PODD

Pragmatic Organisation Dynamic Display Communication Books

Design and Implementation

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Mind Express Version

This book is an amalgamation of the previously available PODD resources

- Porter, G. (2007) *Pragmatic Organisation Dynamic Display (PODD) communication books: Direct access templates* Melbourne: Cerebral Palsy Education Centre.

- Porter, G. (2017) *Pragmatic Organisation Dynamic Display (PODD) communication books: Alternative access templates* Melbourne: Cerebral Palsy Education Centre.

With adaptations to suit production of PODD communication book resources using Mind Express Software.

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Contents

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Since 1990 I have been extremely fortunate to work in transdiciplinary teams of talented physiotherapists, occupational therapists and speech pathologists, problem solving the application of the principles of conductive education (Hari & Akos, 1988) to the teaching of movement to individuals who have severe sensory and/or motor challenges and complex communication needs. The knowledge that I have been able to share in this resource on developing movements for communication originates from my learning in these programs. I would particularly like to acknowledge Lynn Carter (physiotherapist), Claire Cotter and Fiona Beauchamp (occupational therapist) for their knowledge and years of commitment to problem-solve how individuals with significant motor and/or sensory challenges can develop the movements they require for autonomous communication.

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Introduction

The challenge!

"A child who uses speech will independently select the words she wishes to use from the vast array of words she hears/sees used everyday.
A child who uses AAC will independently select the words she wishes to use from the vocabulary other people have chosen to model and, for aided symbols, made available for her to use." *Porter & Kirkland, 1995, p.93-94*

An ongoing challenge for people supporting individuals who are learning to communicate using aided symbols (pictographs, graphic symbols, whole written words) is the need to predict and **provide sufficient vocabulary to both meet their present communication requirements and to stimulate the further development of their communication and language skills.** The complexity of this challenge increases when physical and/or sensory impairments limit the number of items which can be presented at one time.

The availability of electronic communication devices with multiple levels, dynamic displays and iconic encoding has significantly expanded the possibilities to provide individuals with access to a broad range of vocabulary. Speech generating devices can also support more independent communication with speech and print output. However, the operational parameters of electronic speech generating devices can also present some significant limitations. They need to be charged, may break down and cannot be used in all environments. Some individuals are also only able to operate their SGD in a restricted range of physical positions and set ups. It is therefore not possible to depend on an electronic device as the only option for communication. All people who use aided communication require a non-electronic (paper) option to ensure they have a method to communicate using all their language at any time in all situations. The availability of multiple systems provides the individual with possibilities to select the most effective / preferred method they have available to communicate in any situation. The 'cost of learning' to operate some of the Augmentative and Alternative Communication (AAC) technologies can also be high for young children.

"Whilst there is evidence that young children can be taught to use these technologies, doing so requires significant instructional time - time that could be better spent by young children learning to communicate, learning language and literacy skills, playing and socialising with peers." *Light & Drager, 2000, p.45*

A significant advantage of non-electronic (paper) systems for some individuals is the availability of a **'smart-partner operating system'**. Human partners can observe and problem solve in ways a computer operating system cannot. For example, using a non-electronic system a partner can interpret which of the fingers touching the display is pointing to a symbol and which are resting, can wait additional time when they see the communicator is about to indicate 'yes' and can interpret the body language and facial expressions that indicate an error has been made. Partners can also extrapolate from key words the meaning of a message using contextual cues. For some individuals the 'smart-partner operating system' has additional advantages in the earlier stages of learning. Partners can provide extra processing time before turning pages to support learning

navigation patterns. For some individuals, the partner's role in operating the non-electronic system also supports learning about human interaction and the purpose of communication. The focus shifts to interacting with their partner rather than the device. Individuals who are still learning to operate an electronic system may be able to access and use more complex vocabulary organizations in a non-electronic system with the support of a smart-partner.

It is important to remember that there are **three main components involved in selecting a communication aid.**

1. Hardware

Hardware for AAC systems may be a non-electronic (paper) communication book or board, a dedicated speech generating device, PC, tablet or iPad. There is often a focus by families and professionals on the specific features of different hardware options. For example:

- Size, shape, display, battery, memory, processor speed, speech output volume, Bluetooth, IR, WiFi, mounting, stand, durability, LOOK
- Features related to access such as touchscreen, keyguards, auditory and or visual scanning, eye-gaze
- Computer access and printing
- Other, non-communication, functions of the hardware.

It is important that the selection of the hardware does not become the sole focus during AAC systems assessments and prescriptions.

2. Software or Application

Some dedicated speech generating devices are pre-loaded with one specific software option. However, many dedicated devices and PC, tablet and iPad hardware can now be used with multiple software options. There are also multiple software options to publish communication boards and books. One key variation in AAC software and applications is the symbol set.

Each software or application will provide different features to support the creation of AAC displays to support the individual's communication and language requirements. For example:

- Navigation, word prediction, rate enhancement, word morphology, coding
- Options to support access / layout, e.g. button spacing
- Customisation and programming options.

3. Language organisation or page set

This is a **critical component** to provide an individual with access to vocabulary they require to communicate. It is possible to have wonderful hardware and software features on a communication aid, but if it is not possible to access the vocabulary required to communicate your message, or the language organisation does not efficiently support the individual to say what they want to say, when they want to say it, then the communication aid will not be useful to the individual.

PODD is a language organisation that may be presented on a range of different hardware using a variety softwares or applications with the required programming features.

A significant challenge for providing vocabulary using whole word/phrase graphic symbols is the requirement to have the vocabulary presented spatially in a 'hard copy' physical form. There are limitations on the number of items that can be included on one page. It is therefore necessary to determine appropriate strategies to organise vocabulary in aided systems to provide the individual and their communication partners with easy access to the broad range of vocabulary items they require to communicate. In other words, to ensure that they can get to the range of words they need.

What vocabulary do we need to provide?

Beukelman and Mirenda (2013) provide a useful overview of the range of factors that influence augmentative and alternative communication (AAC) message selection. They emphasise the uniqueness of preselecting vocabulary and phrases for AAC systems.

"message selection during natural speech interactions and written communication is usually so automatic that even most AAC specialists have little experience selecting vocabulary items in advance of the acts of speaking or writing." Beukelman and Mirenda, 2013 p. 18.

The variation in personal word choice further complicates the matter. Vocabulary usage patterns will vary with different partners (e.g. friends or teachers), in different environments (e.g. home talk and school talk) and the modality used (spoken and written communication). Individuals who use aided AAC may also use more multi-modal communication, combining their aided language mode with informal signals, to increase the efficiency of their communication. This can influence the frequency of word usage in situations where a nod of the head, wave of the arm, quick eye-point directly to an object would be more efficient. Vocabulary usage patterns are also influenced by factors such as age, gender, social role, social contexts, medical condition and personal style.

The purpose, or intent, of the communication also influences the vocabulary required. Is the communicator's aim to establish social closeness, have a need met, a complaint heard, demonstrate knowledge, request information, relate information or another specific purpose? The messages of conversation include greetings, small talk, narration, story telling, public speaking, procedural descriptions, content-specific conversations, wrap up remarks and farewell statements (Beukelman and Mirenda, 2013).

The reason for providing whole word and phrase vocabulary in AAC systems also influences the vocabulary required. The current communication capabilities of the individual will influence the messages selected for inclusion in the AAC system. Individuals who are able to spell will primarily select messages to enhance the rate of their communication and to reduce fatigue. Individuals who are not (as yet) able to spell sufficiently to generate all their messages, will require access to a broad range of vocabulary to meet all of their communication requirements.

Beukelman and Mirenda (2013) identify two main types of vocabulary requirements:

- **Coverage vocabulary**. This is the vocabulary needed to communicate essential messages. It is highly dependent on the needs of the individual and may vary in different environments.
- **Developmental vocabulary**. This is vocabulary that the individual does not yet know and is selected for inclusion in the AAC system to encourage language development and growth. Developmental vocabulary needs to include words from a range of semantic categories and enable expression of all (age relevant) pragmatic functions. Vocabulary and morphological markers also need to be available to lead the individual's development of syntax (over time) for the intelligible communication of more complex, abstract ideas and messages.

The frequency which vocabulary may be required by the communicator influences the location of the word/phrase within the language organisation. Based on frequency of use, two types of vocabulary are identified in the AAC literature.

- **Core Vocabulary.** Core vocabulary is a small set of simple words, in any language, that are used frequently and across contexts (Cross, Baker, Klotz & Badman, 1997). Approximately 75-80% of what we say uses the same 200 core words. These are the general words used in most sentences, such as *I, the, to, and, a, it, is, was, that, in, of, my, you*. The vocabulary is not specific to the individual. It is commonly used by most people across the lifespan.

- **Fringe (extended) Vocabulary.** Approximately 20-25% of what we say uses all the other words in our vocabulary. These words may be specific to the individual, or more generally used. In terms of frequency, a particular word may be relatively frequently used by an individual (such as the name of a friend, a place they go, an activity they frequently engage in), occasionally or rarely used (such as the name of your first teacher or the place you went on holiday years ago).

All individuals require access to both core and fringe vocabulary. Individuals cannot intelligibly express all of their messages using only core vocabulary. Core vocabulary is generally dependent on an established topic, context or other words in the sentence to convey the specific meaning.

For example: If an individual initiates communication without an established topic or out of context and uses only core vocabulary to communicate, "I have that" it will probably be unintelligible to the partner. However, if the individual says the same words after someone else has just related that they recently bought XXX (book title), or shown their new book, the partner would interpret the core vocabulary message using the context to mean 'I have that book".

The frequency of core vocabulary use, gives these words priority to the faster to access locations within AAC language organisations. Factors such as the increased use of multiple modes of communication, the individual's current stage of communication and language development and whether the language organisation is presented on a non-electronic aid or an electronic speech generating device can alter the frequency of core vocabulary use by people who use AAC.

For example: The core word THAT is frequently used from the earliest stages in spoken language development in combination with the gesture of a point to the referent. Using a communication book, an individual cannot simultaneously select the symbol THAT from their display and point to the referent. As the actual meaning of the message is conveyed in the point to the referent (not the word), individuals using aided language are more likely to select to point to or look at the referent than to point to the aided symbol THAT without the gesture. Therefore, the frequency of use of the word THAT in early language development may be less for the individual using aided symbols than it is for children using spoken language.

It is necessary to consider the vocabulary usage patterns of people who use AAC in general, and the individual in particular, to prioritise the core and fringe vocabulary into faster and slower to access locations in an aided language vocabulary organisation.

Vocabulary selection and organisation for AAC is a multi-factorial, decision-making process with compromises required due to the inability to have all of words the communicator and their partners may need readily available on the one page to be selected with equal speed. It does not take a person using speech longer to say a fringe word than a core word; a speaking person does not loose the ability to produce a word because they rarely use it!

Strategies to organise aided language vocabulary

Many different, often complementary, strategies are employed to expand the range and improve the organisation of aided symbol vocabulary. These aids include communication boards and books, multiple activity/topic displays, dynamic displays, and message encoding techniques. Non-electronic solutions include:

- multiple activity and/or topic displays available in the individual's environment
- core vocabulary boards (with or without additional fringe vocabulary)
- displays which accommodate many levels of vocabulary i.e. multi-level communication books.

Multiple activity/topic displays

Topic and activity displays provide an individual with a concentrated vocabulary to communicate in one situation or about one topic. The selected vocabulary should enable expression of a range of communication intents and messages related to the targeted activity/topic. The restriction of vocabulary to that required for the current activity/topic can increase the efficiency (speed) of communication during the targeted activity/topic. Activity displays may be positioned with the activity materials or where the activity occurs in the environment for easier use. Activity/topic displays may also be stored separately and presented to individuals by communication partners at appropriate times, i.e. during that activity or when discussing that topic.

Limitations in the use of multiple activity/topic displays include:

- The vocabulary is selected by others and does not include vocabulary to say messages that were not predicted as part of that activity/topic. This doesn't support individuals to introduce or change to a different topic.
- Individuals may have limited ability to independently access the vocabulary on these displays at other times, i.e. independently retrieve the display or access the display when in a different environment.
- Vocabulary may appear and disappear at the discretion of others.
- The changing presentation of symbols may complicate and slow the learning process for individuals who have complex learning requirements. For example, a child may have found that touching the symbol to the left got HELP a minute ago, and they would like to say HELP now. However, that display has been moved away and replaced with another display when the activity changed. Touching the symbol on the left now makes their partner CLAP and they no longer have a symbol available to ask for HELP.

Burkhart & Porter (2006) suggested that a systematic approach to present vocabulary that doesn't disappear and can be built upon, instead of replaced, will more effectively support learning because:

- the brain builds understanding based upon patterns
- working memory can only deal with a limited amount of information at a time
- routine placement and availability of symbols assists to develop automaticity for more efficient location of vocabulary.

Core vocabulary boards and general interaction displays

Core vocabulary boards or general interaction displays are used to enable communication across a range of activities and between activities. The vocabulary allows for the expression of a range of communication intents using very general vocabulary, to say a LITTLE AT ANY TIME.

