

An Experimental Analysis of Error Correction Procedures in Fluency-Based Instruction

Michael A. Fabrizio
Sara Pahl

- Identify and describe methods for clinical assessment of instructional practices related to error corrections
 - High levels of internal validity
 - High levels of external validity
 - Across students
 - Across skills
 - Across curriculum areas
 - Easily implemented in clinical settings
 - One-on-one instruction
 - Paraprofessional staff members
 - Provided high quality intervention while allowing analysis
 - Used the Standard Celeration Chart (SCC)

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- High levels of internal validity
 - Alternating Treatments Design
 - ABAB Design
 - Combination
- High levels of external validity
 - Across students
 - 2 students
 - » Katie – 10 years old, severe autism
 - » Joshua – 8 years old, severe autism
 - Across skills
 - See/Say Prose (Katie and Joshua)
 - Hear/Write Words (Joshua)
 - Across curriculum areas
 - Reading (See/Say Prose)
 - Writing (Hear/Write Prose)

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- Easily implemented in clinical settings
 - One-on-one instruction
 - All data collected in one-on-one instructional arrangements
 - Paraprofessional staff members
 - 5 paraprofessionals
 - » Undergraduates
 - » Training time <15 minutes
 - » High levels of treatment fidelity

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- Both error correction algorithms likely to be effective
- Both supported by previous research

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- All data for the project charted on the Daily per Minute Standard Celeration Chart

- Independent Variables
- Dependent Variables
- Designs used
- Procedural Reliability

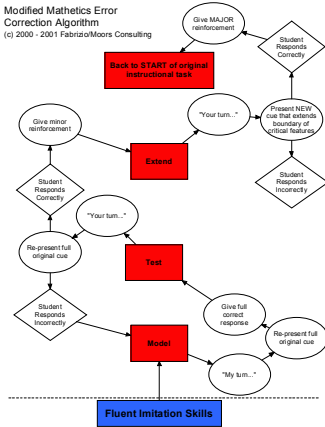
- Independent Variables
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- Mathematics Error Correction
- Discrimination Error Correction

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- Mathematics Error Correction
 - Model ("My turn...")
 - Represent instructional cue (the S^d)
 - Demonstrate correct response
 - Test ("Your turn...")
 - Represent instructional cue (the S^d)
 - Notice whether student emits correct response
 - Moderate praise if correct
 - Repeat sequence from Model if incorrect
 - Extend
 - Present new instructional cue (if possible) that occasions same response and significantly extends the relevant dimensions of the variable stimulus attributes
 - Notice whether student emits correct response
 - Significant positive feedback if correct

Modified Mathematics Error Correction Algorithm (c) 2000 - 2001 Fabrizio/Moors Consulting

