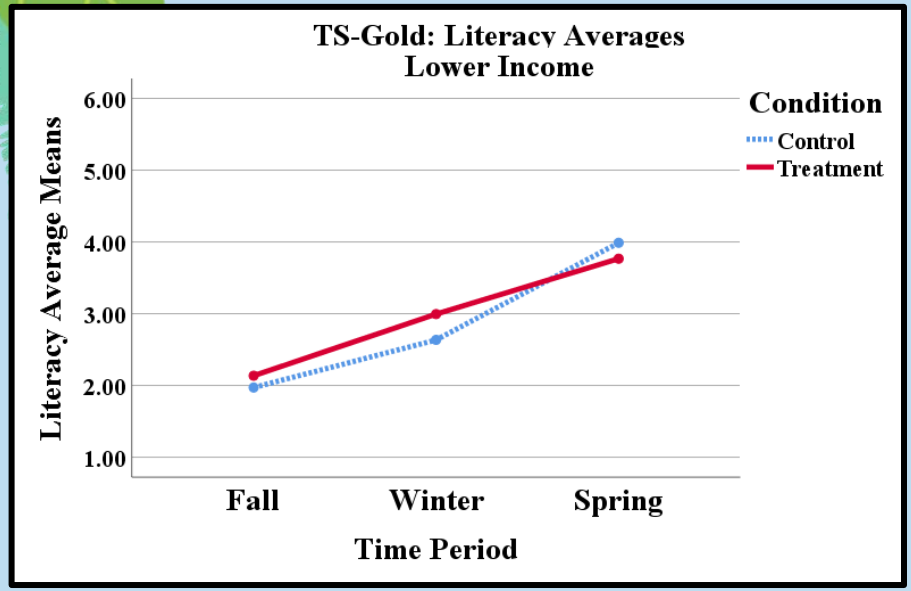


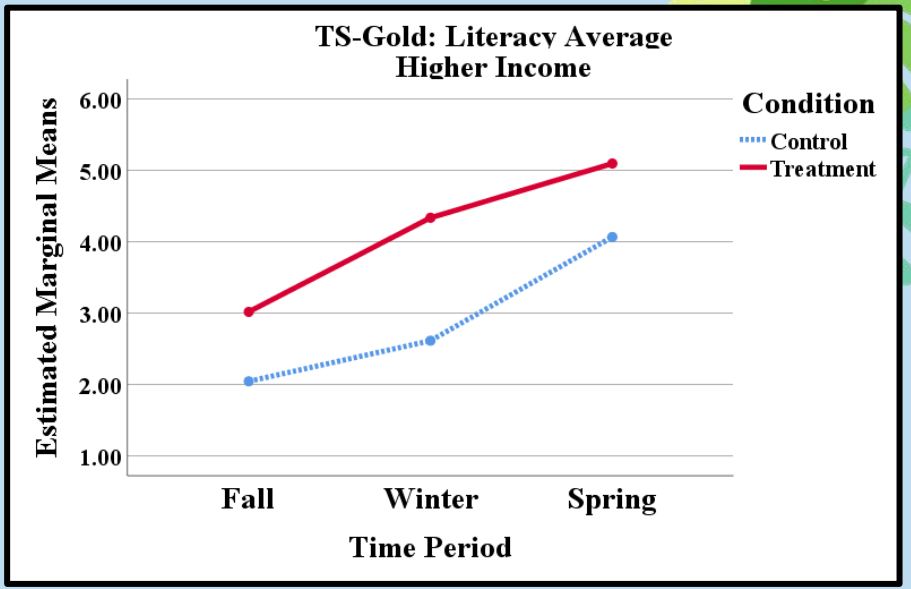


Main Effect Time: $F(1, 192) = 240.14$, $p < .001$
Time x Condition: $F(1, 192) = 3.07$, $p = .047$
Time x Age: $F(1, 192) = 8.84$, $p < .001$
ME Condition: $F(1, 192) = 3.84$, $p = .052$
ME Age: $F(1, 192) = 134.97$, $p < .001$
Age x Condition: $F(1, 188) = 76.95$, $p < .001$

- The Kindness Curriculum had a notable effect on the **cognitive** skills of older children (4-5 years old). Older children who were taught the KC did better than older children in the Control group.
- Among the younger children, the Control group did better, though all groups improved over time.

TS-Gold Results: Literacy Skills Varied with Socioeconomic Status

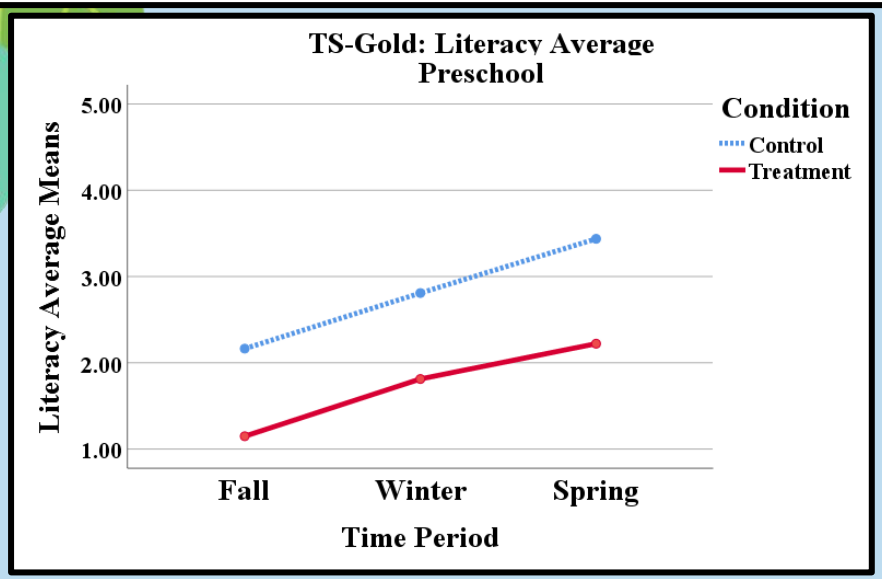


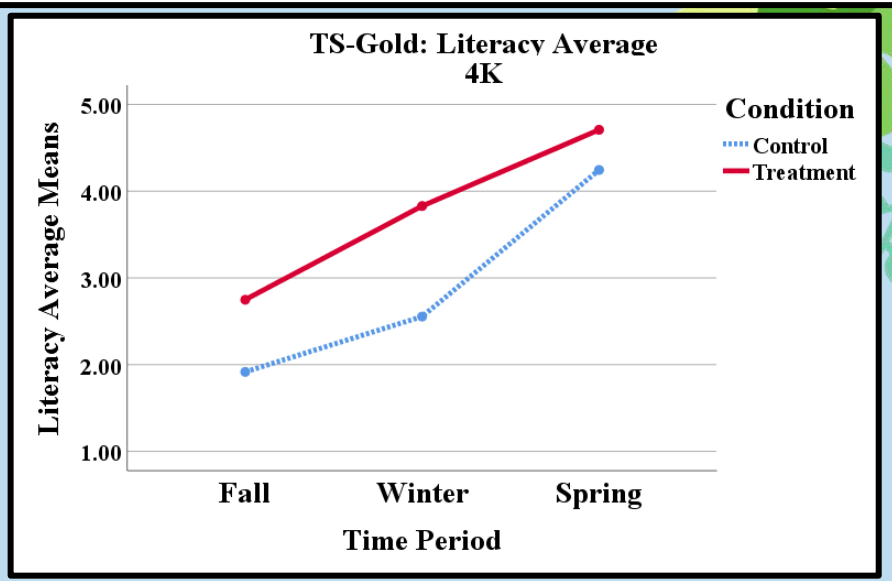


Main Effect Time: $F(1, 192) = 419.41$, $p < .001$
ME Condition: $F(1, 192) = 19.20$, $p < .001$
ME SES: $F(1, 192) = 16.07$, $p < .001$
Time x Condition: $F(1, 192) = 12.17$, $p < .001$
Time x Condition x SES: $F(1, 192) = 2.39$, $p = .093$

Higher-income children in the **Kindness Group** improved more in literacy skills than those in the Control group. There were no group differences among lower income children, though all groups improved significantly over time.

