Partner-Assisted Communication Strategies for Children Who Face Multiple Challenges

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Which Children and Why:

- Children who face significant motor and communication challenges
- Additional multiple challenges including visual challenges
- Additional multiple challenges including hearing challenges
- Beginning Communicators or children who don't have any effective forms of communication yet
- Struggling Device Users
- When other communication strategies are not available/effective at the moment

Partner assisted scanning:

Partners provide scanning by showing/pointing and/or speaking the names of items. Partner assisted scanning may be

- **Visual** - The child relies on visual recognition of the symbols. The partner scans by showing or pointing to items with a finger or light without verbally labelling the symbols.
- **Auditory** - The partner reads out loud the labels for each symbol or a group of symbols. The child relies on their understanding of the spoken labels.
- **Visual plus auditory** - the partner both shows/points to and reads out loud the labels for each symbol. The child may rely on their understanding of the spoken labels or visually recognise the symbols.

- Often used to enable children to utilise their current understanding of spoken language to communicate whilst providing opportunities for them to learn to visually recognise symbols (for future use).
- May be used with children who have cortical vision impairment to provide visual stimulation towards the development of their visual skills.
- May be used with children who do not yet have any language skills as multi-modal receptive language
- **No tech** – auditory scanning without a communication aid.
- **Light-tech** – to access single level or multiple level communication aids

Children may use either use:
- **One movement to accept** i.e. a signal to indicate "YES"
  - The child does nothing until the required option is indicated (similar to automatic scanning using a switch).
  - This option requires the partner to provide an appropriate pause time between each scan.
  - The child needs to be able to reliably produce their "YES" movement within the identified pause time.
  - Experience suggests that less familiar partners often feel more confident of the child's responses / message when the child also does a specific movement to indicate "NO, not this one".
- **Two movements to reject & accept** i.e. differentiated "YES" / "NO" signals
  - This option requires less skill from the partner by eliminating the timing element and may increase the confidence of less familiar partners.
  - Increased activity may cause fatigue for some children.
  - Allows the child to control the speed of the communication according to his ability to process and understand the choices.

Partner Assisted Strategies Vs. Popular Current Approaches:
Current Strategy: Vocabulary flies in out of thin air and then poofs back into oblivion at the end of the activity.
- We need to be presenting vocabulary that doesn't disappear and can be built upon, instead of replaced.
- The Brain Builds Understanding Based Upon Patterns

Current Strategy: "20 Questions"

- Need a Way to Systematize "20 Questions" so the Child Can Begin to See a Pattern in How Vocabulary is Presented
- Working Memory Can Only Deal With a Limited Amount of Information at a Time
- Need to develop automaticity for location of vocabulary

Partner-Assisted Communication:
- All Communication is Co-constructed and Dependent Upon Participation and Feedback from Both Sides
- Partner-Assisted Communication Strategies Take Advantage of this Co-Construction "Smart Partner" vs Technology

"Smart Partner" vs. Technology:

A significant advantage of light-tech systems for some children is the availability of a 'smart-partner operating system'. Human partners can observe and problem solve to assist the communication process in ways a computer operating system cannot. For example, "smart partners" can
- interpret movement, including recognise the intent of less accurate movements and ignore associated reactions (Accuracy of motor skills is not as crucial for success)
- can alter timing of scanning
- read the subtle nonverbal cues from the child
- use contextual cues to assist interpretation of message
- adjust the interaction as needed

Light-tech systems can use the capabilities of human partners to enable children who have complex difficulties to communicate NOW.

Focus on developing language and communication skills separately from motor skills

Parallel Programming:
- Juggling the sensory-motor, language, and cognitive demands need to control a communication device or access a computer can be very overwhelming
- Many individual components must be coordinated. For example:
  - **Sensory-motor demands:** motivation, strength, motor planning, endurance, motor automaticity, auditory filtering, reaction time, visual discrimination, visual scanning/memory, visual tracking

- **Cognitive demands**: motivation, cause/effect, initiating, discriminating purpose and function, developing cognitive schemas, making active choices, trial and error, problem solving
- **Language components**: motivation, processing of language in activity, pragmatics, processing of questions, auditory filtering, processing of symbol set, syntax/grammar, attention to task, memory
- If we wait for everything to develop in a coordinated fashion, you will be waiting forever
- We don't want to hold the child back in one area because of deficits or difficulties in other areas
- We need to be careful that we continue to develop rich cognitive schemas and not just splinter skills
- The answer to this problem is to work on individual components in parallel. Use functional and natural contexts to give the child opportunities to develop skills, where only one component is cognitively challenging them at a time. Provide a variety of these types of activities that challenge the child in all areas of development, but mainly just one at a time. Help the child make associations see the relationships between skills that she is developing.

Aim of AAC interventions:

The primary aim of AAC interventions is the same for all children who have complex communication needs.

*For the child to meet his/her **varied communication requirements** as **intelligibly, specifically, efficiently, independently** and in as **socially valued** a manner as possible in order **to understand others** and to **be understood**.* *(Porter, 1997)*

Communication requirements:

- Peer referenced: What do children this age need to communicate?
- Generally for a full range of communication intents.
- Specifically in a given activity or situation.
- Functional: To actively participate in their daily life (range of activities, environments, partners)
- Developmental: To stimulate the further development of communication, language and literacy.

The task in order to achieve this aim is

To **discover the "circumstances"** which will enable the child to **achieve his / her present communication requirements** and to provide opportunities to **stimulate**

development of more intelligible, specific, efficient, independent and socially valued communication in the future.

