



# **Engagement as a mediator for the development of self-regulation: The importance of the preschool environment**

**Dale C. Farran, PhD**

**Professor of Education and Psychology**

**Vanderbilt University**

*Researcher's Conference on Children*

*in Need of Additional Support*

**Science Park Jönköping, Sweden**

**May 28, 2014**

# Investigations of the *processes* by which classrooms have effects



Design is a correlational one, not experimental. Leads to the identification of promising practices. *Causal* conclusions require manipulation of the processes identified to bring about expected effects.

# **MEASURES TO OBSERVE CLASSROOM PROCESSES**

# Behavioral Observations of Children (COP)

## Child Observation in Prekindergarten Classrooms (COP)

**Coding Sheet as it appears on Tablet. Drop down menus have code letters.**

No	Teacher	WG	Teacher	NonAcad	Pass Inst	High	Math	Literacy
Yes	Child	SG	Child	Parallel	Non Seq	MedH	Literacy	LangArts
Listen	Sm Grp	Centers	SG	ASsoc	SeQ	Med	SCience	Reading
FssCry	SGT	SGC	SGT	ASsocP	Fantasy Dr	MedL	Soc.Studies	Math
	Wh Grp	Transition	WG	Coop	None	Low	Toy	SCience
	WGT	TransitionI	WGT	CoopP	Other		Art	Soc.Studies
	Self	MealTime	Self	ALone	SOCial		Music/Move	Drama
	No Talk	Other		Onlooker	Disruptive		Dramatic	Other
				SOCial	DisruptiveX		Computer	None
				Unocc	TimeOut		Worksheet	
				TimeOut			TV / video	
							None	
							Can't Code	

Time	SW	Verbal	To Whom	Schedule	Prox.	Interact	Type Task	Invol.	Material	Focus
	1									
	2									
	3									
	4									

# Behavioral Observations of Teachers (TOP)

Teacher Observation in Prekindergarten Classrooms- Tools of the Mind (TOP-TOM)										Page
Place teacher label here.				Date						
				Observer						
				Start Time			End Time			
X out	No	No Talk	WG	Teacher	Instruction	0 none	Math	Literacy	Vibrant	
	Yes	Child	SG	Child	AssessT	1 low	Literacy	LangArts	Pleasant	
	Listen	Sm Grp	Centers	SG	MANage	2 skills	SCience	Reading	Flat	
			SGT	SGC	SGT	Behavior	3 inf	Soc.Studies	Writing	Negative
	Wh Grp	Transition	WG	WG	Approving	4 hi inf	Toy	Math	ExtremeNeg	
	WGT	MealTime	WGT	WGT	Dissapp.		Art	SCience		
	Self	Other	Self	Self	Pers/ Care		Music/Move	Soc.Studies		
	Parent		CT	CT	MONitor		Dramatic	Drama		
	Teacher				ADmin		Computer	Other		
	Ext Adlt				SOCial		GrossMotor	None		
				None		Worksheet				
						TV / video				
						Can't Code				
						None				
Time	SW	Verbal	To Whom	Schedule	Prox	Task	Level of Instruct.	Materials	Focus	Tone Affect
	1									
	2									
	3									

# Instrumentation: Pre-Post Individual Child Assessments

- Woodcock-Johnson Tests of Achievement
  - Literacy
    - Letter-Word ID
    - Spelling
  - Language
    - Academic Knowledge
    - Oral Comprehension
    - Picture Vocabulary
  - Mathematics
    - Applied Problems
    - Quantitative Concepts
- Self-Regulation (EF)
  - Attention
    - DCCS
    - Copy Design
  - Inhibitory Control
    - Peg Tapping
    - Head-Toes-Knees-Shoulders
  - Working Memory
    - Corsi Blocks (forward and backward digit span)

*Investigation of level of engagement and achievement gains but with no self regulation assessments*

*Canan Aydogan, Dissertation (AERA Award)*

# **STUDY 1**

# Study 1: Method

- Participants
  - 57 urban prekindergarten classrooms located in 16 public schools and 4 Head Start programs
  - 660 children with full assessment and observation data
- Procedure and Design
  - Classroom/teacher and child observations for four hours on three different days across the academic year
  - Children's learning engagement (from COP)
    - Amount of engagement in learning
    - Complexity of engagement in learning
  - Child pre- and post achievement assessments, individually administered in 2-3 sessions



