

BACKGROUND

Although learning may be teachers' ultimate objective, they are often focused increasing children's positive engagement with classroom resources. Teachers structure the classroom to provide learning experiences for children, and in turn children interact with the environment. More research is needed to understand these reciprocal interactions (Bronfenbrenner & Morris, 2006). The purpose of the present study is to examine these longitudinal associations in the context of a typical preschool day.

HYPOTHESES

We hypothesized four sets of bidirectional associations in regards to teachers' behavior (emotional and organizational supports) and individual children's behavioral engagement (positive and negative, with teachers and tasks). We expected:

- Teachers' emotionally supportive behaviors and children's positive engagement with teachers to be positively related over time.
- Teachers' emotionally supportive behaviors and children's negative engagement to be negatively related over time.
- Teachers' organizationally supportive behaviors and children's negative engagement to be negatively related over time.
- Teachers' organizationally supportive behaviors and children's task orientation to be positively related over time.

METHOD

Participants: 606 children (306 girls and 300 boys) that were on average 4.18 years old ($SD = .45$) in 314 classrooms from preschool classrooms in 8 states.

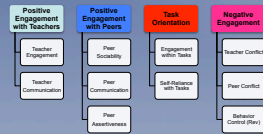
Procedure: A typical data collection involved observing with the CLASS (15-minute observation and 10-minutes of coding cycles), then observing two children in succession with the inCLASS (10-minute observation and 5-minutes of coding cycles for each). Classroom and child observations were repeated three to four times across a day.

OBSERVATIONAL INSTRUMENTS

Measures: All observations were rated on 7-pt scale (1=low, 7=high) using behavioral markers in two standardized manuals. For each measure, domain scores across all cycles were calculated; see Figures 1 and 2 for details.

The *Individualized Classroom Assessment Scoring System* (inCLASS; Downer et al., 2010) measures a child's classroom engagement using 10 dimensions aggregated into 4 domains (see Figure 1). ICCs averaged .80 (ranging from .65-.87) based on blind double-coding during 20% of live visits.

Figure 1: inCLASS Domains & Dimensions



DATA ANALYSIS

Using structural equation modeling, this study utilized cross-lagged autoregressive models to test hypotheses. The cross-lagged aspect of the models refers to the fact that subsequent models add in associations (one set at a time) between domains of variables across time. These cross lags allowed us to test if teachers' behaviors set the stage for children's later behavior and vice versa. Initially, all possible single cross lags were tested to see if each of these models accounted for the data better than the unconditional model. Then, a model was run that included both sets of lagged relationships (see Figure 3).

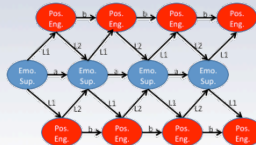
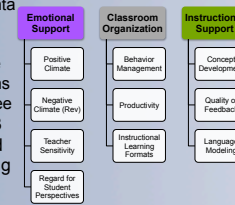


Figure 3: Sample Cross-Lagged Model

The *Classroom Assessment Scoring System* (CLASS; Pianta La Paro, & Hamre, 2008) measures teacher-child interaction quality for an entire classroom using 10 dimensions aggregated into 3 domains (see Figure 2). ICCs averaged .83 (ranging from .78-.88) based on blind double-coding during 20% of live visits.

Figure 2: CLASS Domains & Dimensions



RESULTS

For the SEM analyses represented in Table 1, we were looking for the best fitting model in relative terms.

Table 1: Model comparison tests and path regression coefficients

Emotional Support (EMO) and Positive Engagement with Teachers (PET)									
Model	χ^2	df	$\Delta\chi^2$	Δdf	p	CFI	b ₁	b ₂	
Unconditional	484.66	184	-	-	-	0.87			
EMO→PET	425.90	183	58.76	-	1 < .001	0.89	0.23		
PET→EMO	479.30	183	5.36	1	< .01	0.87		0.02	
Combined	420.80	182	5.10	1	< .01	0.90	0.23	0.02	

Emotional Support (EMO) and Negative Engagement (Neg. Eng.)									
Model	χ^2	df	$\Delta\chi^2$	Δdf	p	CFI	b ₁	b ₂	
Unconditional	509.83	184	-	-	-	0.87			
EMO→Neg. Eng.	508.80	183	1.03	1	n.s.	0.87	-0.01		
Neg. Eng.→EMO	508.20	183	1.63	1	n.s.	0.87		0.03	
Combined	507.20	182	1.00	1	n.s.	0.87	-0.01	0.03	

Classroom Organization (ORG) and Negative Engagement (Neg. Eng.)									
Model	χ^2	df	$\Delta\chi^2$	Δdf	p	CFI	b ₁	b ₂	
Unconditional	580.14	184	-	-	-	0.84			
ORG→Neg. Eng.	566.90	183	13.24	1	< .001	0.85	-0.05		
Neg. Eng.→ORG	551.64	183	42.37	1	< .001	0.85		-0.15	
Combined	537.77	182	13.87	1	< .001	0.86	-0.05	-0.15	

Classroom Organization (ORG) and Task Orientation									
Model	χ^2	df	$\Delta\chi^2$	Δdf	p	CFI	b ₁	b ₂	
Unconditional	526.38	184	-	-	-	0.85			
ORG→Task Orientation	473.50	163	52.88	1	< .001	0.88	0.21		
Task Orientation→ORG	525.80	183	0.58	1	n.s.	0.85		-0.01	
Combined	472.90	182	0.60	1	n.s.	0.88	0.21	-0.01	

DISCUSSION

- Bidirectionality was evident between child and teacher behaviors in regards to teachers' emotionally supportive behaviors and children's positive engagement with teachers, as well as teachers' organizationally supportive behaviors and children's negative engagement.
- A unidirectional association was evident between teachers' organizationally supportive behaviors and children's later task orientation.
- There was no evidence for any lagged associations between teachers' emotionally supportive behaviors and children's negative engagement.

CONCLUSION & IMPLICATIONS

Some teacher and child behaviors were linked bidirectionally, but not all. That is, certain sets of behaviors operate more independently than others. Thus, transactional views of development do not hold universally across behaviors or at least units of analysis. It could be that over longer periods of time, the transactional nature of these relations would become more apparent.

Classroom-to-child associations were generally stronger than child-to-classroom associations. This suggests that, overall, there is some efficiency offered with teacher-oriented interventions. Yet, multi-tiered interventions, like in an RTI model, that target both teacher and individual children's behavior may have the largest positive impacts.

ACKNOWLEDGEMENTS

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A060021 to the University of Virginia – funding the National Center for Research on Early Childhood Education (NCREE) – as well as the National Institute of Child Health and Human Development and the Interagency Consortium on Measurement of School Readiness: R01 HD051498. The opinions expressed are those of the authors and do not represent views of the funding agencies.