<u>**Aim to develop (over time)**</u>
- Communication autonomy
    - o Few restrictions on what they can say
    - o Responsible for own language production.
    - o Not necessarily able to formulate message completely independently (esp. physical impairment)
    - o Refers to where messages originate
    - o Able to express self in accordance with own communicative intentions
- Communicative accessibility. There are people in the social environment who
    - o understand the alternative communication form
    - o can scaffold it in the acquisition period
    - o are able and willing to communicate in a manner that gives the individual maximal communicative autonomy.
- Communication competence
    - o Light (1989) Sufficient knowledge, judgment and skill in four areas
- linguistic competence
- operational competence
- social competence *(sociolinguistic & sociorelational aspects)*
- strategic competence

Discovering appropriate intervention strategies:
The task of discovering appropriate intervention strategies to enable children who have physical and sensory challenges to meet their varied communication requirements is complicated.
- Limited control of body movements for communication
- May have additional challenges processing sensory information from their own bodies and the environment.
- Communication relies on the use of sensory motor skills
    - o Sensation (vision, hearing, tactile, vestibular, kinesthetic, proprioception) to understand others and provide the child with feedback on their own communication relies on
    - o All modes of communication, including speech, sign, gesture, actions on the environment and accessing a communication aid or device, rely on movement of some kind.

- Intelligible communication depends on the ability to accurately repeat these movements and, if the child has atypical pattens of movement, the partner's knowledge of how the individual child moves.

Our reliance on sensory motor skills to assess cognitive and communication skills.
- At a basic level, assessment is the observation of a motor response to a sensory input.
- Even assessment which allows for multiple access methodologies, depends on the child having a way of perceiving the stimulus materials and intelligibly move to communicate / participate in assessment e.g. facial expression, eye gaze, whole body movements, arm and hand movements, gesture, actions (reach, grasp, manipulate materials), speech – vocalization.
- Additional challenges such as a cortical vision impairment or sensory processing disorder further complicates the communication and assessment process as the child may require very specific presentation and environmental conditions in order to actively participate.

The information gained from any assessment will depend on the assessor / informant's knowledge/understanding of
- How the child processes sensory information
  - Hyporeaction, hyperreaction (atypical reaction)
- How the child moves including atypical patterns of movement, associated reactions and difficulties grading movement.
  - Difference between intention and performance
- Possible strategies to accommodate for sensory and movement challenges (including use of AAC symbols and selection techniques)
- Variability of response (movement)
  - Influence of position & stability
  - Motivation (effort required for effect)
  - Influence of associated difficulties (e.g. vision, hearing, sensory processing, epilepsy, health issues)
  - Specific supports required for success?

Initial assessment is further complicated by the following "catch 22" for children who require aided modes to communicate using language.
1. Aided language does not naturally exist in the environment
   - Child cannot spontaneously "uptake" something that is not there

- Professionals intervene - provide aided language based on their expectations of what's possible
2. Child can only demonstrate ability to use what has been set up for use
   - Uptake may be influenced by a variety of factors
3. Others can only be influenced by child's use of what has been set up to use.

The "different" communication behaviours (movements) of children who have complex communication needs may influence the input naturally provided by others.

Need to provide these children with opportunities to learn movements for communication and exposure to aided symbols in order to assess for potential strategies to enable child to meet their communication requirements.

Dynamic Assessment:

"Vygotsky (1978) argued that standardized tests (in which the tester cannot actively intervene to enhance the test taker's performance) provided data only on the individual's past history and present functioning, not on his future potential. He sought to find out where (and how) education could optimize each individual's performance across a variety of skills."   Olswang, Bain, & Johnson (1992).

Zone of proximal development: Vygotsky (1962, 1978)
- The difference between what the child can do alone and what they can achieve in collaboration with a skilled partner.
- This zone is jointly determined by the skills of the child and the form of structured guidance provided by the partner.

Using information on current functioning, the examiner interacts with the person providing models, cues, instructions, prompts, feedback to aid the person to successfully complete "tasks" they were unable to achieve alone.
Dynamic Assessment can be used to provide both quantitative and qualitative information.
Quantitative
- Determine amount of change in test-teach-test
- Readiness to learn a skill
Qualitative
- Identify processes or factors that interfere with the person's successful completion of task
- Identify processes or means that enable the person to learn to successfully complete task

- Identify how the person solves problems and suggests specific strategies
- Bridges assessment – intervention gap

This qualitative information assists to identify possibilities to enable a to most effectively meet their communication requirements

<u>**Dynamic observational assessment for AAC   (Porter, 1997)**</u>
- Developing knowledge of child's key issues for participation and learning related to the child's motor impairment, cortical vision impairment, etc.
  - o Information on specific capabilities/challenges
  - o Observation of child's participation in a range of activities & key person report
- Observe HOW child currently achieves communication functions
  - o What person does?
  - o What others are doing which may influence person's performance (supporting – limiting)
- Gather additional information re: communication in a range of environments, different partners, range of communication intents, messages, topics, etc.
  - o Information from key communication partners (may use profiles such as Dewart & Summers, 1995 to structure interview)
- Interact with the person
  - o Try a range of strategies to extend communication skills (ZPD)
  - o Observe how person makes use of strategies to achieve communication function
  - o May set up communication temptations within motivating activities (Iacono, Carter, & Hook, 1998).
- Use knowledge of physical & sensory impairment, communication & AAC
  - o Outline learning requirements
    - What does the student require to communicate more competently? (today & tomorrow)
  - o Hypothesize on specific strategies
    - What circumstances (strategies) will be implemented (trialed) to enable the child to optimally achieve their varied communication requirements?
- Intervene - observe – intervene – observe.
  - o Assessment and intervention occur simultaneously and are continuous directed toward the developmental process.

A range of motor learning, sensory and AAC strategies are introduced during a dynamic observational assessment for children who have severe physical and sensory challenges.

- Based on what may enhance child's communication and facilitate their learning
- General strategies include
    - Modifications to sensory input
    - Developing knowledge of child's movement patterns
    - Identification of and assigning meaning to possible intentional movements for communication
    - General improvement of physical position and movement control (motor learning)
    - Teaching specific movements for communication
    - Receptive input in a range of AAC modes
    - Creating opportunities for the child to communicate
- Aim to provide parents and professionals with opportunities to observe the child's response and discover, over time, the strategies which will enable the child to communicate more effectively.
- May require long term dynamic observational assessment

Cortical Vision Impairment:

- CVI - problem with the brain's ability to process visual information
- Vision gets better or worse, but it does not remain static
- Sometimes neural pathways can be "rewired" around damaged areas of the brain to make new cortical connections
- Dr. Christine Roman (www.aph.org/cvi/)

Characteristics:
Normal eye report; Light gazing; Color preference; Movement assists vision; Latency of visual gaze; Visual field differences; Visual novelty difficulties, Issues related to Complexity, Reduced visual reflexive responses; Visual motor difficulties; and Difficulty with coordinating Looking and Listening.

