Improving Expository Language through Intervention on Note-taking & Verbal Rehearsal
A Researcher-Clinician(-Student) Collaboration

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What Happens as Children With Language Impairment Get Older?

- Talking and listening → reading and writing
- Language impairment → learning disability
- >50% SLI in kindergarten → RD or poor readers & writers

(Conti-Ramsden et al., 2012; Dockrell et al., 2009; Nippold, 2017; Scott & Windsor, 2000)

Intervention for Older Students

Strong evidence that explicit, systematic, individualized instruction can improve reading and writing
(Kamil et al., 2008; Mason, 2013; Mason et al., 2011; Swanson et al., 2014; c.f. Ukrainetz, 2015a, Ch. 15)

But who does it?

What isn’t language?

- The lines don’t exist almost between any of our jobs anymore
- What I see happen in the resource room is that they’re not taught any strategies, they’re just taught how to maintain. You’ve got a test coming up, let’s all study... But as far as a strategy to help them on the next test, I don’t see that the resource teachers have any time for that. They’re doing all they can do to just to help the kids pass. Whereas I can have time to teach them the strategy that they may eventually use. Nobody else is doing that.
- Great because we can go in there and ask her things, she figures out things, she can analyze something

Ukrainetz & Fresquez (2003)

SLPs as Learning Interventionists

- SLP Orientation
  - Individualized problem-solving orientation
  - Underlying processes, skills, & strategies
  - Freedom from but connected to classroom & curriculum
- SLP Instruction
  - Oral & written language through talking & listening
  - Systematic, individualized tx for select skills
  - Repeated opps for learning and practice
- SLP Service Delivery
  - Pull-out for focused learning and practice
  - In-class for application and automation

(Ukrainetz, 2015a; 2015b; 2016)

The Research Program

- Distinctive SLP interventions beyond third grade
- Simple expository intervention procedures
- A few language skills and learning strategies
- Fairly rapid, noticeable change
- Challenging informational texts
- Connected to classroom and curriculum
- With student buy-in

For more independent, competent learners

USHA Conference, Salt Lake, UT
March, 2018
How About Note-Taking (& use) as a Target Strategy?

- Taking notes
  - Select info from whole
  - Reduce to key words & phrases
  - Minimize writing, punctuation, spelling
  - Transform to icons, diagrams, graphs
  - Organize into categories

- Using notes
  - Expand into full, well-formed sentences
  - Paraphrase and summarize from source
  - Compose into own text product

Notes for Learning – Don’t Just Copy

Lexically abbreviate

Syntactically condense

Physically transform

(Piolat, 2005)

Elaborate Reorganize Retrieve

(Arnold et al., 2017; Chang & Ku, 2015; McDaniel et al., 2009)

Note-takers who actively reduce, transform, and retrieve info show stronger lecture and reading comprehension and recall

(Boyle & Rivera, 2012; Kobayashi, 2006)

Verbatim vs. Paraphrase

But verbatim sounds so good!

- Summarized and paraphrased notes > verbatim notes and notes following text order
- Explicit, inferential, and integrative learning
- Immediate and 1-wk delayed recall
  (Bretzing & Kulhavy, 1979; Slotte & Lonka, 1999)
- Student verbatim a give-away on non-understanding!
  Ought to be rare and cited (“XXX” “p.X”)

But Good Note-Taking is Hard

- Students across grades and achievement levels
  - take incomplete notes
  - miss important ideas
  - write verbatim notes
  - mix up important, minor, and tangential ideas
  (Boyle & Forhelli, 2014; Chang & Ku, 2015; Hebert, Graham, Rigby-Wills, & Ganson, 2014)
- Students with learning disabilities additionally challenged with mechanics of spelling and decoding