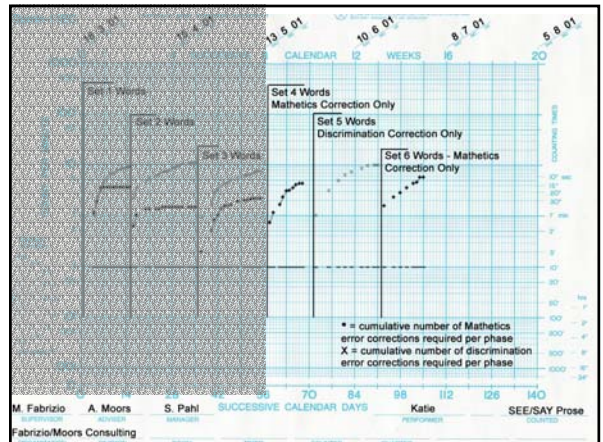
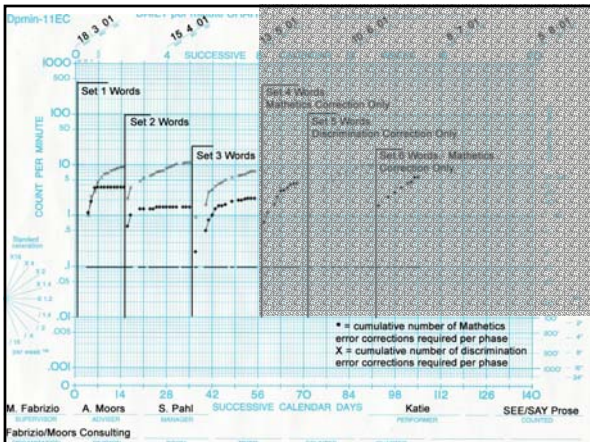
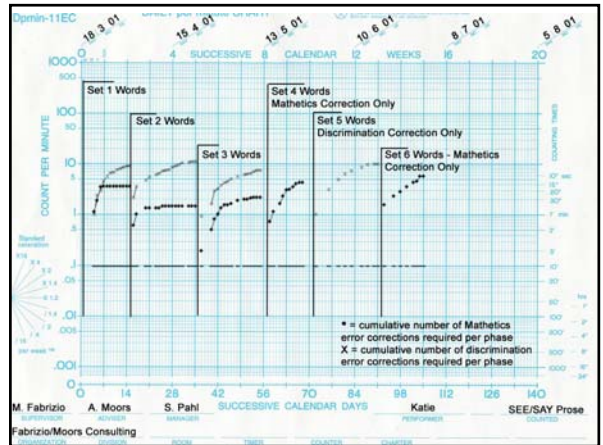
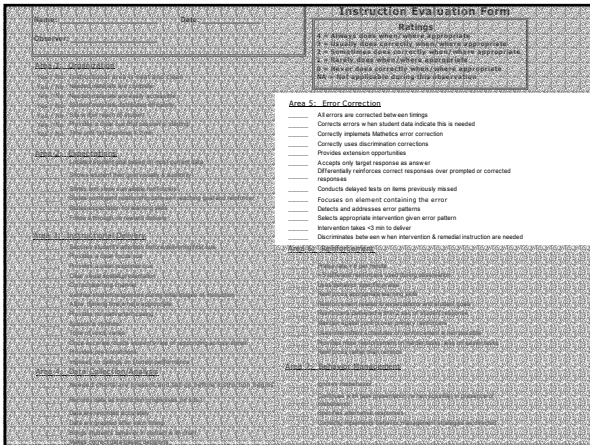


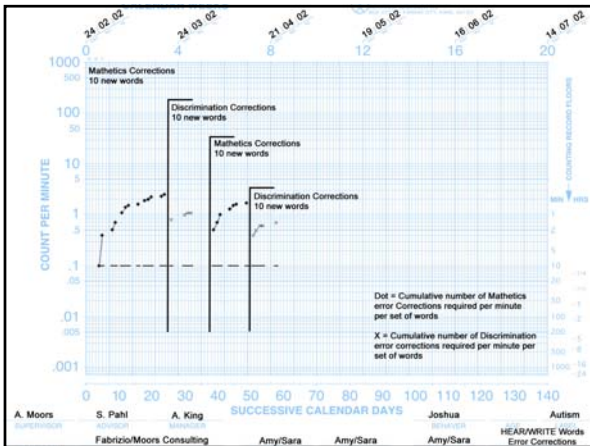
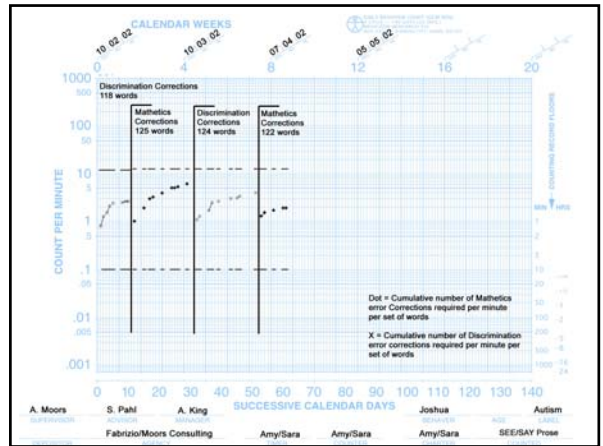
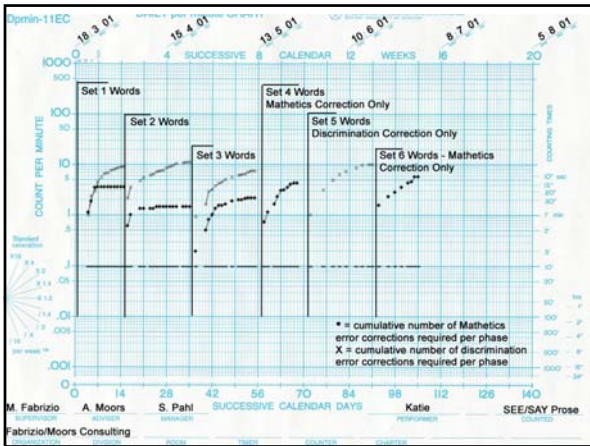
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 - Test ("Your turn...")
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 - Notice whether student emits correct response
 - Moderate praise if correct
 - Repeat sequence from Model if incorrect
 - Juxtapose
 - Present new instructional cues (if possible) for targeted and error response that occasion same responses and significantly extend the relevant dimensions of the variable attributes of each stimuli
 - Notice whether student emits correct responses
 - Significant positive feedback if correct