Strategies:
- Begin with what is visually familiar to the child and build upon that
- Encourage use of vision through daily environmental adjustments
- Pay attention to visual fields
- Reduce complexity

- Bring symbols close
- Utilize movement to attract visual attention
- Separate looking and listening and reward looking with sound
- Flashlight highlighting
- Provide visual contingencies
- Simplified picture symbols, background highlighting (Goossens' Crain, Elder)
- Take visual cues from the child
- Focus on auditory strengths for communication strategies, while continuing to work on visual skills at other times - auditory scanning
- Include visual feedback that my become familiar, and thus paid attention to, at a later time
- Partner assisted scanning can allow for a smart partner who pays attention to the child's delayed responses and allows time for thinking and self talk to occur within the process.
- Try 2 switch step scanning - increases cognitive engagement and time to process information visually and auditorally

Hearing Impairment:
- Depends on type/degree of hearing impairment as it relates to the child's ability to understand spoken language.
- Children who have very limited understanding spoken language acquire aided language without reference to speech. Independent creation of a meaning system with AAC language forms.
- Need sufficient experiences of AAC language modes (sign and aided language) in order to develop this meaning system (i.e. cannot map onto/ recode knowledge from spoken language).
  - To communicate real messages in real situations
  - Multiple experiences to "work out" meaning
  - Sufficient exposure to perceive as linguistic (frequent and broad vocabulary use required to perceive as a language)
- Cannot use speech to clarify, expand and recount message being expressed in aided language

Strategies
- Early introduction of AAC language modes to express a larger range of communication intents and vocabulary
- Receptive use of sign language (& expressive communication if possible)

- Provide sufficient aided language vocabulary to meet child's receptive language requirements
- Increase vocabulary available on one level
  - May require child to use partner assisted visual scanning expressively
  - May have sections of smaller symbols for receptive input on same page as larger/spaced symbols to suit expressive requirements
  - Can have separate child and adult displays (practically more difficult)

Sensory Processing Disorder:
- May look more capable of using hands but have significant difficulties with motor planning.
- Difficulty combining looking and touching
- Sensory seeking behaviours overriding interaction with people, distracting from interaction
- Children who also have physical challenges may have more a limited range of possible sensory seeking behaviours that are less effective to meet sensory needs.
- Learning intentional use of movements without vision (e.g. head movements) may be more difficult for children who receive poor proprioceptive feedback
- Many children who have severe physical impairment have associated sensory processing difficulties (e.g. children with athetosis, spastic quadriplegia). The addition of tactile cues may therefore provide limited support.

Strategies
- Assessment to determine child's specific sensory profile
- Implementation of program to meet child's specific sensory needs.
- Educate others on child's sensory needs
  - assist them to understand what sensations the child is seeking/avoiding
  - ideas of how to more effectively support child's interaction
- Embed strategies into daily life routines to address sensory needs and support child's active participation e.g. use of weights, lycra body splints
- Physical cues to suit child's sensory requirements (firmness, speed, etc)
- Use of specific verbal information may assist motor planning/learning.
- Consider the sensory properties of the communication aids.
- Simplifying the sensory –motor requirements using partner assisted scanning.

Motor impairment:

- Communication requires movement
  - o Assist others to understand difference between communication intention and the actual performance (our recognition) of that intention
- Developing knowledge of the child's movement patterns
- Key issues for participation and learning e.g.,
  - o Associated reactions
  - o Weightbearing
  - o Weightshifting
  - o Symmetry
  - o Stability
  - o Effects of gravity
- Communication happens all the time. Children need strategies to communicate in all physical positions.

Strategies

- Provide access to modes of communication they will be able to learn to use.
- Initially partner plays a very active role actively interpreting any movement that may communicate meaning. Gradual shaping toward a more generally intelligible form.
- Programs to generally develop motor control (address key issues for participation and learning)
- Supports for stable, symmetrical position – enable disassociation and use of more graded movements
- Teach specific movements for communication
- Teach child to use of "self talk" to control their own movement

Access method to meet communication requirements

- Balance "easy access" with vocabulary needs
  - o Availability of vocabulary for child to use / adult to model (on each page / display).
  - o Motivation versus effort to communicate
  - o Increased physical/cognitive effort to operate the system
- Control of movements for communication alters with physical position. Teach multiple methods to access aided language to suit different requirements

- o Partner assisted scanning is a useful technique for many children to learn. Enables use of their communication aid when in positions where direct access is more difficult.
- Access methods may change over time to meet changing communication requirements

3 important factors in language acquisition:

1. The role of a language learning environment
   - o Children need to experience models of their language used to communicate
2. Language acquisition is driven by the desire to communicate
   - o Aided language needs to be used for genuine communicative purposes.
   - o Aided language interventions need to address unmet communicative challenges.
3. Skilled communication partners actively strive to jointly construct meaning with the child
   - o Partners use a range of strategies to scaffold the child's successful communication and use of language in the acquisition period.
   - o more autonomous communication develops over time as children acquire language competence.

Creating an aided language learning environment:

Three important tasks required to create an aided language learning environment:
1. ensuring the required aided symbol vocabulary is available at all times
2. using the aided symbols to interact for genuine communicative purposes throughout the day
3. training partners to use the AAC systems.

Making aided symbol vocabulary available in the child's environments
The challenge!

Dale (1976) and Retherford (1996) reported the results of a comprehensive investigation of vocabulary growth in young children by Smith (1926). Whilst caution needs to be exercised in the use of these figures collected more than seventy five years ago, Smith's data does highlight the extent of the challenge facing children learning to use aided symbols and the people supporting them.