Note-Taking Instruction

- Systematic reviews of instruction research
  (Kobayashi, 2006; Boyle & Rivera, 2012)
  - Helps note-taking form and content
  - Helps comprehension, retention, & expression
  - Mostly with older students
  - Poor readers show largest gains
- Success with 3rd – 5th grade
  (Chan & Ku, 2015; Lee et al., 2008; Laidlaw et al., 1993)

Using Notes: Add Self-Talk

3R: Read-Recite-Review

(Boyle & Rivera, 2012; Kobayashi, 2006)

- Do not just re-read your notes – quiz yourself!
- Read text, set text aside, recite ideas out loud
- Read text again, assess yourself

- Group experiment: 3R vs. re-reading vs. note-taking
  - College students
  - Literal and integrative comprehension
  - Immediately after reading and after 1-week interval
  - Read-recite-review the winner!
  - Note-taking 2nd place, but slower
**Writing-to-learn + Talking-to-learn = SLP Tx?**

- Note-taking tx
  - Notes are short and fast
  - Plus a special way of note-taking
- Talk in tx
  - Elicit, model, expand, revise, and confirm learning
  - Students reciting sentences from their notes

Clinical expertise, client values, and research evidence

- Ukrainetz and Ross start on this path...
- Ukrainetz, Peterson and Risueno continue the journey...

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**Special Notation for Weak Writers: Pictography**

- Quick & easy, just enough to remember
- In narrative bxs (Petersen et al., 2014; Gillam et al., in press)
  c.f. Ukrainetz, 2015a, Ch. 9

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**Speak and Sketch Note-Taking & Oral Practice Tx**

**Shared reading**
- Say it simply
- Sketch it simply
- Say it simply
- Note it simply
- Write it fully

1. Quick & easy **pictography** of ideas extracted from text
2. Turned into concise, informative **bulleted notes**
3. With repeated **oral practice** of sentences & reports

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**What We Have Investigated – So Far**

1. Use note-taking and oral practice as **teaching strategies**
   - SLP tools to improve tx topic learning & language
   - SLP perceptions of benefit
2. Teach note-taking and oral practice as **learning strategies**
   - Student tools to help their own learning & language
   - Immediate use & benefit on different subject area texts
   - Compared to no-tx controls

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**Study #1:**

*Can SLPs Improve Students Note Taking and Use – Quickly & Easily?*

- For gr4-6 with language-related LD
- Vs. no-tx control condition
- On outcomes using history texts?
  1. Notes
  2. Oral reports
  3. Written reports

  + Perceptions from SLP instructors

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**Speak-and-Sketch Tx:**

*Group Experimental Study*

What is the effect of 3 hrs of tx using science texts?

- For gr4-6 with language-related LD
- Vs. no-tx control condition
- On outcomes using history texts?
  1. Notes
  2. Oral reports
  3. Written reports
  + Perceptions from SLP instructors
Participants

- 44 4th-6th graders from 9 schools
  - IEP with oral language, reading, or writing services
  - SLI, SLD, OHI
  - No intellectual disability, autism, emotional disability

- Assignment
  - Randomly assigned to tx or control conditions
  - Balanced (mostly)
    - Grade & CELF5 core language
    - IEP services, gender, ethnicity, free/red lunch
    - With 1-5 tx participants per school

Treatment Procedure

- 3 hrs of Speak-and-Sketch tx
  - 9 school SLP instructors
  - 2x/wk of six 30-min indiv or pair sessions
  - Regular or specially scheduled
  - Grade-level unusual animal articles
  - 2-column note form

- SLP training & fidelity
  - 3 group sessions
  - Practiced with non-study student
  - Tx observed and tweaked in first week
  - 1+ participant per SLP audio recorded

The cassowary is a species of large flightless bird. It is found in northeastern Australia and the island of New Guinea. The cassowary is closely related to emus and ostriches. It is the third tallest and second heaviest bird in the world...

The axolotl, or Mexican salamander is found naturally only in two connected lakes in southcentral Mexico. It is also kept as a popular freshwater aquarium pet. Axolotls are sometimes called Mexican walking fish because they look like fish with legs...

