

The Link Between Self-regulation and Early Childhood Preliteracy in Low-Income Urban Settings

David Shi

Self-regulation

- Ability to control, modify, and adapt one's emotions, impulses or desires (Murtagh & Todd, 2004; Magar, Phillips, & Hosie, 2008)
- Divided into two constructs: executive function (EF) and effortful control (EC)

Executive function vs. Effortful control

Executive function	Effortful control	Both
Neural-based	Emotion-based	Regulatory
Cognizant	Automatic	Inhibition of inherent impulses
Planning & execution	Motivation & purpose	

What does self-regulation do?

- Predicts growth in early literacy, language, and math skills during prekindergarten (McClelland, Cameron, et al., 2007).
- Greater success in math and reading in elementary school (McClelland, Acock, & Morrison, 2006).
- Difficulty in self-regulation = lower achievement skills (Howse, Lange et al., 2003).

Developing self-regulation

- Teachers
- Mothers
- Maltreatment
- Neighborhood

The Current Study

- Differentiate EF and EC for the tests, but group them together as one variable (self-regulation)
- PSRA and Pre-CTOPP
- EF: Pencil Tap and Balance Beam
- EC: Snack-delay and Toy Wrap Wait & Peek
- Literacy: Elision and Letter Naming/Print Awareness

Hypotheses

1. Higher self-regulation will predict higher early childhood preliteracy
2. Self-regulation will predict preliteracy more accurately than the covariates
 - Covariates: age, gender, race-ethnicity, and income-to-needs

Selection

- Head Start funding
- At least 2 classrooms offer day care
- Located in one of 7 high-poverty neighborhoods

Participants

- N = 103

	N	Minimum	Maximum	Mean	Std Deviation
Age	103	3.75	5.66	4.7882	0.58788
Gender	103	0	1	.46	0.501
Child Ethnicity (African American)	103	0	1	0.7087	0.45657
Income-to-Needs Ratio	103	0	3.57	0.7278	0.63559

Procedure

- Parents for demographics
- Teacher recommended poorly regulated children
- Pre-CTOPP with National Reporting System
 $r(194) = .42, p < .01$
- PSRA $\alpha = .93$ for Elision and $\alpha = .94$ for Print Awareness

Unstandardized Results

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$$

Table of Unstandardized Coefficients and Standard Error

	Model 1: Elision		Model 2: Print Awareness	
	Step 1: EF & EC only	Step 2: EF, EC & covariates	Step 1: EF & EC	Step 2: EF, EC & covariates
Executive Function and Effortful Control	1.70* (0.42)	1.08* (0.49)	0.97* (0.16)	0.47* (0.17)
Income to Needs Ratio		-0.16 (0.52)		0.45* (0.18)
Child Gender		-1.57* (0.62)		-0.46* (0.22)
Child Ethnicity African American		1.32+ (0.69)		0.45+ (0.24)
Child Age		1.53* (0.61)		0.94* (0.21)

* $p < 0.05$ + $p < 0.10$

Note: Unstandardized coefficients

Standardized Results

	Model 1: Elision		Model 2: Print Awareness	
	Step 1: EF & EC only	Step 2: EF, EC & covariates	Step 1: EF & EC only	Step 2: EF, EC & covariates
Executive Function and Effortful Control	0.37 (0.00)	0.24 (0.03)	0.52 (0.00)	0.26 (0.01)
Income to Needs Ratio		-0.29 (0.77)		0.20 (0.02)
Child Gender				-0.17 (0.03)
Child Ethnicity African American		0.17 (0.06)		0.15 (0.06)
Child Age		0.26 (0.01)		0.39 (0.00)

Discussion of Hypotheses

- Self-regulation $1/3$ standard deviation change for every unit change in Elision. $1/2$ standard deviation change for every unit change in Print Awareness
- Controlling for covariates, self-regulation was dominant predictor of preliteracy (except age)

Discussion

- Income-to-needs held very little predicting strength on Elision ($\beta=-0.29$, $p=0.77$), but it was a significant predictor of Print Awareness ($\beta=0.20$, $p=0.02$)
- Being African American correlated with higher literacy scores compared to being non-African American ($\beta=0.17$, $p=0.06$)

Discussion

- No declaration of causation
- Finding causation will improve intervention
- Larger sample
- Urban sample

