

The Effects of Goal-Setting on a Skill and Performance-Based Math Intervention for Children with Emotional and Behavior Disorders

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Importance of Mathematics

- Linked to future success.
- Early failure in mathematics linked to failure in higher level material.

(Badian, 1999; Daly & McCurdy, 2002; Gersten & Chard, 1999; Kaufmann, 2001; National Center for Education Statistics, 2004; Rivera-Baltiz, 1992; Seethaler & Fuchs, 2005)



Skill-Based Math Interventions

- Fluent computation is a goal for mathematics instruction.
- Linked to improved skills on more complex tasks, increased retention, and increased opportunities to respond.

(Dehaene & Akhavein, 1995; Johnson & Layng, 1996; Mastropieri, Scruggs, & Shiah, 1991; National Council of Teachers of Mathematics, 2000; Sutherland & Wehby, 2001)





Performance-Based Math Interventions

- Feedback effective in improving academic achievement
- Improved performance when combined with goal setting.

Goal-Setting

- ❑ Improves self efficacy, motivation, and performance.
- ❑ Increases student awareness of goal knowledge.
- ❑ Increases student's ability to set realistic goals.

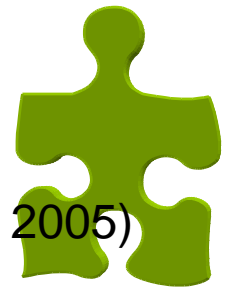
(Conte & Hintze, 2000; Fuchs, Fuchs, & Hamlett, 1989; Schunk; 1985; Schunk, 1989; Swain, 2005)



Limitations of Previous Research

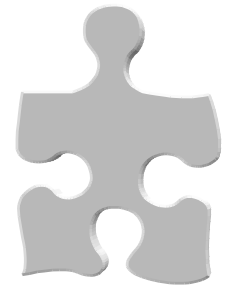
- ❑ Students are falling behind in mathematics.
- ❑ Lack of research in math interventions.
- ❑ Few studies combined different interventions into a treatment package.
- ❑ Lack of research on effects of goal setting in mathematics.

(Greenbaum et al., 1996; Kauffman, 2001; U.S. Department of Education, 2005)



Purpose of the Present Study

- To extend research on academic interventions for children with EBD through the implementation of a goal setting intervention.
 - It is hypothesized that the addition of goal-setting will produce greater gains in mathematical fluency than in the math intervention alone.
 - It is also hypothesized that children's mathematical fluency level will improve following the implementation of the math intervention.



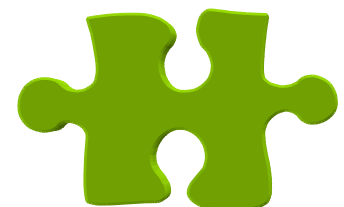
Research Question

- What are the effects of goal setting on the mathematical fluency growth of children with emotional and behavioral disorders?



Participants

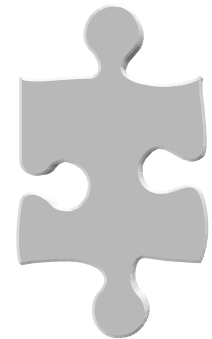
- 4 students
 - Recruited from approved private school for children with behavior problems
 - Identified with an emotional or behavioral disorder
 - Know less than 70% of the multiplication facts.
 - All students in same math class
 - All of the students had behaviors that impeded learning and goals related to mathematics performance recorded on their Individualized Education Plans (IEP).



Measures

- Multiplication Single Skill Fluency Probe
 - Total digits correct
- Treatment acceptability
- Procedural integrity
 - 39% of sessions
 - 100% agreement across all sessions
- Scoring reliability
 - 37% of probes
 - 99.8% agreement

(Burns, 2005; Deno, 1985; Shapiro, 2004; Shinn, 2004)



Procedures

- Assessed fluency on 3rd grade computation probe
- Conducted an initial assessment of each participant's known and unknown math facts
 - Used procedures outlined by Burns, 2005