Vocabulary for specific content words (fringe, extended vocabulary) is not included. This makes it difficult to introduce a new topic or talk about something unknown to the partner. Communicating using only core or general vocabulary requires the partner to know the context of the message in order to interpret the communicator's message. The context for interpreting the message may be established by the current activity, conversation or partner's question.

For example, using a core vocabulary board a child indicates I WANT TO DO THAT. This is a perfectly intelligible message if communicated after someone has just fed a doll a bottle - it means "I want to feed the doll a bottle". It would also be intelligible if communicated after someone had just said "I am going on holiday to the beach" - it means "I want to go on holiday to the beach too". However, if an individual initiates the message I WANT TO DO THAT out of any established context, the partner will not know what THAT refers to and the message will be unintelligible.

Strategies to use general core words flexibly to describe or hint at another word are often recommended to extend the range of meanings that can be expressed using a core vocabulary. However, thinking of hints that will be intelligible to the partner using only core vocabulary can be quite challenging for individuals at earlier stages of development and interpreting the hints often relies on considerable shared knowledge with the partner.

Some core vocabulary boards include side panels or flip charts to include more extended vocabulary usually organised via categories.
Activity and topic displays are often used alongside general interaction displays to provide the individual with more specific vocabulary.

A general interaction display can be used:

- as an early introduction to Pragmatic Organisation Dynamic Display (PODD) books to develop the concept and habit that aided language is used to communicate all of the time. It is the individual's method of communication, not just a teaching task or strategy to be used at specific times. This is usually done for a short period of time before the individual has access to their own PODD communication book in daily life and/or the key partners have participated in training to use the PODD communication book.
- to accommodate environmental constraints, including vocabulary that is frequently required/useful to say quickly, for individuals who also have access to a system with more expanded vocabulary, e.g. PODD communication book/speech generating device.

Multi-level communication books

Communication books with multiple levels have frequently been developed to expand the range of vocabulary available for people who use pictographs and/or whole written words to communicate. The multi-level communication book stays with the individual and vocabulary is available in multiple environments and activities. A multi-level communication book can allow an individual to communicate for a broad range of functions across a variety of topics, to change and introduce topics. However, the multi-level communication book may not always provide sufficient vocabulary to enable an individual to say a lot about one topic or in all activities. This varies depending on the design and complexity of the individual book.

Numerous designs for multi-level communication books 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 communication books has typically been either:

- Taxonomic - organised according to categories
- Schematic - organised according to events or activities
- Topic – organised according to topics
- Anecdote - chunking of information to relate scripted stories/anecdotes.
- Core vocabulary plus extended/fringe vocabulary organised by category or activity/topic

Common difficulties associated with the use of multi-level communication books have been:

- Teaching the individual and communication partners how to move between levels (pages) to locate the required vocabulary to communicate:
    - a range of messages
    - for a variety of communication functions
    - in a range of situations.

- The speed of communication:
    - number of level changes required to communicate a message
    - ease of combining words for different messages.

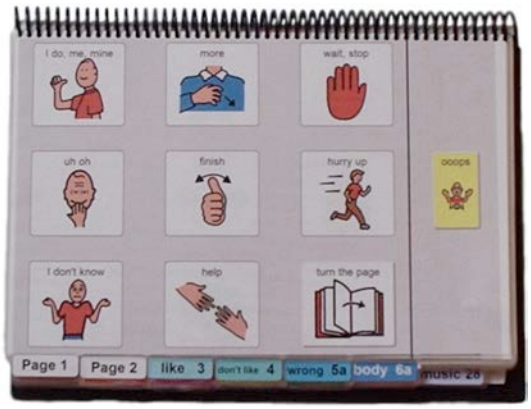
- Enabling quicker access to predictable messages and access to a broad vocabulary for spontaneous, unpredicted messages.

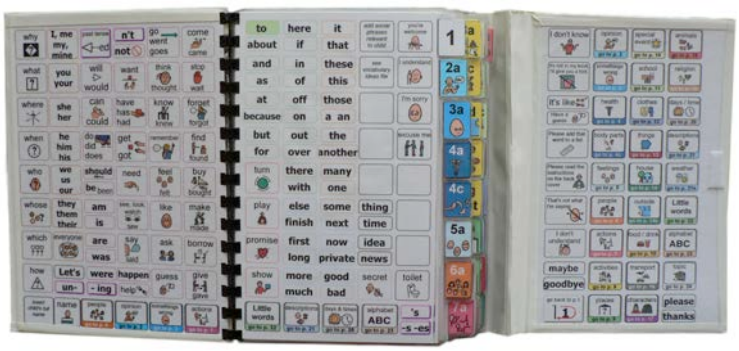
The pragmatic organisation of dynamic display (PODD) communication books addresses these challenges.

Pragmatic organisation dynamic displays (PODD)

In PODD communication books and page sets for speech generating devices (SGD):

- Vocabulary is organised according to communication function and conversational discourse requirements.
- Multiple vocabulary organisations (e.g. pragmatic, core, category, activity, topic, social, anecdotal) may be used to suit different communication requirements, discourse and vocabulary usage patterns.
- 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 individual's development.
- Individual requirements (skills and lifestyle) are taken into account in the design. This includes a range of access methodologies and visual presentations.
- The routine placement and availability of vocabulary assists to develop automaticity, language learning and initiation.
- Strategies are available to:
    - scaffold the communicator's inclusion of sufficient information to enable partner understanding
    - compensate for AAC system limitations.





The concepts and strategies of the PODD approach can be applied to both non-electronic systems (PODD communication book) and electronic speech generating devices (PODD page sets for dynamic display communication devices).

Differences in the 'real estate' (size and shape of device), functionality, smart-partner operating system versus computer operating system and the addition of independent speech output requires some variation from the specific layouts used for PODD communication books. **PODD page sets for speech generating devices are NOT identical to the corresponding communication book.** It would not be appropriate to merely copy a page set designed for a paper book onto a speech generating device, as the result would not meet the overriding principle of PODD design – that is, to always select the most efficient option to enable the individual to meet their varied communication requirements.

Transparency between PODD page sets for the speech generating device and PODD communication books at the same language level reduces learning time and increases the ease of switching between systems to support autonomous communication at any time.

The development of PODD

"..the adults who plan and adapt the language environment of children who use alternative means of communication should be providing models of language use in their own form. Moreover, these should be used for genuine communicative purposes, in all types of everyday settings and when the children are very young. One advantage for adults using a child's alternative language forms is that they may be able to identify shortcomings of the system and suggest ways and means to overcome them, as well as demonstrating to the child how the system may be best used."

Renner, 2003, p.79

The development of the pragmatic organisation of dynamic display (PODD) communication systems has been influenced by:

- the experiences of children and adults who use AAC and their communication partners using multi-level communication books in their daily lives
- key underlying principles of AAC intervention.

In 1993, a team of speech pathologists (Porter & Kirkland, 1995; Porter, Kirkland & Dunne, 1998; Porter, 2000) began encouraging parents and professionals to attempt to use activity displays and multi-level communication books to provide aided language stimulation (Goossens', Crain & Elder, 1992). PODD communication books subsequently evolved as a result of problem-solving the design features which enabled more effective use of these multi-level communication books with individuals who have complex communication needs and their families.

As these individuals gained access to electronic speech generating devices (SGDs), PODD concepts and strategies were applied to the creation of page sets for dynamic display devices. Some problem solving was required to capitalise on, and accommodate for, the different features of computer operating systems, but overall the vocabulary organisations are very similar to the non-electronic communication books. This similarity between the individual's non-electronic and electronic systems has been found to reduce teaching-learning time and facilitate easy transition between the two systems to meet different communication requirements for both communicators and their communication partners.

The features included in PODD books and page sets for SGDs have also been influenced by the general **aims** and desirable **outcomes** for all individuals using **AAC** illustrated by the AARCH. These concepts are used as quality indicators as to the effectiveness of AAC interventions and have influenced both the design and intervention choices made using the PODD system.

Communication autonomy refers to where the message originates, that the individual can communicate according to his or her own intentions or, put more simply, the individual is ***able to say what I want to say, to whoever I want to say it to, whenever I want to say it, however I choose to say it.***

von Tetzchner & Grove (2003) describe autonomous communication for the person who uses AAC as when the individual:

- has few restrictions on what they can say
- is responsible for their own language production
- is able to express self in accordance with own communicative intentions.

Communication autonomy is not dependent on the individual's ability to independently operate their AAC system. Others may set up or participate in the operation of an AAC system in a manner that supports the individual's autonomous communication. Differentiating autonomous communication from the independent operation of a communication system is particularly important for people who have severe physical disability using partner-assisted alternative access methods such as eye-gaze, partner-assisted scanning or coded access.

Autonomous communication is dependent on the individual's access to the vocabulary they need to generate their own messages, to say what they want to say. In this respect the ability to combine speech sounds or letters (spell) to generate words "from scratch" provides the most individual autonomy. For individuals who currently cannot spell all the words they want to communicate and rely on whole word/symbol based AAC systems, the degree of autonomy will be influenced by the size and diversity of the vocabulary pool available for self-expression. However, autonomous communication does not always require complex or sophisticated language. The complexity of language required by an individual to be autonomous depends on the complexity of their thought and the messages they need to express.

Autonomous communication also involves being able to express my message, "when I want to say it". Enabling communication to happen at any time, according to the individual's intentions, can be an issue when communication requires the use of an external aid or device. Ensuring that the person is able to initiate use of an aided system at any time, in all environments and situations according to their own intentions is essential. Where is the AAC system when the individual has something to say?

Communication accessibility requires that people in the individual's social environment understand their form of communication and are willing and able to support the individual's autonomous communication and scaffold it in the acquisition period (von Tetzchner & Grove, 2003). Training people in the individual's social networks to have sufficient knowledge, judgement and skills to be competent communication partners and general community capacity building is required to develop communication accessibility for individuals who use AAC. Communication accessibility is dependent on others developing habits which support the individual's autonomous communication.

Communication Requirements. The general aim of AAC intervention could be stated as:

For the person 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)

This aim focuses assessment and intervention on problem-solving in order to *discover the circumstances which will enable the individual to achieve their present communication requirements and to provide opportunities to stimulate development of more intelligible, specific, efficient, independent and socially valued communication in the future.*
The aim is subsequently used as a **quality indicator**.

Is the intervention enabling the person to meet their receptive and expressive communication requirements more intelligibly, specifically, efficiently, independently or in a more socially valued manner than currently available to them?

Addressing these communication requirements should enable the individual to more fully and effectively participate in all of their various social roles including interpersonal interaction, education, employment, and community activities.

This aim encourages the consideration of multiple solutions and modes of communication for more efficient, autonomous communication to suit varied requirements.

Communication is multi-modal and different forms of communication may be more or less effective to communicate:
- different types of messages
- in different situations
- with different partners.

To determine the most appropriate communication form (modes, symbols, aids, techniques) to suit the communication requirement:
- Focus on the function and content of the communication, with the form of communication decided in relation to its effectiveness at transmitting the message in a given situation.
- Evaluate the communication form in terms of its relative effectiveness (or potential) to enable the individual to meet his/her varied communication requirements.

"an individual does not abandon simpler strategies in the march towards independence. Instead the individual acquires more and more sophisticated communication methods to add to an existing repertoire."
Blackstone & Hunt Berg, 2003. p. 15

"the function of communicative abilities is to solve communicative challenges."
von Tetzchner & Grove, 2003 p.14

Communication Competence is "the quality or state of being *functionally adequate* in daily communication, or of having *sufficient knowledge, judgement, and skill* to communicate" (Light, 1989 p. 138). Communication competence for the individual who uses AAC requires the mastery and integration of sufficient linguistic and operational knowledge and skill to operate the AAC tools and sufficient social and strategic knowledge and judgement in interaction. (Light, 1989; Light & McNaughton, 2014).

Habits for communication at any time include routinely ensuring the AAC system is carried and available for use in all situations and allowing time for the person to communicate their own message to support autonomous communication. Habits such as putting the AAC system away "until needed", asking lots of YES/NO questions, offering choices from a limited set of options or speaking for the person do not. The development of

healthy AAC habits is dependent on sufficient experiences or practice using an AAC system within the context of real world challenges to develop some degree of automaticity. The motivation to embark on this practice of using AAC, especially in the early stages before the development of automatic habits, will in turn be dependent on the partner's beliefs and understanding of the purposes and critical importance of AAC use to the person who relies on this method to communicate

These principles of intervention have been applied to the features included in PODD communication books. These criteria are also applied to weigh the relative pros and cons of different design decisions in order to make compromises which most effectively enable each individual to meet their communication requirements.

It is vital that the language and physical features of a communication book enable the individual to more successfully meet their actual, daily life, communication requirements. Poor uptake of aided communication systems in the individual's daily environments has frequently been a challenge in AAC interventions. Asking the question "What does the individual need to say, when, to whom and how?" can clarify the individual's specific communication requirements for an aided system and raises considerations for the design of effective AAC systems.

Figure 2 includes some specific questions to clarify the language and features required in the AAC system to meet an individual's communication requirements. The range of PODD communication book templates has been influenced by the answers these questions have generated.

