



# Environmental and Familial Factors Associated with Child Eating Behaviors: Observational Approaches to Studying Mealtimes

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HER NOPREN EARLY CHILDHOOD GROUP, APRIL 15<sup>TH</sup>, 2019

# Aim

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Describe the barriers and facilitators to collecting and coding high quality observational data in the home environment.

Discuss how these methods can be applied in other contexts, such as the center- or home-based child care context.

# Outline

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- Quick topical introduction
- STRONG Kids 2: Protective Parents Subproject
  - Data collection
  - Coding
- Application: Recent findings
  - Mealtime emotional climate and child eating behavior
  - Distractions and maternal feeding responsiveness
- Discussion

# Ecological and Family Systems Theories

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## Family Characteristics & Processes

### Parent-Child Dyad

### Child Behavior

Health and health behavior in early childhood need to be studied in context of:

1. The family as a system of interrelated units
  - Individuals
  - Dyads
  - Triads, etc.
2. The family as a standalone unit of analysis

# Family Systems and Children's Weight-Related Health

More than a third of 2-5 year olds (36%) are considered overweight or obese (> 85<sup>th</sup> percentile of BMI for age and sex)



Obesity tracks into adolescence and adulthood, promotes risk for increased morbidity and mortality

Parents are the gatekeepers to child health in early life

Family mealtime routines are a “window of opportunity” to observe:

- Typical family functioning in a patterned/repeated daily interaction around food
- How these patterns may be linked to weight-related health

Skinner, Ravanbakht, Skelton, Perrin, & Armstrong, 2018; Lumeng, Taveras, Birch, & Yanovski, 2015; Woo Baidal et al., 2016; Frankel et al., 2012; Fiese & Bost, 2016; Fiese, Foley, & Spagnola., 2006

# STRONG Kids 2: Protective Parents Subproject

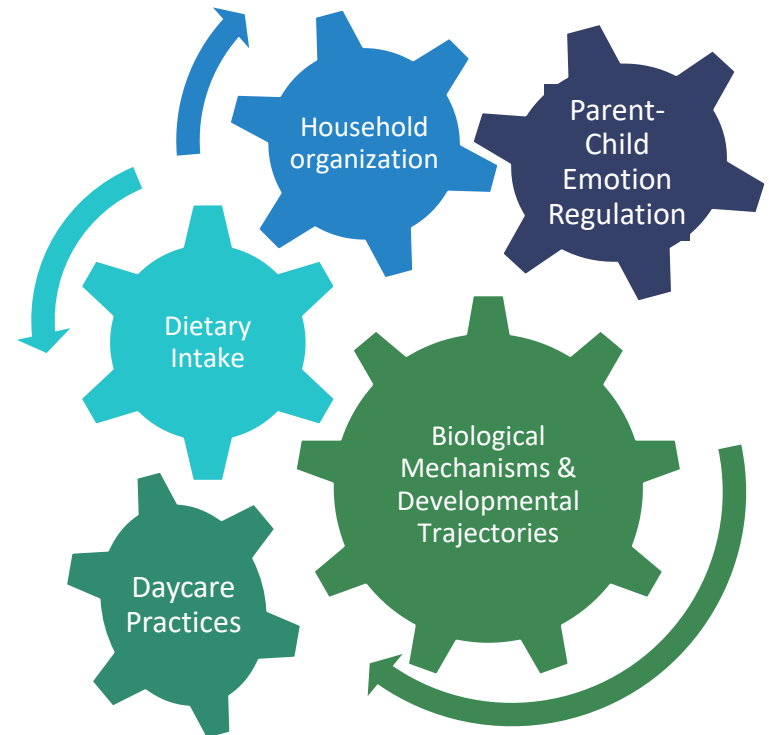
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PI: KELLY BOST, BARBARA FIESE, SHARON DONOVAN

PROJECT MANAGER: JACLYN SALTZMAN

# STRONG Kids Program Context

- Transdisciplinary research team comprised of experts from:
  - Nutrition + sensory science
  - Human development and family studies
  - Community/public health
  - Economics
  - Biostatistics
  - Genetics