# The Influence of the Level of Engagement on Academic Gains

Fixed Effects	<i>b</i>	<i>SE</i>	$\beta$	<i>p</i>
Child engagement	0.60	0.26	0.05	.020

# The Influence of the Complexity of Engagement on Academic Gains

Fixed Effects	<i>b</i>	<i>SE</i>	$\beta$	<i>p</i>
Complexity of child engagement	0.19	0.05	0.08	.000
Control variables	0.00	0.15	0.10	.000

# Study 1 Conclusions

- Higher amount of engagement in learning activities associated with gains in academic achievement for young children
- Classrooms that promoted more complex engagement facilitated children's learning

*Two investigations of the role of self regulation (Executive Function) in promoting achievement and the role of classrooms in promoting self regulation.*

## **STUDY 2**

# What is Executive Functioning (EF)?

## Self Regulation

### Cognitive

Working Memory  
Inhibitory Control  
Attention Shifting

### Emotional

Emotion Regulation  
Impulsivity  
Delay of Gratification

With thanks to Mary Fuhs

# Why is EF Important?

- Greater EF skills are associated with:
  - Greater academic achievement
  - Better adult health and well-being
- Poor EF skills are associated with:
  - ADHD
  - Specific learning disabilities
  - Aggressive and disruptive behavior

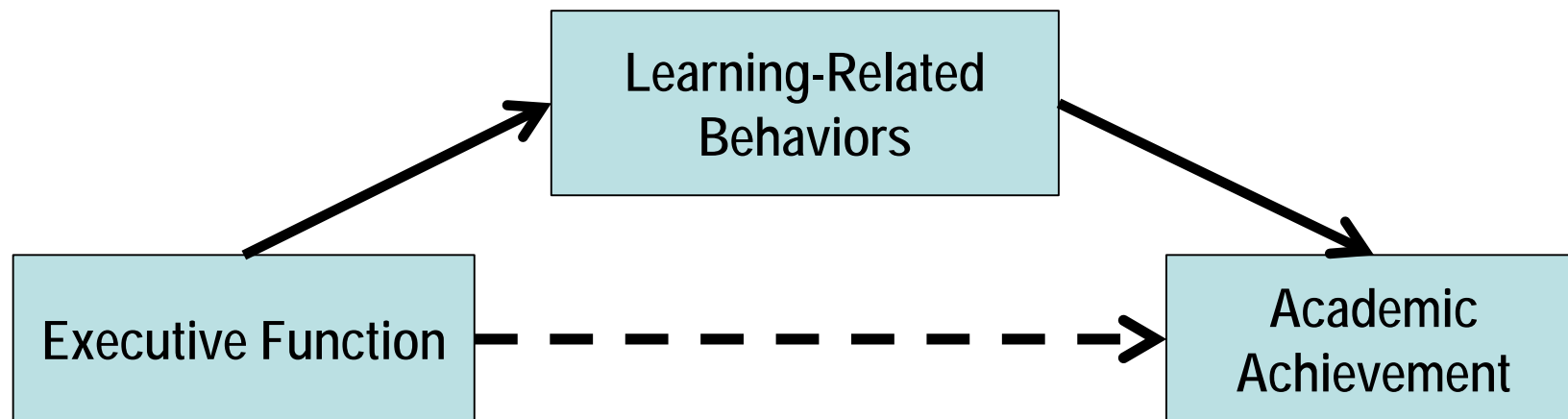
# EF Skills and Gains in Academic Achievement

- Established associations between young children's entering executive function skills and subsequent academic achievement (e.g., Blair & Razza, 2007; Bull, Espy, & Wiebe, 2008; Duncan et al., 2007; McClelland, Cameron, Connor, Farris, Jewkes, & Morrison, 2007)



# EF Skills, Classroom Behaviors and Gains in Academic Achievement

- Researchers have hypothesized that executive function facilitates children's ability to successfully adapt to school context (e.g., Blair & Diamond, 2008; McClelland & Cameron, 2011; Eisenberg, Valiente, & Eggum, 2010)