TS-Gold Results: Literacy Skills Varied with Preschool or 4K

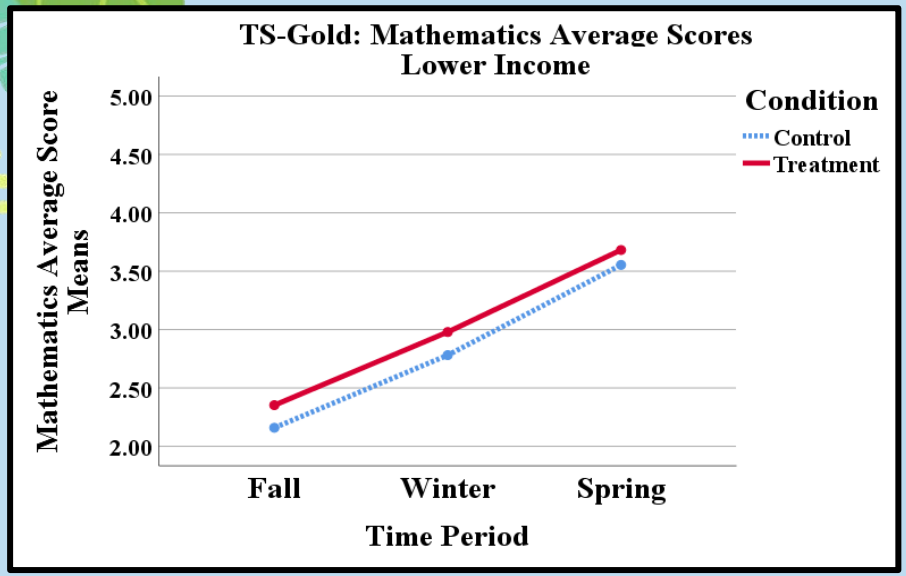


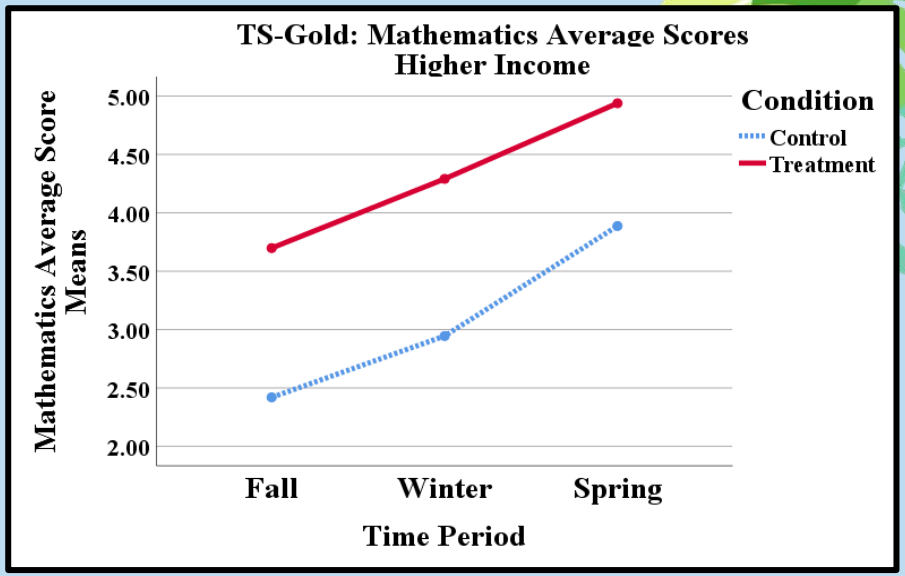


Main Effect Time: $F(1, 192) = 364.22$, $p < .001$
Time x Preschool/4K: $F(1, 192) = 34.56$, $p < .001$
ME Preschool/4K: $F(1, 192) = 71.94$, $p < .001$
Time x Condition: $F(1, 192) = 8.81$, $p < .001$
Condition x Preschool/4K: $F(1, 192) = 58.78$, $p < .001$
Time x Condition x Pre/4K: $F(1, 192) = 3.07$, $p = .047$

Children in 4K who **received the Kindness Curriculum** had significantly higher **literacy skills** than 4K children in the Control group. In preschool rooms, the pattern was reversed with Control group children performing better. As expected, children in 4K had better literacy skills than those in preschool overall. All groups improved over time.

TS-Gold Results: Math Skills Varied with Socioeconomic Status

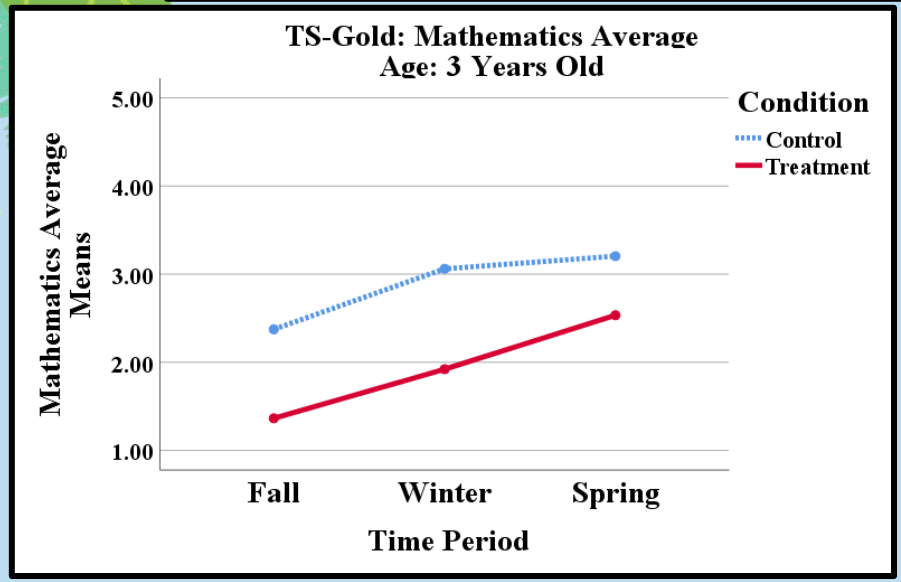


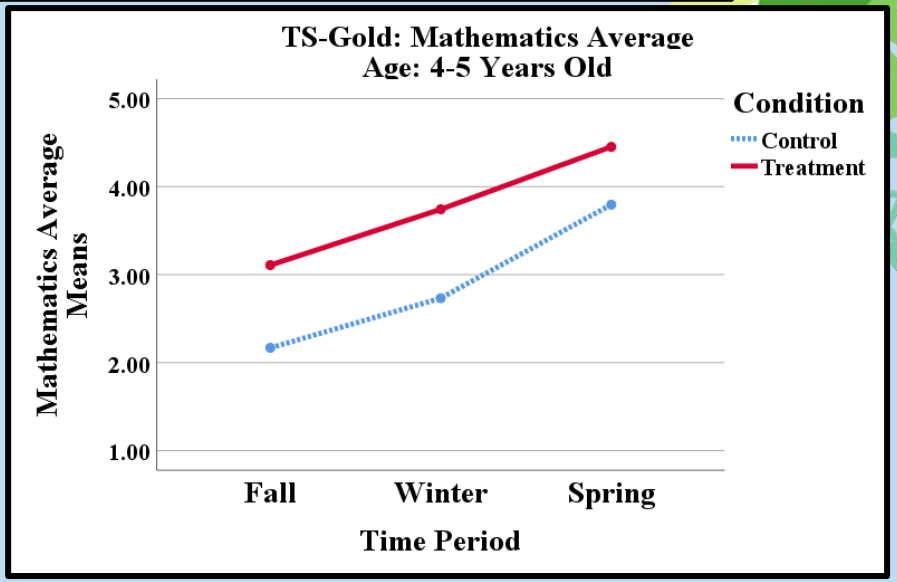


Main Effect Time: $F(1, 192) = 314.95$, $p < .001$
ME Condition: $F(1, 192) = 28.21$, $p < .001$
ME SES: $F(1, 192) = 34.98$, $p < .001$
Condition x SES: $F(1, 192) = 15.97$, $p < .001$

Children from higher income families who received the **Kindness Curriculum** showed stronger **mathematics** skills than children in the Control group at all time periods. There were not significant group differences in the lower SES groups. All groups showed improvement over time.

