Designing Light-Tech & High Tech Dynamic auditory scanning systems

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Light tech Aided auditory scanning

- Partner assisted auditory scanning
  - Human voice
  - "Smart partner" operating system
    - Not as rigid with timing
    - Can interpret a broader range of movements (learning movements)
  - Partner skills to operate the system
    - Operational versus social speech
    - Vocabulary organization

High tech Aided auditory scanning

- Computer or dedicated communication device
  - Digitized or synthesized voice
  - Scanning voice versus speaking voice
    - Can be confusing to "less involved" partners
    - Use different voices
    - Use private and public speakers
  - More independent
  - "Computer" operating system
    - Rigid with timing
    - Accurate movements
    - Vocabulary organization

Selection techniques

- 1 Movement to accept option
  - "Yes" – partner assisted auditory scanning
  - Accurate movement with timing control to access switch with automatic scanning
- 2 movements to reject & accept
  - Differentiated "Yes" & "No" movements
    - generally increases partner’s confidence using scanning
  - Increase activity & possible fatigue
  - 2 switch scanning
    - Reduced timing & attention requirements
    - Need to access to separate locations
    - Increase activity & possible fatigue

Why use auditory scanning?

- Aim is the same as all AAC interventions
  - For the person to meet his/her varied communication requirements as
    - intelligibly
    - specifically
    - efficiently
    - independently
    - in as socially valued a manner as possible

Considerations for auditory scanning systems

- Choice of auditory or auditory + visual system
  - Cortical Vision Impairment
- Operational considerations
  - Social speech vs operational speech
- Selection set is transient
  - Limited selection set presented at one time (auditory memory)
    - Need multiple levels / branches
Activity Specific Scanning Display - Columns

Auditory scanning activity display

Dynamic Auditory Scanning systems

Common issues using auditory scanning branching systems
- Child and partner locating required vocabulary in branches
- Layout instructions
- Speed of communication (number of level changes required to communicate message)
  - Enabling quicker access to predictable messages
  - Enabling access to a wide vocabulary for spontaneous, unpredicted messages

Design strategies
- To enable “automatic” level changes
  - “go to page number” instructions
  - Use of color & numbers on page tags
- Organisation of dynamic display
  - Placement of vocabulary
  - Navigation

Organisation Dynamic displays
- Taxonomic - organised according to categories
- Schematic - organised according to events or activities
- Topic - organised according to the topic (e.g., I’m talking about my dog, I’m talking about pirates)
- Pragmatic - organised according to communication function and discourse requirements
Pragmatic organisation

- Uses communication function and discourse requirements to structure the placement of vocabulary within the dynamic display.
- Taxonomic, schematic, topic and anecdote organisations can all be used within a pragmatic organisation.
- Efficiency to meet communication requirements is the overriding factor determining the types of branches and the placement of specific vocabulary.

Vocabulary placement

“What does the child need to say, when, to whom and how?”

raises many considerations for vocabulary placement

Considerations for vocabulary placement

What functions may be expressed with this vocabulary?

Shop
- Request - “Let’s go to the shops”
- Question – “Are we going to the shop?”
- Relate information – “I went to the shop ……”
- Tell a story – “We went to the shops ……..”
- Pretend – “Let’s play shops”
Etc.

What type of branching organisation suits each function?

Pragmatic branch starters

<table>
<thead>
<tr>
<th>I like this</th>
<th>I don’t like this</th>
<th>I think it’s … (opinion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somethings wrong</td>
<td>I want something</td>
<td>Let’s do something</td>
</tr>
</tbody>
</table>
I want to go somewhere | I’m asking a question |
I’m telling you something | I have an idea |
I’m telling a story | |
Do you want to hear a joke | Let’s pretend |

Considerations for vocabulary placement

Time requirements for effective message transmission?

- Priority continuum
- Varies given message, function, environments, partners & individual requirements.
- Consider discourse patterns of use
- Some context dependent messages need to be said “quickly or not at all”.