# Study 2: Method

- Participants
  - 1051 children from 6 school systems in NC and TN (54% female)
  - Mean age = 55 months ( $SD = 4$  months)
  - 27% African American, 24% Hispanic, 41% white
- Procedure and Design
  - Children assessed on achievement battery pre and post
  - Children assessed on battery of EF measures at Fall (T1) and Spring (T2) of Pre-K
  - Learning Related Classroom Behaviors observed (COP)
    - Level of engagement
    - Unoccupied or in Time Out

# Battery of EF Measures

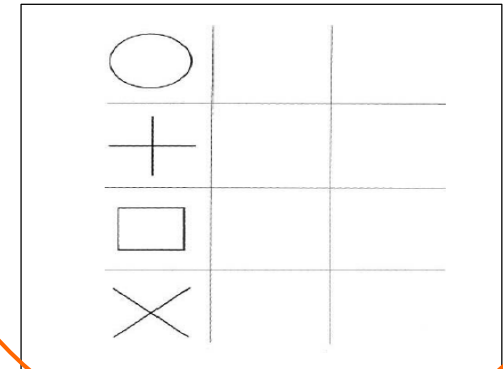
**Peg Tapping**  
(Diamond & Taylor, 1996)



**DCCS**  
(Zelazo, 2006)



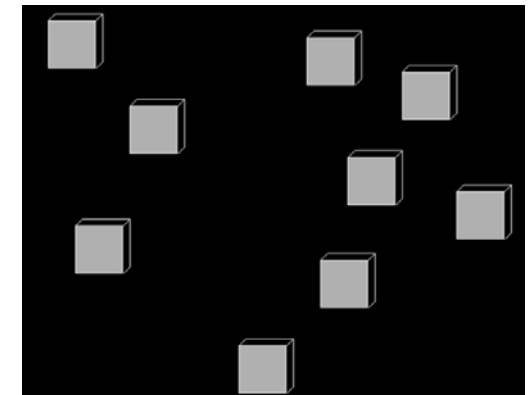
**Copy Design**  
(Osburn, Butler, & Morris, 1984)