TS-Gold Results: Math Skills Varied with Age





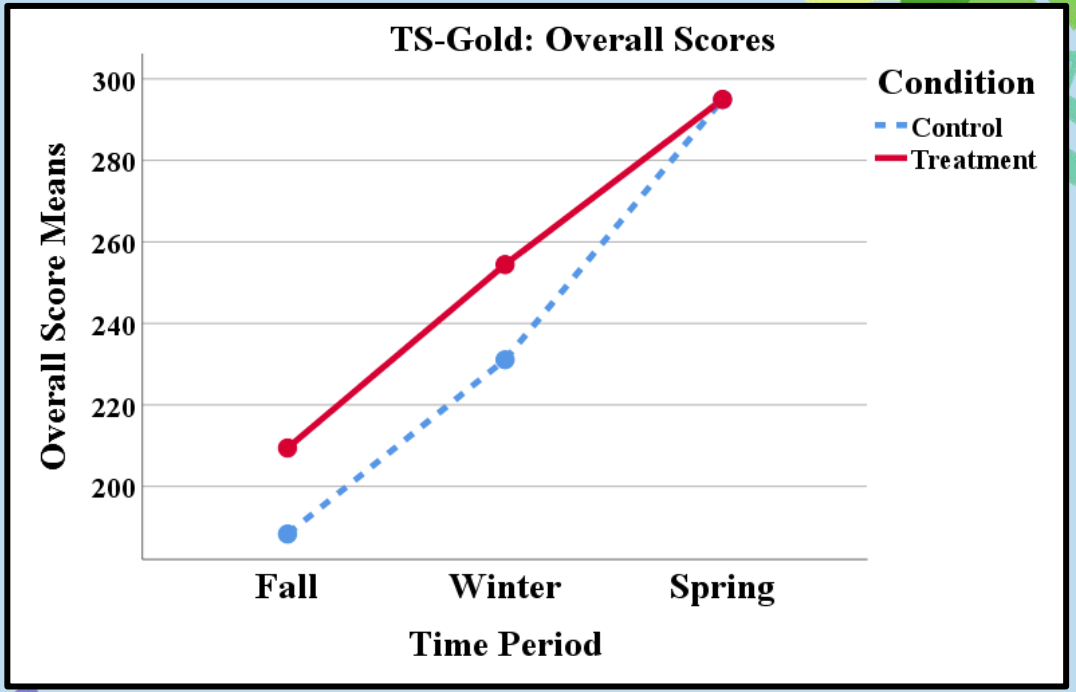
Main Effect Time: $F(1, 192) = 285.93$, $p < .001$
ME Age: $F(1, 192) = 61.19$, $p < .001$
Time x Age: $F(1, 192) = 15.26$, $p < .001$
Condition x Age: $F(1, 192) = 58.61$, $p < .001$
Time x Condition x Age: $F(1,192) = 8.51$, $p < .001$

The Kindness Curriculum was more effective for the **math** skills of **older** children. Older children who received the KC did better than older children in the Control group. Younger children in the Control group showed better math skills than those in the Kindness group, though all groups showed improvement over time.

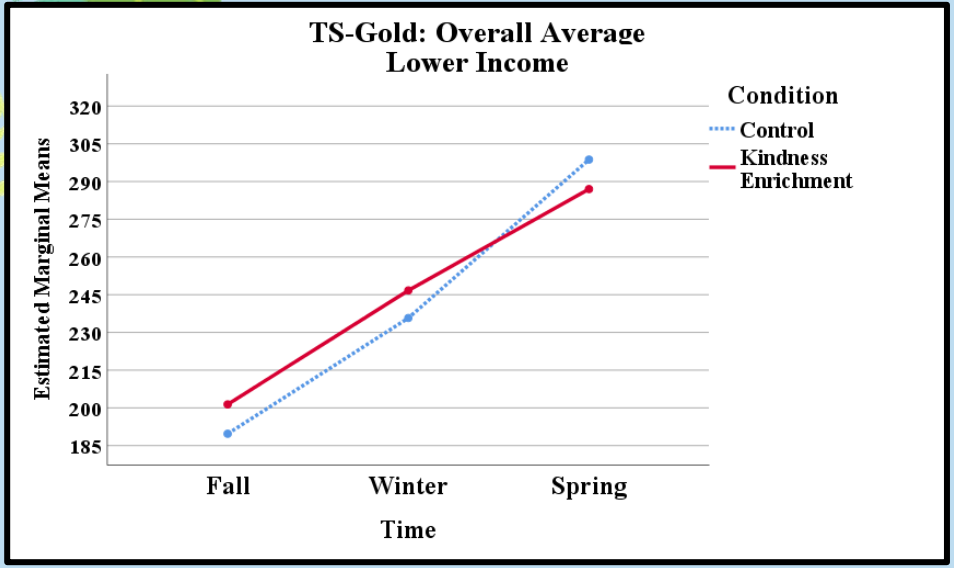
TS-Gold Results: Overall Scores

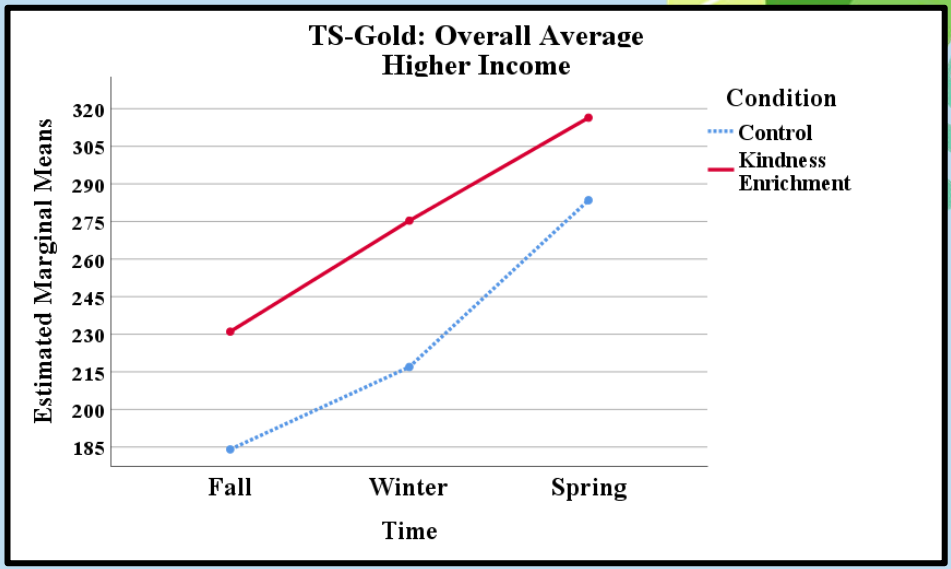
Children who received the Kindness Curriculum had stronger **overall TS-Gold** scores than children in the Control group in the fall and winter when the KC was being implemented. Control group children caught up in spring; all groups showed improvement over time.