Age (years; months)	1;0	1;6	1;9	2;0	2;6	3;0	3;6	4;0	5;0
Number of words	3	22	118	272	446	896	1222	1540	2072
Increment (number of new words)	2	19	96	154	174	450	326	330	532

Figure 1 Based on Smith (1926) as cited by Dale (1976)

Engineering the environment is the term used by Goossens', Crain & Elder (1992) to describe organisation of aided vocabulary in the child's environment.
Strategies in common use to make aided symbol vocabulary available include
- Multiple activity/topic specific displays organised spatially in the environments where these activities occurred.
- Multi-level communication books. Vocabulary organised vertically within the levels/pages of the communication book. Numerous designs have been reported in the literature over the years, incorporating various features aimed to enhance accessibility and ease of use.
- Organisation of vocabulary in these multi-level communication books has typically been either:
  - Taxonomic - organised according to categories, e.g. people, actions, places
  - Schematic - organised according to events or activities, e.g. mealtime, art,
  - Topic -   specific topic pages, e.g. space, pirates.
  - Anecdote -   chunking of information to relate scripted stories/anecdotes.
- Common difficulties associated with the use of multi-level communication books have been:
  - Teaching the child and communication partners how to move between levels (pages) to locate the required vocabulary to communicate for a variety of communication intents and a range of messages in a range of situations.
  - The speed of communication:
  - number of level changes required to communicate message
  - ease of combining words for different messages.

- Enabling quicker access to predictable messages and access to a broad vocabulary for spontaneous, unpredicted messages.
- The pragmatic organisation of dynamic displays (PODD) addresses these challenges.

Pragmatic Organisation Dynamic Display (PODD) Communication Books

Within PODD:
- Vocabulary is organised according to communication function and discourse requirements.
- Taxonomic, schematic, topic and anecdote organisations can all be used.
- Efficiency to meet communication requirements is the overriding factor determining the organisation and placement of vocabulary in the communication book.
- Aided language development is supported through the provision of multiple page sets (communication books). The range of page sets reflects a developmental process as reported in the literature on both typical and aided language development. Page sets are selected to enable the use of aided language stimulation that leads the child's development.
- Individual requirements (skills and lifestyle) are taken into account in the design.
- Strategies are available to:
  - scaffold the child's inclusion of sufficient information to enable partner understanding
  - compensate for AAC system limitations.
- Development of PODD was influenced by
  - Adult's experiences using children's aided systems (activity displays & multi-level communication books) to provide aided language stimulation (Porter & Kirkland, 1995; Porter, Kirkland & Dunne, 1996; Porter, Kirkland & Dunne, 1998; Porter, 2000).
  - Underlying principles AAC intervention

Style of PODD communication book
PODD communication books come in three main forms.
1. One page opening
2. Two page opening
3. Two page opening plus a side panel.
Factors influencing the overall organisation of a PODD communication book include:

- The number of items on a page opening (visual, cognitive, physical skills)
- Communication and language requirements - both current and developmental.
- The access methodology
  - Direct access
    - Point
    - Pick up and give/show
    - Eye-gaze
  - Partner assisted scanning
    - Visual, auditory, visual plus auditory
    - One per page, linear, column-row and group-column-row
  - Coded access
  - Combination Access
    - direct access to a section plus partner-assisted scanning
    - eye-gaze to a section plus partner-assisted scanning.
    - Coded access plus partner assisted scanning

Features of PODD communication books
Strategies to enable "partner powered" level changes.
- Go to "page number" instructions
- Colour coded page tags
- Operational commands

Pragmatic branch starters
Pragmatic branch starters can perform two different functions within PODD.

1. Provide faster predictive links to pages of vocabulary commonly required to express a particular communication function.
   For example, "Something's wrong" leads to pages of vocabulary to complain or relate a difficulty.
2. Compensate for the reduced use of environmental supports, gesture and intonation typically used to establish the communication intent of 1-2 word utterances.
   - As a child's communication skills increase to sentences of 3 or more words, reliance on the use of pragmatic branch starters reduces.
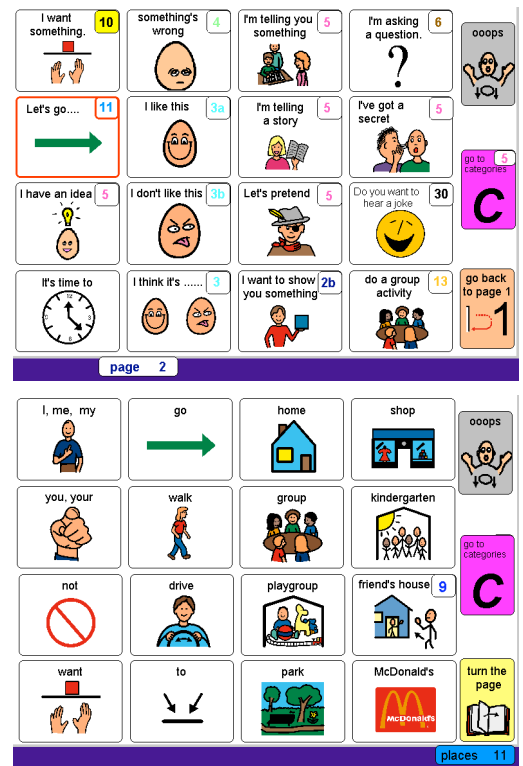
- The branch starters are phrased to provide the communication partner with contextual information.
  - They use conversational speech to promote the communication interaction, e.g. *I want something; I want to go somewhere; I'm asking a question.* This helps the focus remain on conversation as the pragmatic branch starters are an integral part of the message. This reduces the partner's perception that they are turning a lot of pages before they get a message.
  - The wording of each branch starter can be altered to suit the personal preferences of the individual child, and/or the phraseology in common use in the child's environment.
- The range of pragmatic branch starter phrases included in an individual book will be influenced by the developmental requirements of the individual child.
- The pragmatic function being expressed can also form the basis for communication book navigation (organisation) as different types of branches are useful for the different functions of communication.