# STRONG Kids Program Cohorts 1 and 2

## STRONG Kids 1 (SKP1): 2008-2011

- *Ecological Systems Approach To Studying Trajectories of Unhealthy Weight Gain in Preschool Age Children*
- 497 families
- Recruited from child care centers



## STRONG Kids 2 (SKP2): 2012-2017

- *A Cells-to-Society Approach to Nutrition in Early Childhood*
- Supported by the Dairy Research Institute (Rosemont, IL), \$1.1M
- Birth to 3 years of age (n=468)
- Recruited from clinics and birthing centers in third trimester of pregnancy
- *Additional 40 families*
- *24 hour recalls*
- *Home Visit Subsample (n = 110)*














































FRC

FAMILY  
RESILIENCY  
CENTER



# STRONG Kids 2 Timeline

Your Baby's Age	What Will Happen at This Visit?	Gift Card Amount	Description
1-2 weeks		\$25	Home visit with birth height and weight record, stool sample from baby
6 weeks	      	\$40	Survey, home visit with stool samples from mom and baby, saliva samples from mom and baby, weight and length for baby and height and weight for mom, breast milk/formula sample
3 months	    	\$40	Survey, home visit with length and weight for baby, stool sample from baby, food inventory, height and weight for mom
Introduction of solid food		\$25	Stool sample picked up after your baby begins solids
12 months	    	\$40	Survey, home visit with length and weight for baby, stool sample from baby, food inventory, height and weight for mom
18 months	   	\$60	Survey, home visit with length and weight for baby, stool sample from baby and height and weight for mom
2 years	    	\$60-80	Survey, home visit with length and weight for baby, stool sample from baby, food inventory, height and weight for mom
3 years	    	\$60-80	Survey, home visit with length and weight for baby, stool sample from baby, food inventory, height and weight for mom
4 years	    	\$60-80	Survey, home visit with length and weight for baby, stool sample from baby, food inventory, height and weight for mom
5 years	    	\$60-80	Survey, home visit with length and weight for baby, stool sample from baby, food inventory, height and weight for mom



Baby Length/  
Height and Weight

Breast Milk/  
Formula Sample



Baby Saliva

Baby Stool



Food Inventory/  
Pantry Checklist

Mom Saliva



Mom Stool

Parent Survey



Mom Weight

# Home Visits at 18-24 months

- Primary Aim: Examine behaviors and routines around mealtimes, and associations with child eating behaviors.
- Secondary Aim: Evaluate how attachment moderates associations between mealtime routines/behaviors and child eating/weight.

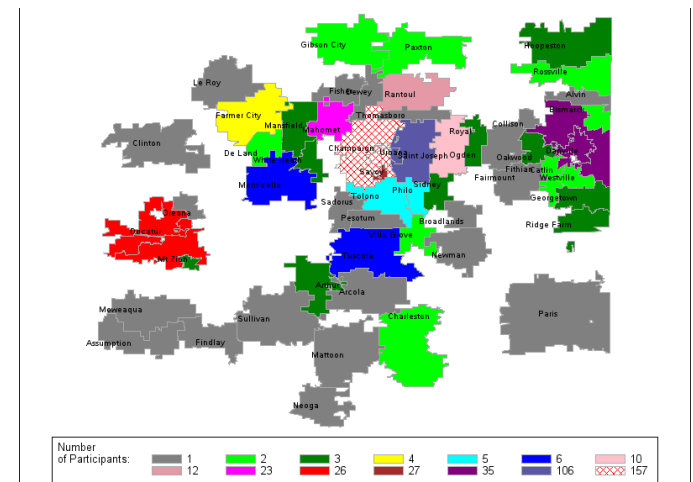


## Format:

- 3 hours, weekday nights (+1 hour before and 2 hours after visit for prep, takedown, and data entry/evaluation write-up)
- Each visit involved:
  - Behavioral task batteries with children
  - Semi-structured attachment interview with mothers
  - Observational evaluation of child attachment
  - Video-recording of family mealtime