Main Effect Time: $F(1, 192) = 576.59$, $p < .001$
ME Condition: $F(1, 192) = 4.87$, $p = .029$
Time x Condition: $F(1, 192) = 10.34$, $p < .001$.



TS-Gold Results: Overall Scores Varied with Socioeconomic Status

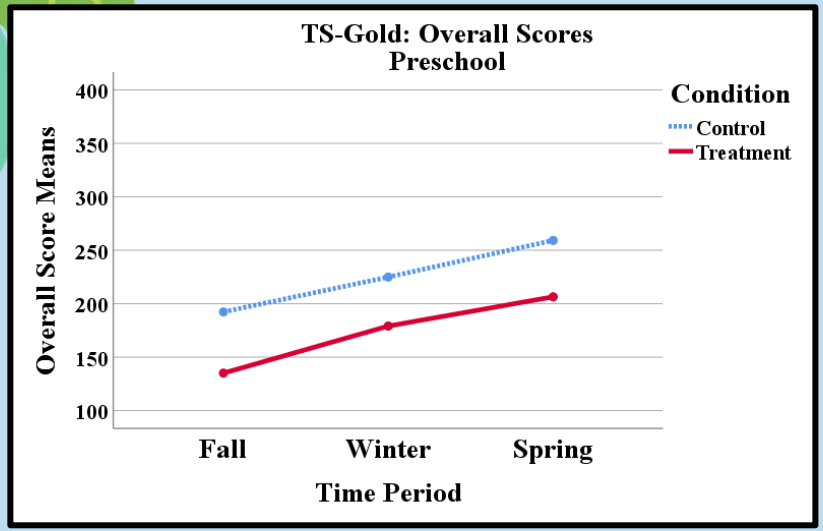


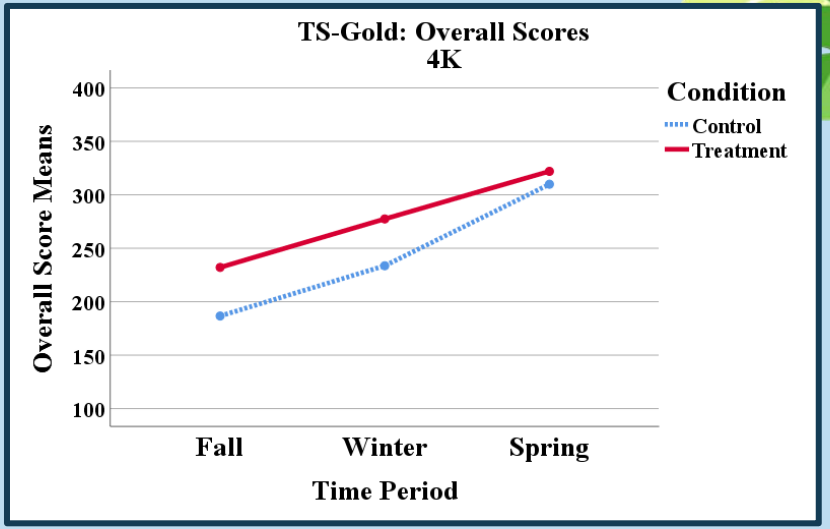


Main Effect Time: $F(1, 192) = 427.51$, $p < .001$
ME Condition: $F(1, 192) = 10.92$, $p = .001$
Time x Condition: $F(1, 192) = 7.56$, $p < .001$
Condition x SES: $F(1, 192) = 7.96$, $p = .005$

The Kindness Curriculum impact was most notable for the **overall TS-Gold** scores of children from **higher-income** families. Higher SES children who were taught the KC did better than higher SES children in the Control group at all time periods. There were no significant condition differences among lower income groups. All groups improved over time.

TS-Gold Results: Overall Scores Varied with Age Group





Main Effect Time: $F(1, 192) = 418.66$, $p < .001$
ME Preschool/4K: $F(1, 192) = 131.13$, $p < .001$
Time x Condition: $F(1, 192) = 5.47$, $p = .005$
Time x Preschool/4K: $F(1, 192) = 21.10$, $p < .001$
Condition x Preschool/4K: $F(1, 192) = 65.36$, $p < .001$
Time x Condition x Preschool vs 4K: $F(1, 192) = 5.00$, $p = .007$

The Kindness Curriculum was most effective for the **overall TS-Gold** scores of children in 4K classrooms. In general, children in 4K settings had significantly higher scores than children in preschool settings. Among preschoolers, the Control group had higher scores at all time periods.

Measures: Report Cards

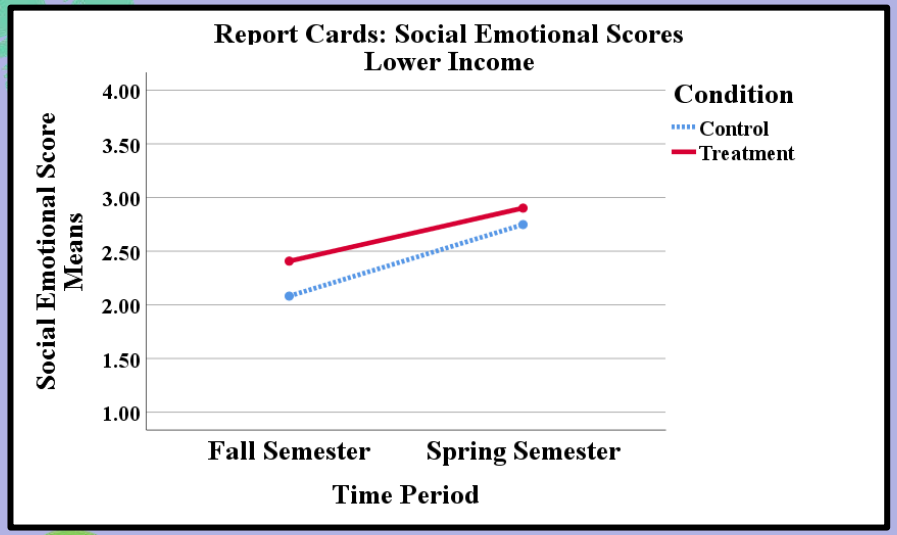
Report Cards were filled out by teachers following each semester of school.

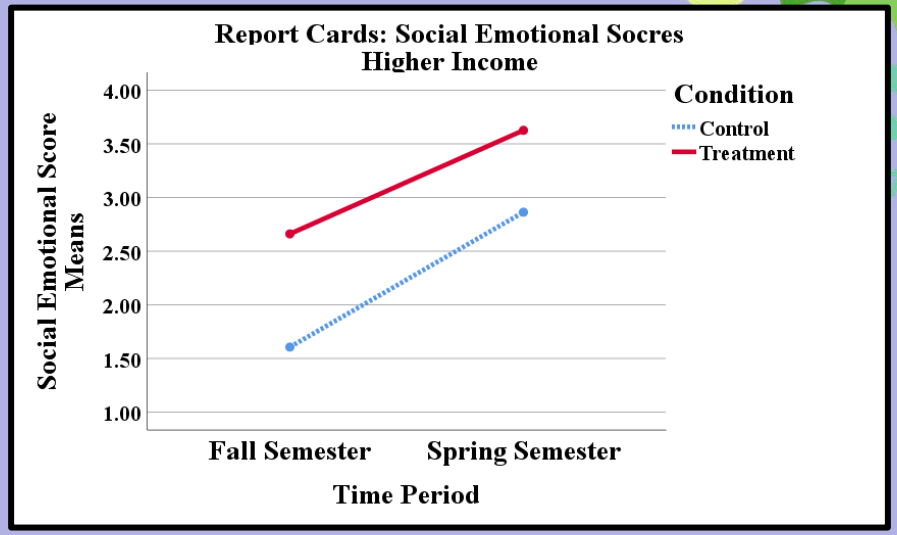
Bridges Enrichment Center, Head Start & Even Start use the same Report Card system.