The aye-aye is a species of lemur that inhabits the rainforests of Madagascar. Madagascar is a huge island near the southeast coast of Africa. The Aye-Aye is the world's largest nocturnal primate. They are not dangerous, but are feared by local people...

Speak-and-Sketch Tx

<table>
<thead>
<tr>
<th>Pictography Notes</th>
<th>Bulleted Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>Session 2</td>
</tr>
</tbody>
</table>

Article A

Session 3
Same as Session 1

Session 5
Same as Session 1, #1-4

Article B

Session 4
Same as Session 2

Article C

Session 6
Same as Session 2, #1-4

5. Dictate written report from notes
6. Compare report to article & notes
Test Articles – Historical Peoples

Apache Nation
The Apache are one of the most famous Native American groups in the United States. Apaches were known as skilled horsemen and fearsome fighters...

Inca Empire
The Inca Empire was the largest kingdom in ancient times on the American continent. It covered the country of Peru and parts of Ecuador, Bolivia, Argentina, Chile, and Columbia...

Ukrainetz, Peterson, & Risueno

Testing Procedure

• Individual pretest & post-test sessions
  – Pre 1: CELF Core Language
  – Pre 2: Apache/Inca notes on 2-col form & oral report
  – Post 1: Inca/Apache notes on 2-col form & oral report
  – Post 2: Written report & comprehension test
  – Audio-rec sessions & video-rec oral reports

• Testers
  – Trained UG RAs from UWyo & USU
  – Blind to tx condition

• Plus SLP instructor reflection essays after tx

Notes Rubric – Form

1. Topic
3 = Relevant topic at top
2 = Topic identified in first item only
1 = Topic ided other than only in first item
0 = Topic not identified or incorrect

2. Bullets (Good) & Periods (Bad)
3 = All items initiated with bullets and no items use periods (! or ? ok)
2 = >half items bullets, regardless of periods
1 = Some bullets or >half no periods
0 = No items have bullets

3. Quick & Easy
3 = All brief items, info dense: lists, phrases, key words, abbrev, sgw omitted, short sents, no category repetition
2 = >half brief or reduced items
1 = Half or fewer brief or reduced items
0 = No brief items

4. Use Your Own Words
3 = All own sentences or built from source sentences; no verbatimish sentences
2 = >half own sentences
1 = Half or fewer own sentences
0 = No own sentences

http://www.readworks.org/
https://lexile.com/analyzer/
1. Important & Interesting Ideas
   3 = 9+ different items; 2 items for distinct multi-idea sentence even if verbatim
   2 = 6-8 items
   1 = 3-5 items
   0 = 2 items

2. Just Enough to Remember
   3 = All items clear enough to generate sentence from categ and note
   2 = 1 confusing or inadequate item
   1 = 2 confusing or inadequate items
   0 = 3+ confusing or inadequate items

3. Use the Categories to Select and Organize
   3 = 4+ categ have info and info fits categ
   2 = 3 categories have info that fits
   1 = 2 categories have info that fits
   0 = 1 or 0 category has info that fits

4. From the Article
   3 = All info matches source even if unclear
   2 = 1 idea not from source
   1 = 2 ideas not from source
   0 = 3+ ideas not from source

Notes Rubric – Content

Oral & Written Report Quality Features
- Transcribed C-units (sentences) on SALT (Miller & Iglesias, 2016)
- Longer & more complex ≠ better learning
- Coded for quality features & relations to notes

<table>
<thead>
<tr>
<th>Good:</th>
<th>Not-so-good:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Open/Close statements</td>
<td>1. Verbatim from source</td>
</tr>
<tr>
<td>2. Full sentences</td>
<td>2. Category labels not in sentences</td>
</tr>
<tr>
<td>3. Modified from notes</td>
<td>3. Extraneous comments</td>
</tr>
</tbody>
</table>

Pre/Post Oral Report Holistic Comparison
- Overall quality of pre/post videos for each participant
  - Three RA raters blinded to pre/post status
  - Familiar with source articles

Results for Study #1
- Group Results on Notes & Oral Report
- Individual Performance
- SLP Instructor Perceptions

Notes – How and What
- Notes Form
- Notes Content

Oral Report – What to Say & Not Say
- Openings & Closings
- Extraneous Comments
- Isolated Category Labels
This is what I learned about the axolotl.