Bibliography

- Banfield, J., Wyland, C.L., Macrae, C.N., Munte, T.F., & Heatherton, T.F. (2004). The cognitive neuroscience of self-regulation. In R.F. Baumeister & K.D. Vohs (Eds.), *The Handbook of Self-Regulation*. pp. 62- 83. New York: Guilford Press
- Blair, C., & Razza, R. P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development, 78*, 647-663.
- Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist, 57*, 111-127.
- Cole, J. D., Dodge, K. A., & Kupersmidt, J. (1990). Peer group behavior and social status. In S. R. Asher & J. D. Cole (Eds.), *Peer rejection in childhood*, (pp. 178-201). New York, NY: Cambridge University Press.
- Copper, D. H. & Farran, D. C. (1988). Behavioral Risk Factors in Kindergarten. *Early Childhood Research Quarterly, 3*, 1-19.
- Dodge, K. A., Pettit, G. S. & Bates, J. E. (1994). Socialization mediators of the relation between socioeconomic status and child conduct problems. *Child Development, 65*, 649-665.
- Evans, G. W. & English, K. (2002). The environment of poverty: Multiple stressor exposure, psychophysiological stress, and socioemotional adjustment. *Child Development, 73*, 1238-1248.
- Howse, R. B., Lange, G., Farran, D. C., Boyles, C. D. (2003). Motivation and self-regulation as predictors of achievement in economically disadvantaged young children. *The Journal of Experimental Education, 71*, 151-174.
- Korenman, S., Miller, J. E., Sjaastad, J. E. (1995). Long-term poverty and child development in the United States: Results from the NLSY. *Children and Youth Services Review.*
- Ladd, G. (1990). Having friends, keeping friends, making friends, and being liked by peers in the classroom: Predictors of children's early school adjustment. *Child Development, 61*(4), 1081-1100.
- Magar, E. C. E., Phillips, L. H. & Hosie, J. A. (2008). Self-regulation and risk-taking. *Personality and Individual Differences, 45*, 153-159.
- Maughan, A. & Cicchetti, D. (2002). Impact of child maltreatment and interadult violence on children's emotion regulation abilities and socioemotional adjustment. *Child Development, 73*, 1525-1542. i need
- McClelland, M. M., Acock, A. C. & Morrison, F. J. (2006). The impact of kindergarten learning-related skills on academic trajectories at the end of elementary school. *Early Childhood Research Quarterly, 21*, 471-490.
- McClelland, M. M., Cameron, C. E., Connor, F. 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.
- McClelland, M., Cameron, C., Wanless, S., & Murray, A. (2007). Executive function, self-regulation, and social-emotional competence: Links to school readiness. In O. N. Saracho & B. Spodek (Eds.), *Contemporary Perspectives on Research in Social Learning in Early Childhood Education*. (pp. 83-107). Charlotte, NC: Information Age.
- McClelland, M. M., Morrison, F. J., Holmes, D. L. (2000). Children at risk for early academic problems: the role of learning-related social skills. *Early Childhood Research Quarterly, 15*, 307-329.
- Murtagh, A. M. & Todd, S. A. (2004). Self-regulation: a challenge to the strength model. *Journal of Articles in Support of the Null Hypothesis, 3*, 19-50.
- Ramey, C. T., Stedman, D. J., Borders-Patterson, A. & Mengel, W. (1978). Predicting school failure from information available at birth. *American Journal of Mental Deficiency, 82*, 525-534.
- Raver, C. C. (2004). Placing emotional self-regulation in sociocultural and socioeconomic contexts. *Child Development, 75*(2), 346-353.
- Raver, C. C., Blackburn, E. K., Bancroft, M., & Torp, N. (1999). Relations between effective emotional self-regulation, attentional control, and low-income preschoolers' social competence with peers. *Early Education & Development, 10*(3), 333-350.
- Raver, C. C., Jones, S. M., Li-Grining, C. P., Metzger, M., Champion, K. M., & Sardin, L. (2008). Improving preschool classroom processes: Preliminary findings from a randomized trial implemented in Head Start settings. *Early Childhood Research Quarterly, 23*, 10-26.
- Raver, C. C., Jones, S. M., Li-Grining, C. P., Metzger, M., Champion, K. M. & Sardin, L. (2007). Improving preschool classroom processes: Preliminary findings from a randomized trial implemented in Head Start settings. *Early Childhood Research Quarterly, 23*, 10-26.
- Raver, C. C., Jones, S. M., Li-Grining, C., Zhai, F., Metzger, M. W., Solomon, B. (2009). Targeting children's behavior problems in preschool classrooms: a cluster-randomized controlled trial. *Journal of Consulting and Clinical Psychology, 77*(2), 302-316.
- Schultz, D., Izard, C. E., Ackerman, B. P. & Youngstrom, E. A. (2001). Emotion knowledge in economically disadvantaged children: Self-regulatory antecedents and relations to social difficulties and withdrawal. *Development and Psychopathology, 13*, 53-67.
- Smith-Donald, R., Raver, C. C., Hayes, T., & Richardson, B. (2007). Preliminary construct and concurrent validity of the Preschool Self-regulation Assessment (PSRA) for field-based research. *Early Childhood Research Quarterly, 22*(2), 173-187.
- Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1999). *CTOPP: Comprehensive Test of Phonological Processing examiner's manual*. Austin, TX: PRO-ED.