Summer Treatment Program for PreKindergarteners Improves Fine Motor Skills

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Background and Aims

- Evidence suggests that early motor skills have cascading effects on subsequent academic performance.[1-3]
- Early fine motor manipulation and writing skills at preschool are predictive of reading and math achievement on standardized tests in second grade[2], as well as reading and math outcomes in 5th grade.[3]
- Programs that target improving school readiness outcomes early in education for at risk children may benefit from including fine motor manipulation and writing interventions in their curricula.
- **Aim**: Examine whether a comprehensive school readiness intervention prior to kindergarten entry had an effect on fine motor manipulation and writing skills in at-risk children.

Methods

- **Participants:** 22 children aged 4 – 5 years were enrolled in the 7-week Summer Treatment Program for PreKindergarteners (STP-PreK)[4,5] at a local early childhood center. Children were from a low-income community; some diagnosed with one or more behavior problems.
- **STP-PreK:** STP-PreK focused on improving academic and behavioral skills to prepare underprivileged children for entry into kindergarten. Along with an intervention targeting emergent literacy skills, the STP-PreK classroom also targets early writing skills through a curriculum, Handwriting Without Tears. School readiness and fine motor skills were assessed pre/post STP-PreK participation.
- **School Readiness:** Children's school readiness was assessed via the Bracken School Readiness Assessment 3rd Edition (BSRA-3).
- **Fine Motor Skills:** Children's fine motor manipulation skills (FM) and fine motor writing skills (FW) were assessed via the Learning Accomplishment Profile-Diagnostic Edition (LAP-D).
- **Analyses:** Paired samples t-tests were conducted to identify pre and post differences on the BSRA-3 and the LAP-D FM and FW subscales. Correlations between program attendance and rate of change in FM and FW scores were conducted. High/Low FW and FM groups were created by comparing individual scores to the sample's mean score for each subscale at pre-intervention. Groups were then compared separately with paired samples t-tests to evaluate whether there were differential gains in school readiness on the BRSA-3 based on children's fine motor skill baseline at the start of the intervention.

Results and Discussion

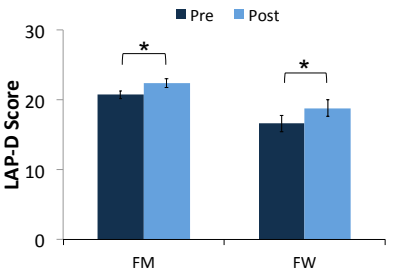

Fig. 1. FM and FW scores pre-/post-intervention.

FM-subscale, $t(21) = -3.170$, $p = .005$, $d = 0.591$
FW-subscale, $t(21) = -2.702$, $p = .013$, $d = 0.397$

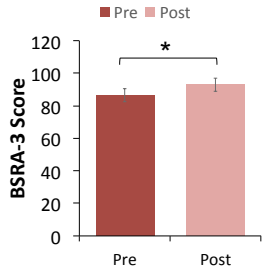

Fig. 2. BSRA-3 scores pre-/post-intervention.

$t(21) = -3.451$, $p = .002$, $d = 0.538$

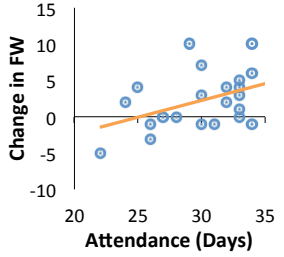

Fig. 3. FW change and attendance.

$R = .431$, $p = .045$
Attendance and FM not correlated, $R = .-046$, $p > .05$

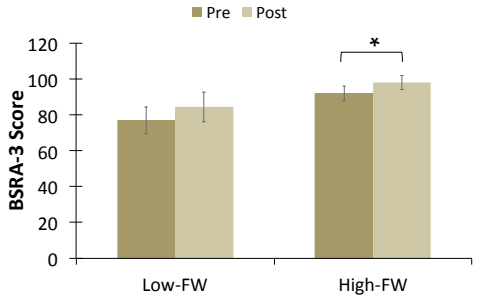

Fig. 4. High and Low FW groups on pre-/post-BSRA-3.

Low-FW, $t(7) = -2.213$, $p = .063$, $d = 0.335$
High-FW, $t(13) = -2.551$, $p = .024$, $d = 0.388$

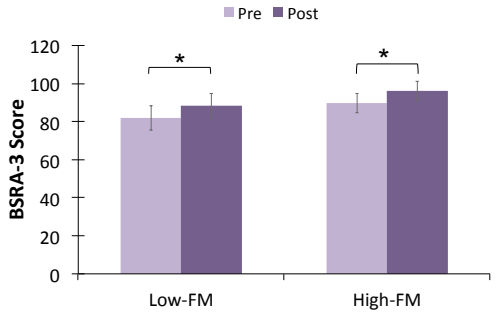

Fig.5. High and Low FM groups on pre-/post-BSRA-3.

Low-FM, $t(8) = -2.490$, $p = .038$, $d = 0.344$
High-FM, $t(12) = -2.392$, $p = .034$, $d = 0.336$

Take-Home Points:

- ✓ Improved writing, fine motor skills, and school readiness after STP-PreK participation.
- ✓ Greater program attendance is linked to greater positive rates of change in writing skills.
- ✓ High scoring FW and FM as well as low scoring FM groups showed significant differences in school readiness.

References and Acknowledgements

[1] Bornstein et al., (2013), DOI: 10.1177/0956797613479974
[2] Dinehart & Manfra (2013), DOI: 10.1080/10409289.2011.636729
[3] Grissmer et al., (2010), DOI: 10.1037/a0020104
[4] Graziano & Hart (2016), DOI: 10.1016/j.jsp.2016.07.004
[5] Hart et al., (2016), DOI: 10.1177/1053815116645923

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