What does the individual need to say	When, where and to whom	How
What vocabulary/messages does the individual need to communicate? What functions may be expressed with this vocabulary? How quickly does the message need to be related? (in a priority continuum!) What type of branching organisation suits each function? What are the individual's functional and developmental requirements for vocabulary items - considering pragmatics, semantics and syntax? What vocabulary does the individual require to manage the interaction? What other vocabulary would predictably be used with this vocabulary?	Where and when is the individual likely to use this vocabulary? Are there any practical considerations related to this environment? What is the individual's physical position? What space is available for the AAC system? Which display features will best suit these situational requirements (size, access method, layout, type of display, included in book or presented separately)? Who will they be communicating with? Are there any specific communication partner requirements? What modes of communication do these partners understand? How can we support the intelligibility of this individual's use of aided language with a broad range of partners? How much scaffolding needs to be built into the design of the system to support the partner's understanding of the individual's messages? What are the time requirements for communicating in this situation?	What are the most effective modes to communicate these messages in different situations? What is the most efficient, intelligible, independent, sufficiently specific and socially valued mode? What are the requirements for aided language within the individual's multi-modal communication systems? Does the individual require graphic symbol vocabulary to communicate that message or will they use another mode? How can we increase the efficiency of using an aided system? How much scaffolding needs to be built into the design of the system to enable efficient and intelligible communication? How can we support the individual to independently access vocabulary? (Related to the concept of communicative autonomy.)

Figure 2. What does the individual need to say, when, to whom and how?

Features of PODD
Pragmatic Organisation of Dynamic Displays

Factors influencing the overall organisation and features included in a PODD system include:

- Communication and language requirements - both current and developmental
- The number of items on a page opening
- The access methodology
- Whether it is presented as a non-electronic communication book or on an electronic speech generating device.

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.**
The side panel is accessible from all pages and generally contains the main navigation index and phrases to manage interactions.

Size

PODD communication books come in various sizes. The overall size of a communication book not only needs to suit the individual's range of movement and visual skills, but also fit into the daily environments in which the individual needs to communicate. As individuals using AAC need to communicate in a range of different positions, and finding space to position a communication book in amongst a range of other activity materials can be difficult, the largest size for a PODD communication book is on A4 / US letter size paper. Two-page opening PODD communication books may be wider than this size when open, but not when closed.

Whilst larger sizes may initially appear preferable to suit the individual's requirements, experience teaches that daily use of larger communication books is often restricted. There is little benefit in having a book that is not being used to communicate throughout the day.

The range of sizes available using the PODD templates can be further extended by using a printer with scaled printing capabilities to print the pages larger or smaller than the original.

Symbols

This resource uses the coloured Picture Communication Symbols (PCS). The coloured symbols have been selected for use as the colour generally assists with the differentiation of symbols, including those with a similar shape, and the visual location of symbols on a page (Wilkinson, Carlin & Jagaroo, 2006). Higher contrast symbols may be used to assist individuals who have visual challenges using the standard symbols.

The PCS symbol set includes multiple pictographs for some vocabulary items. The selection of symbols for use in the PODD books / page sets aims to support the individual's development of language and literacy. One PCS symbol is generally selected to represent the same word for all variations of the word meaning. In page sets designed to support the use of multi-word utterances individuals are encouraged to combine symbols to produce multi-word concepts/labels, e.g. to use 2 pictographs, FRUIT + SALAD, rather than the single PCS symbol for FRUIT SALAD.

It is recommended to use PCS symbols to represent people in PODD systems. Whilst photographs of people may be easier to recognise, it was found that photographs often distracted communicators (and their partners) from the message as they showed/looked at the photos of people in the individual's life, i.e. used them like a photo album. Messages often became very confused as the photos of people, who were not part of the message, were shown and talked about. If photos are used for family relations, e.g. MUM, DAD, GRANDPA, it is more challenging to use these items go refer to another person's relation, e.g. SARA'S MUM. PCS symbols to represent people can be found in Mind Express by typing "person, girl, boy, man or woman" in the symbol finder window.

Partner powered level changes

A dynamic display is a *"communication aid or computer displays of symbols that change constantly based on previous system selections."* Glennen & DeCoste, 1997, p.773

A common difficulty using multi-level communication books is efficiently turning to the required page. Frequently it has been only the designers or very frequent users of a communication book that know which page to turn to next. Taking time to read each page tag, looking for the name of the required page, is also very time consuming.

A number of simple, yet effective, features are incorporated into PODD communication books to improve the efficiency of page turns, support and increase the communicator's autonomy by directing which page their partner turns to next and the accessibility of communication with a broader range of partners.

1. Go to page (*number*) instructions.

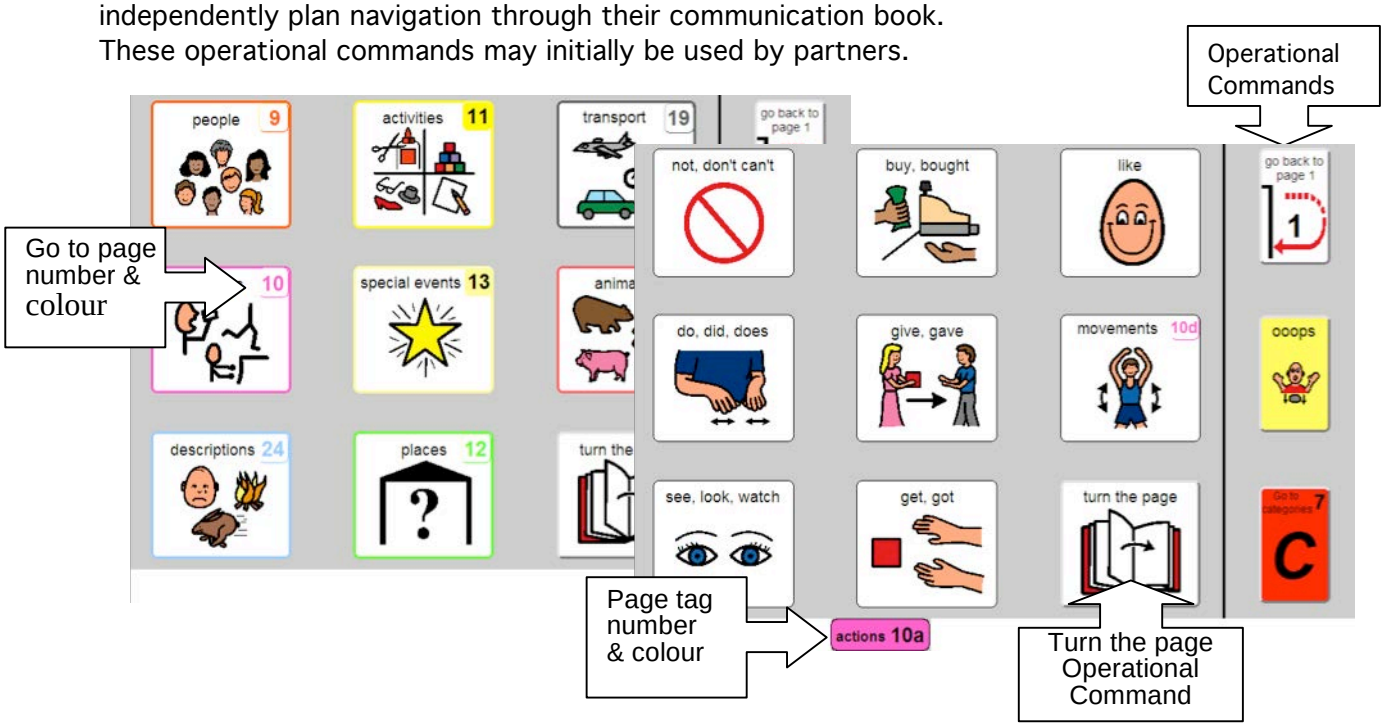
"*Go to .....*" instructions are associated with symbols functioning as part of the branching or navigation system to move between levels in the communication book. Using a "*go to page (number)*" rather than "go to page *name*" allows communication partners to use their knowledge of the sequence of numbers to find the required page more efficiently. They do not have to read the name of each page and they have some concept of how many pages they will need to turn over to get to the required page.

2. Coloured page tags.

Matching the colour of the "*Go to page (number)*" to coloured page tags adds another cue to assist with the efficient location of the required page. The PODD system uses consistent colours for categories across different page sets (see the *colour master file* on the CD).

3. Operational commands.

Symbols for specific operational commands such as "*turn the page*"; "*go to categories*"; "*go back to page...*", are included to facilitate the communicator's control of movement between levels. It has been observed that the presence of these operational commands also provides partners with ideas of which page to move to next with individuals who are not yet able to independently plan navigation through their communication book.
These operational commands may initially be used by partners.



Individuals are encouraged to use the “go to” and operational command symbols until they are able to directly move to the page they require using the page tags.

- Communication frequently breaks down when individuals independently turn the pages of their communication book looking for vocabulary.

- Turning the pages one by one looking for vocabulary is very time consuming and individuals can get distracted on the way, pointing to symbols of interest that are not part of the original message.

- Some individuals with sensory processing challenges are stimulated by turning pages and can become distracted from the interaction by the physical activity of turning the pages. In this instance, try holding the book on the page edges at arm’s length from the child saying, “You tell me which one you want and I’ll turn the page” or use partner-assisted scanning with the book held well away from the individual. Repeated experiences successfully communicating assists most individuals to learn to inhibit their desire to turn pages as they begin to focus on communicating their message.

Pragmatic branch starters

Pragmatic branch starters can perform two different functions.

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 generally used to establish the communication intent of 1-2 word utterances.

“Although not formally studied to date, several professionals have observed difficulties in establishing the communicative intentions of one- and two-word utterances on the part of children using augmentative systems. Able-bodied children often use environmental support (e.g., holding up a toy car; pointing to a dog) and intonation patterns to suggest the types of intention meant. These supports are frequently unavailable to physically disabled children. Consequently, these early developing utterances may be misunderstood by the partner.”
Kraat, 1987, p. 90

In spoken language development, intonation patterns, facial expression, gesture, movement and actions in the environment support the partner’s interpretation of the communicative intent and specific meaning of 1-2 word utterances.

For example:
A young child speaks the single word “shop”. This word may be expressing a range of different meanings depending on the intonation, facial expressions and actions accompanying the spoken word.
- Raising intonation and questioning facial expression = “Can we go to the shop?”
- Pointing to self with a telling facial expression = “I went to the shop.”
- Holding up the toy cash register = “Let’s play shops.”

There is no equivalent to intonation inherent in the use of aided symbols. Individuals who use aided symbols may have limited physical ability to use the facial expressions and actions typically used to support the interpretation of 1-2 word sentences. The partner has to interpret the meaning of 1-2 aided symbol sentences from the context and their knowledge of the individual.

There is great variability in the natural abilities of partners to consider the range of messages an individual may be communicating using aided symbols. Utterances of individuals who use AAC are frequently interpreted as requests, unless the individual specifically indicates they are communicating for a different function.

Familiar partners can more frequently use their knowledge of the individual’s life experiences, interests and personal preferences to interpret the meaning of one to two word sentences. For example, a child indicates “I GO”. The familiar partner, having observed the child was excited about being invited to a birthday party, uses this knowledge to interpret the message and respond, “yes, you are very excited that you are going to Jason’s birthday party”. This partner would probably have also interpreted this message if the child had just indicated JASON or BIRTHDAY. Partners may not be conscious of how much knowledge they are contributing to the child’s communication and be unaware of how unintelligible the child’s message would be to other partners. Ongoing reliance on partner knowledge to

communicate can have some significant effects on an individual's development of language. The individual is not stimulated to add more words to their sentences to clarify their message. At these earlier stages of development, the individual is also unlikely to identify the role of partner knowledge and judge interactions with less familiar people as unsuccessful or not possible. This can result in the individual subsequently selecting to only communicate with a few, knowledgeable partners.

Using categories as the main navigation index or the single word on a core vocabulary board, the partner needs to interpret the intent from the words alone.

