

BACKGROUND

- Family stress plays a role in mediating the effects of economic hardship on child development (Evans & Kim, 2013; Mistry & Wadsworth, 2011). Both **chronic levels of and acute changes in poverty-related stress are important** considerations (Duncan & Magnuson, 2005; Miller & Davis, 1998).
- The family stress model of poverty (FSM; Conger et al., 2002; McLoyd, 1990; Mistry et al., 2002) provides a framework for understanding family stress on child development: **economic well-being affects** child social and emotional outcomes through **parents' perceived financial strain and mental health**, which in turn **affect child social and emotional development through parenting or parent-child relationship factors**.
- Aspects of cognitive self-regulation (e.g., executive function [EF] and delay of gratification) contribute to academic success (Blair, 2002; Duckworth, 2009) and may partially mediate income-achievement gap (Evans & Rosenbaum, 2008; Moffit et al., 2011). The development of **cognitive self-regulation is sensitive to poverty-related stress** (Blair, 2010; Evans & Kim, 2013).
- Whether/which family stress processes confer effects of economic hardship on cognitive self-regulation in young children is unexplored.**

PURPOSE

To examine the effects of baseline levels and changes in FSM processes on improvement in direct measures of young children's cognitive self-regulation from the beginning of kindergarten to the beginning of first grade in a high-risk sample.

METHOD

Context:

- Data are from a program evaluation of an after-school social and emotional learning (SEL) program in an urban district in the southeastern United States.
- 371 kindergarteners recruited from 4 schools hosting the program; 3 consecutive cohorts; all students without severe disabilities were eligible to participate.
- This study used parent reports and direct assessments collected at two time points (beginning of kindergarten and beginning of the following school year).

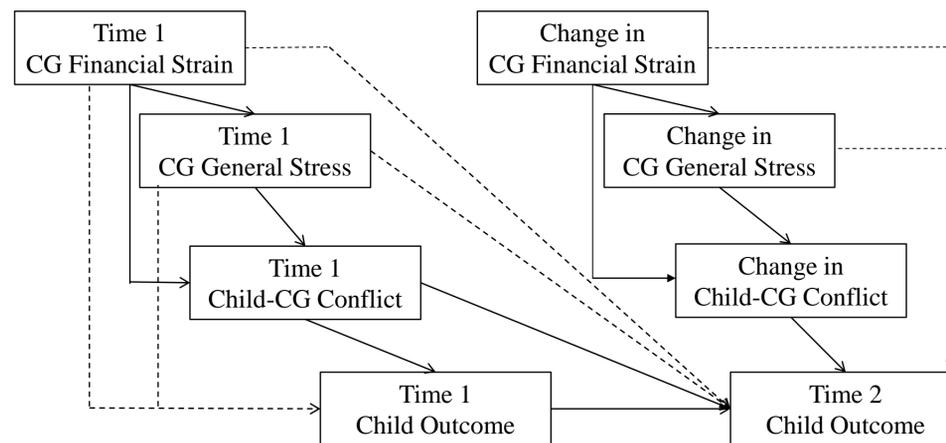
Participants:

- Caregivers (CGs; characteristics known for only 88% of sample):
 - 90% African American; 6% Latino/a; 3% White; 1% Asian American
 - Average age 31.5 years (SD = 8.0 years)
 - 87% Mothers; 6% Fathers; 5% Grandmothers; 2% Other
- Children:
 - 96% Receiving free/reduced lunch (of known eligibility; unknown for 14%)
 - 48% Male
 - Average age: 5.5 years (SD = .31 years or 3.7 months)
 - Randomized treatment condition: 209 (56%) Treatment, 145 (39%) Control, 17 (5%) Not Randomized (but received treatment)

Data Analysis:

- 2 Path models (Figure 1) using Mplus v. 7.3 (Muthen & Muthen, 2007).
- Full Information Maximum Likelihood (FIML) estimation (Acock, 2005).

FIGURE 1: THE FAMILY STRESS MODEL (PATH MODEL)



NOTE: TWO separate path models run, one for each outcome (outcomes at Time 2 were not correlated). COVARIATES = Gender (male); treatment condition; child age at test/report; study cohort. UNCONSTRAINED CORRELATIONS: All Time 1 family stress constructs (CG Financial Strain, CG General Stress, Child-CG Conflict) were allowed to correlate with change in all family stress constructs. Change in all family stress processes were also allowed to correlate with Time 1 child outcomes.

