The Association Between Executive Functioning, Social-Emotional Skills, and School Readiness in Preschool

Carole Upshur, EdD, Melodie Wenz-Gross, PhD, Anthoula Poulakos, PhD

Background

- Behavioral self-regulation, cognitive functioning, and social-emotional competence (SE) are important in early academic development (Konold & Pianta, 2005)
- Executive functioning (EF) skills such as inhibitory control, attention, and working memory predict emergent literacy, vocabulary, and math skills (McClelland, et al., 2007)
- Low income preschool children are likely to have less well developed executive functioning and poorer school readiness skills (Winslow, 2008)
- Executive functioning skills can be taught to children (Bodrova & Leong, 2007; Morrison et al., 2010; Tominey & McClelland, 2011)

Sample

- N=189, 112 boys & 77 girls
- Age M=53 months (SD=4.04)
- Income: 32 % <$10,000 26 % $10,000 – $19,999, 40 % > $20,000
- Ethnicity: 11% Black, 37% Hispanic, 30% White, 22% Other/Multiracial
- From 33 classrooms

Procedure

- Children's social skills assessed by teachers at beginning and end of preschool year
- EF, SE, literacy and math assessed by individual child assessors (blind to study hypotheses) at beginning and end of preschool year

Purpose of Present Study

- We hypothesized a mediational association between SE competence and school readiness via EF processes
- Operationalized and examined the joint contribution of:
    - EF (working memory, hot and cold inhibitory control, and attention shifting)
    - Multiple aspects of SE (emotion knowledge, emotion regulation and social problem solving) to school readiness longitudinally and via a multi-method approach

Measures

- Peabody Picture Vocabulary Test
- Woodcock Johnson Tests of Achievement- Understanding Directions, Letter Word Recognition, and Applied Problems
- Hot executive functioning: Less is More task (using stickers as rewards)
- Inhibitory control/cool executive functioning: Head-to Toes task
- Working memory: Backward digit span
- Emotion knowledge: Emotion Matching scale
- Social Skills: Challenging Situations Task
- Teacher-rated social skills: SSIS

Analyses

- Paired t-tests on teacher rated and individually assessed skills fall to spring assessments
- Measurement Model
- Structural Equation Model (SEM)

Results

- Results of Structural Equation Modeling (Amos, 22) revealed a strong measurement model (χ^2 = 43.549, p = .247; RMSEA = .027; CFI = .987), and a strong structural model (χ^2 = 59.644, p = .085; RMSEA = .039; CFI = .987).
- Strong association between EF and SE skills at baseline (.80).
- Strong longitudinal associations between baseline EF skills and
- follow-up pre-literacy (.75), and
- follow-up pre-math (.75) skills.
- The relationship between baseline SE skills and follow-up literacy was fully mediated by EF skills.
- The relationship between SE skills and pre-math was n.s.
- Income, ethnicity and gender were n.s.
- The model explained 64% of the variance in EF as measured by Head Toes, Backward digit, and Less is More tasks and
- 84% of the variance in pre-literacy as measured by WJ Letter-Word Recognition, Understanding Directions and PPVT.