# Recruitment

- Took 3 years to recruit n = 110 families already involved in the SK2 study, with n = 108 having usable videos
- Fliers, phone calls, newsletters, rapport
- Challenges during recruitment
  - Distance + transportation
  - Staffing
  - Parent willingness to participate, intrusiveness
  - Scheduling (and re-scheduling)
- Facilitators to successful recruitment:
  - Flexible staff
  - Strong communication with families
  - Pre-established and maintained relationships (scheduler is key, consider newsletters)
  - Lots of time
    - Rolling (long term) recruitment vs. short recruitment timeframe



# Data Collection: Behavioral Tasks

- Child executive functioning tasks
  - Fruit stroop vs. sweet stroop (attentional control)
  - Gift delay task (inhibitory control)
  - Reverse categorization
- Yields scores for child:
  - Attentional control
  - Inhibitory control
  - Attentional shifting (ultimately unsuccessful)



# Data collection: Mealtime Videos

- Family ready for dinner, set up the camera facing target child
- Leave the home, wait for notification



## VARIED FACTORS

- Fathers
- Other family members
- Location
- TV
- Eating together?

# Data collection: Semi-structured attachment interview

- Attachment script assessment (ASA)
- Six word prompts, three adult-adult, three adult-child
- Tell a story from the word prompts
- Yields scores for parent/adult attachment security

Table 1. Elements of a secure script (internal working model) of attachment

- (1) Attachment partners are occupied constructively
- (2) Attachment partners are interrupted and one partner is distressed
- (3) Cue or bid for help
- (4) Bid for help is recognized and help is offered
- (5) Help is accepted
- (6) Help is effective in solving the problem
- (7) Help is effective in alleviating or regulating negative affect
- (8) Attachment partners go back to their prior occupation together, or initiate a new interaction

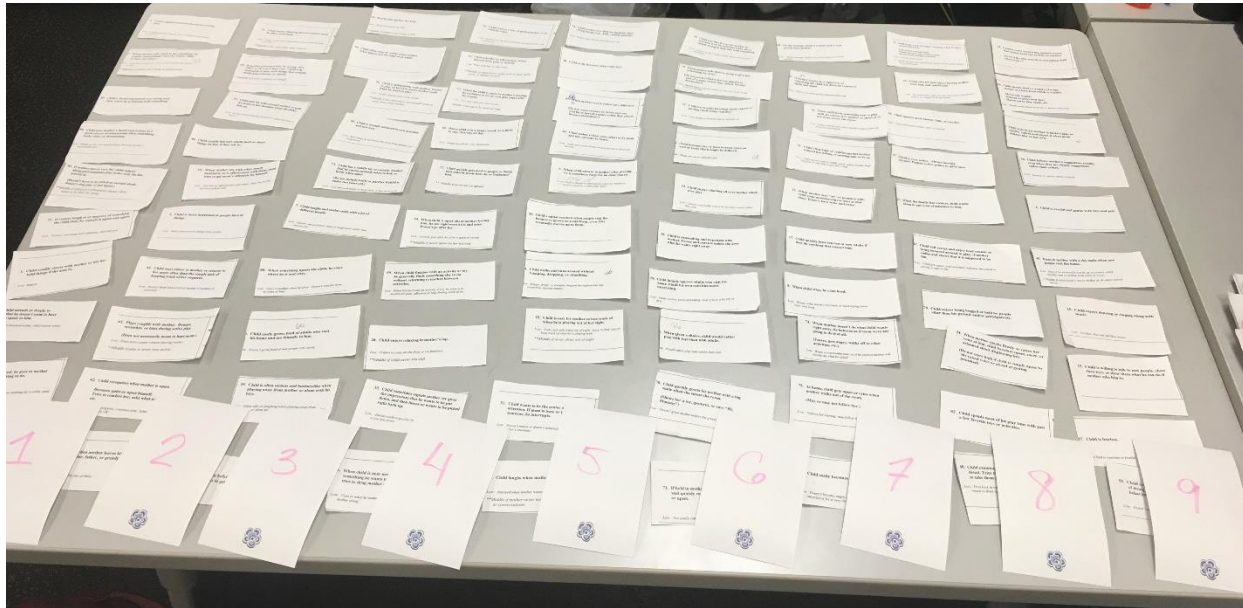
*Note.* Adapted from Waters & Waters, 2006