Children's Center uses a qualitative progress report, noting areas in which children are excelling and areas where they could improve. However, all agencies have similar underlying themes and expectations.

Agency:	Head Start	Bridges CEC	Even Start	Children's Center
Report Cards for:	4K & Preschool	4K	Preschool	4K & Preschool
Questions:	6 social emotional 9 language 5 mathematics 4 health & physical	6 social emotional 9 language 5 mathematics 4 health & physical	6 social emotional 9 language 5 mathematics 4 health & physical	1 social emotional 1 language 1 mathematics 1 health & physical

Report Card Results: Social Emotional Scores Varied with Socioeconomic Status



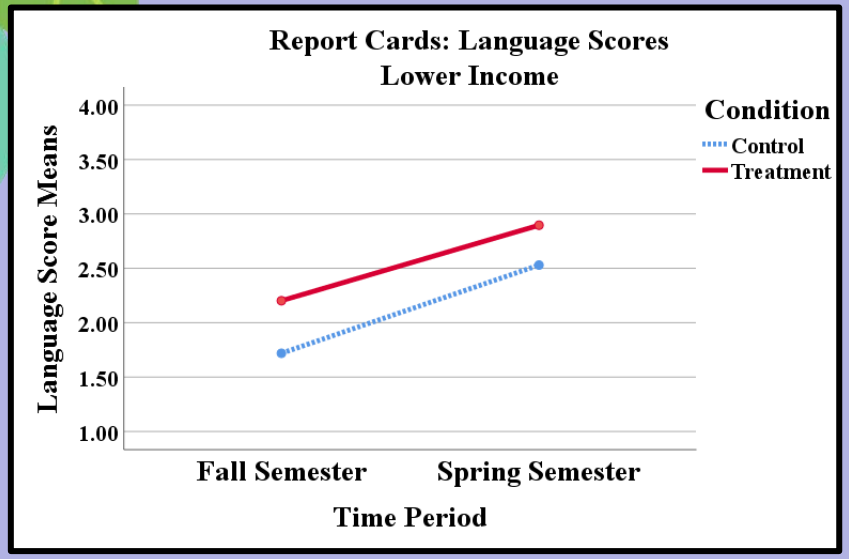


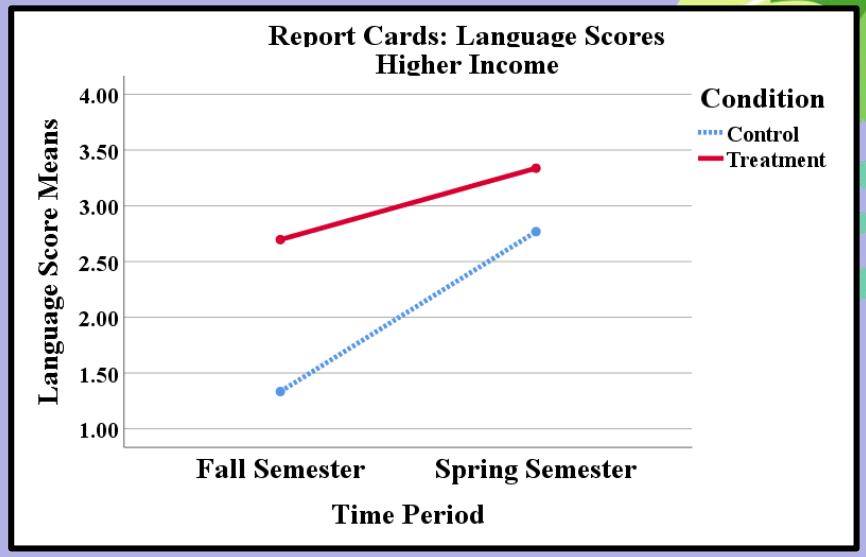
Main Effect Time: $F(1, 148) = 219.90$, $p < .001$
ME Condition: $F(1, 148) = 34.32$, $p < .001$
Time x Condition: $F(1, 148) = 4.13$, $p = .044$
Time x SES: $F(1, 148) = 21.65$, $p < .001$
Condition x SES: $F(1, 148) = 11.67$, $p = .001$

The Kindness Curriculum showed a stronger effect on the s**ocial emotional** scores of children from higher income families. Higher income children who received the Curriculum did better than those in the Control group. All Kindness groups did better than the Control groups.

- Note that Fall Semester report cards were done close in time to when the Kindness Curriculum was completed.

Report Card Results: Language Scores Varied with Socioeconomic Status

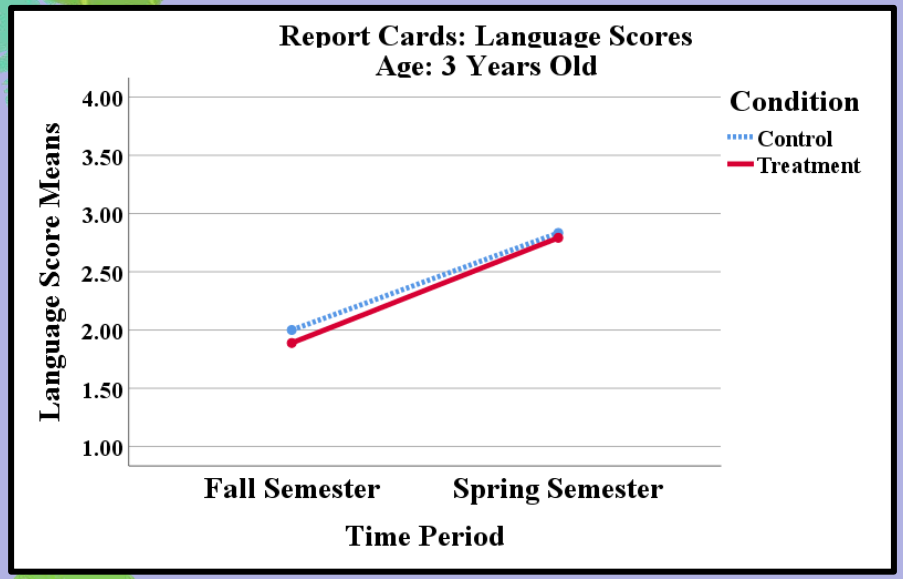


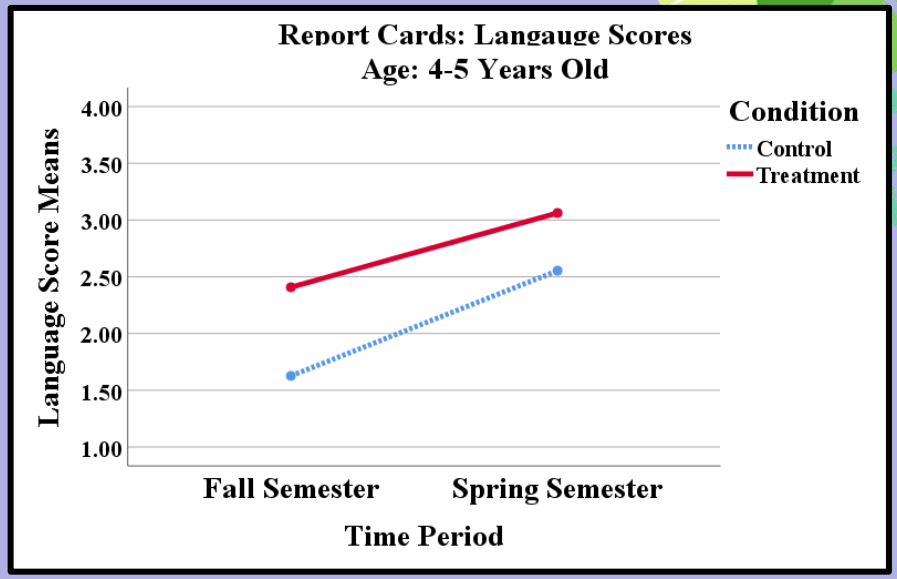


Main Effect Time: $F(1, 148) = 420.15$, $p < .001$
ME Condition: $F(1, 148) = 42.78$, $p < .001$
ME SES: $F(1, 148) = 3.33$, $p = .066$
Time x Condition: $F(1, 148) = 27.19$, $p = < .001$
Time x SES: $F(1, 148) = 10.67$, $p = .001$
Condition x SES: $F(1, 148) = 6.48$, $p = .012$
Time x Condition x SES: $F(1, 148) = 15.06$, $p < .001$