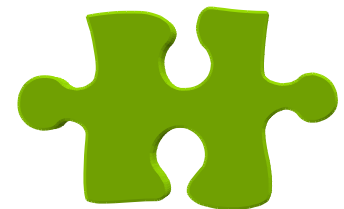
(Burns, 2005; Hintze, Christ, & Keller, 2002; Tucker, 1989)

Procedures

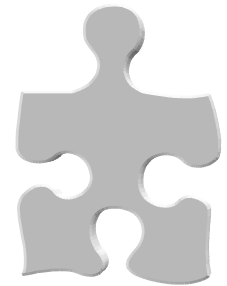
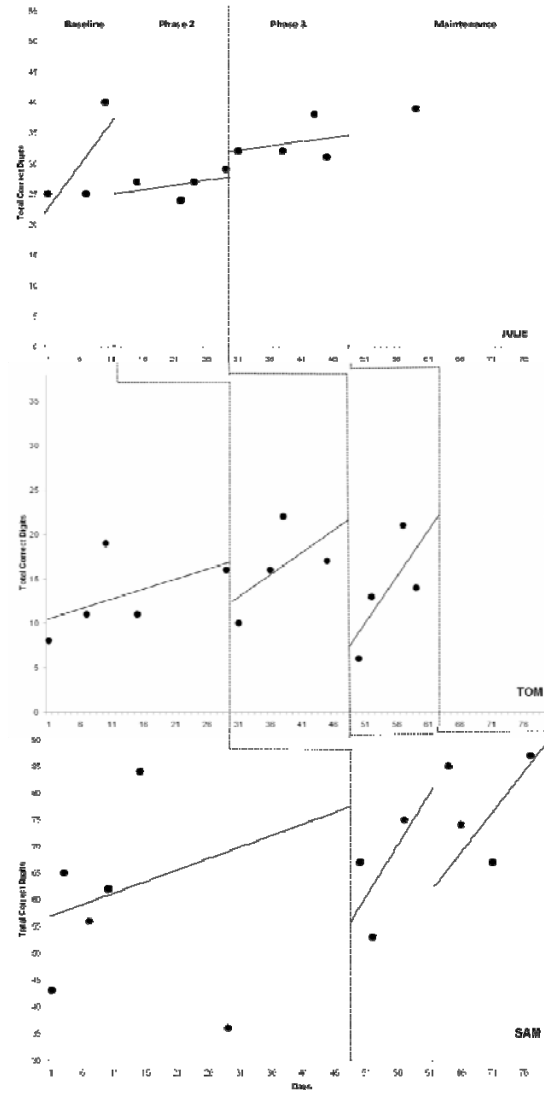
- Phase 1 (baseline)- No rehearsal or feedback
- Phase 2- Incremental Rehearsal + Performance Feedback
- Phase 3- Incremental Rehearsal + Performance Feedback + Goal-Setting

Research Design

- Multiple probe across participants.
- Dependent variable = total number of digits correct



Results



Results

Median Scores and Slopes for Participants

	Median Score for Phases			Weekly Slope for Phases		
	1	2	3	1	2	3
Julie	25	27	33.5	9.996	1.001	1.001
Tom	11	16.5	13.5	1.533	3.43	7.392
Sam	59.5	71	82	3.073	12.649	12.712

Discussion

- ❑ Some limited evidence for inclusion of goal-setting.
- ❑ All participants increased in fluency after skill and performance-based intervention.
- ❑ Two participants increased their ROI with goal-setting.
- ❑ Importance of instructional level for intervention design.
- ❑ Ease of implementation and general acceptability of procedures.

Limitations and Future Research

- Behavioral concerns
 - One participant unable to complete study
 - One participant with significant health issues and excessive fatigue

- OLS based on only 4 data points

- Carry over effects

- Lack of control of % known and unknown across probes




Limitations and Future Research

- ❑ Limited generalizability
- ❑ Time constraints
- ❑ Lack accurate data to determine average student growth
- ❑ No direct procedure for students to evaluate their progress toward goals

Conclusions

- ❑ Multi-component intervention in math was somewhat effective in boosting multiplication performance in a relatively short amount of time.
- ❑ Some utility for the addition of goal-setting to a standard intervention.
- ❑ More research is essential to determine the effects of self-set goals on students' performance over longer durations.



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Are there any questions or
comments?