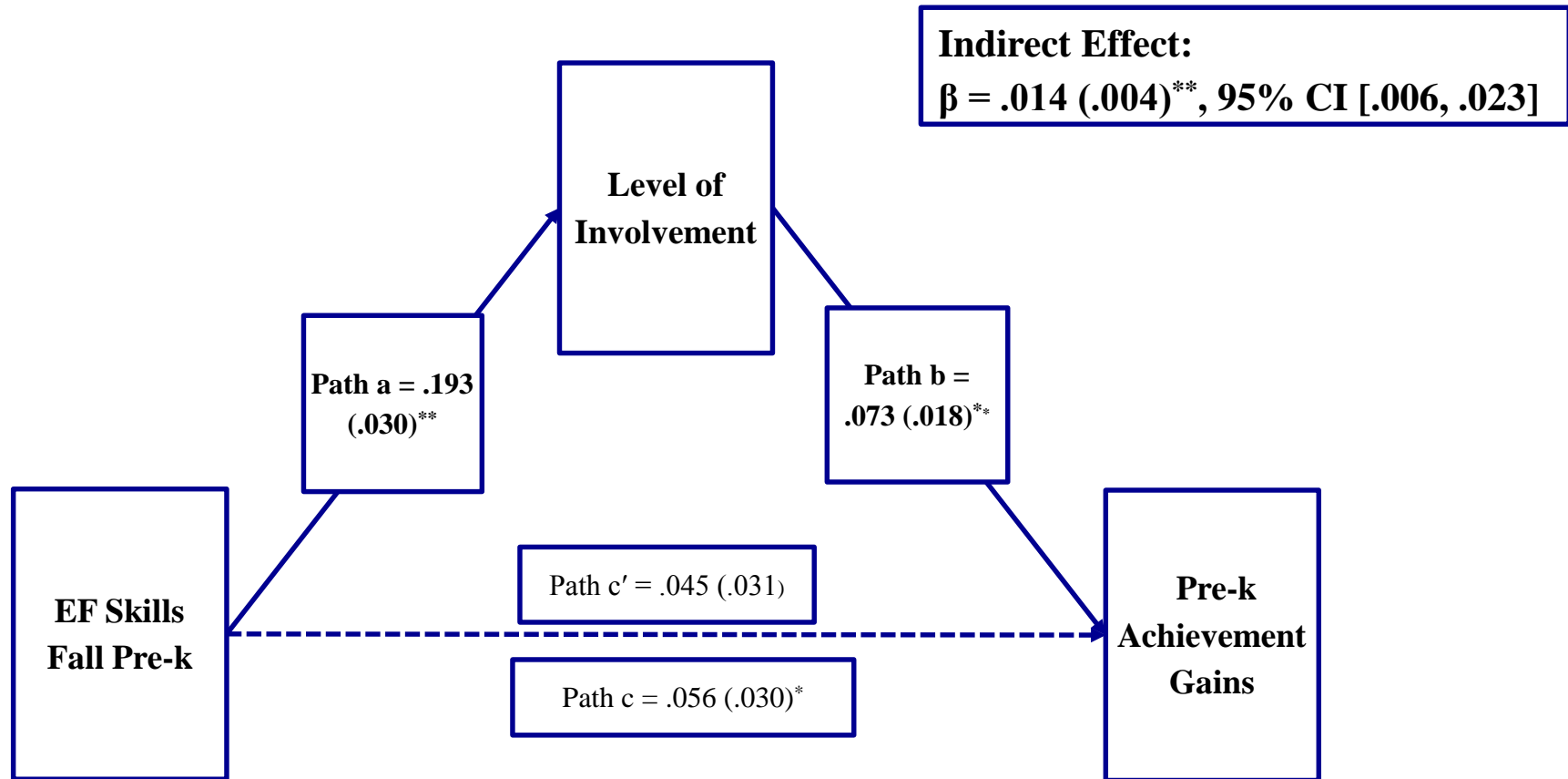
**HTKS**  
(Ponitz et al., 2009)



