An Examination of A Reading Comprehension Intervention in Secondary Students with ASD: CSR–HS Pilot Year 2

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Overview

• Reading and ASD
• Previous Research
• Rationale
• Participants
• Research Design
• Data Collection
• Dependent Variables
• Intervention
• Study Phases
• Results
• Implications
• Limitations
ASD Intervention Research

• The interventions provided for students with ASD historically have focused on reducing challenging behavior and improving communication, rather than treatments designed to enhance academic performance (El Zein, Solis, Vaughn, & McCulley, 2013).

• Previous reading intervention studies with students with ASD have focused on decoding and sight word recognition (Chiang & Lin, 2007; Whalon & Hanline, 2008).
Many students with ASD have unique profiles of reading performance which exhibit strengths in basic reading skills coupled with difficulties in reading comprehension (Asberg, Kopp, Berg-Kelly, & Gillberg, 2010; Chiang & Lin, 2007; Nation, Clarke, Wright, & Williams, 2006).

Students on the autism spectrum do not have well developed reading comprehension skills (Asberg, Kopp, Berg-Kelly, & Gilberg, 2010; Chiang & Lin, 2007; Nation, Clarke, Wright, & Williams, 2006).
Previous Research

The following approaches were found to be promising for improving reading comprehension in students with ASD:

• Strategy instruction (e.g., prediction, main idea, summarization, question development)

• Peer-mediated instruction (e.g., peer tutoring, class-wide peer tutoring, cooperative learning)

• Antecedent and consequence-based ABA principals (e.g., priming, shaping, prompting, task analysis, providing choice opportunities, incorporating student interests, positive reinforcement, etc.)

El Zein, Solis, Vaughn, & McCulley (2013)
Rationale

• Reading comprehension is important to academic success and quality of life (Carnahan & Williamson, 2010).

• NCLB and IDEA (inclusion & same expectations)

• Reading intervention research for students with ASD is very limited (El Zein et al. 2013)
Why CSR?

• During a 20-year period, CSR has been evaluated using quasi-experimental and RCT designs, yielding positive outcomes for students with learning disabilities, students at risk for reading difficulties including ELs, average- and high-achieving students (Vaughn, Klingner, et al., 2011; Bryant et al., 2000; Klingner, Vaughn, & Schumm, 1998; Vaughn et al., 2000), Klingner & Vaughn, 1996).

• Year 1 pilot study by Reutebuch, Vaughn, El Zein, Kim, and Weinberg (in review) suggested that modifying CSR may enhance reading comprehension, reduce challenging behaviors, and increase social interactions of three adolescents with ASD.
Research Questions

1. What are the effects of implementing CSR–HS on reading comprehension outcome and challenging behaviors of three adolescents with ASD and deficits in reading comprehension?

2. What are the effects of implementing CSR–HS with choice of text in comparison to implementing CSR–HS without choice to adolescents with ASD and deficits in reading comprehension?

3. How do students’ perspectives about reading change after implementation of CSR-HS as measured by a researcher-developed social validity student questionnaire?
Selection of Participants

Target students with ASD—

- High school students with ASD who:
  a) Access primarily academic content across the school day;
  b) Read on at least a second grade instructional level;
  c) Have an IQ in the low average to above average range (80 and above);
  d) Are willing to participate; and
  e) Possess skills and abilities to share their ideas, contribute to conversation, and to work cooperatively with another student or tutor to complete a reading activity using taught strategies.
Selection of Participants cont.

