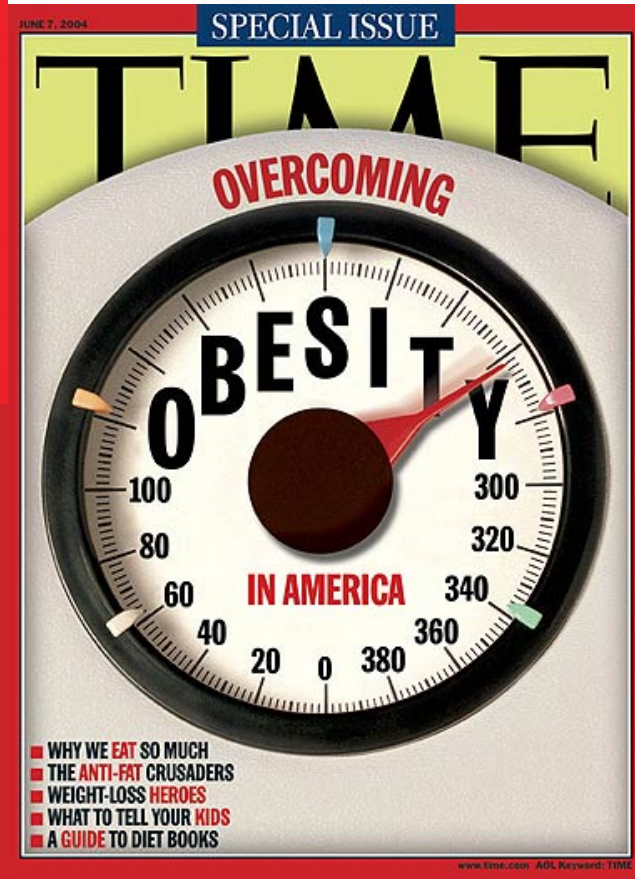


Stress & Child obesity: Dietary pathways in the context of stress

Eleanor Tate Shonkoff, PhD Candidate
8th Biennial Childhood Obesity Conference

July 2, 2015



Newsweek



The New Science of Mind & Body

TREATMENT FOR LIFE

- Forgiveness And Health
- Stress and Infertility
- Rethinking Hypnosis
- Clues to Heart Disease

Harvard Medical School

POSSESSED! HOW BELONGINGS AFFECT OUR SENSE OF SELF page 56

SCIENTIFIC AMERICAN MIND

SEX MAKES YOU SMARTER
Lessons from Rats page 36

BEHAVIOR • BRAIN SCIENCE • INSIGHTS



THE TWO FACES OF STRESS

GLOBAL HAPPINESS
How Culture Shapes Your Bliss

Flooding Syria / Beyoncé / Peyton Power / Steve McQueen

TIME



THE MINDFUL REVOLUTION

The science of finding focus in a stressed-out, multitasking culture

TRESS LESS with YOGA

FROM THE EDITORS OF yoga

anxious awesome: calming flow sequences

28 great grounding poses

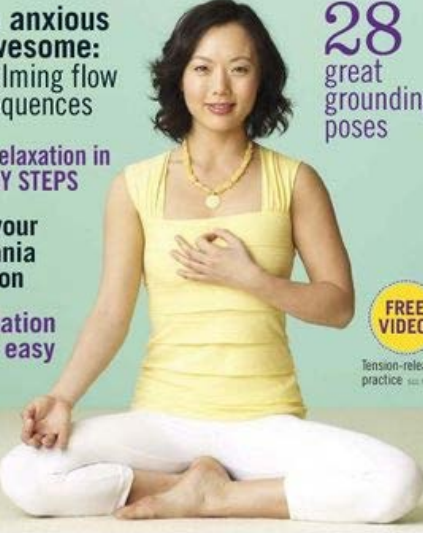
Total relaxation in 10 EASY STEPS

Find your insomnia solution

Meditation made easy

Eat to be happy

FREE VIDEO!
Tension-releasing practice



2013 Publisher Name Here

NEW YOU 13

Body & More



Feasting on STRESS

Life's ups and downs lead many people straight to the cookie jar. Here's how to break the emotional eating cycle today

PLUS
How to Get Buff at Home
5 Diabetes-Friendly Foods
Wheat, Wheat ... Go Away!
Yoga, with a Twist

WALK THE WALK
Why bonding with Mother Nature is a step in the right direction

Celebrity Health:
Seven-time Olympic Medalist
SHANNON MILLER

What is stress?