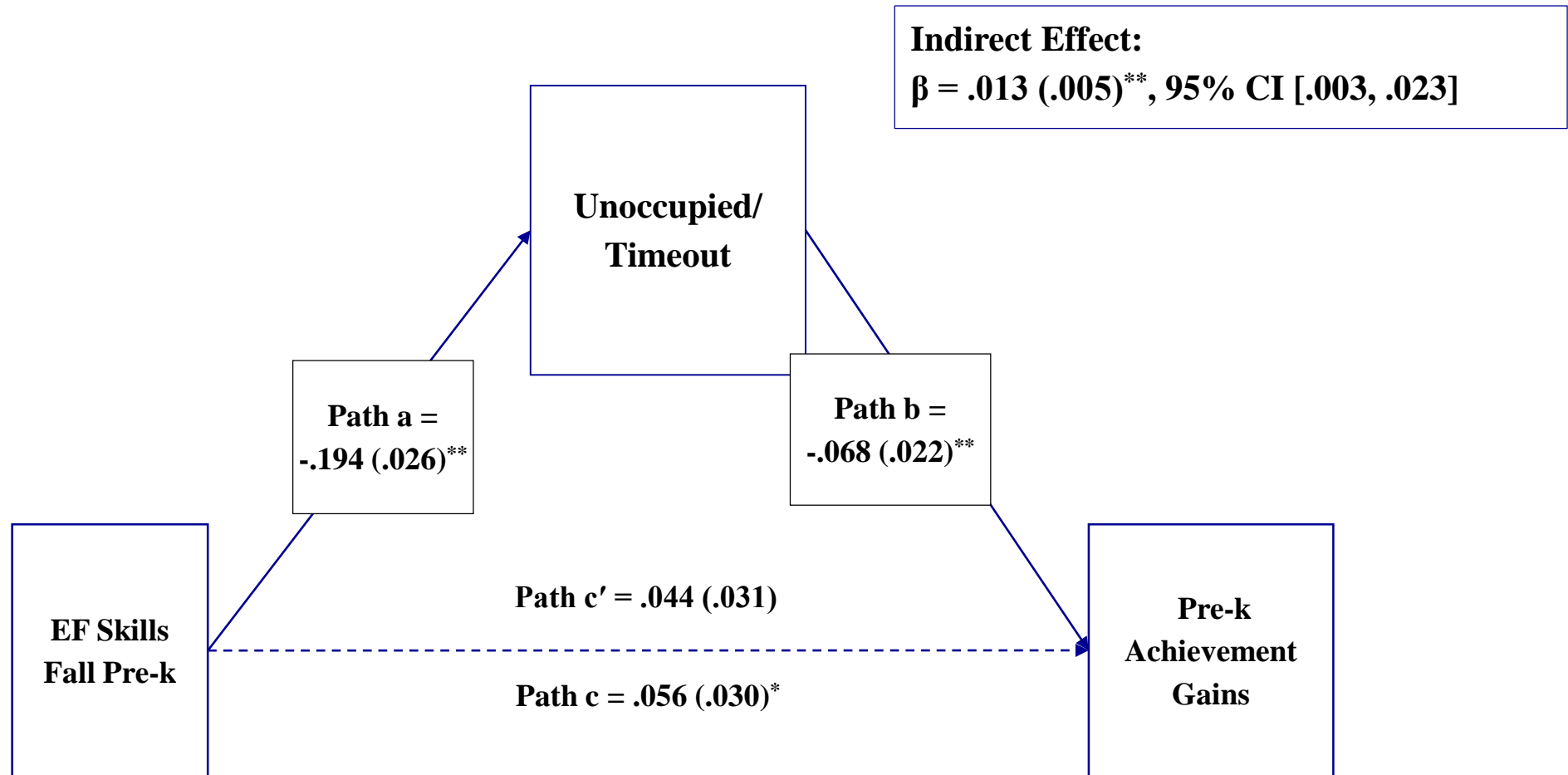
**Corsi Blocks**  
(Corsi, 1972)