Peer Partners—

• High school student:

a) Identified by staff as a good match for target student;

b) Available for participating during target student’s CSR-HS sessions; and

c) Has some experience in working with target student.
### Participant Characteristics

<table>
<thead>
<tr>
<th>Participants</th>
<th>Grade</th>
<th>Age</th>
<th>Diagnosis</th>
<th>Instructional Reading Level</th>
<th>WJ-III PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victor</td>
<td>10&lt;sup&gt;th&lt;/sup&gt; gr.</td>
<td>16</td>
<td>Autism</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; gr.</td>
<td>2.0</td>
</tr>
<tr>
<td>Roxana</td>
<td>12&lt;sup&gt;th&lt;/sup&gt; gr.</td>
<td>17</td>
<td>Autism</td>
<td>5&lt;sup&gt;th&lt;/sup&gt; gr.</td>
<td>4.8</td>
</tr>
<tr>
<td>Maceo</td>
<td>11&lt;sup&gt;th&lt;/sup&gt; gr.</td>
<td>17</td>
<td>Autism</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; gr.</td>
<td>K8</td>
</tr>
</tbody>
</table>
Setting

- Rural Central Texas High School with over 800 students
- Approximately 30 miles southeast of Austin
- 65% of the students are economically disadvantaged
- Pull-out tutorial sessions in the special education setting
Materials

**Teacher Materials** (for modeling and prompting)
- CSR–Lite graphic
- lesson plan
- rubrics
- assigned text
- timer
- instruments for writing

**Optional Materials**
- note cards, sticky notes, or white board for key words
- visual for introducing topic: photos, props, artifacts

**Observer Materials**
- fidelity form
- site implementer note-taking document
Research Design

**Target Participant**

**Baseline Phase**
(minimum of 5 stable data points)

**Intervention Phase: Condition 1**
CSR-HS *with* Choice

**Return to Baseline**
(minimum of 3 data points)

**Intervention Phase: Condition 1**
CSR-HS *without* Choice

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**With peer partner**

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**Target student only**
Dependent Variables

• Reading comprehension
  Accuracy of responding on “cloze” probes

• Challenging behavior
  - Hector: off-task behavior
  - Brian: task refusal
  - Sofia: skin picking
Data Collection

• Percent correct from permanent product (RC probes)

• Event recording for task refusal (% of opportunities)

• Partial interval recording for off-task behavior and skin picking

• Treatment fidelity was measured for 100% of the sessions (M = 97%)

• Interobserver agreement was measured for at least 40% of the sessions (M = 100% for reading; M = 95% for CB)
Preference Assessment

The purpose for this multistep assessment process was:

(1) to ensure that the choice of text presented to each participant included only highly preferred text, and

(1) to keep text preference constant across sessions and conditions in order to increase the likelihood that the impact of choice led to the possible changes in the outcomes during both treatment conditions, and not topic preference.
Preference Assessment

• First, each student was given a paired-stimulus preference assessment (Fisher et al., 1992) to rank order (i.e. 1st, 2nd, 3rd, etc.) broader reading topics (e.g. cells, American pioneers, computers, sea creatures, etc.)

• From the identified high preference topics, a multiple-stimulus without replacement preference assessment (MSWO; DeLeon & Iwata, 1996) was administered to identify the 3 highest-preference passages within each topic.

• Only passages identified as the 1st, 2nd, and 3rd highest preferred in a given topic were randomly selected and presented to the participants during all sessions (i.e., baseline, intervention, and return to baseline).
Baseline

• 30-minute, teacher-led, business as usual sessions

• Participant read out loud or silently a randomly selected passage on his/her instructional reading level.

• Implementer provided directions to answer reading comprehension questions and delivered praise for correct responding and corrective feedback for inaccurate responses.