A stressor disrupts homeostasis and requires an organism to *adapt* and restore equilibrium

Internal vs. External

Acute vs. Chronic

Measurement:

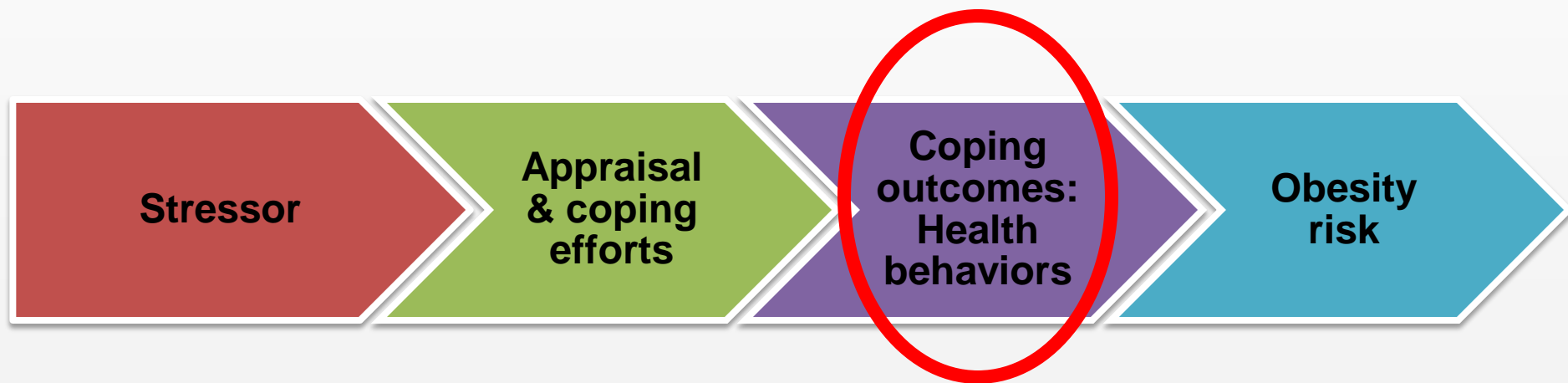
Subjective, Objective, Biological

Are children stressed?

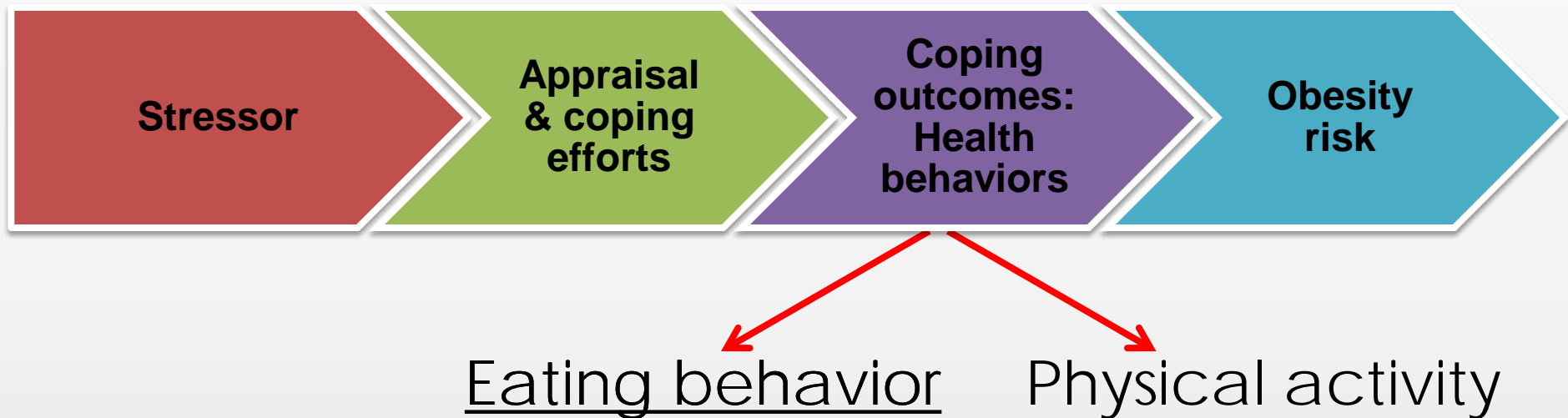
8.3% of 12–17 year olds had “mentally unhealthy days” on almost half of the days in the last month