For example:

Categories index – go to places

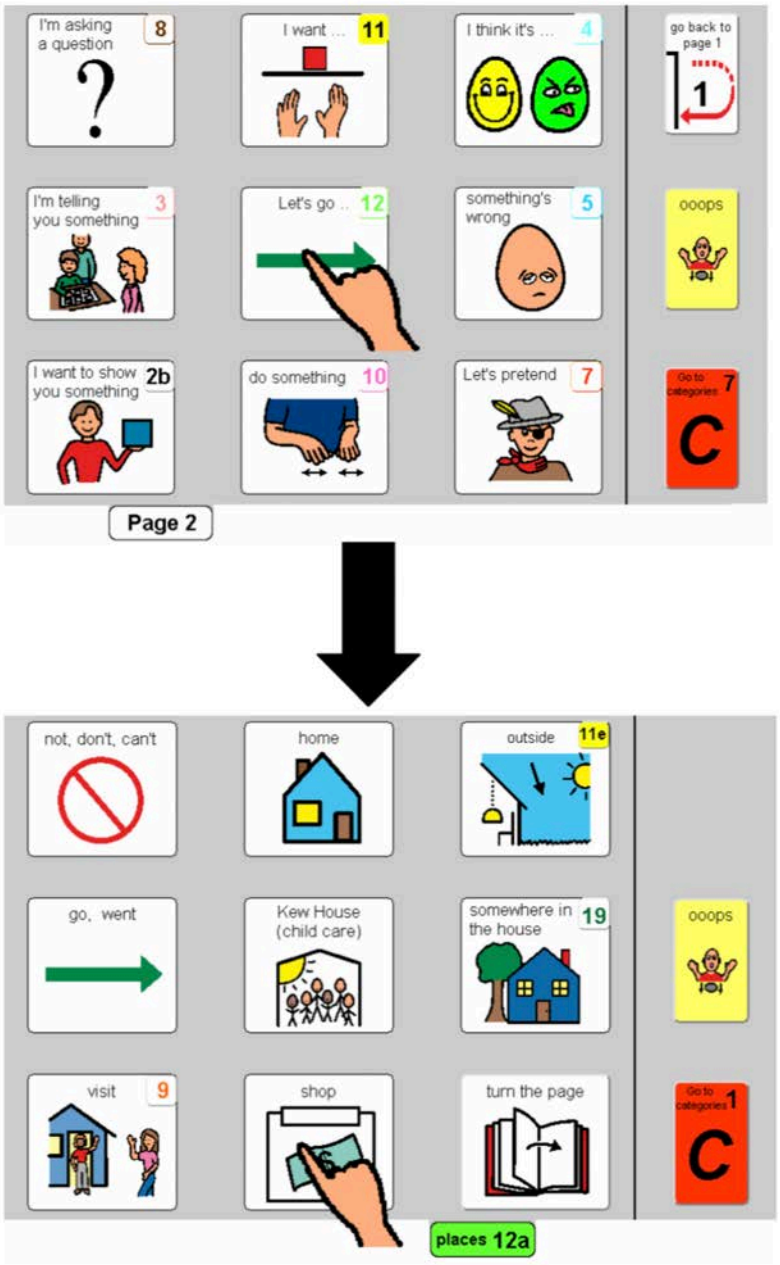
"shop"

For individuals who communicate using 1-3 key word sentences, it is useful to include pragmatic branch starters to enable the communicator to indicate the communication function in addition to the message.

Pragmatic branch starter

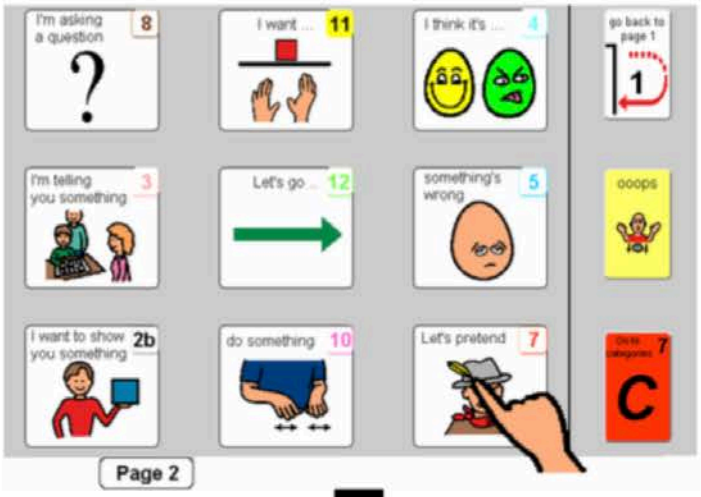
"Let's go"

"shop"



Pragmatic branch starter

"Let's pretend"



Categories index
"places"

"shop"

As an individual's communication skills increase to sentences of 3 or more words, reliance on the use of pragmatic branch starters decreases. The intent of the message is now included in the syntax of the sentence.

The wording of the pragmatic branch starters attempts to use phrases that naturally occur, are often said to, around and on behalf the individual with complex communication needs. For example, *Something's wrong, I want something*; *He wants to go somewhere*; *I'm asking a question.* This enables the individual and their partners to use recognition of the intent. Conversational wording also helps the focus remain on conversation, as the pragmatic branch starters are an integral part of the message. This also reduces the partner's perception that they are turning a lot of pages before they get a message.

Some ideas for branch starters

I like this / I don't like this
I have an opinion (this branch starter may replace like and don't like branch starters)

Something's wrong
I want something
Let's go
Do something
I'm asking a question
I'm telling you something
I'm telling a story
I have an idea
Do you want to hear a joke?
Let's pretend
I want to show you something
I'll tell you how to
Remember to

The wording of each branch starter can be altered to suit the personal preferences of the individual, and/or the phraseology in common use in the individual's environment, e.g. *something's wrong* may be worded as *I'm not OK*; *There's a problem.*

The range of pragmatic branch starter phrases included in a communication book will be influenced by the developmental requirements of the individual. For example, a 20 month old child will require developmentally appropriate functions such as *I want something*; *I want to go somewhere*; *I don't like this; I like this*; *Something's wrong* and *I'm asking a question*. It is not developmentally required for a child of this age to express communication functions such as relating information - *I'm telling you something*. However, these functions may be included for partners to provide receptive input (model language and/or assist the child to understand their messages).

The pragmatic branch starters *I like this* and *I don't like this* may be replaced by *I have an opinion* or *I think it's... I like this* and *I don't like this* tend to be more transparent and developmentally appropriate for young children to access opinion vocabulary. However, it is not always conversationally appropriate to initially identify whether something is liked or not liked when expressing opinions such as SILLY, FUNNY, CRAZY or EASY and the more general *I have an opinion/I think it's* branch starter more accurately expresses the communicative intent of the message.

The pragmatic function being expressed can also form the basis for communication book navigation (organisation) as different types of branches are most effective to support communication for different functions of communication.

Other strategies to manage the limitations of aided language and to scaffold communication

A number of other strategies may be included in a PODD book or page set to compensate for some of the limitations inherent in using aided symbols and to support the production of more intelligible, socially valued communication. These strategies may:

- support the communicators inclusion of sufficient information to enable partner understanding
- enable more specific and socially valued messages (age appropriate)
- prevent or assist with the resolution of communication breakdown.

Predictive links

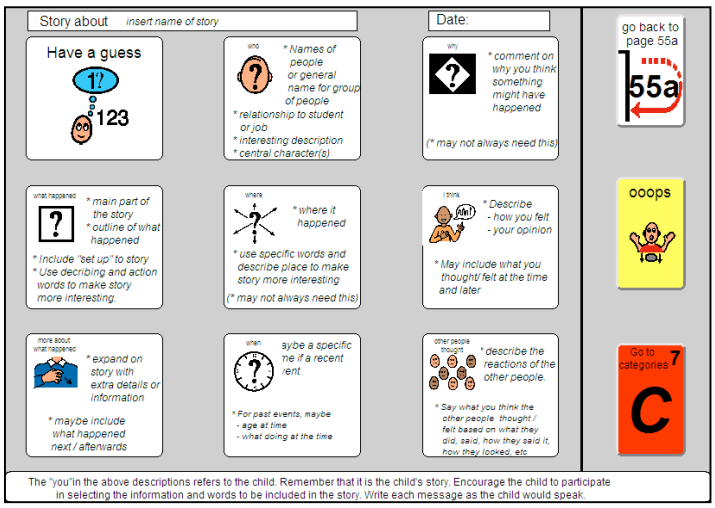
These are links which predict the most likely page required to communicate a predictable message. For example, some of the pragmatic branches use predictive links to pages of vocabulary needed to communicate that function. Predictive links can also be used to assist an individual to produce sentences in English word order.

Tense clues

Prior to the individual 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*. Using these clues supports the partner to change their verbal re-wording of the communicator's message to the correct tense. For example, after the communicator has indicated *It's already happened,* the partner knows to say 'went' when the communicator indicates the symbol for *go.* Whilst this concept can be difficult for early communicators, the inclusion of these cues can still assist partners to think beyond present tense and is often used by partners to clarify the communicator's message.

Information chunking

Whole sentences and parts of narrative are stored on buttons to increase the speed for an individual to relate stories, tell jokes and anecdotes. This assists conversational flow by reducing the need for word-by-word construction of these pre-stored messages.



Yes/no question marker

The phrase *You need to tell me Yes or No* with a link to either categories or the front page marks that the following key words need to be interpreted as a yes/no question.

In typical spoken language development, yes/no questions are initially marked by raising intonation. For example, to ask the question 'Can we go home?' a young child will say 'We go home?' with raising intonation. It is not until 3-4 years of age that children begin to invert the auxiliary to produce the yes/no question form, e.g. 'Can we go home?' question versus 'We can go home' statement. The tendency for individuals learning to use aided symbols to use key word sentences often delays the use of auxiliary verbs. Without intonation, the absence of auxiliary verb inversion can lead to communication breakdown as the partner interprets the communicator's question as a statement. The yes/no question marker functions to support accurate interpretation of the communicator's intention to ask a question.

Partner use of the yes/no question marker can also support individuals who experience difficulty interpreting the meaning of spoken language forms and/or intonation to understand and respond to yes/no questions. Partner use of this clue also appears to increase awareness of the need to respond to the question for some individuals.

Vocabulary to manage the interaction and use strategic competence

A range of other phrases may be included in a PODD book / page set to assist the individual and their partners to manage interactions and compensate for some of the limitations associated with the use of aided symbols.

Hinting

One commonly used symbol is *It's not in my book. I'll give you a hint*. The communicator can use this symbol to extend the range of vocabulary available by encouraging their partner to guess at the word they require. After indicating the *It's not in my book. I'll give you a hint* symbol the communicator may provide their partner:

- with an associated word or a hint about the topic
- the first letter of the word
- a combination of these hinting strategies.

Having correctly guessed a missing word, partners are encouraged to write the word on an appropriate LIST (see information on LISTS in the section on vocabulary).

Conversational repair and request for clarification

All page sets include *I don't know* and many include additional vocabulary to provide more specific feedback to their partner, e.g. *I don't understand*, *Please explain this to me, That's not what I'm saying, That's nearly it*. A list of phrases to manage conversational exchanges is included in the *Additional vocabulary ideas* file.

A symbol for *OOPS* is included on all pages in communication books designed for individuals at earlier stages of communication and language development. This allows a communicator to indicate that something is wrong, a mistake has been made, but they require the partner to assist them to identify and fix the problem.

Predictably associated vocabulary

PODD uses a strategy of including predictably associated vocabulary in all sections/categories of a communication book.

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.

Traditional category organisation

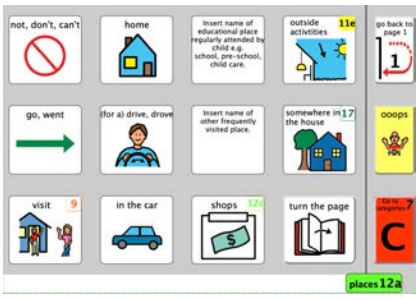
This practice results in frequent page turns as the different words required to produce a sentence are included on different pages, often in different sections requiring a page turn back to the main category index between each word.

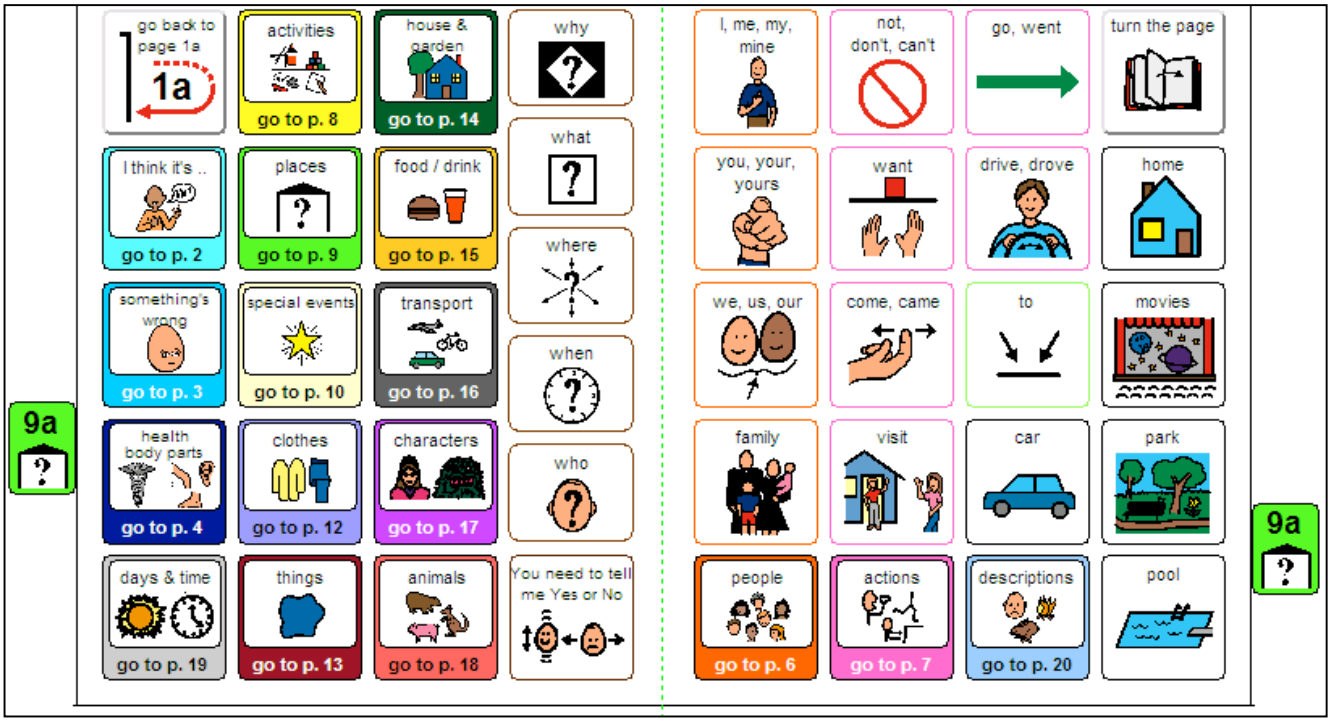
For example, to say *Mum, Dad, and I went to the movies on the weekend,* the process required could be:

- categories index - people
- *mum dad* (maybe categories index – little words –*and* – categories index – people) – *I*
- categories index – actions
- *went*
- categories index – little words
- *to the*
- categories index – places
- *movies*
- categories index – little words
- *on the*
- categories index – days and times
- *weekend.*

Producing this sentence took 12-15 page turns.