## Baby's Morning

Mother	Hug	Teddy Bear
Baby	Smile	Lost
Play	Story	Found
Blanket	Pretend	Nap



# Data collection: Observation of child attachment



Least  
descriptive of  
the child

Most  
descriptive of  
the child

Attachment Q-sort

Completed directly  
AFTER visit

20% Double coded AQS's

Yields score for child:

- Secure base behavior
- Smoothness of interactions with mother
- Physical contact with mother
- Interactions with other adults
- Proximity to mother

# Data Collection Summary

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- One three hour home visit yields:
  - Parent attachment security
  - Child attachment security (several variables)
  - Child executive functioning/self-regulation
  - Mealtime behaviors
    - Distractions from technology, toys, food, leave-taking
    - Maternal and child emotion
    - Maternal emotional responsiveness
    - Maternal (and now paternal) feeding responsiveness
    - Child eating behavior (rapid eating)
    - Presence/absence of father
    - TV watching
    - Lots of other possibilities

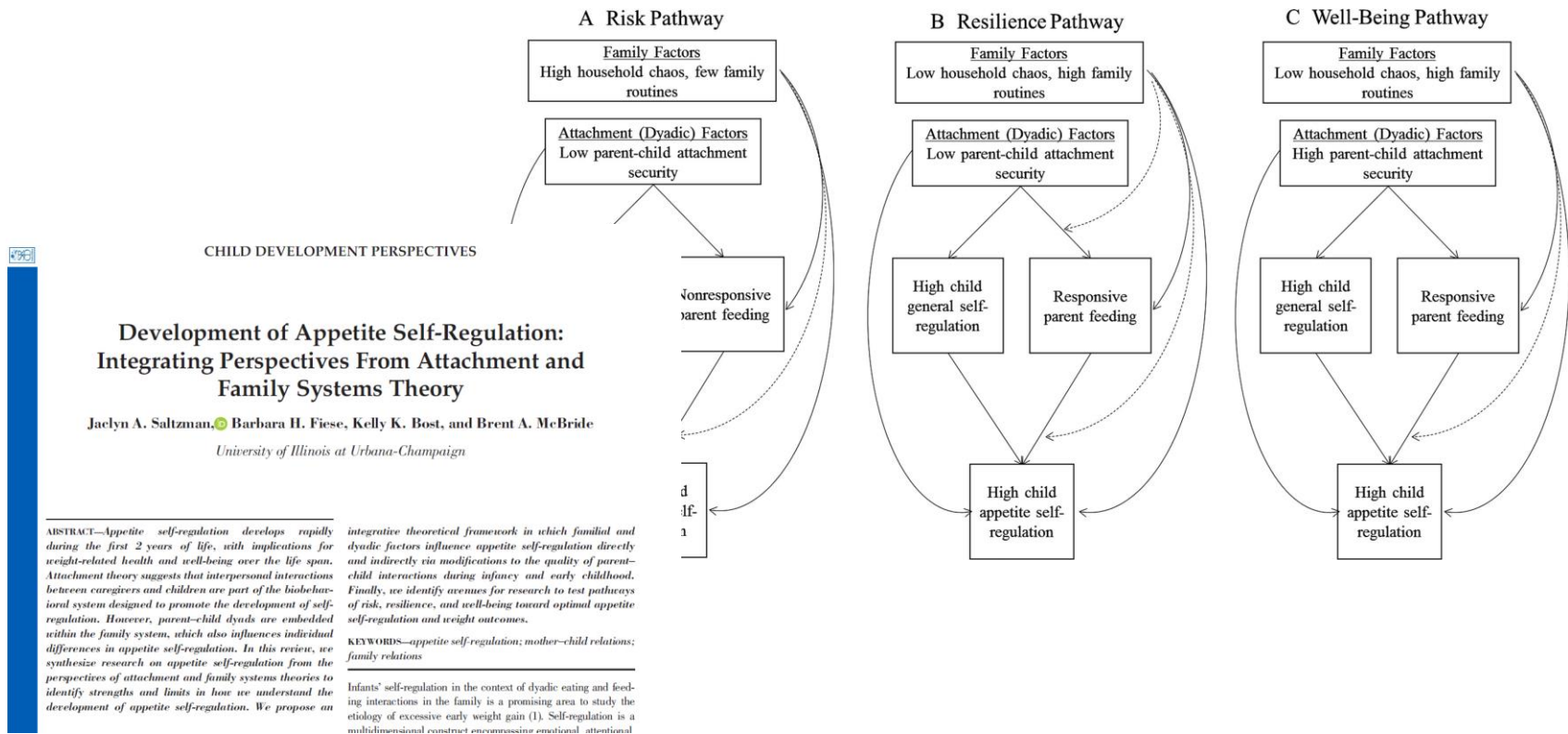
## Key Challenges/ Facilitators:

- 1) Flexibility + adaptability
- 2) Respect for diversity
- 3) The “unknown” error (cats, communication, technology)
- 4) Careful written protocols
- 5) Clear division of responsibility
- 6) Parent-researcher rapport



# Codebook development

1) Evaluation of literature, key aims of studies. Identify a shared theoretical framework



# Codebook development

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- 1) Evaluation of literature, key aims of studies. Identify a shared theoretical framework
- 2) Identify units of analyses (family, father, mother, dyad, child, etc.)
- 3) Each stakeholder group identifies best-practices and coding schemes in their own field
- 4) Come together, evaluate how best-practices/coding schemes fit together. Keep attention toward shared theoretical framework.
- 5) Reiterate, apply, re-evaluate, re-apply.



# Coding Procedure Overview

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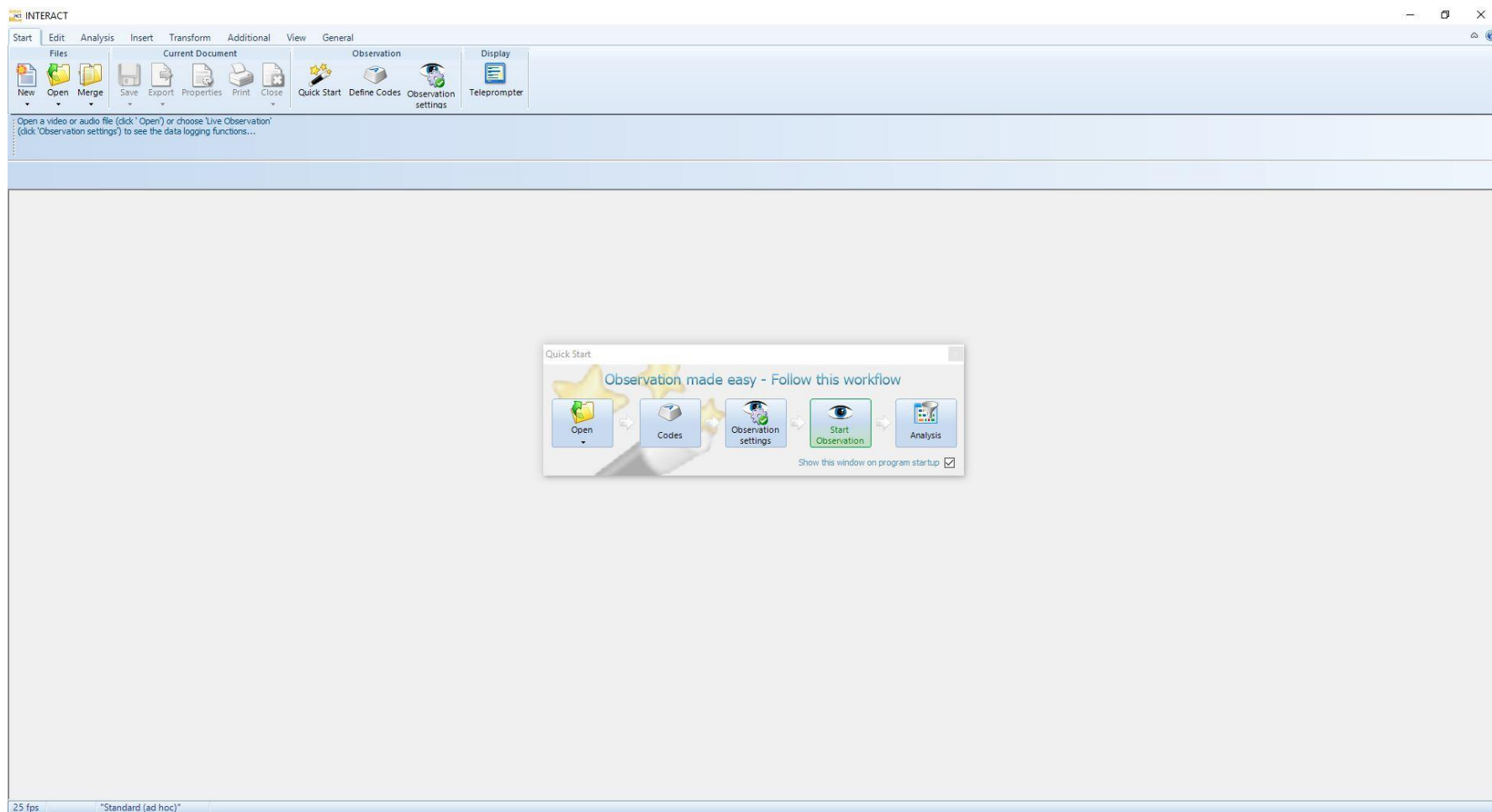
- 1) Codebook drafted, discussed, and revised with coding team (Fiese, Bost, Donovan, Cole, Saltzman).
- 2) INTERACT is pilot tested and coding schemes are set up
- 3) Each coding scheme (chaos, emotion, feeding, and eating) has one master coder, and two primary coders. The master coder is the double-coder.
- 4) All code training videos of mealtimes (not from SK2,  $n = 7$ )
- 5) Revise coding schemes, according to experiences on the training videos.
- 6) Primary coders each code half ( $n = 60$ ) of the videos, checking in during weekly meetings on progress and questions (about 4 videos per week per person).
- 7) Master coders double-code 20% ( $n = 24$ ) of the whole dataset, and will overlap on 12 videos for each primary coder.
- 8) Discussion of disagreement

# Coding Tools: INTERACT

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- INTERACT (Mangold International):
  - Construct and apply hierarchical or non-hierarchical coding schemes with complex skip patterns
  - Code duration or incidence of behavior (can also code in epochs)
  - Apply multiple coding schemes to each video, organized data storage
  - Evaluate inter-rater agreement in a variety of ways









INTERACT - [177\_Emotion\_AP]

Start Edit Analysis Insert Transform Additional View General

Files Current Document Observation Active Codes Display

New Open Merge Save Export Properties Print Close Quick Start Define Codes Observation settings Teleprompter