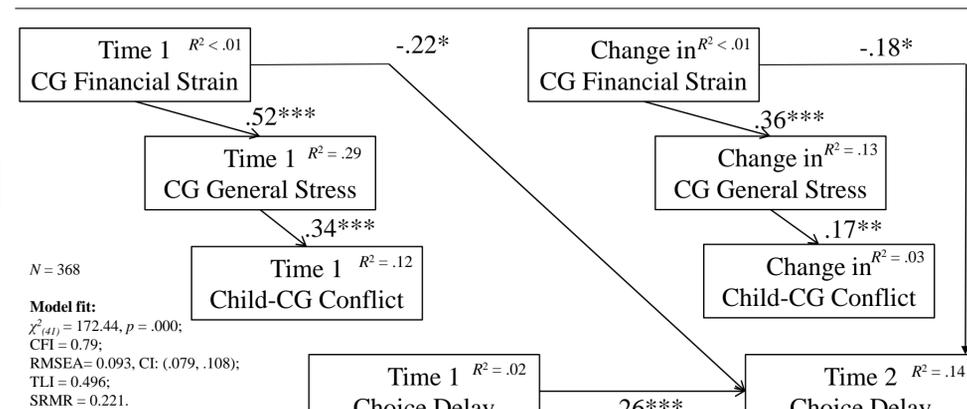
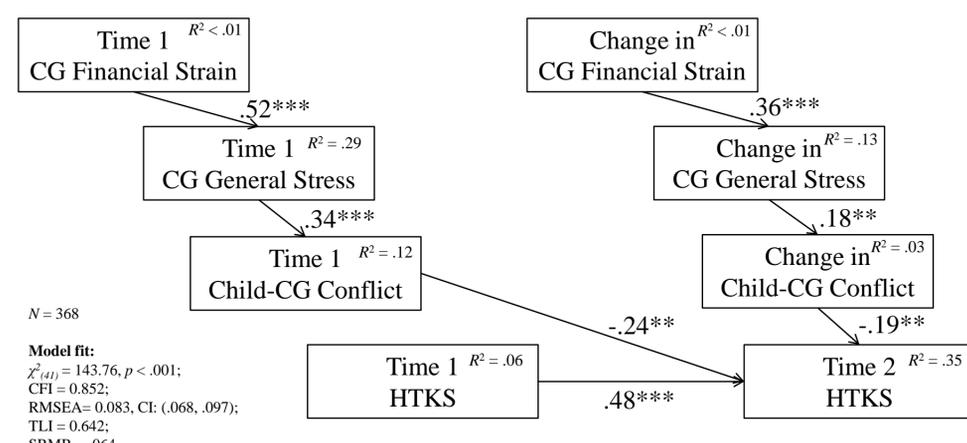
HYPOTHESES

- As predicted by the family stress model, child-CG conflict will mediate the effects of CG financial strain and CG general stress on EF (HTKS), but may only partially mediate the effects of CG general stress given sensitivity of EF stressors in the environment, including non-psychosocial stressors (Evans & Kim, 2013).
- Given sensitivity of delay of gratification to perceived reliability of physical resources (Kidd, Palmieri, & Aslin, 2013; Mahrer, 1956), financial strain may exhibit direct effects on children's delay of gratification behaviors.
- Given the notion that effects of poverty are cumulative and chronic, baseline levels of family stress constructs tentatively expected to be more influential than changes in said processes.

TABLE 1: MEASURES AND DESCRIPTIVES

Construct	Description	Kindergarten M (SD) Range	First Grade M (SD) Range
Caregiver (CG) Financial Strain ($\alpha = .75$)	Mean on 3 item Likert Scale. Items focus on difficulty of living on current income, prospective ability to maintain standard of living (Vinokur, Price, & Caplan, 1996).	2.04 (0.91) 1.00 – 5.00	1.93 (.90) 1.00 – 5.00
CG General Stress ($\alpha = .82-.83$)	Mean on 14 item Likert Scale. Items focus on adult's ability to cope with life challenges, on anxiety and stress, etc. (Cohen, Kamrack, & Mermelstein, 1983).	2.57 (0.59) 1.07 – 4.21	2.53 (0.60) 1.21 – 4.43
Child-CG Conflict ($\alpha = .74$)	Mean of 8 Conflict items in 15-item Likert scale (Child-Parent Relationship Scale; Pianta, 1990). Conflict items focus on child and parent anger and/or relational strain	1.91 (0.80) 1.00 – 5.00	1.93 (0.74) 1.00 – 4.13
Head-Toes-Knees-Shoulders (HTKS) ($\alpha = .89 - .91$)	Sum of 30 two-point items (3 parts). Children required to remember paired rules for responding to verbal instructions; rules require doing the "opposite" of instruction. Requires attention, inhibitory control, working memory, and cognitive flexibility.	15.51 (17.12) 0 – 57	30.67 (17.72) 0 – 59
Choice Delay of Gratification ($\alpha = .83 - .85$)	6 items: Children offered choices between paired smaller-sooner and larger-later rewards.	3.14 (2.20) 0 – 6	3.62 (2.20) 0 – 6

FIGURES 2A and 2B: PATH MODEL RESULTS



Notes (for both models). COVARIATES = Gender (male); treatment condition; child age at test/report. UNCONSTRAINED CORRELATIONS (available upon request): All Time 1 family stress constructs (CG Financial Strain, CG General Stress, Child-CG Conflict) were allowed to correlate with change in all family stress constructs. Change in all family stress processes were also allowed to correlate with Time 1 child outcomes. Solid lines represent significant relations, marginally-significant relations ($p < .10$) and nonsignificant relations are not shown. * $p < .05$, ** $p < .01$, *** $p < .001$.

SUMMARY, DISCUSSION, AND IMPLICATIONS

Family stress process' effects on HTKS performance (EF) at Time 2 were mediated by child-CG conflict, both for baseline levels and change (Fig 2A).

- Consistent with prior research on the family stress model.
- Not consistent with the hypothesis that general stress in the environment (proxied by caregiver general stress) might exhibit both direct effects on EF.
- Extends understanding of longitudinal effects of family stress on children, highlighting a role for both overall levels, as well as change, in stress.

Only financial strain (both baseline levels and change) exhibited direct effects on Choice Delay performance at Time 2 (Figure 2B).

- Not consistent with the family stress model, which posits caregiving or child-CG relationship factors as the mediator of family stress.
- Consistent with notions that children's delay of gratification behaviors are sensitive to perceived reliability of resources in the environment (Kidd, Palmieri, & Aslin, 2013; Mahrer, 1956) and to salience of rewards (Duckworth, 2016).

Effects of family stress may not always be mediated by caregiving or child-CG relationship factors; this may have implications for intervention and prevention efforts (e.g., Wadsworth, 2012). Future research should investigate how and why financial strain might affect delay of gratification choices and behaviors in children.