Using the concept of predictably associated vocabulary, PODD communication books include the vocabulary that would predictably be used in association with the main content words in that category/section. Vocabulary may be repeated in multiple locations throughout the communication book with an aim to increase the efficiency of communication by reducing the number of page turns required to produce a sentence.





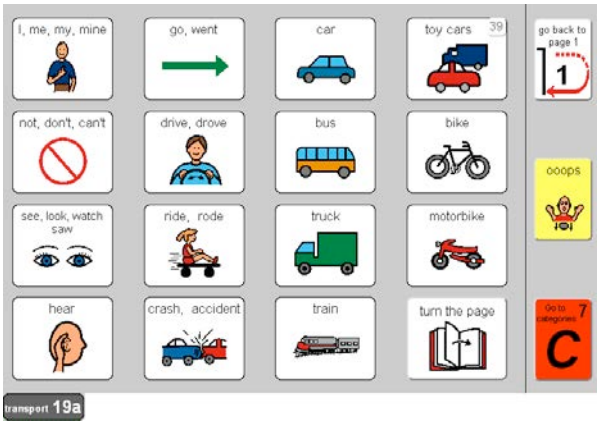
PODD – Predictably associated vocabulary

Using a PODD communication book with predictably associated vocabulary, the above sentence can now be related with only 3-5 page turns.

- categories index – people
- *mum dad and I*
- (categories index) - places
- *went to the movies*
- (categories index) - days and times
- *on the weekend.*

(It only takes 3 page turns if the main navigation index is available from all categories.)

Predictably associated vocabulary is determined using a backward chaining process. The main words are collected for a category or section. Messages that this vocabulary is likely to be used to express are then brainstormed to determine the predictably associated vocabulary. Predictably associated vocabulary has also been collected during the years of use of PODD communication books, with contributions from a range of people discovering the required words during genuine interactions in their daily lives.

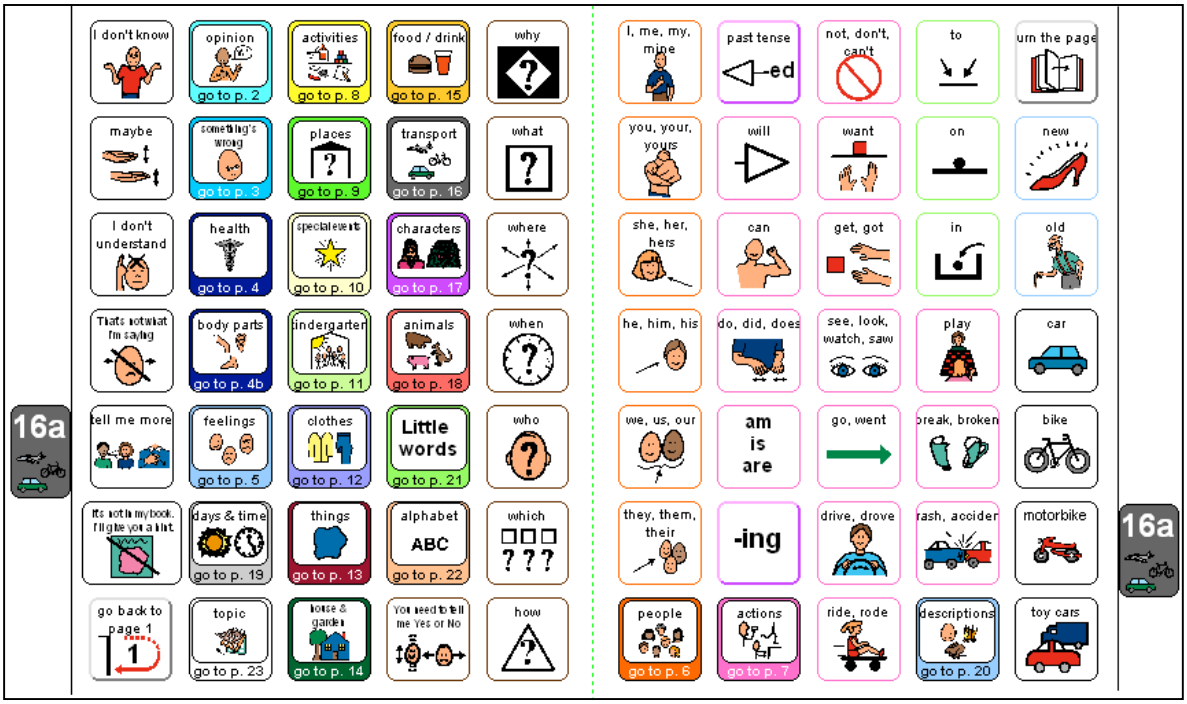


For example, in a transport section, the main vehicle names are likely to be used in sentences such as

I go in/on the....
We went for drive in/on....
I ride my....
I can see a....
The ..... is broken.
Push the (toy) .....
Open the ... door.
Drive fast.

PODD – Predictably associated vocabulary (less items on the page)

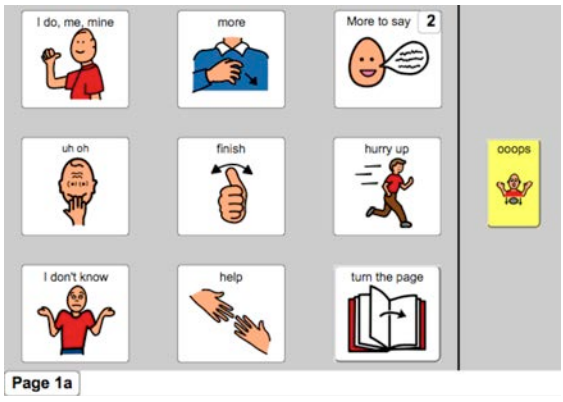
The range of predictably associated vocabulary included in each category/section depends on the number of items an individual can manage on one page opening and their current stage of language development.

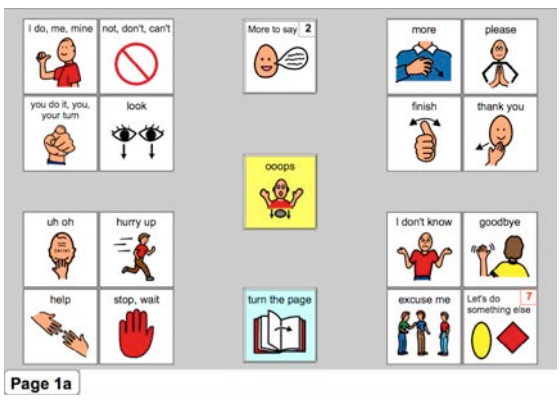


PODD – Predictably associated vocabulary (more items on the page)

In addition to enabling the use of sentences to communicate, the use of predictably associated vocabulary has been observed to increase the partner's use of aided language stimulation with models and expansion of more complete sentences to extend an individual's learning. The aim is to include a sufficient range of predictably associated vocabulary for partners to expand the communicator's expressive production at least "one more stage", i.e. if communicator is expressively using two-word sentences, the aim is to enable the expansion to at least a three-word sentence using predictably associated vocabulary.

The effectiveness of including predictably associated vocabulary, enabling the use of more specific communication and stimulating language development, encourages us to consider the use of alternative access methodologies when access difficulties are the primary reason for limited items on a page opening. For example, combination (direct pointing to a section plus partner-assisted scanning) or coded access methodologies may be considered for an individual who has direct access to only 9 items on a page.





Navigation

Navigation is the term used to describe the routes used to move between pages in a PODD communication book. There is an emphasis in PODD design on the communicator being able to control the movement between pages using the *Go to page (number)* instructions and operational commands. Communicative autonomy is reinforced as the communicator independently directs the movement between pages, even though a partner may physically turn the pages. Partners may initially assist communicators to navigate through the book as they learn this skill.

Main navigation indexes

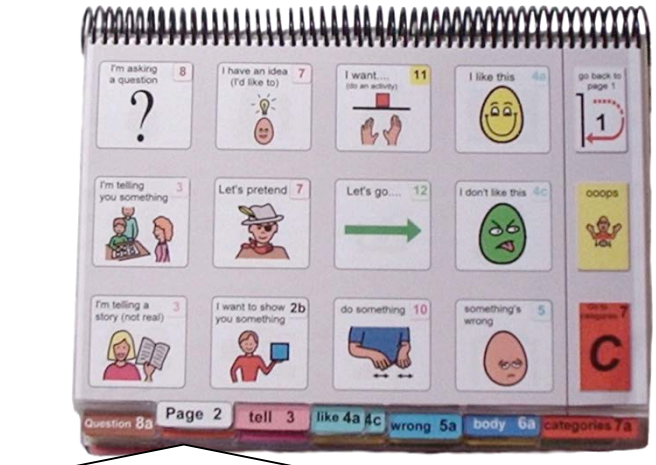
All PODD communication books have main navigation indexes. The main navigation index may:

- use pragmatic branch starters
- use category/section names.

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

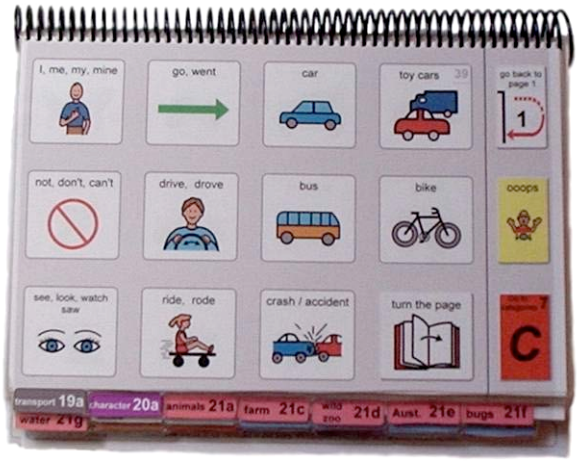
The main navigation indexes are located in different positions depending on the style of the PODD communication book.

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.