The Kindness Curriculum had a significant impact on the **language scores** of children from **both lower- and higher-income families**. Higher SES children did much better than higher SES children in the Control group in their fall grades, immediately following the KC. All Kindness groups did better than the Control groups, maintaining their higher scores through spring semester. All groups improved over time.

Report Card Results: Language Scores Varied with Age

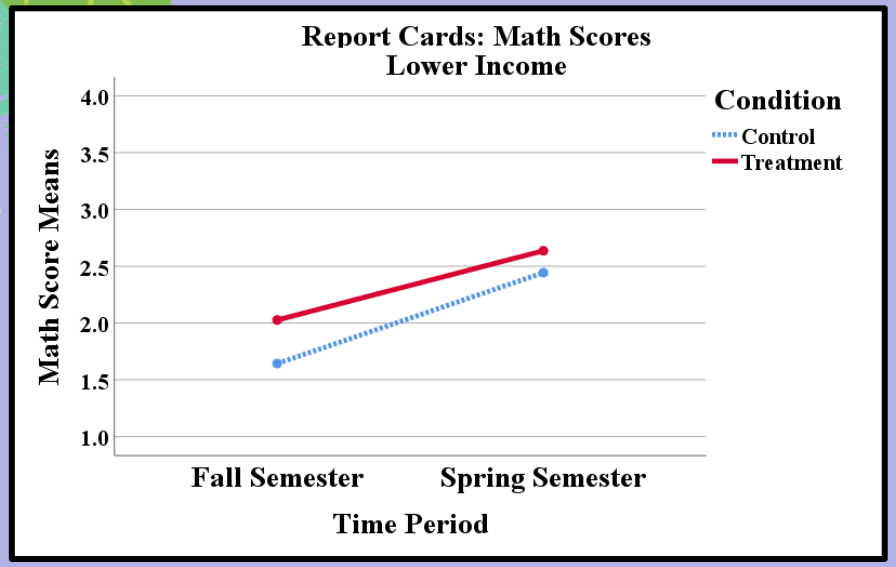


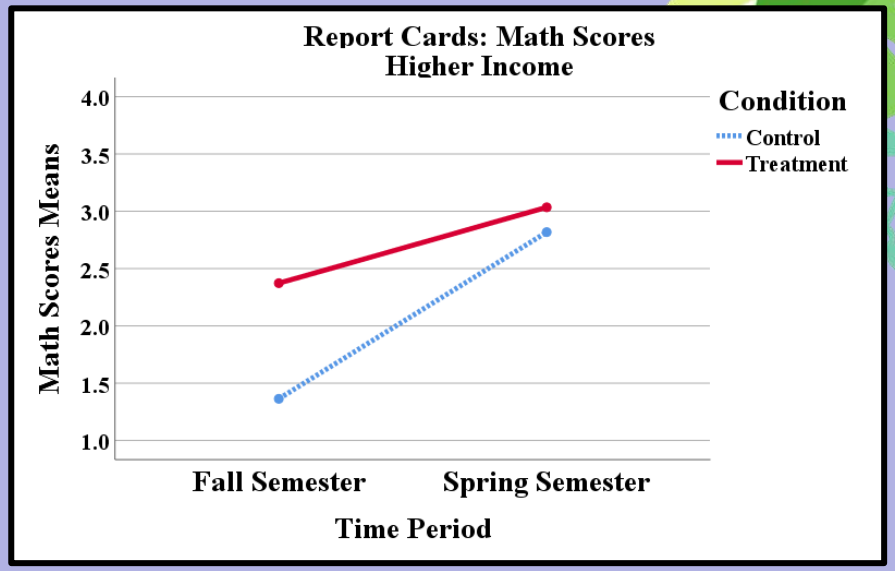


Main Effect Time: $F(1, 148) = 129.72$, $p < .001$
Condition x Age: $F(1, 148) = 4.34$, $p = .040$

The Kindness Curriculum was especially effective for the **language** scores of older children. Older children who received the KC did better than older children in the Control group. There were no condition differences for younger children. All groups improved over time.

Report Card Results: Math Scores Varied with Socioeconomic Status

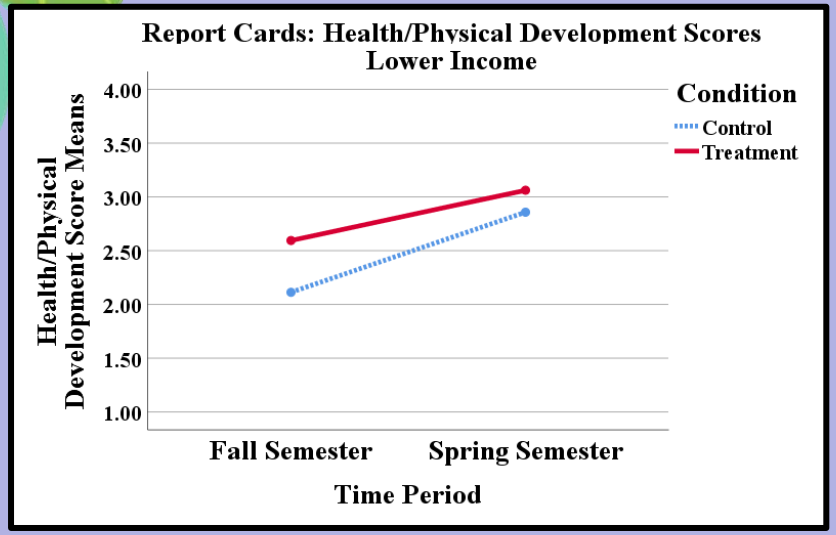


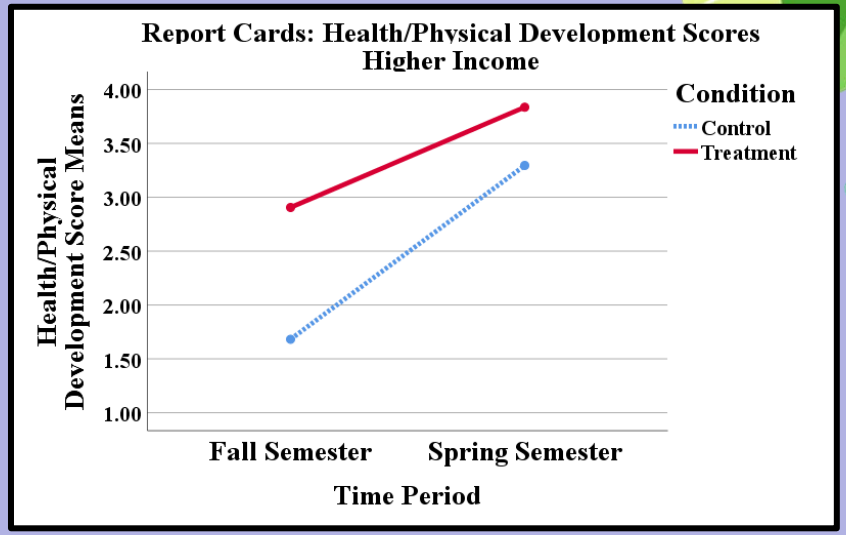


Main Effect Time: $F(1, 148) = 273.28$, $p < .001$
ME Condition: $F(1, 148) = 14.38$, $p < .001$
ME SES: $F(1, 148) = 3.13$, $p = .079$
Time x Condition: $F(1, 148) = 21.22$, $p < .001$
Time x SES: $F(1, 148) = 10.98$, $p = .001$
Time x Condition x SES: $F(1, 148) = 7.97$, $p = .005$

- The Kindness groups did better overall, and the Curriculum was especially effective for the **math** scores of children from higher income families. Higher SES children in the Kindness group did much better than those in the Control group in the fall semester, immediately after receiving the Curriculum.
- All groups showed improvement over time.