The axolotl lives in two lakes in Mexico. The axolotl breathes underwater. Also the axolotl lives in fresh water in an aquarium. Axolotl looks like a fish that has legs. And the axolotl blends in to stuff because of its camouflage.

The axolotl eats worms small fish and crabs. The axolotl don't chew their food but they suck it whole.

The axolotl female lays about one hundred eggs to one thousand eggs. People research about the axolotl.

I hope you learned something new.
**Donal – Notes Before & After**

- Notes okay before
- BUT pictography oral report better
  - Longer sentences, more words & diversity
  - Opening and closing
  - Better presentation gaze & voice
  - 2/3 raters judged better

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**Tyrone – Notes Before & After for a Strategy User**

- Con sentences with similar content score
- MLU 6.4 vs. 8.3 words
- NTW 51 vs. 100 words
- NDW 35 vs. 65 words
- Neither had verbatim
- Post had fewer extraneous
- Post had better open/close
- Post had more paraphrased
- 3/3 rated Post holistically better

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**Tyrone – A Natural Gets Better**

Pre-test to Post-test
- MLU 6.4 vs. 8.3 words
- NTW 51 vs. 100 words
- NDW 35 vs. 65 words
- Neither had verbatim
- Post had fewer extraneous
- Post had better open/close
- Post had more paraphrased

3/3 rated Post holistically better

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**SLP Instructors Reflections on Speak-and-Sketch Tx**

Using teaching strategies of:
1. Pictography
2. Bulleted notes
3. Oral practice
To improve comprehension & expression of challenging expository texts on unusual animals

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**Why The Tx Benefit? Simplicity and Quick & Easy Visuals**

- It isn’t complicated. Students appeared to quickly grasp how the process worked. This seems crucial to the idea of carry over. If they are going to be using this strategy on their own, it has to be simple enough to remember and not require significant materials
- With the focus on ‘quick and easy, just enough to remember,’ many of my students who typically lose focus were more able to come up with a picture or a few words to use for their notes
- Pictography strategy helped kids remember the meanings of words such as “nocturnal” and “amphibian”

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**Why The Benefit? Repetition & Ownership**

- Once a well-formed sentence was established, the student took ownership of the sentence and successfully implemented these complete sentences in well-formed oral reports.
- The repeated oral practice appeared to build confidence. When initially starting the study, the students were overwhelmed by the length and complexity of the articles.
  
  With the repetition and strategies, by the third article, each student was eager to not only tackle the article and learn about the interesting animal, they also immediately identified details with more independence and overall confidence.
Why the Benefit? Oral Practice

- The benefit of the student’s continued repeated practice of complete sentences was eye opening…The more practice they received, the more complex their sentences appeared to become.
- The oral practice phase. A concept I grasped well for younger learners… I was failing to understand how this concept looked for older students. The oral practice piece of this intervention was the answer and it makes so much sense.
- Having the student practice the full sentence until a good grammatical sentence was achieved…it paid off for the students when giving the full report.

Speak & Sketch Tx → Writing Intervention

So many of our students are reluctant writers. Before understanding how this process worked, I was leery that I would be attempting to be the ‘writing teacher’, which is an area where I am uncomfortable.

However, I was pleasantly surprised to discover that the writing aspect of this process was not the main focus. In fact, the final writing project flowed very smoothly … naturally from the notes and oral practice stages.