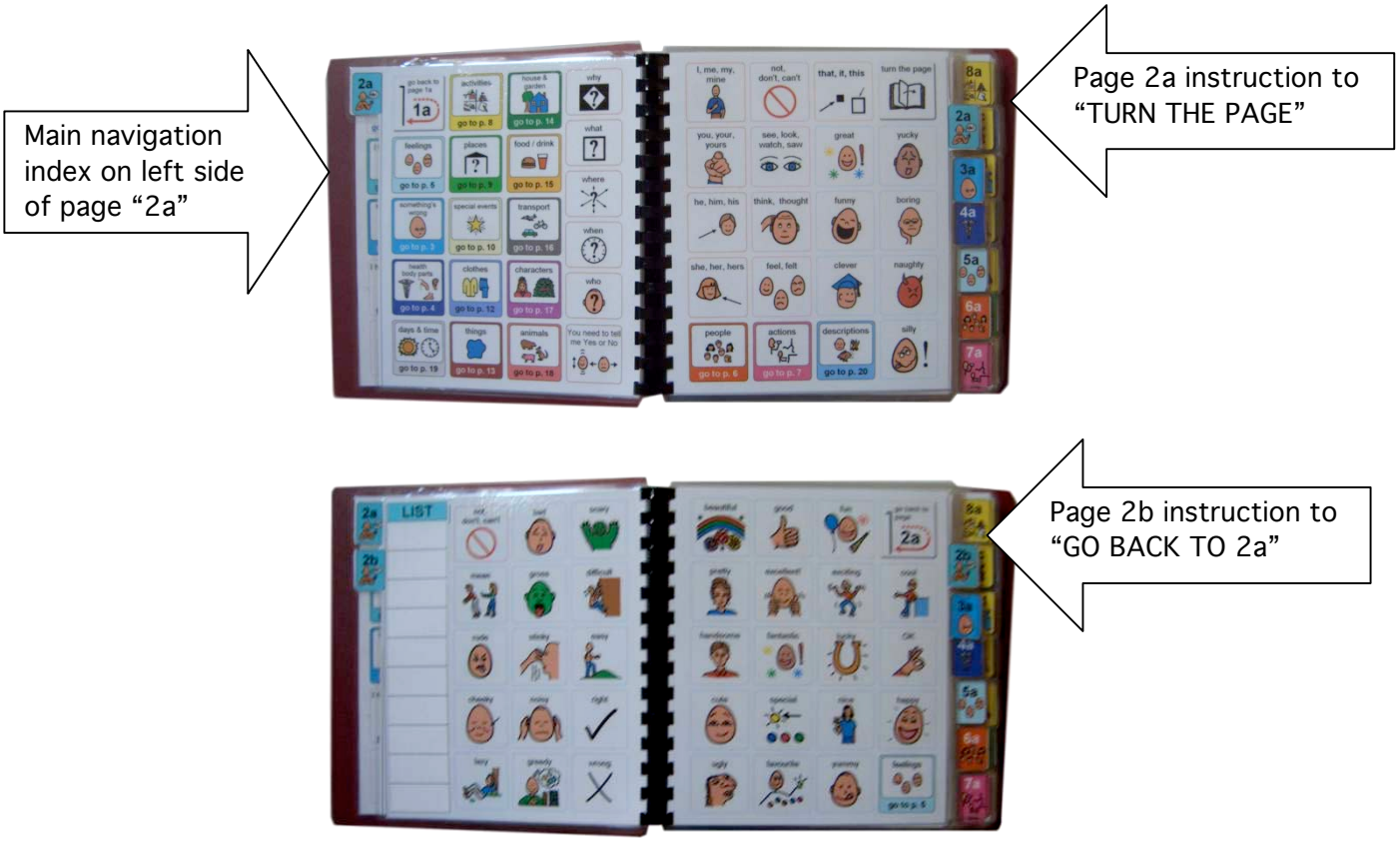
Pragmatic Branches

Categories

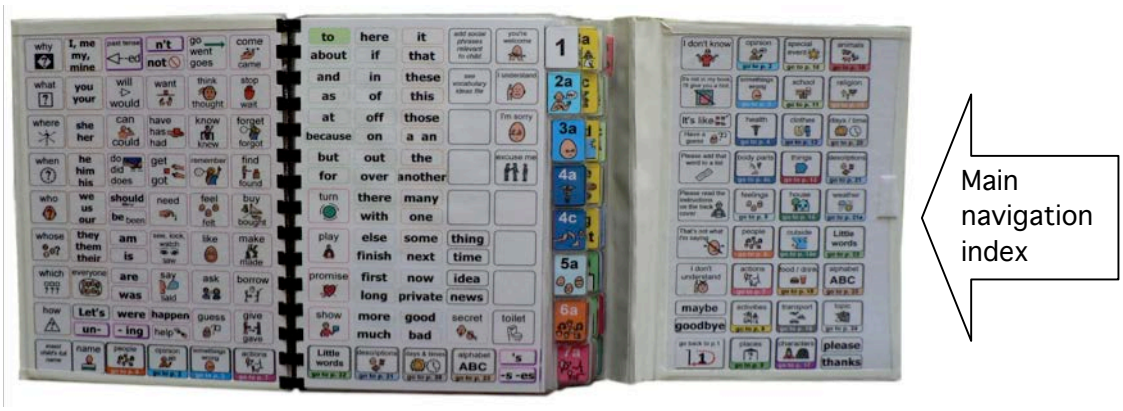


"GO TO CATEGORIES"

Two page opening – the main navigation index is on the left side of the "*a"* page in all categories/sections of the PODD book. All pages in the section include an operational button to "*go back to page (number of section)a"*, to access the main navigation index.



Two page opening plus side panel – the main navigation index is located on the side panel which is accessible from all page openings. Considerations for choosing a PODD book with a side panel for individuals who use direct access include the tendency of the side panel to move around if not supported on a stable surface such as a table. This can make access to items on the side panel very difficult, especially for individuals who have difficulty maintaining stable body positions, e.g. to rest PODD book on their lap, and/or have difficulty stabilising the book with one hand whilst pointing with another. It is also important to check that the individual's range of movement allows for accurate targeting and to access the extra width required for the side panel. For individuals using eye-gaze alternative access methods, the extra width of the side panel may be challenging for individuals who experience associated reactions when they turn their head to the side the side (e.g. ATNR - Asymmetrical tonic neck reflex).



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/drink; clothes; activities; places*
- pragmatic function, e.g. *opinions, something's wrong.*

The categories in PODD books / page sets are often referred to as sections as the pragmatic vocabulary organisation does not always reflect traditional notions of word categories.

Concern is often expressed about the use of a taxonomic (category) organisation with children prior to the achievement of certain cognitive skills and/or the ability of young children to relate to a taxonomic organisation (Fallon, Light & Achenbach, 2003; Beukelman & Mirenda, 2013). However, experience using the PODD communication books has demonstrated that children less than two years, and older individuals with significant cognitive challenges, have learned to access vocabulary via a category index, despite an inability to successfully complete other categorisation tasks.

It is hypothesised that frequent experiences seeing categories used by others to communicate messages (aided language stimulation) allowed these individuals to learn to use categories as part of the language structure (semantics/syntax) they use to communicate, prior to the development of categorisation as a cognitive task. The following example supports this hypothesis.

A 2 year old boy with severe cerebral palsy was frequently requesting activities using the *I'm telling you something* navigation pathway which involved the use of categories, e.g. *I'm telling you something*, go to tell page, *It's about now*, go to categories page, *activities*, go to activities page, *want something to eat and drink,* despite the availability of a more efficient, and supposedly easier, navigation pathway using the pragmatic branch starter of "*I want ...*" that leads straight to the *activities* page and does not involve the use of the categories index. When we looked at what was happening, we discovered that the adults in his environment rarely modeled the "*I want..*" pathway as they rarely asked him for anything. They tended to use the "*I'm telling you something*" pathways to tell him what activities they were doing or the "*I'm asking a question*" pathway to ask what he wanted to do. This boy began to initiate use of the more efficient *"I want.."* pathway after only a few models of adults using this pathway to request activities from other people. This boy's psychologist was very interested in his use of categories at such a young age (prior to what is seen in typical development) and administered a range of categorization tasks. He was unsuccessful on all of these assessment tasks, but able to effectively use the categories index in his communication book to express a range of messages to the psychologist during the session.

Typically developing children are not provided with models of language that involve the use of categories, nor do they need to indicate a category to access the vocabulary required to communicate their messages. Indicating a category is not part of the language structure (semantics or syntax) of spoken English. However, it may be part of the semantics or syntax of aided language systems using a taxonomic organisation, i.e. the aided language semantics/syntax for the message *Mum go home,* may really be categories *people mum,* categories *action go,* categories *places home*.

ENGLISH: MUM GO HOME

Aided language translation:
(categories people mum) (categories action go) (categories places home)

A taxonomic (category) organisation has some distinct advantages for the organisation of large vocabularies to generate less predictable messages. When making choices between different organisational strategies we must always ensure that the organisation is not only the simplest, or most guessable, but that it enables the person to most efficiently meet all of their varied communication requirements.

What typically developing children can or can't do, or prefer, can be used as a guide, but we must remember that the individual who has complex communication needs will need to learn many skills toward developing communication competence using AAC that are not required by typically developing children learning to use spoken languages. Typically developing children may not be the best subjects to inform our understanding of the processes involved in aided language development or direct our intervention practices with individuals who have complex communication needs. More research to determine the underlying processes involved in the early use of taxonomic organisations by individuals who have complex communication needs is required.

Subcategories

Subcategories are used to reduce:

- **the number of items in the main navigational index.** For example, instead of having multiple categories in the main navigation index to get to vocabulary for each different type of activity, e.g. *toys, outside activities, inside activities, making activities, sport, games*, only the general category *activities* is included in the main navigation index and the other pages are subcategorised in the activities section.
- **the number of *turn the page* operational commands required to access vocabulary within each category.** There is an attempt in PODD books to limit the number of TURN THE PAGE operational instructions to access vocabulary within each category to one, or at most two.

In our early attempts to design multi-level communication books, we attempted to include links to all groupings of vocabulary directly from the main navigation index. This resulted in a huge number of items in the main navigation index, often requiring multiple page turns to indicate the category name for page sets with limited number of items on each page opening. This arrangement adversely affected the flow of communication as it was very unwieldy to get through the main navigation index to actually communicate the message. There were frequent reports of partner dissatisfaction with this arrangement. Comments often expressed the perception that too much time was spent turning pages that added

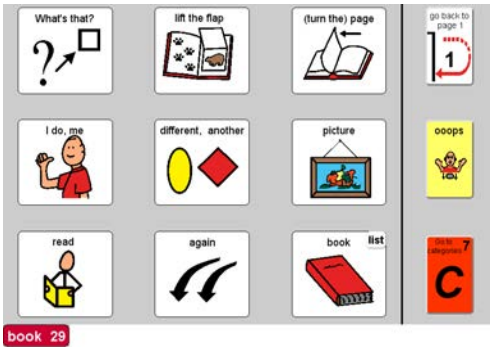
nothing to the message, i.e. a disproportionate amount of time was spent just operating the system. The use of subcategories has assisted to reduce this perception.

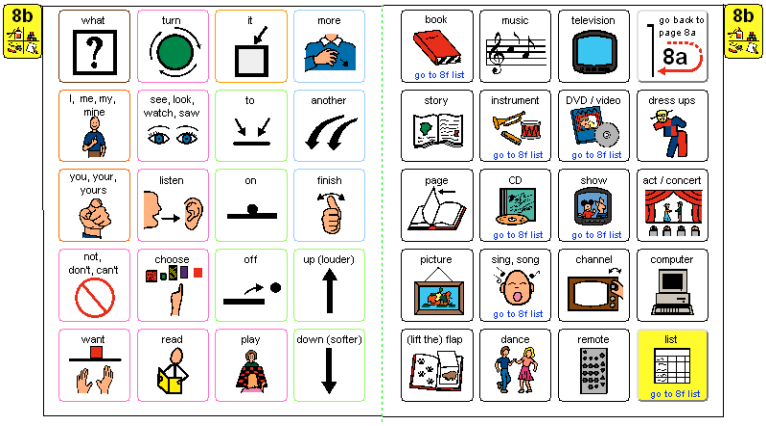
The use of conversational wording for subcategory names has further reduced negative comments from partners that they are spending a disproportionate amount of time turning pages to just get to words. For example, the phrase *make something* may be perceived as part of the message, whereas the phrase *art words* suggests an operational process to get to the message.

Activity pages

Some of the PODD books / 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. For example, in a page set with only 9 items per page, a link from the word, *book,* in the *activities* section goes to a separate *book* page with vocabulary to participate in story book reading. However, in a page set with 40 per page opening, there is space to include vocabulary to interact during book reading in the *activities* section.





Links

When designing a PODD system, 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

The navigation routes in PODD communication books have been influenced by the time requirements for effective transmission for different types of messages. Typical discourse patterns used to express messages are considered when planning the placement of vocabulary within the PODD communication book. The relative speed required to communicate a particular message and maintain conversational flow assists the planning of navigation routes and the number of levels it is desirable to move through to access different vocabulary. This is 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 communication intent.**

  For example, communication to establish social closeness and relate information is expected to take more time as communicating is the primary focus. When the intent is to express a need or want, the primary focus may be another activity and the communication is only necessary to achieve another aim. In this situation speedy communication is desirable.

- **The function being expressed.**

  For example, relating a story is generally expected to take time. A quick comment or opinion, e.g. *This is fun! Boring! Cool!* is not expected to take a long time to communicate.

- **The message's reliance on context for interpretation.**

  The interpretation of some messages is contingent on the ongoing activity or the partner's previous utterance. For example, the single word *more* may be interpreted in relation to the current activity, the comment *I did that too* needs to be interpreted in relation to the partner's previous statement *I went to the beach*. These messages may become ineffective or difficult to interpret if multiple page turns are required to access the vocabulary and the conversation or activity has moved on before the communicator finishes their message. Some context dependent messages need to be said quickly or not at all, e.g. *Uh oh*, *Hurry up.*

- **The individual's personality and current ability to take time to communicate a message using aided language.**

  This may vary depending on the type of message being expressed, e.g. access to vocabulary to complain often needs to be fast for young children who are still learning to use words when they are upset.

- **When and where the message is generally communicated.**

  Environmental constraints can influence how much time it is desirable to spend communicating a message. For example, fast access is required to vocabulary to engage in a quick social interchange in the hallway at school.

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. This strategy

has been observed to increase the frequency of communication using aided symbols to actively participate in activities and contribute to conversations.

Other vocabulary is accessed from the front pages via the main navigation index.