Some ideas for branch starters

I like this	*I want something*	*I'm telling you something*
I don't like this	*I want to go somewhere*	*Let's pretend*
I have an opinion	*I'm asking a question*	*I'm telling a story*
Something's wrong	*I have an idea*	*Do you want to hear a joke*
I want to do something	*I want to show you something*	*I'll tell you how to*

Other strategies included in PODD to manage the limitations of aided language and support the production of more intelligible, socially valued communication.
These strategies may:
- support the child's inclusion of sufficient information to enable partner understanding
- enable more specific and socially valued messages (age appropriate)
- prevent/assist with the resolution of communication breakdown
- increase efficiency of communication

- **Predictive links**
- **Tense clues**: Prior to the child using word morphology functions to indicate verb tense, clues as to the verb tense may be provided using symbols for *It's already happened, It's about now, It's going to happen, It's always happening.*
- **Information chunking**
- **Yes/no question marker:** compensates for lack of intonation to mark yes/no questions prior to the development of skills to invert the auxillary
- **Vocabulary to manage the interaction and use strategic competence**

- **Hinting** e.g. *It's not in my book. I'll give you a hint.*
- **Conversational repair and request for clarification** e.g. *I don't know; I don't understand, Please explain this to me, That's not what I'm saying, That's nearly it.* OOPS is included on all pages in many of the page sets designed for children at earlier stages of communication and language development.

Predictably associated vocabulary

Traditional practices for organising vocabulary by category in a dynamic display or multi-level communication book include only the words directly associated with that category. PODD uses a strategy of including predictably associated vocabulary in all sections and categories of a communication book.

- Vocabulary that would predictably be used in association with the main content words is included in that category.
- Vocabulary may be included in multiple locations throughout the communication book
- Reduces number of page turns required to produce a sentence (increase efficiency and reduce memory load)
- Observed to increase partner's use of aided language stimulation to model and expand – aim to include vocabulary to expand child's expressive production "one more stage".
- Predictably associated vocabulary is determined using a backward chaining process i.e. determine main vocabulary associated with a section/category, then brainstorm the vocabulary required to express messages commonly expressed with that vocabulary.
- The range of predictably associated vocabulary included in each category depends on the number of items a child can manage on one page opening and their current stage of language development.
- Consider use of partner assisted scanning /combination / coded access methodologies to expand range of vocabulary available on one page opening.

Navigation

- Routes used to move between pages.
- There is an emphasis in the design of PODD on the child being able to control the movement between pages using the *Go to page (number)* instructions and operational commands.
  - o Communicative autonomy is reinforced as the child independently directs the movement between pages, even though a partner may turn to the page.

o Partners may initially assist children to navigate through the book as they learn this skill.

Main navigation indexes

All PODD communication books have main navigation indexes. The main navigation index may:
- use pragmatic branch starters
- use category names.

Both of these indexes may be included within the one communication book to suit different communication functions.

The main navigation indexes are located in different positions depending on the style of the PODD.

1. One page opening – the main navigation indexes are on separate pages with an operational button, e.g. *go to categories page ….,* on all other pages to provide a direct link to the main navigation index.
2. Two page opening – the main navigation index is on the left side of the *a* page in all categories / sections of the PODD. All pages in the section include an operational button to *go back to page (number of section)a,* to access the main navigation index.
3. Two page opening plus side panel – the main navigation index is located on the side panel which is accessible from all page openings.

Categories

The category groupings used in PODD may be based on:
- part of speech, e.g. *action words (verbs); description words (adjectives); little words (prepositions, determiners, and other frequently occurring words used to build sentences);*
- semantic associations, e.g. *food and drink; clothes; activities; places*
- pragmatic function, e.g. *opinions, something's wrong.*

- A taxonomic (category) organisation has some distinct advantages for the organisation of large vocabularies to generate less predictable messages
- Frequent experiences seeing categories used by others to communicate messages (aided language stimulation) allows young children to learn to use categories as part of the language structure (semantics/syntax) they use to communicate, prior to the development of categorization as a cognitive task.

Subcategories

- Reduces the number of items in the main category index
- Reduces the number of *turn the page* operational commands required to access vocabulary within each category. There is an attempt in PODD to limit the number of operational page turn instructions to access vocabulary within each category to one.
- The use of conversational wording for subcategory names has reduced the negative comments from partners that they are spending a disproportionate amount of time turning pages to just get to words.

Activity Pages

- Some of the PODD page sets include activity specific displays (schematic organisation) to increase the efficiency of vocabulary location to interact during frequently occurring activities.
- Activity specific displays are particularly useful in page sets with less vocabulary items on the page opening.
- In page sets with more vocabulary items on a page opening, separate activity displays are generally not required as the predictably associated vocabulary in each section includes the vocabulary required to interact during related activities.

Links

When designing a PODD it is vital to ensure that pages are linked using *go to page (number)* instructions and/or operational commands. All new pages need to be linked to the other pages in the book. Check that links are always available to move:

- from the front page to the main navigation index
- back to the front page from the main navigation index
- to all sections from the main navigation index
- back to the main navigation index from all pages
- to all pages within a section:
    - turn the page/next page
    - go back/previous page
    - to and from sub-category pages
    - to other pages that include vocabulary which is predictably used in association with the vocabulary on that page.

Navigation to suit communication requirements
Efficiency to meet communication requirements is the overriding factor determining the organisation and placement of vocabulary within the communication book.

Time requirements for effective message transmission
Actually a priority continuum as we would really like immediate access to all words! The speed required to communicate a message varies depending on the:
- The communication intent.
- The function being expressed.
- The message's reliance on context for interpretation.
- The child's personality and current ability to take time to communicate a message using aided language.
- When and where the message is generally communicated.