• Participant completed probes without receiving error correction or prompting
Intervention

• **Overview Sessions:** priming technique that provided students with an opportunity to access the steps of CSR–HS strategies prior to beginning CSR–HS lessons

• **CSR-HS Sessions:**
  - Paired with trained typically developing peer
  - Before, during, and after reading model
  - Strategy instruction
  - Structured task units through a “learning log”
  - Cooperative learning

• **Adaptations for ASD:** priming (tutorials), task analysis, self-monitoring (checklist), least-to-most prompting, and visual cues (pictures, video clips)

• **CSR-HS-C:** Identical to CSR-HS-NC procedures except for providing the target student with three passages to choose from.
Results

Accuracy of Responding on Reading Comprehension Probes

The graph shows the accuracy of responding for three participants (Victor, Roxana, and Maceo) during baseline, intervention (Choice vs. No Choice), and return to baseline phases. The percentage correct on reading comprehension probes is plotted against sessions, with different symbols representing Baseline, Choice, and No Choice conditions.
### Results

#### Accuracy of Responding on Reading Comprehension Probes

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline (%)</th>
<th>CSR-HS-C (%)</th>
<th>CSR-HS-NC (%)</th>
<th>Return to BL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victor</td>
<td>16</td>
<td>96</td>
<td>89</td>
<td>80</td>
</tr>
<tr>
<td>Roxana</td>
<td>15</td>
<td>100</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>Maceo</td>
<td>16</td>
<td>91</td>
<td>82</td>
<td>67</td>
</tr>
</tbody>
</table>

- Performance on reading comprehension probes improved upon implementation of CSR-HS for the 3 participants.
- Levels of performance were higher during the CSR-HS-C condition in comparison to CSR-HS-NC for the 3 participants.
- Less differentiation between conditions was noticed during the final sessions of the intervention.
- A decrease in % correct was detected for the 3 participants upon “return to baseline”.
Results

Occurrences of Challenging Behaviors
## Results

### Occurrences of Challenging Behaviors

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline (%)</th>
<th>CSR-HS-C (%)</th>
<th>CSR-HS-NC (%)</th>
<th>Return to BL(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victor</td>
<td>85</td>
<td>30</td>
<td>19</td>
<td>59</td>
</tr>
<tr>
<td>Roxana</td>
<td>90</td>
<td>22</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>Maceo</td>
<td>93</td>
<td>2</td>
<td>16</td>
<td>24</td>
</tr>
</tbody>
</table>

- Occurrences of challenging behavior (CB) decreased upon implementation of CSR-HS for the 3 participants.
- Levels of CB were higher during the CSR-HS-C condition in comparison to CSR-HS-NC for Victor, yet the opposite was detected for Maceo.
- No CB data differentiation between conditions was noticed for Roxana.
- An increase in CB was detected for the 3 participants upon “return to baseline”.
Results

Victor’s Social Validation Scores

<table>
<thead>
<tr>
<th>Response</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, definitely</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>closer to Yes</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>closer to No</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>No, definitely</td>
<td>60</td>
<td>80</td>
</tr>
</tbody>
</table>
Results

Roxana’s Social Validation Scores

% of Times Response Selected

Pre-Intervention
Post-Intervention

- Yes, definitely
- closer to Yes
- closer to No
- No, definitely
Results

Maceo’s Social Validation Scores

<table>
<thead>
<tr>
<th>Response</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, definitely</td>
<td>0</td>
<td>60</td>
</tr>
<tr>
<td>closer to Yes</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>closer to No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No, definitely</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>
Implications

• Strategy instruction and peer-mediated instruction are promising approaches to enhancing reading comprehension for this population.

• Multicomponent interventions that incorporate ABA-based techniques may improve academic performance and reduce incidences of challenging behaviors in students with ASD.

• Providing students with opportunities to make choice is a promising antecedent-based intervention to enhance academic performance for students with ASD.

• A modified version of CSR-HS was shown to be associated with more positive student attitude towards each of the participant’s own reading abilities and experiences.
Limitations

- Limited number of participants
- Self-contained setting
- Researcher-implemented intervention
- Lack of generalization data
Direction for Future Research

• Future research is warranted to examine generalization of CSR-HS effects across settings and content areas.

• Future research efforts are also needed to examine the effects of each approach employed through component analysis.

• Further investigations are warranted to establish evidence-based practices particular to enhancing reading comprehension performance in students with ASD.