5% of 13-18 year olds had ever experienced Post-traumatic Stress Disorder

Transactional Model of Stress and Coping



Could stress affect children's weight-related behaviors?



Health behavior learned in childhood tends to track to adulthood

Craigie, A. M., Lake, A. A., Kelly, S. A., Adamson, A. J., & Mathers, J. C. (2011). Tracking of obesity-related behaviours from childhood to adulthood: A systematic review. *Maturitas*, 70(3), 266-284.

Lazarus, R. S., & Cohen, J. B. (1977). Environmental stress Human behavior and environment (pp. 89-127): Springer.

Stress may change eating behavior

- Stress may lead to:
 - higher sweets consumption (older age; girls)
 - emotion-driven eating & high-calorie/low-nutrient foods
- Emotion-focused coping & unhealthy snacks
- High-reactive/high-restraint:
 - more calories (≈ 173 kcals)
 - eat for longer (> 3 mins)

Balantekin, & Roemmich, (2012). Children's coping after psychological stress. Choices among food, physical activity, and television. *Appetite*, 59(2), 298-304.

Michels N. et al. (2015). Longitudinal Association Between Child Stress and Lifestyle. *Health Psychology*, 34(1), 40-50.

Shimai, S., et al. (2000). Snacking behavior among elementary and junior high school students and its relationship to stress-coping. *Jap. jrn pub. hlth*, 47(1)

Tate et al. (2015). Two facets of stress and indirect effects on child diet through emotion-driven eating. *Eating Behavior*.

Stress may increase obesity risk

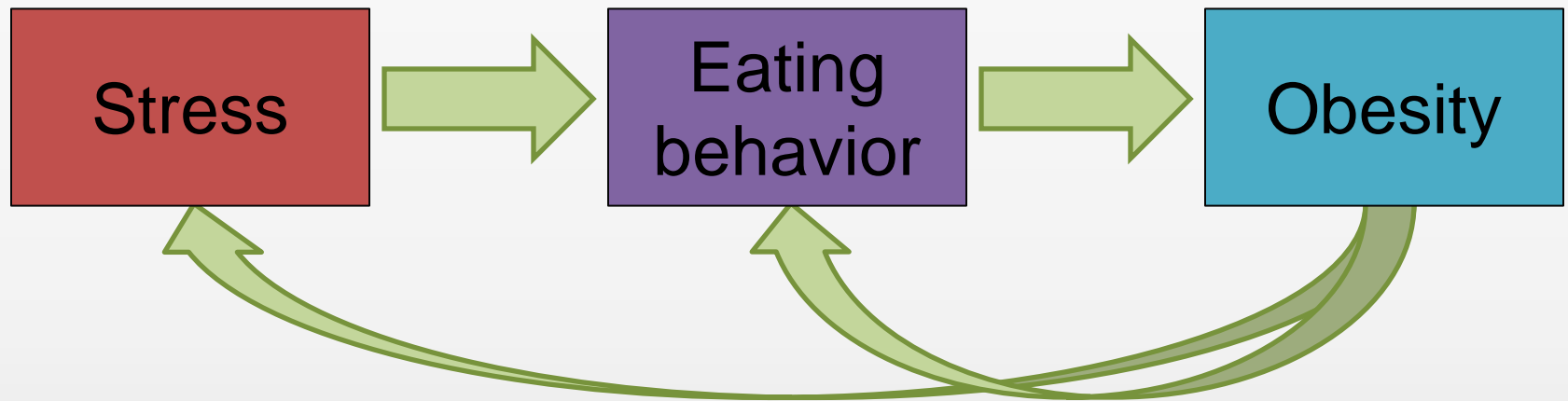
- Chronic stress has been associated with higher obesity risk
- More likely for girls
- Stress-eating & higher odds of obesity