To accommodate these discourse requirements, the first pages of a PODD communication book generally include words and phrases to express messages that are contingent on the ongoing activity or interpreted in relation to the partner's previous utterance.*

* The exception to this practice is found in the PODD communication book designs for children using partner assisted auditory scanning. As this access methodology requires a partner to read out each word, it was found to be very time consuming to always go through all the quick words on the front page before getting to the main navigation index. Therefore, the front page of these communication books is a main navigation index with a link to *QUICK CHAT* vocabulary on the second page.

Different navigation routes to suit different requirements
Five factors strongly influence the navigation routes used in a page set:
1. The child's communication requirements:
   - range of communication functions
   - range of vocabulary.
2. The child's need for pragmatic branch starters to indicate communication intent.
   - Children whose expressive mean length of utterance is 2 words or less will benefit from the use of pragmatic branch starters. Although these children may produce some 3 word sentences most sentences are 1 –2 words.

- Children whose expressive mean length of utterance is more than 2 words may also use pragmatic branch starters
  - When the communication intent is not clearly communicated within the sentence structure (depends on the inclusion of the essential words to express the message and the use of typical word order).
  - To access sections where vocabulary is collected together to more efficiently express a particular communication intent, e.g. *I think it's..,*
3. The need for other predictive links to scaffold the child's inclusion of sufficient information to enable partner understanding.
4. The number of items the child can manage on one page opening.
   - If the child is able to manage *more than 40 vocabulary items* on a page opening, it is possible to include the main navigation index in all sections.
5. The child's ability to physically and cognitively manage a separate navigation index.
   - Physically manage a third section on communication book and remember to look outside of the main content page when they want to change pages.
   - Consider the range of physical positions the communication book will be used in as the third section may move around without a stable base of support.

<u>Lists</u> are included in every category/section of a PODD communication book to:
- Enable the inclusion of more fringe vocabulary without substantially increasing the size and weight of a communication book. Familiar partners can often use "20 questions" to discover who the child is talking about given a general hint, but unfamiliar partners have no idea of the possible options.
- Enable the addition of new vocabulary "on the spot". In addition to providing children with ready access to the vocabulary they require when they require it, this use of lists:
  - reduces the frequency required for hard copy changes to the communication book, e.g. adding new pictographs and replacing pages
  - provides substantial data on the child's vocabulary requirements when updating/customising communication books
  - provides data on the strategies children and their partners use to categorise vocabulary.
- Lists are usually accessed via partner assisted auditory scanning
- The vocabulary on the list is generally represented by a written word (for the partner to read out loud), but pictographs or hand drawn picture cues may also be added:

- In one-page opening PODD communication books, lists are generally included on the back of one page in each category, with a link button to direct the partner to *go to the list*.
- In two page opening PODD communication books, lists are generally placed on the left side of the last page in each category.
- Blank list spaces to add new vocabulary are usually printed onto stickers which are attached over the top of laminate in order to enable the addition of vocabulary using any available writing instrument.

Vocabulary placement within each section

Vocabulary is organised in each section or category in a PODD communication book with consideration to how the vocabulary is likely to be used.
- What communication functions are likely to be expressed using this vocabulary?
- What messages are likely to be expressed using this vocabulary?
- What other vocabulary is likely to be needed to communicate these messages? (see section on predictably associated vocabulary).

Vocabulary may be included in multiple sections and on multiple pages within the one section to increase the efficiency of communication:
- to express different communication functions. For example, the word *scary* may be included in both the *opinions* and the *something's wrong* sections.
- to combine words into sentences with a minimum number of page turns.

Page layout

The efficient location and use of vocabulary is facilitated by the use of strategies to ease visual scanning, visual location and motor access.
- Repeated vocabulary is located in the same position, or at least in a similar area, on different pages. Routine placement of vocabulary can facilitate the development of more automatic motor patterns to access frequently used vocabulary and navigation buttons.
- Similar types of vocabulary are grouped together on the page or within each section.
- The groupings are primarily according to part of speech, e.g. personal pronoun, verb, preposition, adjective, noun
- Meaningful semantic associations or alphabetical order are then used to sub-group large numbers of vocabulary within each part of speech. In PODD communication books semantic associations are used when obvious meaningful

associations are available. Alphabetical order is used to organise large vocabularies with limited semantic associations on complex displays

- o Using alphabetical order to locate vocabulary is often slower. It refocuses attention onto the written word, reducing the use of the pictograph shape and colour cues which can assist with the speedy location of vocabulary.
- o Children can use semantic associations prior to the development of alphabetical skills.
- o Semantic associations also facilitate the efficient use of predictably associated vocabulary when organising a general group of vocabulary over multiple pages

- Groupings are arranged into columns to facilitate the visual scanning of the group of words to locate the specific word.
  - o Visually scanning a column uses vertical (up/down) eye movements.
  - o Visually scanning across a row requires both horizontal (left/right) eye and head movements.
- Vocabulary is positioned to facilitate sentence building in English word order from left to right across the page.
  - o enables smoother visual and motor movements to locate vocabulary
  - o The columns are scanned to locate the specific word required (as in scanning a list to locate an item) and the sentence is built from left to right across the page (as sentences are written in connected text).
  - o This layout may support the use of more complete (syntactically correct) sentences.
  - o The ordering of vocabulary within a part of speech grouping follows typical English word order, e.g. verbs are positioned in relation to each other to support the production of the verb phrase from top-bottom, left-right.
- A modified Fitzgerald key is used to colour the button borders of vocabulary to assist with the visual location of vocabulary on complex displays.
- Navigation and operational buttons look different from vocabulary buttons.
- The ease and speed of access is considered when positioning high-use items.
  - o Customisation of the PODD page sets may be required to suit the movement abilities for children who use direct access.
  - o PODD page sets designed for the use of partner assisted scanning have been designed to enable faster access to the vocabulary likely to be frequently used.

o Different page layouts are often required to support the use of an alternative access methodology.