Coding mode "Standard (ad hoc)" 00:07:58:26 Stop

177\_Emotion\_AP

	Date	Person	Affect	N.Affect	Parent	SelfReg	Response	Sensitivity
6	00:02:59:00 00:03:00:19	Child-target	Negative Affect					
7	00:03:03:07 00:03:10:12	Child-target	Positive Affect					
8	00:03:13:29 00:03:20:17	Child-target	Positive Affect					
9	00:03:53:20 00:03:55:04	Child-target	Positive Affect					
10	00:04:37:08 00:04:39:18	Child-target	Positive Affect					
11	00:05:49:28 00:05:51:21	Child-target	Positive Affect					
12	00:06:04:09 00:06:09:00	Child-target	Positive Affect					
13	00:08:03:18 00:08:06:09	Child-target	Positive Affect					
14	00:09:08:10 00:09:14:02	Child-target	Positive Affect					
15	00:09:45:08 00:09:55:13	Child-target	Positive Affect					
16	00:11:14:17 00:11:28:00	Child-target	Positive Affect					
17	00:11:36:13 00:11:41:21	Child-target	Positive Affect					
18	00:11:51:11 00:11:52:26	Child-target	Positive Affect					
19	00:12:41:06 00:12:46:04	Child-target	Positive Affect					
20	00:13:39:02 00:13:44:00	Child-target	Positive Affect					
21	00:13:48:05 00:13:55:00	Child-target	Positive Affect					
22	00:14:01:29 00:14:06:07	Child-target	Positive Affect					
23	00:14:11:14 00:14:16:08	Child-target	Positive Affect					
24	00:00:59:29 00:01:03:28	Mother	Positive Affect					
25	00:01:07:29 00:01:15:18	Mother	Positive Affect					
26	00:01:24:03 00:01:28:06	Mother	Positive Affect					
27	00:02:07:25 00:02:09:26	Mother	Positive Affect					
28	00:02:19:13 00:02:21:08	Mother	Positive Affect					
29	00:03:30:04 00:03:35:03	Mother	Positive Affect					
30	00:04:17:25 00:04:19:15	Mother	Positive Affect					
31	00:05:54:12 00:05:58:29	Mother	Positive Affect					
32	00:06:04:28 00:06:21:09	Mother	Positive Affect					
33	00:06:37:28 00:06:41:21	Mother	Positive Affect					
34	00:11:15:08 00:11:21:20	Mother	Positive Affect					
35	00:13:07:10 00:13:12:07	Mother	Negative Affect					
36	00:13:48:21 00:13:53:05	Mother	Positive Affect					
37	00:14:14:11 00:14:23:12	Mother	Positive Affect					
38	00:00:26:22 00:00:32:09			Child negative affect	Mother	Other-directed verbalization attempt to fix	Ignoring/ Mom not present	
39	00:02:59:00 00:03:00:19			Child negative affect	Mother		Passive Attending	Sensitive
40	00:07:58:26 00:07:58:26			Child negative affect				

Current Codes [Response\_category2:key]

File Edit

New Open Save

Key	Code	Dur	Exd	Class	Lex.chain	Prefix	EOC	CMNT
s	Structure/Expectatio		a	Response	Response_sensitivity			
t	Positive Response		a	Response	Response_sensitivity			
i	Distracting		a	Response	Response_sensitivity			
p	Passive Attending		a	Response	Response_sensitivity			
d	Negative Response		a	Response	Response_sensitivity			
l	Ignoring/ Mom not		a	Response	Response_sensitivity			

☐ This file contains the "Master Object" Codes

☒ SPACEBAR is treated as a Code with duration

☐ Enter comment after coding with the SPACEBAR

INT 29.97fps 00:07:58:26 TC

S:\...[SK2 Home Visit Videos\Mealtime\177 meal\177 meal.MTS]

29.97 fps "Standard (ad hoc)" Line: 42 Duration 00:00:00:01 00000.03 sec

# Data Coding Challenges and Facilitators

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## CHALLENGES

- Technology learning curve and cost of INTERACT
- Iterative nature of coding (oh, just one more thing!)
- Coding operational definitions: making time for discussion of uncertainty
- Personnel training and retention

## FACILITATORS

- Customer support/service from technology companies
- Clear hierarchical management structure → division of responsibility
- Institutional environment fostered effective collaboration across disciplines
- Organized and planned approach to management and logistics (do not underestimate, do not ignore)
- Incentives for staff to stay: clear path to authorship, posters, papers; incrementally increasing responsibility, training opportunities
- Observational approach appealing to funders



# Observational Research Overview

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## BENEFITS

- Ecological validity and reliability
- Opportunity to operationalize new constructs using empirical data
- Behaviors may be context dependent (e.g. mealtime vs. playtime differences)
- “Real-world” view of behaviors
- Rich data available from recorded interactions (endless possibilities for recoding)