De Vriendt et al. (2012). European adolescents' level of perceived stress and its relationship with body adiposity-The HELENA Study. *European Journal of Public Health*, 22(4), 519-524.

Jaaskelainen et al. (2014). Stress-related eating, obesity and associated behavioural traits in adolescents: a prospective population-based cohort study. *Bmc Public Health*, 14.

Wilson & Sato, 2014

Could obesity also affect stress reactivity and eating behavior?



Obesity may affect stress responses and eating behavior

- Overweight/obese youth:
 - higher cortisol response to social stressors
 - more high-density salty foods following social stress

A photograph of a woman with blonde hair, looking distressed and pulling at her hair with both hands. In the background, two children are visible, one in a blue and white striped shirt. The scene is outdoors with greenery in the background.

Is maternal stress related to child obesity risk?

Bauer et al. (2012). Parental employment and work-family stress: Associations with family food environments. *Social Science & Medicine*, 75(3), 496-504

Hurley et al. (2008). Maternal symptoms of stress, depression, and anxiety are related to nonresponsive feeding styles in a statewide sample of WIC participants. *Journal of Nutrition*, 138(4), 799-805.

Parks et al. (2012). Influence of Stress in Parents on Child Obesity and Related Behaviors. *Pediatrics*, 130(5), E1096-E1104.

Methods

- Maternal stress after the child's birth
- 17 studies; 19 independent effect sizes
- Mother-child dyads
 - $M = 2,462$
- Child age at maternal stress measure
 - cross-sectional ($M = 6.36$ yrs., $SD = 3.23$)
 - longitudinal ($M = 1.68$ yrs., $SD = 1.38$)

Positive effect size between maternal stress & child obesity risk

Cross-sectional $d = .20, p < .01$

Longitudinal $d = .18, p = .05$

Moderators in longitudinal studies:

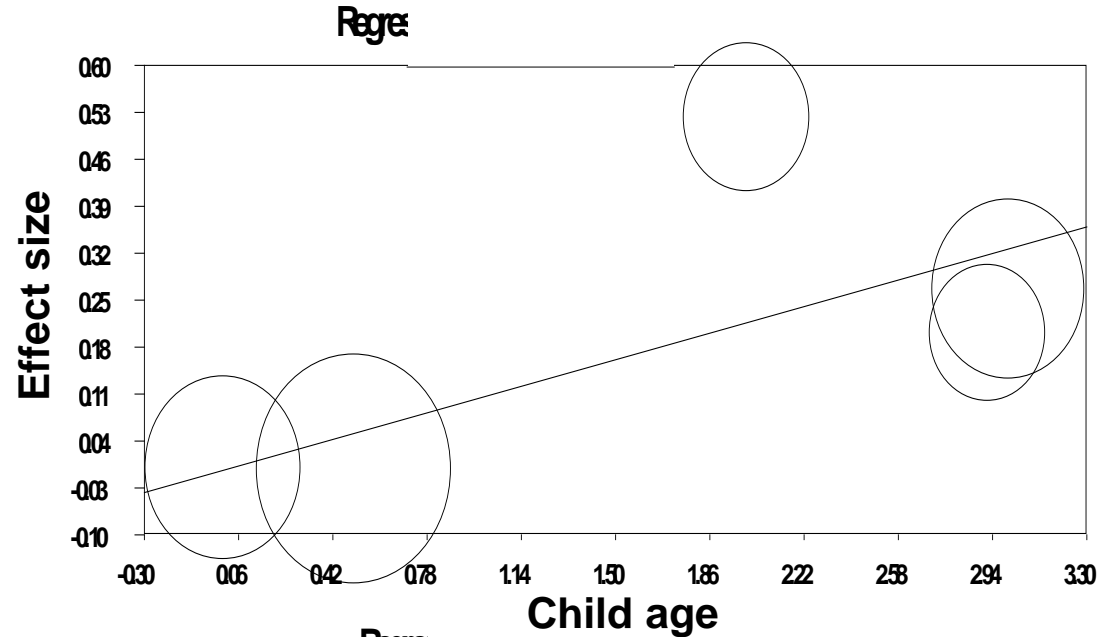
Child stress

Study quality

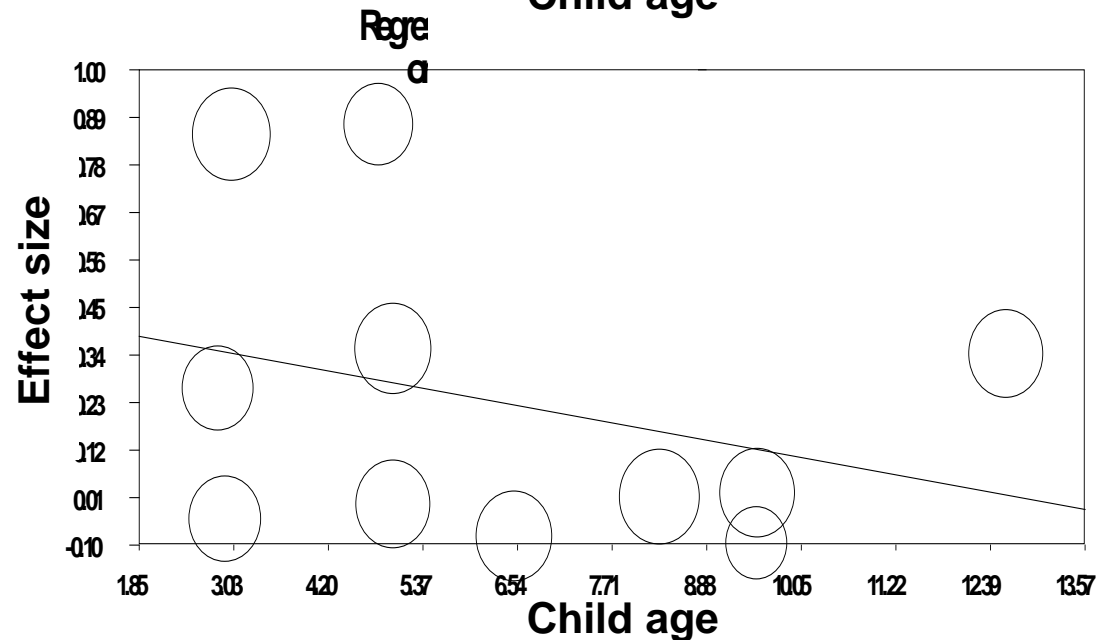
Child age

Child Age at Maternal Stress Measure

Longitudinal



Cross-sectional



Maternal stress is associated with higher child obesity risk

Effect size $d \approx .19$

Effect may be stronger for toddlers than infants

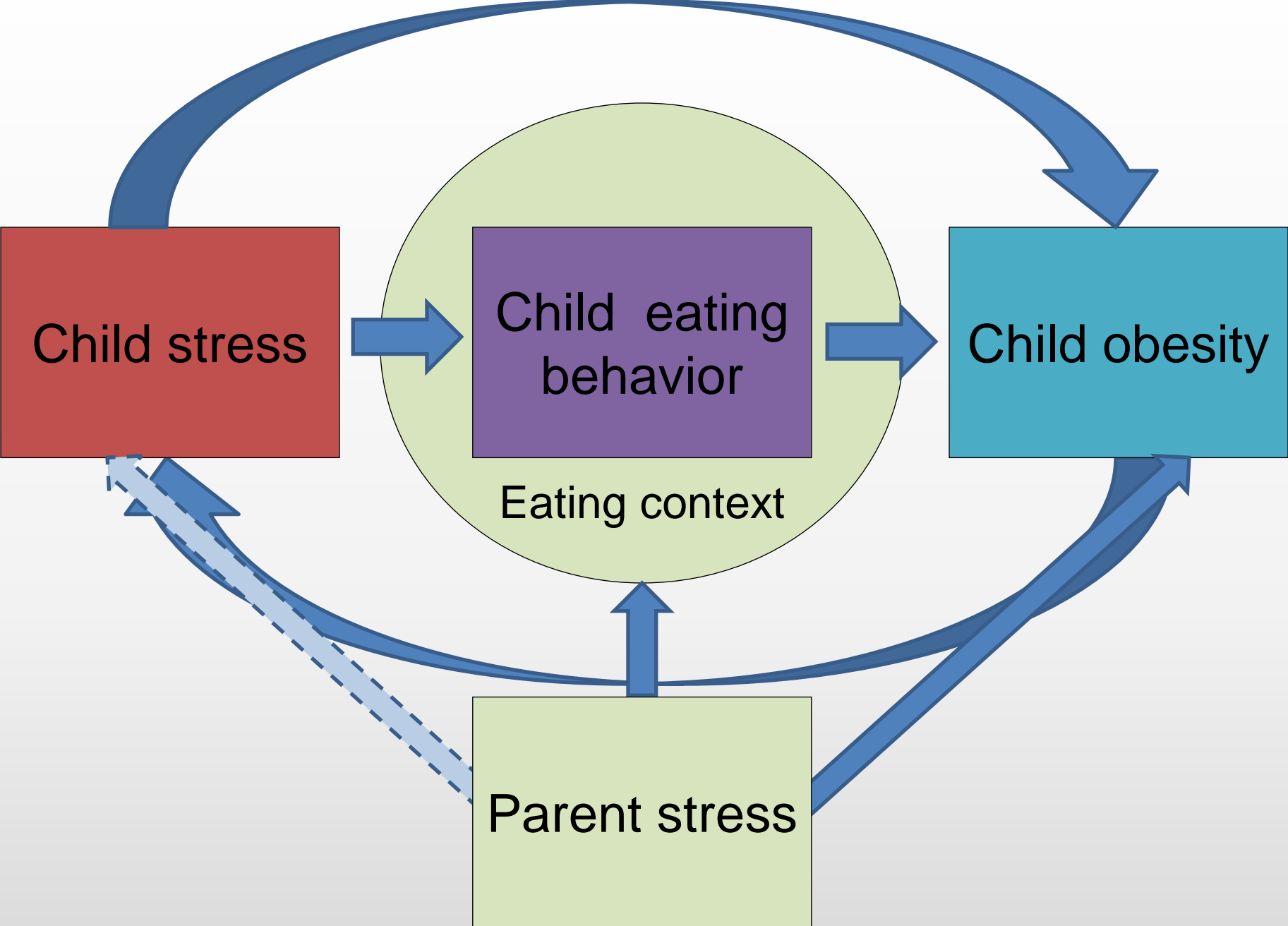
obesity reviews

doi: 10.1111/obr.12262

Review

**Do stressed mothers have heavier children?
A meta-analysis on the relationship between maternal
stress and child body mass index**

E. B. Tate¹, W. Wood², Y. Liao¹ and G. F. Dunton¹



Conclusions & Implications

- Helping families and children **cope with stress** may help prevent obesity
 - Education in stress-management techniques
 - Be attuned to eating habits for children in high-stress environments
- Future research:
 - Family/external stressors vs. perceived stress vs. stress reactivity (ex. cortisol)
 - Interventions

Thank you!

Advisors and co-authors

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Dr. Yue Liao

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