Organisation of vocabulary across multiple pages

Most sections or categories in a PODD communication book have multiple pages. In PODD communication books the following factors are considered when organising vocabulary across multiple pages:

- the time requirements for effective message transmission
- the frequency of vocabulary use, with more commonly used items positioned on the first page of a section
- the possibilities for meaningful sub-category groupings (words may be grouped onto different pages according to the predictably associated vocabulary)
- the positioning of predictably associated vocabulary within a section depends on how the vocabulary is to be used and its sentence position in relation to other words in that section. Generally:
   - o vocabulary which is primarily used to start sentences is positioned on the first page of the section or category
   - o vocabulary that is positioned between two words on the one page is included on that page
   - o repetition of the predictably associated vocabulary is more common on pages which will frequently be used to interact during an activity, e.g. in the activities sections, on activity specific pages.

Features of PODD communication books support the use of a broader range of vocabulary for children at earlier stages of communication and language development.

- The pragmatic branches with predictive links assist children to locate vocabulary in the communication book.
   - only needs to respond to the items presented at each level and relevant options appear automatically.
   - A partner can also suggest a pathway to assist the child to get to page they require
- The vertical presentation of vocabulary on different pages allows for larger vocabularies to be readily accessible to the child and partner when the child can only manage a more limited number of items on each page.

- Can have more vocabulary available for partners to provide receptive input (model/assist understanding) than the child is currently able to expressively use. Extra vocabulary is "hidden" in the vertical arrangement.
- Vocabulary is consistently available in the same location. Routine placement of vocabulary can
  - assist children to learn symbol meanings
  - allow use of placement cues
  - assist some children to manage more items on a page.
  - provides consistency of symbols available to communicate.
  - supports the child's learning to initiate and generate communication in different situations.

Aided Language Stimulation (Goossens', Crain and Elder)
- Input before Output
- Multi-Modal Language Stimulation - information needs to go in before it comes back out
- Analogy to Foreign Language Immersion
- Early vocabulary is first introduced receptively
- Language is not learned by straight imitation, it is learned through broad experiences that provide multiple repetitions of concepts, vocabulary and conventions. This provides a scaffold from which children can construct language.
- Utilize the same communication strategies that the child will need to use in order to communicate.
- Model a wide variety of communicative functions
- Model and encourage self-talk

Learning any Language Includes Subtle Pragmatic Issues particular to that language:
- Difference of Speed
- Vocabulary Selection
- Conversational Flow
- Use of multiple systems
- Access

Children who will need to use scanning systems have very limited opportunities to observe others using similar systems to communicate

Teaching versus Testing

Aided Language Stimulation for Prospective Scanners
- Crucial for learning how to use a system
- Difficult due to time and conversational flow constraints, but still important!
- Gives the partner a good perspective on what the child is facing
- Utilize a Multi-Modality Approach to Receptive Language

Strategies for Teaching Partner Assisted Communication:
- Input comes before output - Receptive Language first
  - Input should be the same form as the child will later use for output
  - Aided Language Stimulation
- Ask Questions - using the system
- Symbolize communicative intent
- Model communicative intent in context
- Encourage others to model
- Look for subtle, nonverbal communicative intents and negations
- Model a form of "Yes" / "No" as you go
- Start with the child's way to confirm - for example a smile
- Use of both a confirmation and negation can make the communication more clear
- Move toward adding technology when possible
  - May need to reduce cognitive task when adding technology
- Model initiation
- Assume the child has something to say
- Respond to all communication as intent - build a sense of competence
- Engineer opportunities for Expression according to communicative intent
- Communication is new information, not something already known by the partner
- Model operational speech as well as social speech
  - Use different tone, voice and expression for self-talk and operational speech than you do for the actual social communication.
- Model self-talk
  - Organize
  - Predict
  - Confirm
  - Remember
  - Encourage

- o Correct
- Model Additional Self-Talk that may be needed by a Scanner:
  - o What do I want to say?
  - o Do I have a way to say it
  - o Where is it?
  - o Listen, no, listen, no , listen, yes
  - o Weight shift, move, recover, wait
  - o Remember what I was Saying
  - o Monitor flow
  - o Hold that thought for later....
  - o Monitor communication partner
  - o Repair communication break downs
  - o What's that noise?   etc..........
- Give All the Choices First. Then, List them Simply and Slowly
- Position yourself for best observation by the child visually and auditorally
- Watch the child for clues of active listening and self-talking along with you to guide your pace and acknowledge his/her efforts
- State why you are turning to a particular page: "I'll tell you who" …"go to 14"… so I'll turn to page 14 which is the people page
- When the child is communicating to you, you can also use speech to let them know what operational cue, you are responding to.
- Be careful not to give too many verbal prompts
- Focus on giving logical feedback to the child - Not "hit the switch"
- Expand upon what the child communicates using the same system
- Focus on interaction
- Have a conversation
- Use Both "High Tech" and "Light Tech"

Partner learning

The complexity of knowledge and skills required by different communication partners depends on their relationship with the child and the skills of the child. There are basically two types of partners

1. Those who require sufficient skill to interact with the child. These partners need sufficient knowledge, judgment and skill to
   - understand the child's communication,
   - read the child's movements for communication/access methodology,
   - operate the PODD communication book, use partner assisted scanning

- provide general opportunities for the child to be an interactive participant.
- partners of children who require AAC to support their understanding will also need to develop sufficient skills to expressively use the PODD communication book to talk to the child.

2. Key communication partners who also need sufficient competency as "AAC users" to support the child's communication and language development.

What assisted communication partner learning?

- Immediate family members (McPhee & Porter, 1996; Porter, 2002) reported
  - Participation as a member of a group with other children and families learning to use AAC (PODD communication book).
  - Models of other people using AAC (PODD communication book) including a range of professionals (beyond the AAC specialist who is paid to use AAC), other parents and children.
  - Ongoing support with information presented and assimilated in a graded manner.
  - Supported use of the PODD communication book, i.e. a more experienced person accomplices the parent to communicate with their child.
  - Positive expectations that they and their child will (be able to) learn to use the system.
  - Talking about communication and AAC – helping them to understand why they might want to use AAC. This could occur formally or informally in a group with other parents or individual session.
  - Lessons on how to use the PODD communication book, demonstration of vocabulary organisation, operational buttons, access methodology (friendly teaching). This could occur formally or informally in a group with other parents or individual session.
  - Written information to reinforce information presented at workshops, etc.
  - Video of children and partners using PODD
  - Involvement in organising vocabulary in PODD communication book.
  - Aided systems which had enough vocabulary. Many partners reported frustration when trying to say something and finding that the word was not there. More vocabulary allowed for more frequent use of communication aid, providing more opportunities to practice and develop skills, speed of communication and confidence.