## LIMITATIONS

- Significant potential for researcher bias
- Time and labor intensive
- Demographic representativeness is rare and difficult to attain
- Doesn't represent attitudes and opinions, just behavior
- Not experimental, so no causation
- Hawthorne Effect: awareness of observation may change behavior

# Examples of papers

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# Predictors and Outcomes of Mealtime Emotional Climate in Families With Preschoolers

**Jaclyn A. Saltzman, MPH, Kelly K. Bost, PhD, Salma M. A. Musaad, MD, PhD, Barbara H. Fiese, PhD, Angela R. Wiley, PhD, and The STRONG Kids Team**

University of Illinois at Urbana-Champaign

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The STRONG Kids Team includes Drs. Kristen Harrison, Kelly Bost, Brent McBride, Sharon Donovan, Diana Grigsby-Toussaint, Juhee Kim, Janet Liechty, Angela Wiley, Margarita Teran-Garcia, and Barbara Fiese.

Received May 11, 2017; revisions received August 3, 2017; accepted August 4, 2017

# Associations Between Father Availability, Mealtime Distractions and Routines, and Maternal Feeding Responsiveness: An Observational Study

Jaclyn A. Saltzman, Salma Musaad, Kelly K. Bost, Brent A. McBride, and Barbara H. Fiese  
University of Illinois at Urbana-Champaign

Responsive feeding and frequency of family mealtimes are related to healthier eating behaviors and weight outcomes in children and adolescents. Distractions at mealtimes are related to greater intake of unhealthy food and a less positive mealtime emotional climate. However, there is little understanding of the effects of routines and father availability on distractions at family meals, and there is limited research investigating the effects of distractions among all family members on maternal feeding practices in toddlerhood. This study aims to characterize distractions at family mealtimes and examine associations between father availability, distractions, and observed responsive feeding. Descriptive analyses, nonlinear mixed models, and path analyses were conducted using observational (home-based family mealtimes) and self-report data collected from a subsample of families ( $n = 109$ ) of 18- to 24-month-old children in the larger STRONG Kids 2 Study ( $N = 468$ ). Between fathers, mothers, and children, families spent almost half of the mealtime distracted. Fathers and mothers engaged in about equal amounts of distractions, and children engaged in more technology-related distractions than parents. Fathers' absence at the mealtime was associated with more child distractions and less maternal feeding responsiveness. Lower paternal total distractions, maternal non-technology-object-related distractions, and higher household income were significantly associated with more observed maternal feeding responsiveness. Future research should investigate how father availability and family mealtime distractions may be associated directly and indirectly with children's eating behaviors and weight outcomes.

# Acknowledgements

- SK2 Families

- PIs: Kelly Bost, Barbara Fiese

- STRONG Kids 2 Birth Cohort Team:  
Kelly Bost, Barbara Fiese, Brent McBride, Sharon Donovan, Margarita Teran-Garcia, Soo-Yeun Lee

- Research Team Leaders: Alyssa Parsons, MA, Natasha Chong Cole, RD, PhD, Maria Pineros-Leano, PhD, MSW, MPH

- Research Assistants: Steve Tran, PhD, Samantha Iwinski, BA, Marisa Cullnan, BA, Valerie Sherman, Jocelyne Lopez, BS, Jacqueline Bellefontaine, BSW, McKenzie Martin, BA, and Bella Yu Tang



# Discussion Questions

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- 1) These studies were all conducted in home-based settings, but these behaviors can all be observed in a variety of contexts.
  - How would you go about measuring these concepts in childcare?
  - What challenges would arise unique to collecting observational data in the childcare context?
- 2) A component of the Head Start guidelines calls for family style meals to promote positive interpersonal interactions and socialization at mealtimes. What else could be done during mealtimes in childcare centers to promote healthy eating behaviors and outcomes?
- 3) What policy implications do these studies bring to mind?

# Thank you!

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Questions?

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[`www.jaclynsaltzman.com`](http://www.jaclynsaltzman.com)