# Level of Involvement Mediates Relationship between EF and Achievement Gains



# Unoccupied Behavior Mediates Relationship between EF and Low Levels of Achievement Gains



# Discussion

- Greater executive function skills at beginning of pre-k were associated with:
  - Higher levels of involvement during learning opportunities
  - Less demonstrations of off-task and disruptive behaviors
- Children's learning-related behaviors were a mechanism by which children's executive function skills facilitated their pre-k academic gains
  - Children entering pre-k with better developed EF skills became more involved, learned more
  - Children entering pre-k with less developed EF skills had a hard time engaging and were punished more
  - It appears that in the US teachers do not know how to engage children who have difficulties with attention and distraction

# **WHAT CHARACTERISTICS OF CLASSROOMS FACILITATE THE DEVELOPMENT OF EF?**

# Classroom Emotional Climate and Children's Gains in EF Skills

- Teacher positive affective tone and support and encouragement for appropriate child behavior
- Positive emotional climate may encourage exploration and self-directed behavior in the classroom
  - Maternal warmth and autonomy-support associated with higher EF (Bernier et al., 2010)
  - Lower environment-related stress associated with higher EF (Blair & Raver, 2012)

# Procedures & Measures

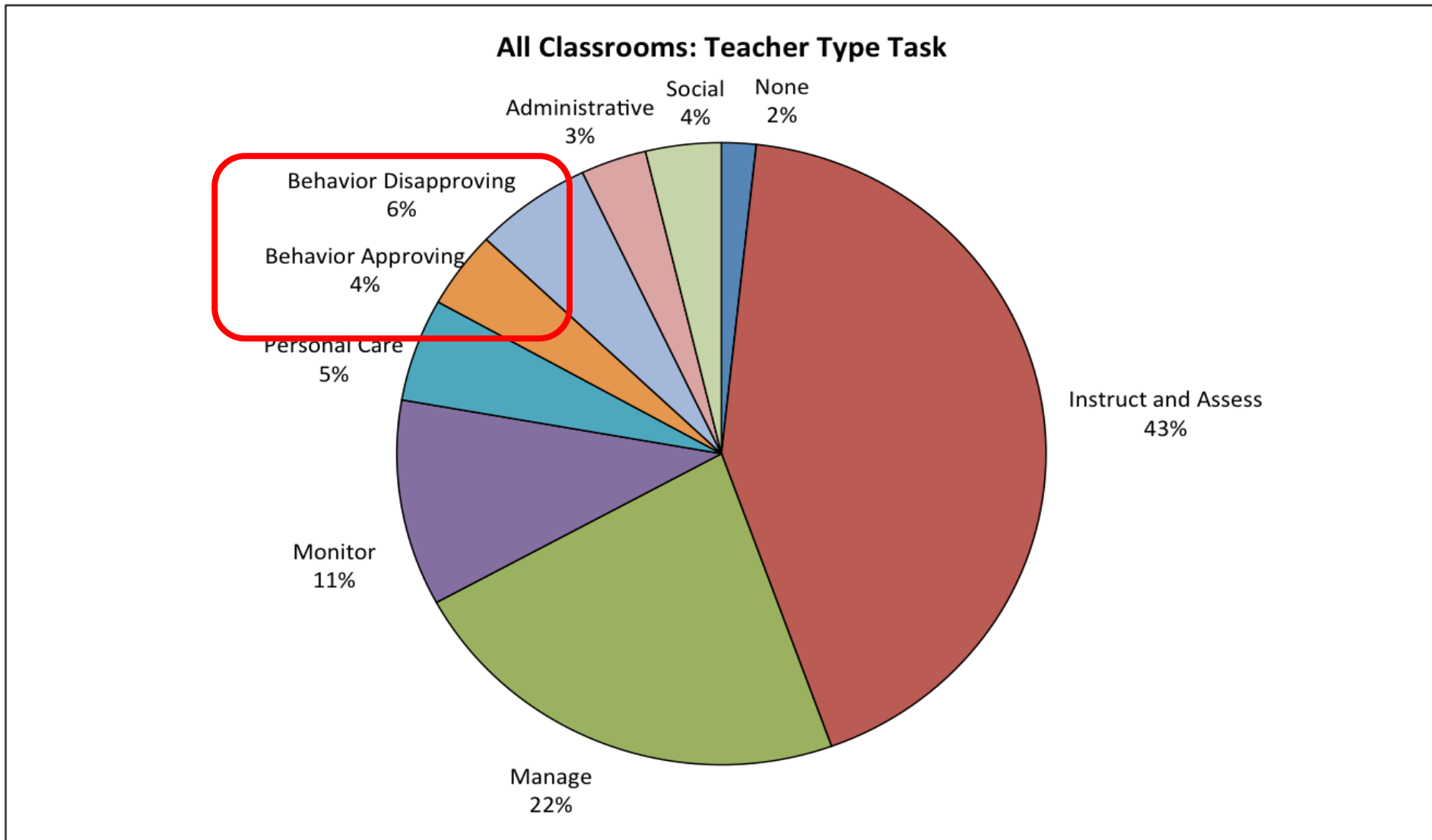
- Sample
  - Same 1051 as in previous analyses
- Procedure and Design
  - Children assessed on battery of EF measures at Fall (T1) and Spring (T2) of Pre-K
  - Emotional climate : Classroom teacher observed 3 times during classroom year with TOP