Data from Child Assessments at Baseline and Follow-Up
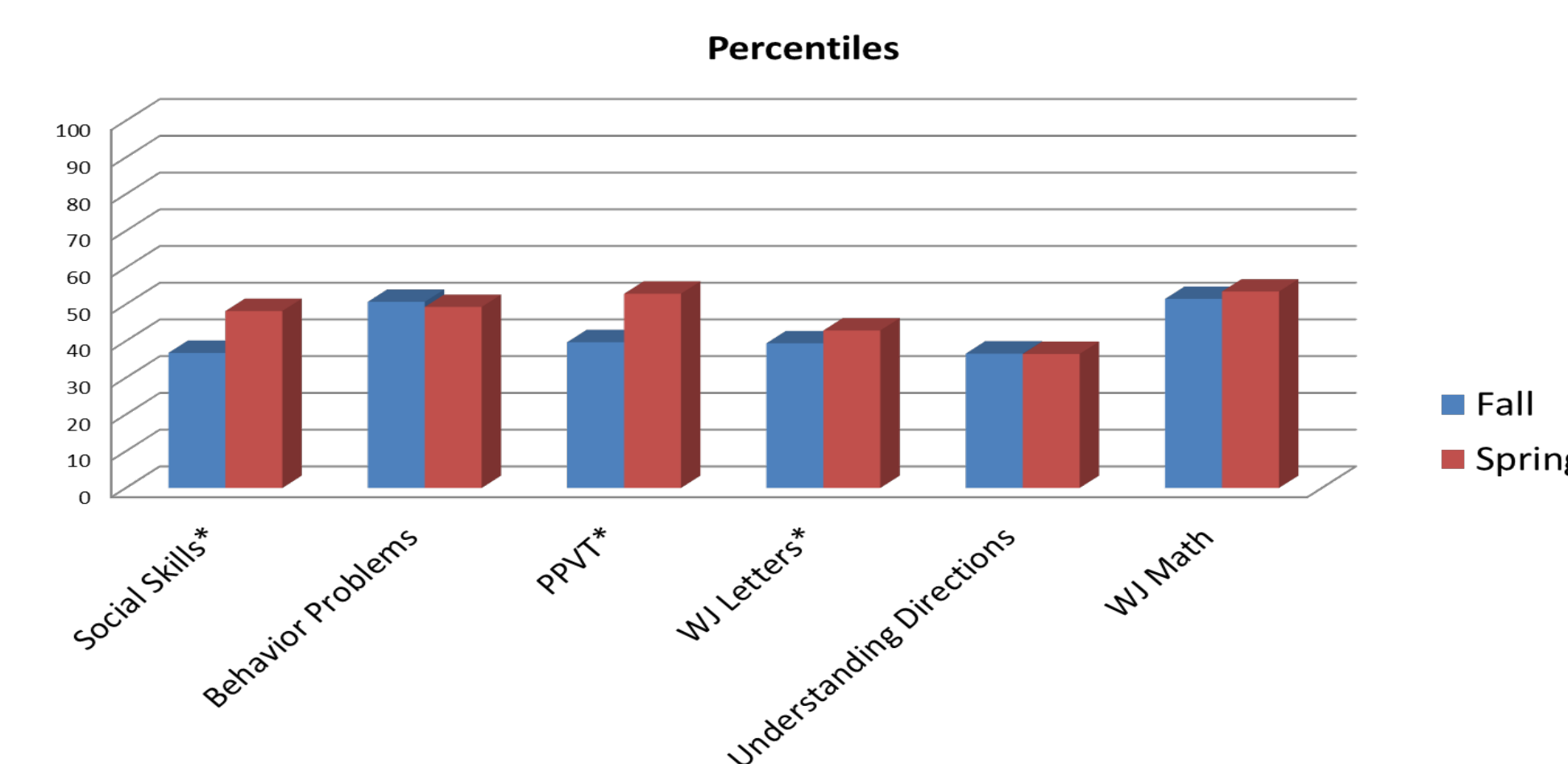
Structural Mediation Model
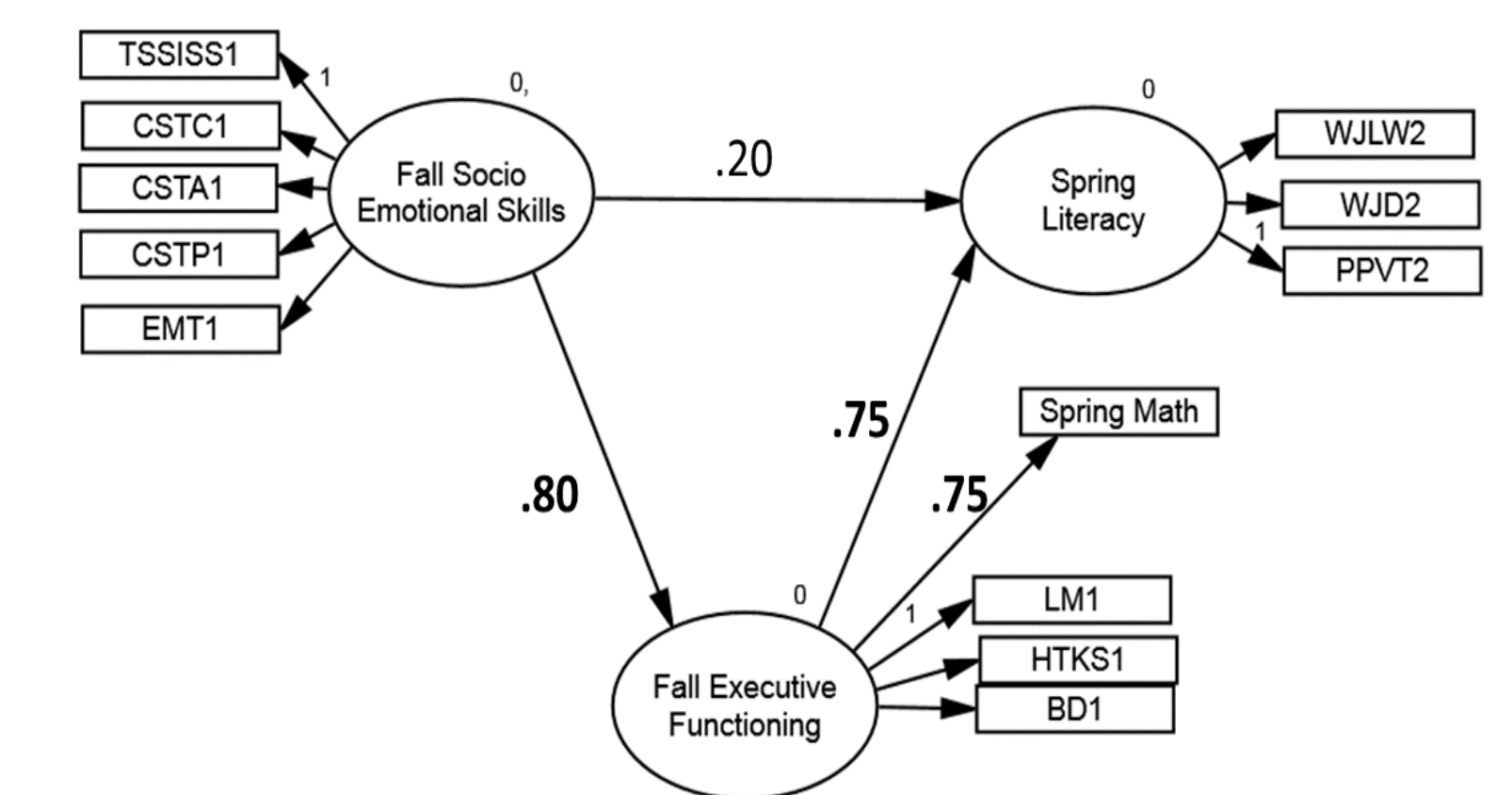
Structural mediation model between time 1 EF, time 1 SE and time 2 school readiness. Standardized estimates in bold sig. at the .01 level.