***** The exception to this practice is found in the PODD communication book designs for individuals using partner-assisted auditory or auditory plus visual 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

A number of different navigation routes are used in PODD books to suit different communication requirements. **Five factors strongly influence the navigation routes:**

1. **The individual's communication requirements:**
   - range of communication functions
   - range of vocabulary.
2. **The individual's need for pragmatic branch starters to indicate communication intent.**
   - Individuals whose expressive mean length of utterance is 2 words or less will benefit from the use of pragmatic branch starters. Although these individuals may produce some 3 word sentences, most sentences are 1–2 words.
   - Once individuals are routinely producing sentences with a mean length of utterance of 3 or more words, the communicative intent of the message is usually conveyed in the sentence structure with less reliance on pragmatic branch starters (or gestural and environmental multimodal communication in typical speech development).
   - Some individuals whose expressive mean length of utterance is more than 2 words, but whose use of syntax is less developed, may also benefit from the use of phrases identifying the communicative intent. These phrases may or may not form part of the book navigation as a pragmatic branch starter with predictable links. Interpreting the communicative intent and meaning of keyword sentences depends on the inclusion of the essential words to express the message and the use of typical word order. This difficulty is most apparent when there is a disparity between a communicator's current semantic/syntactic capabilities and the thoughts they want to express. For example, *play dough big yellow flower mum home made* is a 7 word sentence, but the communicative intent is not clear. In this example, the use of the phrase *I'm telling you something* to introduce the message and the tense clue *It's already happened* can assist the interpretation of the meaning *Mum made me a big yellow play dough flower at home.*
   - Individuals whose expressive mean length of utterance is more than 2 words may also use pragmatic branch starters to more efficiently access some sections of their PODD books where vocabulary is collected together to express a particular pragmatic function, e.g. *I think it's..*, *Something's wrong, I have a question.* These individuals may not require pragmatic branch starters for other functions.
3. **The need for other predictive links to scaffold the individual's inclusion of sufficient information to enable partner understanding.**
   - Does the individual require a predictive link through a number of levels to support their communication of particular functions? For example, the inclusion of tense clues.

4. **The number of items the individual can manage on one page opening.**
    - If the individual is able to manage *more than 35-40 vocabulary items* on a page opening, it is possible to include the main navigation index in all sections. This reduces the need to physically turn to the index page to construct sentences using vocabulary from different sections.
    - Additional considerations as to both page layout and navigation are required for individual's who rely on the auditory cue to identify vocabulary. Auditory presentation is transient and only a few vocabulary items can be presented at a time. The communicator is unable to look across a whole page to see what other vocabulary may be located on the page. This influences the navigation routes for PODD books using auditory or auditory plus visual scanning.
5. **The individual's ability to physically and cognitively manage a separate navigation index.**
    - Some individuals can physically manage a third section on their communication book and remember to look outside of the main content page when they want to change pages.
    - It is important to 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.

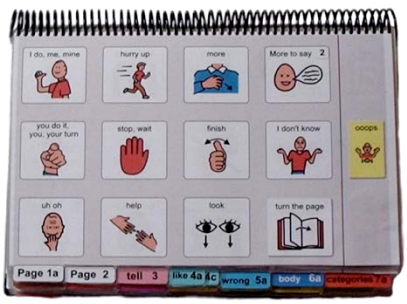
Common navigation routes used in PODD

In addition to the specific developmental and functional requirements of the individual, one factor which has been found to significantly influence the organisation of vocabulary is the number of vocabulary items which the individual can manage on each page opening (including side panel).

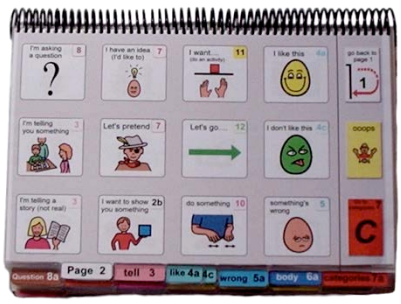
One page opening - less than 40 buttons per page opening including the side panel

The first page(s) in one page opening books include *QUICK CHAT* words/phrases and pragmatic branch starters.

The remainder of the vocabulary in the PODD book / page set is organised into different branches linked from the pragmatic branch starters. The main navigation is via the pragmatic branch starters, with a secondary categories index included in PODD books designed to express an expanded range of communication functions. There may also be a direct link from the pragmatic branch starter page to the categories index in some PODD communication books. This allows for more direct access to vocabulary organised into categories to answer questions or continue conversation on a known topic, i.e. when the communication intent is already obvious. Communicators and partners are encouraged to use the pragmatic branch starters to establish communication intent at other times.



Page 1 Quick chat

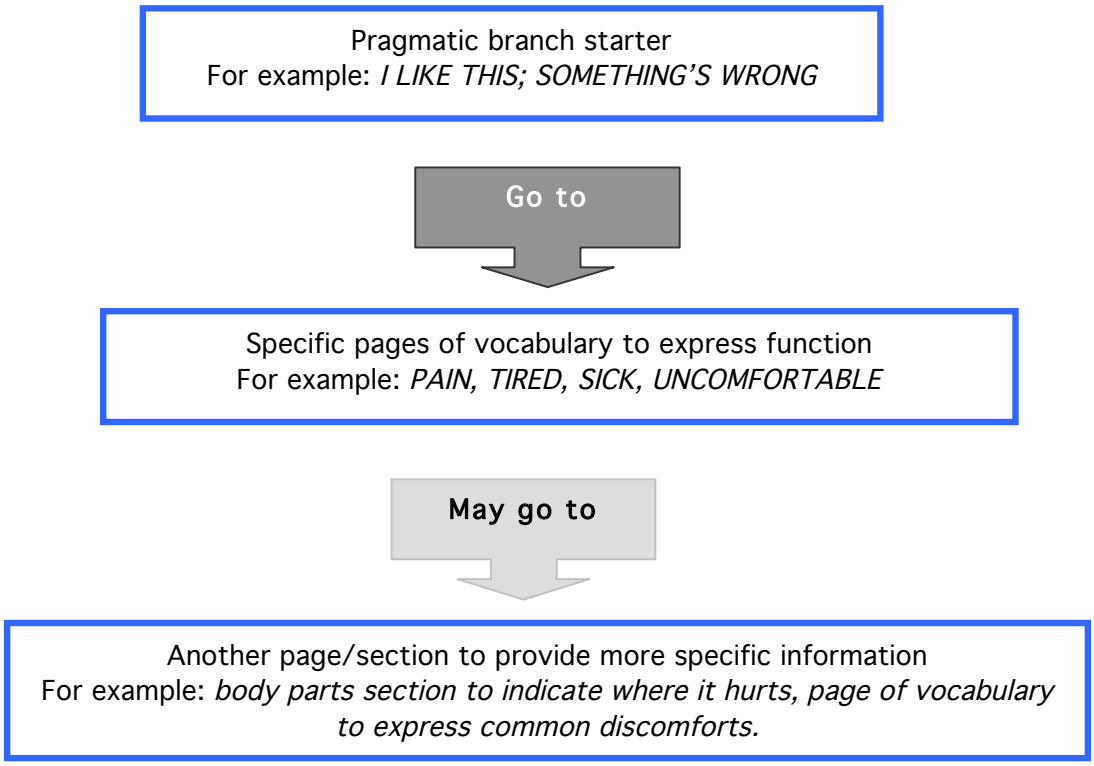


Page 2 Pragmatic branches

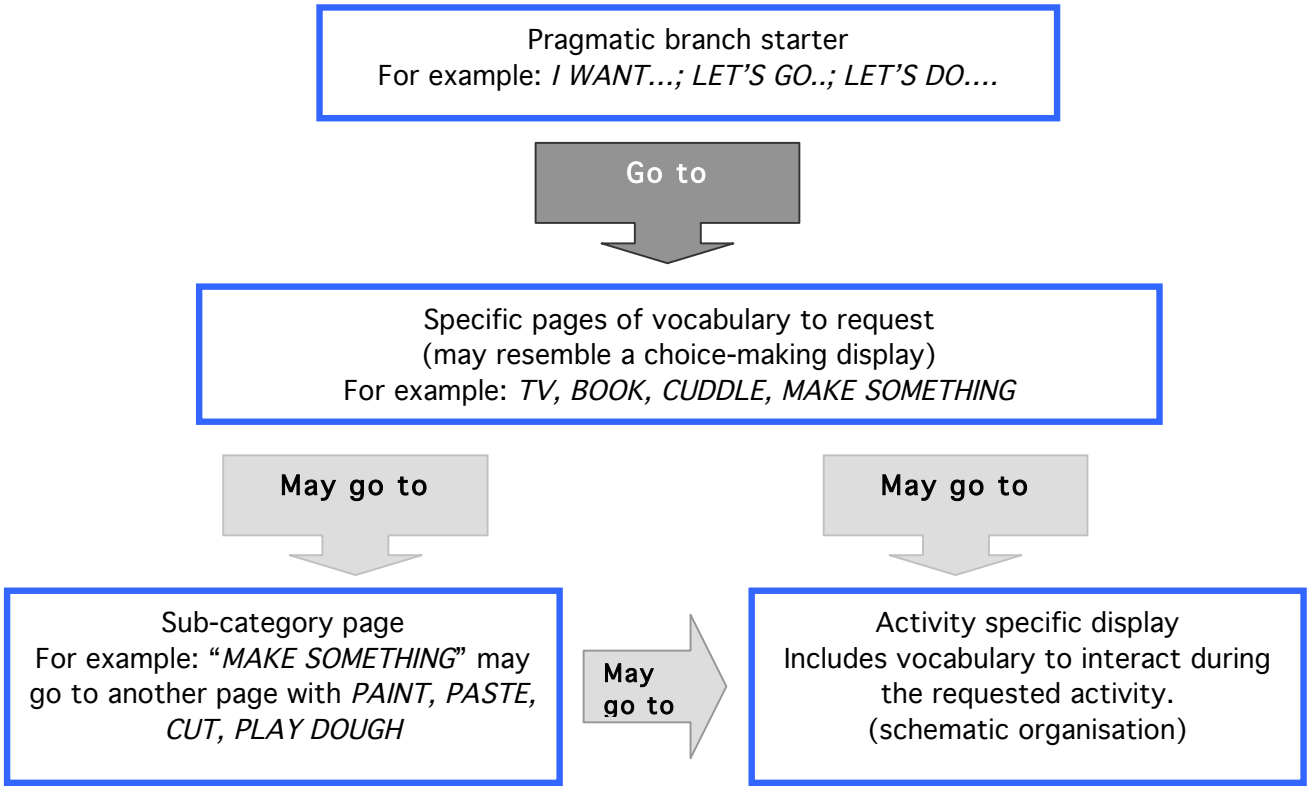
Page 7 Categories

Different types of branches are useful for different pragmatic functions. The following examples illustrate some commonly used branches, but the system is open. Other functions may be added, and more efficient branches created, to suit specific purposes.

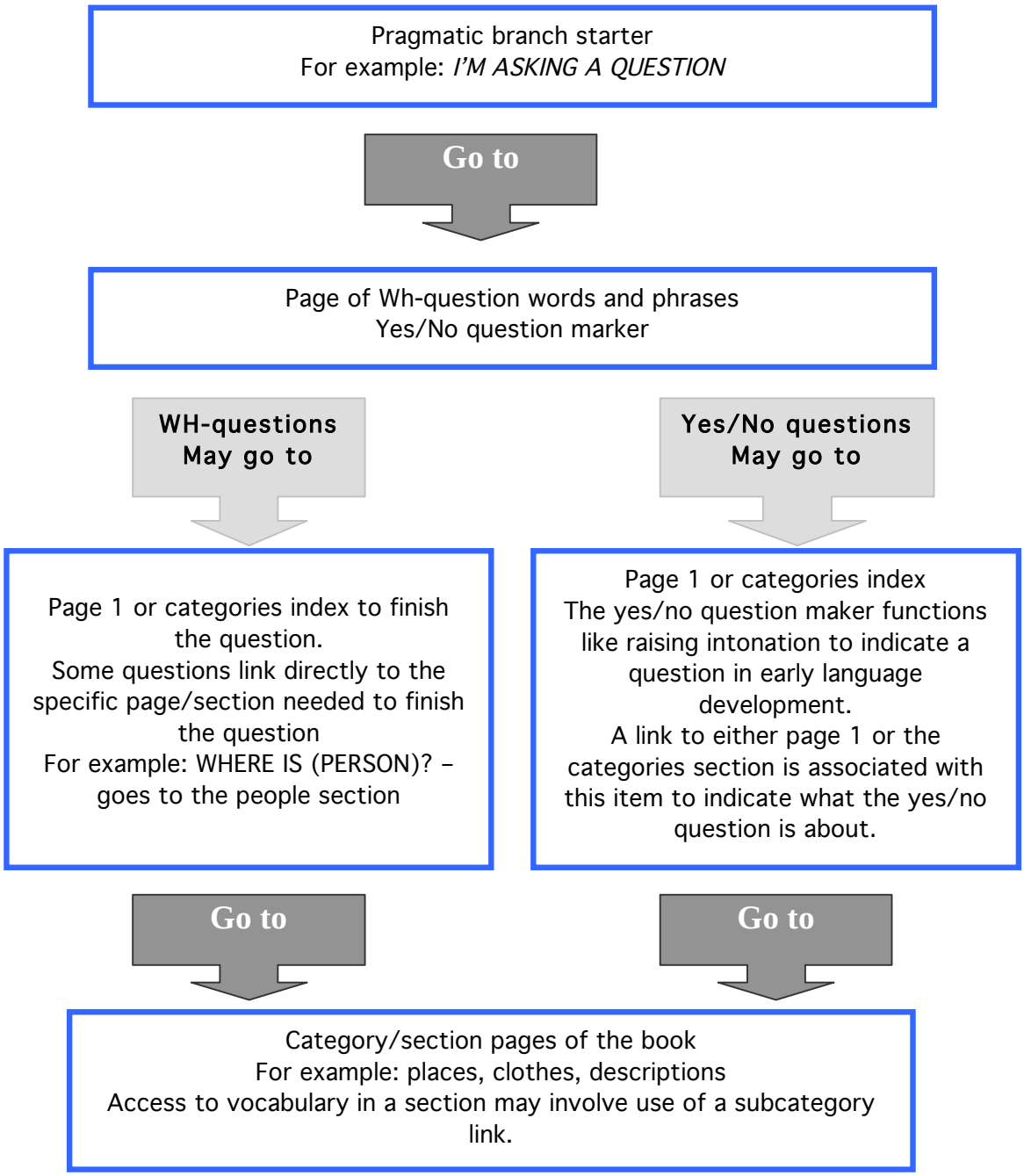
Branch type 1: Suits pragmatic functions such as opinion, complain, or protest