- o Meeting and observing parents and children who were already (further ahead) using a PODD communication book. Other parents and children have also commented positively on their experiences meeting adults who competently use aided communication. These experiences were reported to assist their understanding of what they were trying to teach and the possible positive outcomes for their child.
- Partners at school (Porter, 2004) reported that the following experiences assisted them to learn
    - o Models of child and experienced people (mother, AAC specialist, experienced therapists, assistants, teachers & peers) competently communicating.
    - o Experiences interacting with child (ongoing teaching/demonstration by child as they communicate using their PODD)
    - o Lessons on how to use the PODD communication book, demonstration of vocabulary organisation, operational buttons, access methodology (friendly teaching)
    - o Class session where everyone uses abridged PODD communication displays (only pages with necessary vocabulary) to play games such as "guess the picture", "Guess who" or "I went shopping and I bought …". These class sessions include explanations of how to use the PODD communication book, demonstration of vocabulary organisation, operational buttons, access methodology.
    - o Class copy of communication book for additional practice when the child is not present, e.g. adults could take book home and practice, peers can use to talk to each other, play.
    - o Practice sentences, graded learning
    - o Assistance of a more skilled person to support (scaffold) a new partner's interaction with the child. This partner
        - Verbally references what they are doing, what the child is doing, what they are responding to, and what this means as they model successful interactions with the child using a PODD communication book.
        - Gives "permission" and encouragement to others to use AAC systems.
        - Re-directs others to communicate directly with child
        - Talks partners through the process of using the PODD communication book ("Tell me what you want to say and I'll help you tell ……").

- Provides a "safety net" – supports successful interactions, assists to prevent and solve communication breakdowns – provides new partners with confidence to try.
  - o Comments from primary school age children on what assisted them to learn how to communicate with their peer who used a PODD communication book and speech generating device included
    - *"Have a go, watching people and learning"*
    - *"Have a go and watch people"*
    - "*Watching friends and playing around*"
    - *"Watching, listening, trying, watching (child), having a go"*

Learning to understand the child's communication

- All PODD communication books include instructions for communication partners. These instructions include information on how to operate the PODD, e.g. use the go to instructions, lists, and basic information on the child's access methodology.
- Most partners benefit from opportunities to observe others model how partner assisted scanning is used and opportunities for supported practice performing partner assisted scanning.
- Partner assisted auditory scanning usually requires additional opportunities to learn to perform the scan using "operational speech patterns" without reverting to social speech patterns.
- More intensive opportunities for learning are required with children who have not, as yet, developed readily intelligible movements for communication. In these instances the partner
  - o often needs to be taught which movements to attend to at a given time.
  - o Specific information analysing movements can be of assistance to less familiar partners e.g. He turns his head to the side for NO and moves his head down and up for YES. His head sometimes turns a little to the side before he drops it forward for YES, but it never comes forward when it's NO. So anytime you see his head come forward, you'll know he is saying YES.
  - o an experienced partner verbally referencing what they see the child do and their interpretation of this movement can also assist new partners to learn to recognise the child's movements for communication.

Learning to provide receptive input using a PODD communication book

Strategies found useful to support others learning to use a PODD communication book to provide receptive input include

- AAC experts provide lots of models using the PODD communication book
    - to communicate real messages
    - interacting with children and other adults
- Discuss the organisation of vocabulary - Involve key people in the selection and placement of vocabulary at the planning stage
- Copy of the child's PODD book to practice / familiarise self with vocabulary placement and organisation
    - This is particularly important for people who only have access to the child's PODD when the child is awake and with them. Many partners have commented that it takes off pressure if can practice by self
- Expect others to use dynamic displays
    - Explain (probably repeatedly) that it just takes some time - practice.
- Practice skills for aided language stimulation initially using
    - single level displays
    - displays with only a few levels.
    - add pages as gain confidence
- Grade the expectations for how many different messages you attempt to communicate. Assist the person to select
    - a few interactive comments / questions relevant to particular situations.
    - one communication function and use that branch for a defined time.
    - a few messages, requiring the use of a few levels, that they will try to use when the situation arises.
    - Can get different members of a family to choose different messages / functions (learn from seeing each other - spread the load).
    - Gradually add messages, functions or branches.
- "Script" (write down) messages, including the go to page numbers.
    - Doing this with the other person may help them to learn how to find vocabulary and "self script" - plan messages they can use.
- Workshop sessions where everyone practices uses a PODD communication book to say scripted messages.

- Teach the conventions for modelling using a PODD communication book, i.e. Conventions for modelling using a PODD communication book
    - Use the child's dynamic display to interact.
    - Model the child's method of initiating communication
    - Begin modelling from the front page
    - Follow the branch pathways to express your messages.
    - Speak aloud the label on the symbol as you point
    - Regularly recap the message "thus far"
    - Repeat the message in normal spoken English at the end
    - Use the student's method of access some of the time.
- Provide partners with written instructions outlining the conventions for modelling using a PODD communication book.
- Reassure people that they cannot "do it wrong" - i.e. making a mistake provides an opportunity to model "oops" behaviours for the child.

Establishing Habits

It is useful to discuss the basic habits that need to be established in the child's daily life to enable communication using AAC. These habits include

- **Communication systems always available**
    - "See child see book / device"
    - Strategies for transporting communication systems
    - Repeated modeling of this expectation
- **Expectations that child will participate in solving own communication challenges**
    - Responsible for message transmission
    - Avoid yes/no, "20 questions"
- **Providing receptive input using the child's AAC system**
    - Use PODD communication book to chat – say whatever you would normally say to the child (boring and interesting messages)

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