- Contrived practice to 100% criterion delivering both error correction algorithms
- Weekly observation
– ≈ 17% sessions
- Reliability consistently above 90% for implementation and counting
- Met previous training standards

Name: _____ Date: _____		Instruction Evaluation Form Ratings 4 = Always does when/where appropriate 3 = Usually does correctly when/where appropriate 2 = Sometimes does correctly when/where appropriate 1 = Barely does when/where appropriate 0 = Never does correctly when/where appropriate NA = Not applicable during this observation
Observer: _____		
Area 1: Organization Yes / No Instructional area is neat and clean Yes / No Needed materials are easily accessible Yes / No Student materials distributed efficiently Yes / No Site w/ in reach of student Yes / No Provides a clear cue that session is starting Yes / No Time used for responses < 2 min		
Area 2: Expectations Locks student goal based on most current data Shows student their goal visually & auditory States and shows available reinforcers States contingent relationship before each teaching goal and reinforcer States expectation for learning skills Follows a through on cue and delivery		
Area 3: Instructional Delivery Begins students attention before delivering first cue Provides a clear focus cue Provides a clear response cue Clear visual spatial presentation Control learning channel Verifies student responses during initial stages of instruction Allow trying time w/ here appropriate Provides no incidental cuing Speech is rhythmic Tone of voice varied Once accurate, builds student's rate of responding across stimuli Provides pre-corrections Reprases on ratings on student performance		
Area 4: Data Collection/Analysis Needed charts are present and set-up before instruction begins Records data as instruction progresses (in situ) Data are recorded accurately Data are graphed after each thing Brings students behavior in contact with chart Makes correct data-based decisions		
Area 5: Error Correction All errors are corrected before next trials Corrects errors when student data indicate this is needed Correctly reprints Mathematics error correction Correctly uses discrimination corrections Provides extension opportunities Accepts only target responses as answer Differentially reinforces correct responses over prompted or corrected responses Conducts delayed tests on items previously missed Focuses on element containing the error Detects and addresses error patterns Selects appropriate intervention given error pattern Intervention takes < 3 min to deliver Discriminates when when intervention & remedial instruction are needed		
Area 6: Reinforcement Release rate > 8 per minute > 5 different reinforcers used during observation Uses behavior specific praise Reinforces appropriate learning skills Reinforcement related to expectations and student goals Reinforcers delivered w/ time of student response Maintains spatial control over primary reinforcers Uses reinforcer schedules of reinforcement w/ two possible Provides more reinforcement on harder tasks, less on easier tasks Reinforces rather than reminds		
Area 7: Behavior Management Ignores misbehavior Continues with task presentation (w/ when possible) in presence of misbehavior Specifies alternative responses Correctly implements behavior management strategies as directed		





Fabrizio/Moors CONSULTING Some Conclusions

- **Katie**
 - Mathematics error corrections more efficient than discrimination corrections for oral reading errors
 - Sight reader
- **Joshua**
 - Neither correction algorithm clearly more efficient than the other for oral reading
 - Discrimination corrections more efficient than Mathletics corrections for dictation tasks
 - Phonetic reader
 - Order effects
- **General**
 - Analyzing instructional procedures enhances program efficiency
 - Component skills MAY be important factors in selecting error correction procedures

Fabrizio/Moors CONSULTING Threats to internal validity

- **ABAB designs**
 - Order effects
 - Carryover effects
- **Readability differences across stories**
 - Joshua's data

Fabrizio/Moors CONSULTING Future Research Directions

- Investigate relationship between student component skills and error correction effectiveness
 - Does the strength of requisite component skills predict that one correction algorithm is more/less likely to be effective?
- Extend the current work into other curricular areas (e.g., language instruction)
- Extend the current work to other students

References

- Kazdin, A. E. (1982). Single-Case Research Designs: Methods for Clinical and Applied Settings. New York: Oxford University Press.
- Richards, S.B., Taylor, R.L., Ramasamy, R., Richards, R.Y. (1999). Single-Subject Research: Applications in Educational and Clinical Settings. San Diego, California: Singular.