Conclusions

- Pre-literacy and pre-math readiness skills are associated with EF and SE skills
- Baseline EF fully mediated the relationship between baseline SE and follow-up pre-literacy
- Strong associations between baseline EF and follow-up pre-math
- Relationship between SE skills and pre-math n.s.

Funding & References

- Based on data from Kidsteps II: Promoting school readiness through social-emotional skill building in preschool. # R305A130336: US Department of Education, Institute for Education Sciences. Contact: Carole Upshur, EdD at Carole.Upshur@umassmed.edu
- Bodrova, E., & Leong, D. J. (2007). Tools of the mind: The Vygotskian approach to early childhood education (2nd ed.). New York: Prentice-Hall.
- Konold, T. R., & Pianta, R. C. (2005). Empirically-derived, person-oriented patterns of school readiness in typically-developing children: Description and prediction to first-grade achievement. Applied Developmental Science, 9, 174–187.
- McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. Developmental Psychology, 43, 947–959.
- Morrison, F. J., Ponitz, C. C., & McClelland, M. M. (2010). Self-regulation and academic achievement in the transition to school. In S. Calkins & M. Bell (Eds.), Child development at the intersection of emotion and cognition (pp. 203–224). Washington, DC: American Psychological Association.
- Tominey, S., & McClelland, M. M. (2011). Red light, purple light: Findings from a randomized trial using circle time games to improve behavioral self-regulation in preschool. Early Education and Development. 22(3), 489-519.
- Winslow, A., Tran, H. Hartman, S. C., Madigan, A. L., Manfra, L., Bleiker, C. (2008). School readiness gains made by ethnically diverse children in poverty attending center-based child care and public school pre-kindergarten programs. Early Childhood Research Quarterly, 23, 314-329.

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