Report Card Results: Health/Physical Development Varied with Socioeconomic Status

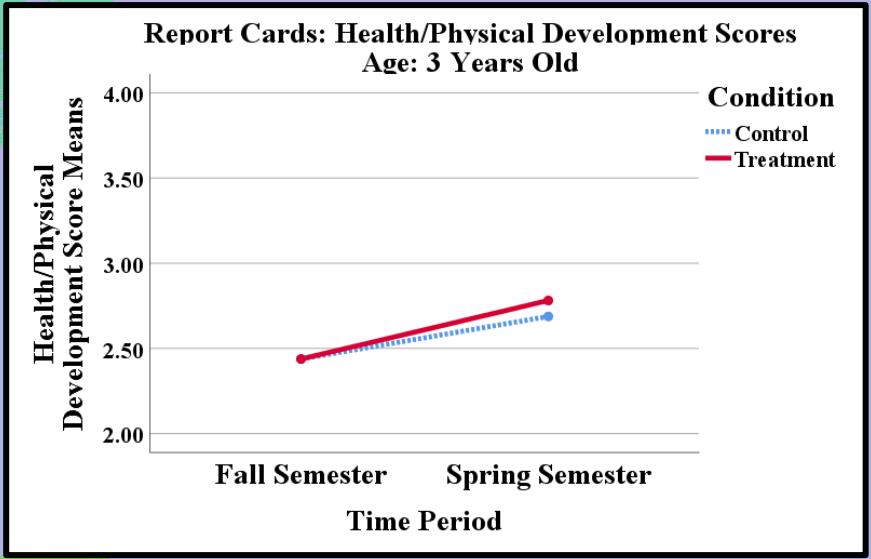


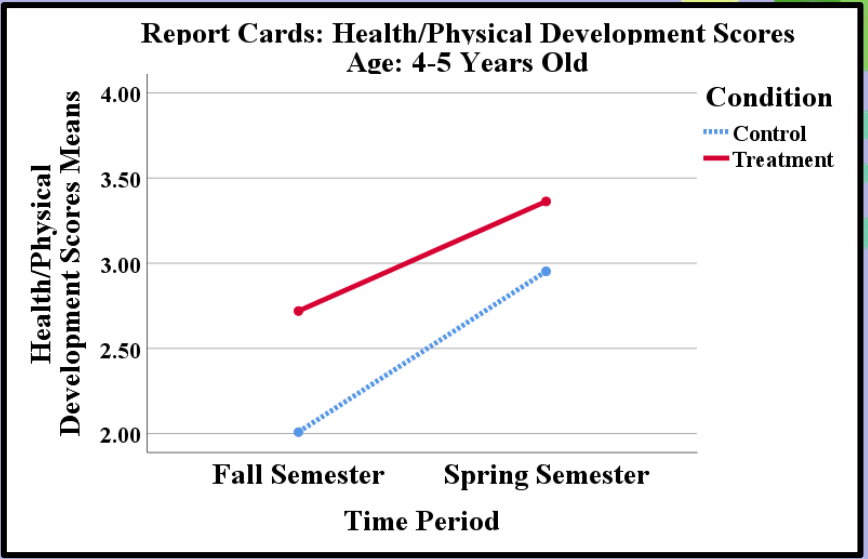


Main Effect Time: $F(1, 148) = 270.20$, $p < .001$
ME Condition: $F(1, 148) = 64.08$, $p < .001$
ME SES: $F(1, 148) = 12.75$, $p < .001$
Time x Condition: $F(1, 148) = 17.66$, $p < .001$
Time x SES: $F(1, 148) = 33.98$, $p < .001$
Condition x SES: $F(1, 148) = 12.45$, $p = .001$
Time x Condition x SES: $F(1, 148) = 3.14$, $p = .079$

Children in the Kindness Groups scored higher on **health and physical development;** the effect was strongest for children from higher income families. Higher SES children who received the KC did better than higher SES children in the Control group. All groups showed improvement over time.

Report Card Results: Health/Physical Development Varied with Age Group





Main Effect Time: $F(1, 148) = 30.81$, $p < .001$
ME Condition: $F(1, 148) = 5.22$, $p = .024$
Time x Age: $F(1, 148) = 6.39$, $p = .013$
Condition x Age: $F(1, 148) = 3.73$, $p = .055$

- **Older children** in the Kindness group did much better than the Control group on **Health/Physical Development** scores in the fall semester after learning the Curriculum, and maintained gains in their spring semester scores.
- **Among younger children**, there were not condition differences in either semester.

Children's Center Report Card Results

The University Children's Center completed progress reports on each child documenting their development in four areas: Social Emotional, Language, Cognitive, and Health/Physical. Each semester, teachers also established goals for the children. These progress reports are consistent with the numerical report card findings from the other agencies.

Example Report for Social Emotional	Example Goal for Social Emotional
Plays and interacts with others. Tries new things. Accepts authority. Feels secure away from family, expresses himself, developing self-confidence.	Problem solving with friends. Empathy for others.

All children who attended the University's Children Center received the Kindness Curriculum. Close examination of teacher's comments reveal that children improved significantly between the fall and winter. A majority of the children were able to reach their development goals for health/physical, cognitive, and language development. The most significant improvement was seen in their social emotional development, as recorded by the teachers, as most children were able to reach the goals set out for them. Children also met and exceeded the goals that were established for them in the fall by the spring. The Kindness Curriculum may have helped children reach their goals and further their development.

Measures: Classroom Impact Survey

To evaluate the classroom impact of the Kindness Curriculum, teachers were asked to rate eight statements (below) on the following scale & provide comments.

0: n/a	1: Strongly disagree	2: Disagree	3: Neutral	4: Agree	5: Strongly Agree

Statements	Mean	Standard Deviation
1) I found the Kindness Curriculum to be useful in my classroom.	3.92	0.67
2) The children seemed to remember key concepts from the curriculum.	3.88	0.68
3) The training helped prepare me to use the Curriculum.	3.46	1.72
4) The mindfulness training helped me to develop my own personal mindfulness practice.	3.33	1.72
5) The Kindness Curriculum had a positive impact on my classroom environment.	4.13	0.74
6) The mindfulness coaches provided me with helpful support in the classroom.	4.29	0.75
7) The mindfulness coaches provided me with helpful support with my own mindfulness practice.	3.71	1.36
8) I'm looking forward to using the Curriculum in my classroom again next year.	4.38	0.83

Classroom Impact - Teacher Comments

Most teacher comments were positive and some offered ideas for implementing the Curriculum in the future. Below are some representative comments that teachers provided:

I found the KC to be useful in my classroom:

- "I referred to the curriculum often"
- "Part of the curriculum/concepts were above the students learning"
- "Sometimes it was too long of a lesson"
- "Some language intensive explanations were lost on bilingual students"

The children seemed to remember key concepts from the curriculum:

- "The students who needed more classroom support were more difficult"
- "When revisiting [lessons], surprised by how much they remembered"

The training helped prepare me to use the Curriculum:

- "The training is great, but more time is needed to teach the children"

The mindfulness training helped me to develop my own personal mindfulness practice:

- "I try to be more mindful about my own emotions"

The KC had a positive impact on my classroom environment:

- "The children were really engaged in most lessons"

The mindfulness coaches provided me with helpful support in the classroom:

- "[Coaches] always checked in and willing to lend a hand"

The mindfulness coaches provided me with helpful support with my own mindfulness practice

- "Was not always able to take them up on their offers, but I knew they were there for me."