Why the Benefit? Connecting to the Classroom

- Bridge some gaps between the tx setting and actual classroom skills and assignments…potential to positively change my delivery of services for the intermediate population
- Collaborating with teachers about an upcoming project, using the classroom resources in therapy, and using this strategy to create the finished project would be incredibly helpful and successful

Study #1 Conclusion

1. For independent performance on non-taught texts, compared to no-tx controls
   - Significantly better note form and paraphrasing
   - Hints of other improvements for notes & reports
2. For scaffolded practiced performance on taught texts, SLPs say:
   - Better comprehension, expression, engagement, & ownership
   - Simple, practical treatment that makes sense

Descriptive Case Study

Participants
- Two 4th graders (Pete & Angel) & one 6th grader (Steph)
- With language impairment
- SLP instructor, LCSD, Cheyenne WY

Pre/Post Testing
- Pre = Inca, Post = Apache

Session 1
- Shared reading
- Take notes
- Oral report from notes

Session 2
- Written report from notes
- Learner Interview
- + SLP perceptions
Note It Simply – Say It Fully

2nd Try

Six hours in 10 weeks of 16 20-min sessions

S1-8 = Study #1
- Pictography & oral practice
- Bulleted notes & oral practice
- Two animal articles
- Sentences and report
- Lots of scaffolding

The New Tx: Promoting Strategy Use

S9-10, Article #3
- Choice of notation
- Verbal rehearsal
- Less scaffolding

S11: Classroom #1 Presentation
- Choice of report with existing notes
- Whisper rehearsal

S12-13: Animal Brochure
- Dictate sentences from existing notes
- Notes & oral practice → written report

On the Way to Independence

S14-15: MJ article
- Notes & verbal rehearsal
- Minimal scaffolding

- S16: Classroom #2 Presentation
  - Choice of report notes
  - Independent whisper rehearsal
  - Demo three strategies to peers and teachers

Whisper Rehearsal & Perform - Pete

Results of Study #2

Do students show use & awareness of learning strategies?

Does use help their oral and written reports?
Notes: Form and Content

<table>
<thead>
<tr>
<th>Form /12</th>
<th>Steph</th>
<th>Pete</th>
<th>Angel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>6</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Post</td>
<td>8</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>

Notation: Notes / Pictography / Notes

<table>
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<td>9</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Post</td>
<td>11</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Notation: Notes / Pictography / Notes

Quality of Oral and Written Reports

Which is better, Apache or Inca presentation? Why?

Oral report?
- Both raters chose Steph’s and Pete’s post-test reports
- One rater chose Angel’s post-test report

Written report?
- Both raters chose everyone’s post-test reports

Why did the raters like the post-tests?
- More academic, organized, cohesive, confident

There’s a story...

Quality: Form & Content

Pre & Post Notes & Oral Report - Steph

Pete’s Pre Notes & Report

Pete’s Post Notes & Report

Learner Interview:
Did you say anything in your head as you took notes?

Angel ☺

Pre: Well, when you were reading it, well I said in my head that I didn’t know about the empire was the largest kingdom.

Post: I was saying in my head, “What should I write?” or “What should I do, like bulleted notes or pictography?”


**Speak and Sketch Tx: Note It Simply – Say It Fully**

- Pictography, bulleted notes, verbal rehearsal
- Practical, flexible SLP treatment
- For oral and written language and learning
- Academic relevance, noticeable gains & student buy-in

**Next steps:** Tighter research procedures, compare to alternate txs, more tx of strategy use

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**Study #2 Conclusion**

1. For independent performance on non-taught texts
   - Two students with language impairment and one with autism
   - Showed clear benefits that could be logically linked to strategy tx

2. SLP still likes it and maybe even more
   - Simple, practical, and flexible core tx elements
   - Noticeable changes for students and teachers

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**References**

Dockrell, J. E. et al. (2009). Impact of SLL on adolesc written text. *Exceptional Ch*, 75, 427-446.  

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