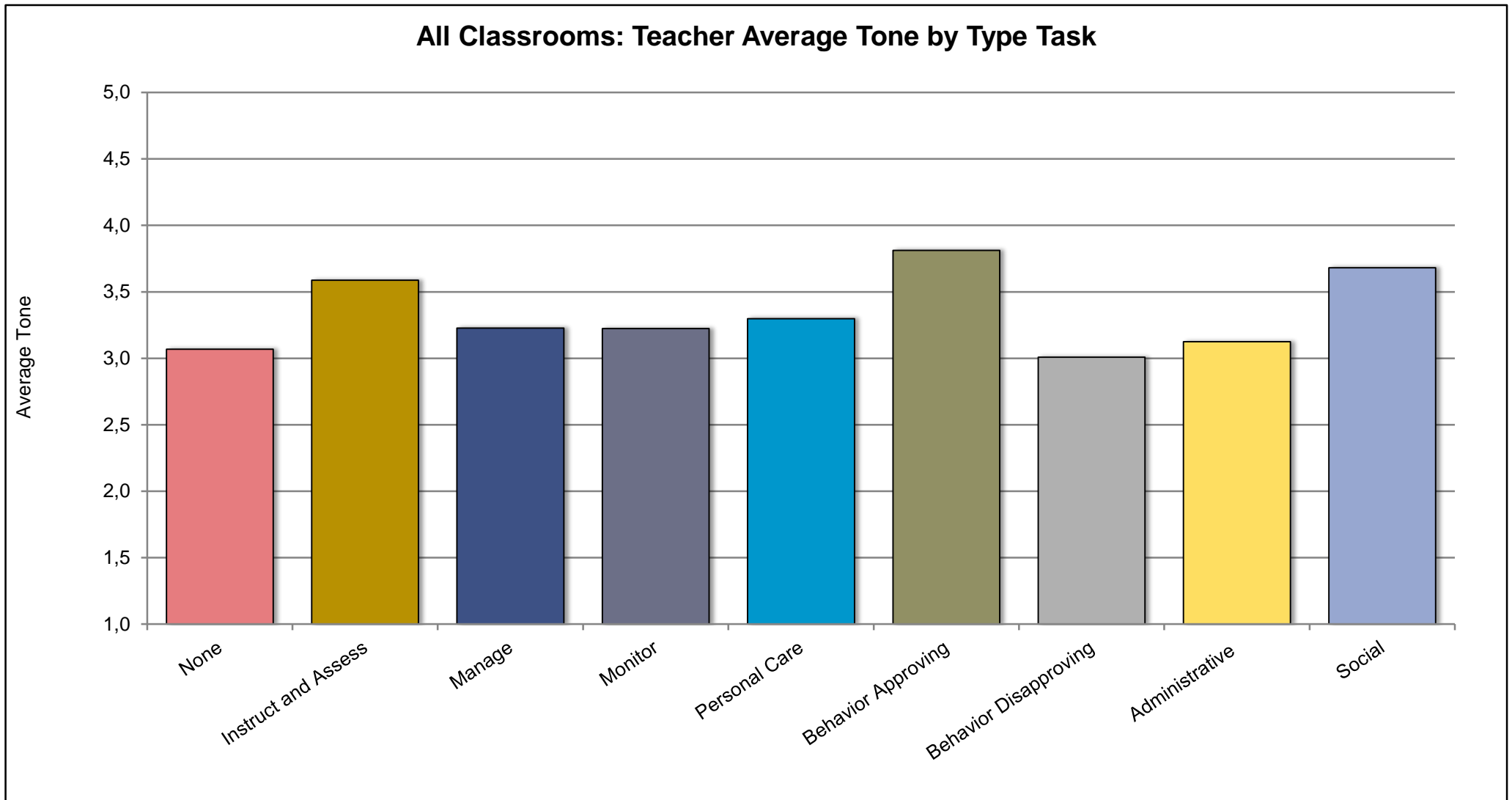
# Classroom Emotional Climate Composite from TOP

- Behavior Approving – I like what you are doing, and I want you to keep doing it.
- Behavior Disapproving – I don't like what you are doing, and I want you to do something different.
- Emotional Tone – Rating of teacher ranging from extremely negative to vibrant.