Early learning auditory scanning book

- Partner instructions
- Visual symbols present
- Opportunities to learn
- Point of focus (partner / child)
- Early communication functions on separate pages
- Introduction to lists within function
- Light tech
- Partner scaffolds
- Active observation & interpretation of movement
- Adapt timing
- Reduced attention / skill needed for operation
Early learning auditory scanning book

- Need ear buds
  - more

- Read each had
  - finish

- Read each had
  - Uh oh

- Read each had
  - I do

- Read each had
  - help

- Read each had
  - Something's wrong
Visual plus auditory scanning
- May use light to highlight individual pictographs

Auditory scanning chart

Quick Words
- communicate
- make of choice
- Inside
- Outside
- Above
- Below
- Something is missing
- name of house
- name of person
- name of thing
- name of color

Visual plus auditory scanning
- May use light to highlight individual pictographs
Expanding vocabulary

- Expand range of communication functions
  - Less predictable
  - Require categories

- Group interaction words – “quick chat”
  - Include anecdote strategies
Telling about group

I've got more to say
Go to p.7

Telling about group

I'm telling you something
Go to p.8

Read group news

Granny had a birthday party
I've got more to say
Go to p.7
Granny had a birthday party

I'm telling you something
Go to p 8

Granny had a birthday party

It's already happened
Go to p 9

Granny had a birthday party

people
Go to p 10

Granny had a birthday party

actions
Go to p.13

Granny had a birthday party

have (had)
Go to categories p.9

“yes”

Granny had a birthday party

“yes”
Granny had a birthday party

Birthday

Go to categories p. 9

“no” party

Please put on a CD

I want something

Go to p. 11

Please put on a CD

I don’t like this

Go to p. 11

Let’s go somewhere

Go to p. 11b

I’m asking a question

Go to p. 11b

I’ve got more to say

Put on a CD

Put on something

Computer

Turn it up louder

Turn it off

Put on again

Not

Individual vocabulary placement

Individual vocabulary placement
Individual vocabulary placement

Operational commands
- Link pages
  - To and from the front / main page
  - Need to be able to get to all pages from the front page and main navigation index
  - Need to be able to get back to main navigation index from all pages
  - To other “predictably” associated pages
  - Within a category or topic
    - Turn the page / next page
    - Go back / previous page
    - Sub-category pages

Increasing linguistic complexity
- Scaffolding
  - Inclusion of more specific information
  - Grammatically correct sentences
- Uses conversational topic with pragmatic branch organisation
  - Narrows options for auditory scanning whilst allowing for broader vocabulary
- Developed by Louise Dunne

My class learned about the Federation of Aust.
I have a message about school
Go to page 4
I'm telling you something. Go to page 4b.

My class learned about the Federation of Aust.

Past tense My whole class learned about. Go to page 4c.

The federation of Australia.

Let’s work with James. I have a message about school. Go to page 4.

I've got an idea. Go to page 4g.

Let’s work with James.

Let’s work with someone. Go to page 9b.

Let’s work with James.
Let’s work with James.

High tech dynamic displays

- Enough vocabulary/message types to meet wide range of communication requirements
- Limited number of options on a page with linear scanning
- Absence of ‘co-construction’ from a communication partner in message formation
  - Key words/sentences expanded by partner
- Voice output messages may not sound grammatically correct to the child

Louise Dunne 2001

Pragmatic organization for High Tech auditory scanning dynamic displays

- Can use similar organizations to light tech displays
  - Pragmatic branch starters
  - Strategic clues such as “It’s already happened”, “going to happen”.
- However, computer technology only responds to it’s programming. Need to program extra pages and link buttons
  - Operation and navigation buttons
  - Scaffold language output
  - Do tasks that partners do in light tech systems

Other options

- Combination direct access (eye, hand) to limited set of visual symbols with attached lists to use auditory scanning.
  - Auditory scanning groups of words

References