I'm looking forward to using the Curriculum in my classroom again next year:

- "I look forward to using [the curriculum] again!"

A Summary of Key Findings

Dimensional Change Cart Sort Task: Cognitive Flexibility

- **The Kindness Curriculum increased children's scores on harder mixed problems where more cognitive flexibility is required. Additionally, children receiving the Kindness Curriculum answered more problems correctly overall.**
- **Older children did especially well when they received the Kindness Curriculum, performing better than older children in the Control group specifically on pre-switch and post-switch scores.**
- **Flook et al. (2015) found** that the **KC Group** showed **modest positive effects** (effect sizes favoring the KC group) on **post-switch trials (cognitive flexibility).** We also found positive effects favoring the KC group on post-switch problems, especially among our older children (who were comparable in age to their group). **In addition, we found a significant impact of the Kindness Curriculum on the harder mixed trials and the overall percent correct on the task.**

Flanker Task: Inhibitory Control

- **The Kindness Curriculum benefitted higher socioeconomic children but did not lead to improvement in scores for lower socioeconomic children.** In comparison, Flook et al. found nothing favoring the KC group on this task.

More Important Findings

BRIEF-P: Executive Function Skills

- **The Kindness Curriculum showed positive effects in many areas: Inhibiting weak responses, Shifting flexibly, Working Memory, Planning/Organizing Scores, Inhibitory Self-Control, Mental Flexibility, Emergent Metacognition (i.e., cognitive self-monitoring), and overall Executive Function scores.**
- **While lower income children sometimes began the year displaying more problems in executive functioning, when receiving the Kindness Curriculum, they showed great strides in Inhibitory Self-Control, Shifting flexibly, Mental Flexibility, and their Global Executive Composite scores over time.**
- **The Kindness Curriculum also proved effective for preschoolers (3 year-olds) on Planning/Organizing, Inhibiting weak responses, Emergent Metacognition (i.e., cognitive self-monitoring), and overall Executive Function Skills. Preschoolers even achieved similar results as 4K children on Working Memory when they received the KC.**

More Major Findings!

TS-Gold: Developmental & School-Readiness Skills

- **Children in the Kindness Group did better on language skills, cognitive skills, and overall scores than those in the Control group. However, most findings for language skills, cognitive skills, literacy skills, math skills and overall scores were stronger for children from higher income families.**
- **Many effects of Kindness programming (e.g. language skills, cognitive skills, and overall scores) occurred for fall (November) and winter (February). This suggests that either Control group children caught up by spring or there was a "ceiling effect" in which scores beyond a certain level typical for the children's age group are not given.**
- **Higher socioeconomic status children who received the Kindness Curriculum displayed higher skill levels for language, cognition, literacy, math, and overall than those in the Control group especially in the fall and winter.**
- **Overall, older children did better than younger children. Older children also did especially well when they received the Kindness Curriculum, performing better than older children in the Control group.**
- **All groups eventually showed higher skill levels, but children who received the Kindness Curriculum advanced at a faster pace than children in the Control group.**

More Highlights!

Report Cards

- **Children in the Kindness Curriculum had better social emotional scores, language scores, math scores, and health/physical scores than children in the Control group regardless of socio-economic status.**
- **Higher socioeconomic status children did better than low socioeconomic status children on social emotional scores, language scores, math scores, and health/physical development.**
- **Older children who learned the Kindness Curriculum had higher scores than older children in the Control group on language scores and health/physical development scores.**
- **Like Flook and colleagues (2015), report card results were strong. In both studies, the Kindness group had significantly higher grades on social emotional and health/physical development than the Control group. However, in the present study, the Kindness Curriculum had an equally impressive impact on language and math scores.**

Classroom Impact

- **Teachers had a predominantly positive view of the Kindness Curriculum and its impact on their students. They highlighted that the children really enjoyed the lessons and seemed to retain the information that was taught.**
- **Teachers offered constructive feedback for the future use of the Kindness Curriculum, offering multiple pieces of constructive criticism as well as showing excitement for continuation of the program. Both preschool and 4K teachers strongly endorse the Kindness Curriculum after seeing its impact on their students.**

Overall Comparisons to Past Research

- Our findings are similar to Flook and colleagues' (2015) smaller study on comparable measures, though we tended to find additional significant results and in more areas. **These findings support the benefits of teaching both preschool and 4K children mindfulness skills through the Kindness Curriculum.**
- **Our findings also show that *regular classroom teachers* can effectively implement the Kindness Curriculum with strong training and support from Mindfulness Coaches.** Although much past work has used Mindfulness Experts to teach lessons, training and supporting classroom teachers makes mindfulness curricula accessible to more children, and benefits the teachers themselves.
- Stronger, more regular findings occurred for measures using teacher observations than direct measures of children, similar to Flook and colleagues (2015) and other past research that used teacher or parent reports like Kim and colleagues' (2020) work. Given the age (3-5 years) and cognitive levels of the children, this is not surprising. Also, direct measures of children were done 1-2 months after the KC was completed, and teacher measures were nearer to KC completion. The fact that findings support the effectiveness of the mindfulness-based Kindness Curriculum with both types of measures is compelling.

Important Considerations

- Although the Kindness Curriculum was more effective for older children (4-5 years) in some areas, there is also evidence of good impact on younger preschoolers (3 year-olds) in some areas (e.g., Inhibitory Self Control & Working Memory). Teachers had good insights on how to modify the Curriculum for younger children. Mindfulness is a practice, so all children need ongoing opportunities to practice and develop their skills.
- Teachers highlighted the success of the Kindness Curriculum and some chose to repeat lessons and reinforce concepts after the Curriculum was completed. The findings that measures done later showed weaker results and the control group's TS Gold scores (a developmental assessment) sometimes caught up to the Kindness group by Spring (several months after the KC) could suggest that reinforcing and repeating mindfulness lessons is important to children practicing and maintaining skills they have acquired.
- Selection of teacher-reported measures vs. direct child measures is an important consideration for future studies as applied projects may not need to invest the time and resources required to directly assess children. Future work could focus on teacher observations, many of which are already used in high-quality preschool programs.
- The Flanker and Dimensional Change Card Sort tasks were assessed using an **iPad**. As children have various levels of experience with iPads, their familiarity with iPads may have affected the results. While we combatted this issue for the Dimensional Change Card Sort by offering an identical hard copy option, this physical format was not offered for the Flanker tests and could have contributed to weaker performance on that task.

Future Implications

- The Kindness Curriculum had measurable positive effects on the cognitive skills of children. Investment in the Kindness Curriculum showed that the academic progress of the children benefitted from the inclusion of mindfulness practices.
- The Kindness Curriculum has shown itself to be effective in increasing children's cognitive and executive functioning skills, even beyond the benefits that children gain through experiencing a strong social-emotional learning curriculum.
- Mindfulness programs, like the Kindness Curriculum, can be implemented and effective even for very young children (3 year-olds). In fact, toddler teachers expressed interest in further modifying the Curriculum for even younger children.
- Preschool and 4K programs should invest in mindfulness-based programming, like the Kindness Curriculum, in order to help children fully realize their potential, and to support teachers in the important work they do.

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