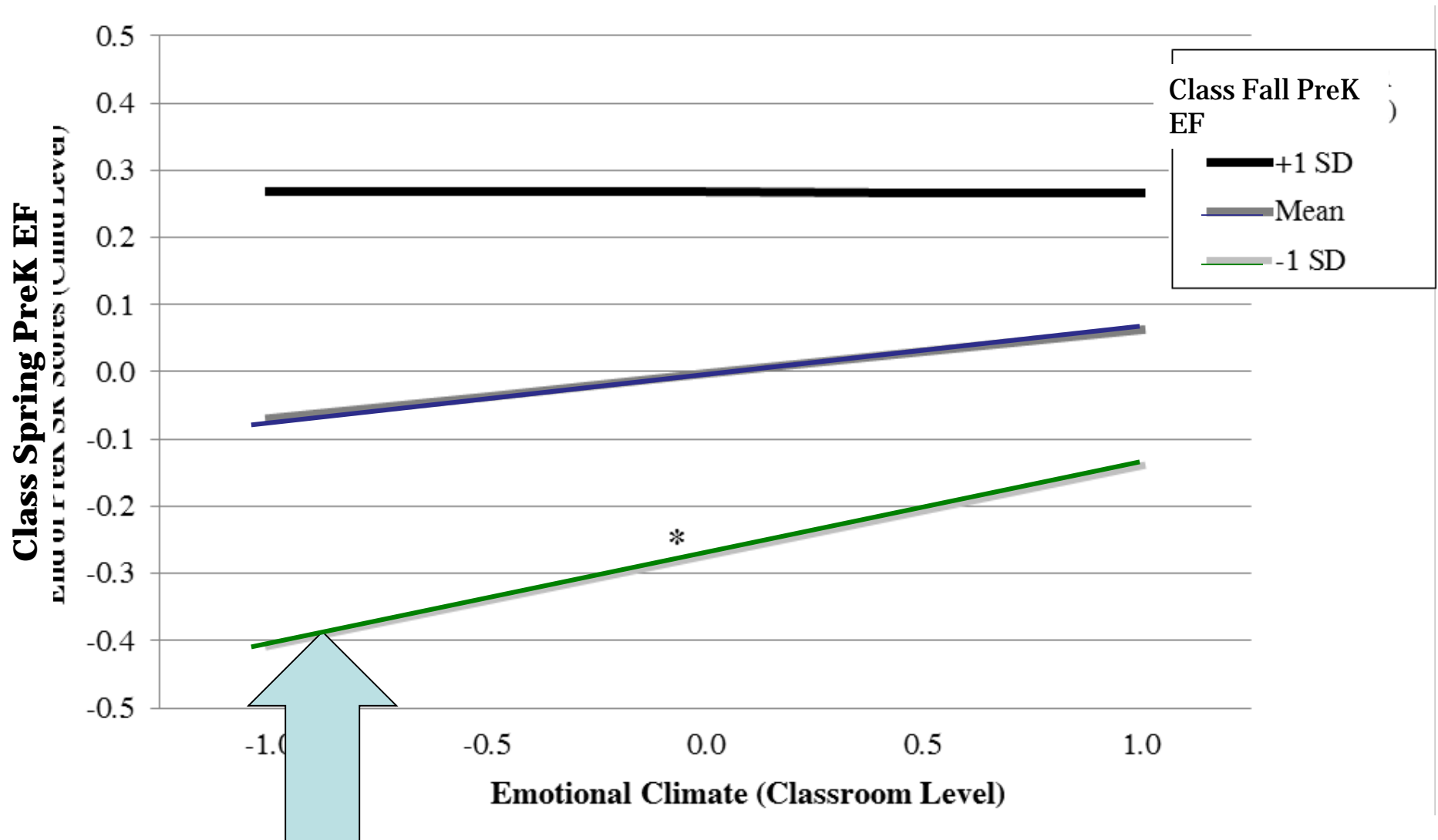
# Behavior Approving and Disapproving



# Emotional Tone



# Classroom Emotional Climate and Spring EF Associations Moderated by Fall EF



# Discussion

- Findings
  - Emotional climate significantly predicted gains for classrooms with poor EF skills at school entry.
  - Consistent with *Chicago School Readiness Project* findings (Raver et al., 2011)
- Implications for practice...
  - Particularly for children who start preschool with low EF skills, teachers who are warm and positive may create an atmosphere that supports exploration and self-directed behavior.

# Final Thoughts

- Children's development is complex, especially in large group, classroom settings
- Consistently in classrooms where children are observed to be more engaged, they learn more
- Engagement is predicted in part by those EF skills children bring with them to the class
- In classrooms where the emotional tone is positive and supportive, children learn more self regulation (EF) skills
- The field needs complex designs to match the complexity of the questions we are asking.

**Questions?**



**E-mail: [dale.farran@Vanderbilt.edu](mailto:dale.farran@Vanderbilt.edu)  
<http://peabody.vanderbilt.edu/pri.xml>**

**Peabody Research Institute  
Vanderbilt University  
Box 0181 GPC, 230 Appleton Place  
Nashville, TN 37203-5721  
USA**