Branch type 2: Suits pragmatic functions such as request object, action, activities. Also used to navigate to activity specific displays

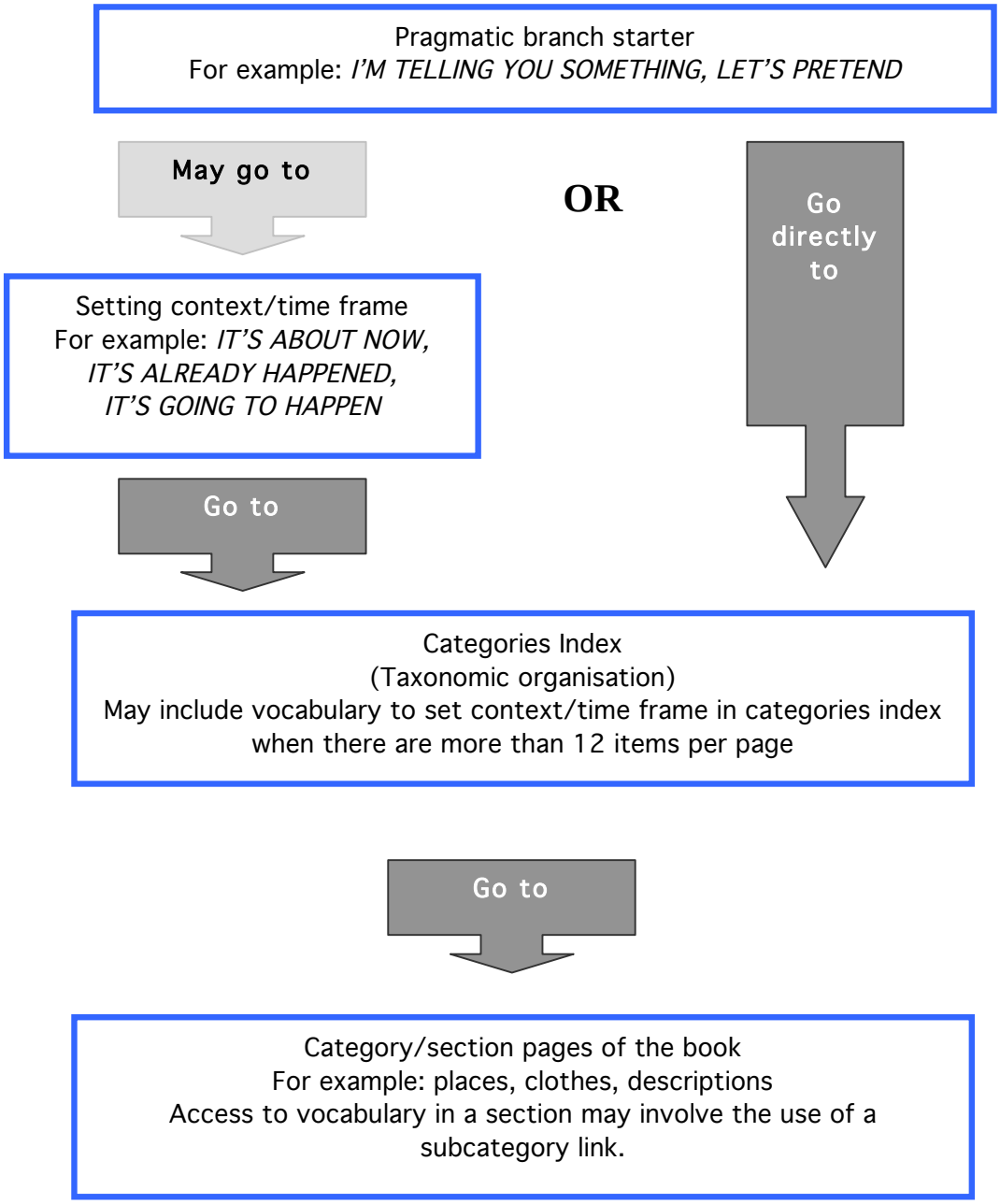


Branch type 3: Suits the pragmatic function requesting information



Construction of a multi-word question may require additional returns to the categories index. A vocabulary item to instruct the communication partner to *Go to categories page number....* is included on every page.

Branch type 4: Suits a range of functions with less predictable messages, E.g. relating information, telling a story, expressing an idea

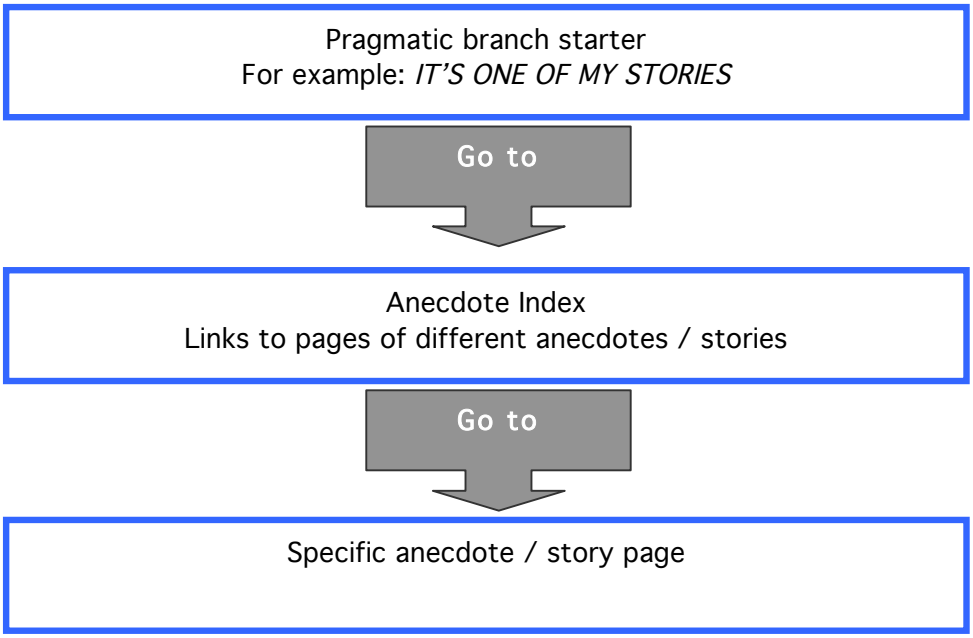


Construction of a multi-word sentence may require additional returns to the categories index to access additional vocabulary from other sections. A vocabulary item to instruct the communication partner to *Go to categories page number....* is included on every page.

NOTE: The predictably associated vocabulary in each section should reduce the frequency of multiple returns to the categories index to construct a (key word) sentence appropriate to the language level of the selected PODD book. If communicators are routinely accessing multiple pages via the categories index to construct sentences there are two possibilities:

1. The partners are modelling aided language at a more complex level than the individual currently requires
2. The individual needs a different PODD book with more complex language.

Branch type 5: Suits telling of anecdotes and other pre-prepared stories



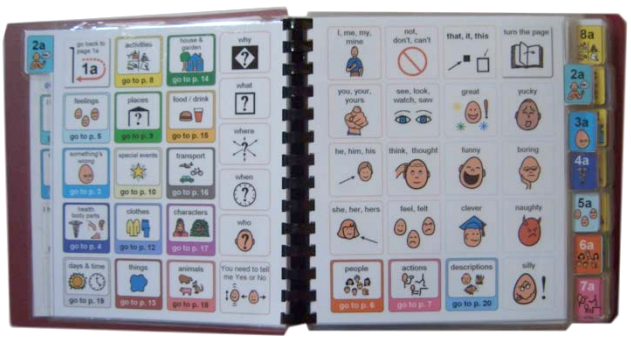
Two page opening – more than 40 items

The main navigational index in PODD books with **two-page opening and two-page opening plus side panel** is usually based on categories. The exception is the key-word two-page opening PODD books with the option to use pragmatic branches with predictable links to clarify communication intent and support navigation for individuals still learning to produce one-two word sentences. Other two-page opening PODD books may include phrases to introduce a message without predictable links, e.g. I'm *telling you something*; *I want* ...., *I'm asking a question*. However, the use of phrases is not obligatory and they do not perform the same key navigational role that they do in the one-page opening PODD communication books. Pages to express these messages are accessed directly from the categories index.

With more than 40 buttons on a page opening, it is possible to have the categories index readily available from all sections in the communication book.
The categories index in two page opening PODD communication books is located either:

- on the side panel (available from all pages)
- on the first page and repeated on the left side of the "*a*" page opening in every section.

The repetition of the categories index in every section increases the speed of navigation to move between categories to construct multi-word sentences and continue conversations with multiple turns using words from different sections.



Vocabulary selection

When considering the range of approaches to vocabulary selection and organization, we need to remember the purpose of AAC to enable the individual to autonomously communicate to meet all of their varied communication requirements.

Different approaches to predict and select vocabulary for AAC systems are more (or less) effective for different types of vocabulary. A growing number of word lists have been generated from in the AAC research literature to support the identification and selection of the most frequently used core vocabulary. Lists based on a sample group that has the most similarities to the individual are most informative.

Developmental vocabulary lists suggest words chosen from developmental language inventories based upon language acquisition principles. These lists provide a structure for supporting individuals at different stages of communication and language development (pragmatic, semantic, syntactic and morphology). Aided language stimulation requires vocabulary selection to lead development with vocabulary included for partners to model and expand the individuals' current expressive language.

Strategies commonly suggested to identify coverage or fringe vocabulary requirements include informant questionnaires, ecological inventories and communication diaries and checklists. (Beukelman and Mirenda, 2013).

Combining multiple approaches for both vocabulary selection and organisation is needed to enable the individual to efficiently select the words they require to 'say what I want to say, to whoever I want to say it to, wherever, whenever, however I choose to say it!'

The pragmatic approach to vocabulary selection developed for the PODD system uses a combination of developmental, ecological, functional communication and core vocabulary approaches. Multi-model communication and the influence of the AAC form on vocabulary requirements is taken into consideration.

Vocabulary is selected for partners to model so that the individual can autonomously select the words they want to use from the vocabulary modelled and made available by others. PODD also includes strategies to "collect vocabulary" during interactive communication using lists and blank vocabulary spaces in generic books and page sets for speech generating devices.

Porter & Cameron (2008) reported on the usefulness of generic template resources to support partners to collect specific core and fringe (extended) vocabulary during ongoing interactions with individuals using aided language displays.

Vocabulary chosen for inclusion in a PODD book / page set is influenced by both functional communication requirements and language developmental requirements. Vocabulary selection has been informed by:

- the literature describing typical language development and vocabulary selection for AAC.
- Suggestions provided by people using PODD communication books in their daily lives (since 1993). These suggestions have been stimulated by:
  - partner use of the communication books to provide aided language stimulation identifying vocabulary gaps in a generic (trial) or current communication book

- the pragmatic functions and categories in PODD supporting informant's generation of vocabulary ideas
- the use of LISTS in PODD communication books. These lists provide a valuable practical resource for collecting vocabulary suggestions. They are filled in "on the spot" whenever a required word is found missing from a communication book.

Some general considerations for vocabulary selection when developing a PODD book / page set include:

- **What are the individual's current communication requirements? What does the individual or their partner need to say?** This involves identifying the functions, topics and messages required for different activities, in all environments, with a range of partners.

- **What are the individual's language development requirements?** A PODD communication system should always include sufficient vocabulary to model and expand to stimulate the development of more complex communication and language skills than the individual's current abilities.

- **Primarily select single words rather than whole phrases.** This allows for multiple meanings to be interpreted from the one word. For example, the single word HELP, can be interpreted to mean *Can I help you?*; *I'm helping*; *I need some help,* depending on the current context. The use of a whole phrase would limit the likely interpretations to only the one meaning expressed by that phrase. Whole phrases/sentences may be used to increase efficiency and preserve conversation flow when expressing highly predictable, time dependent or social messages, e.g. I DON'T KNOW; I LOVE YOU; EXCUSE ME; I'M SORRY.

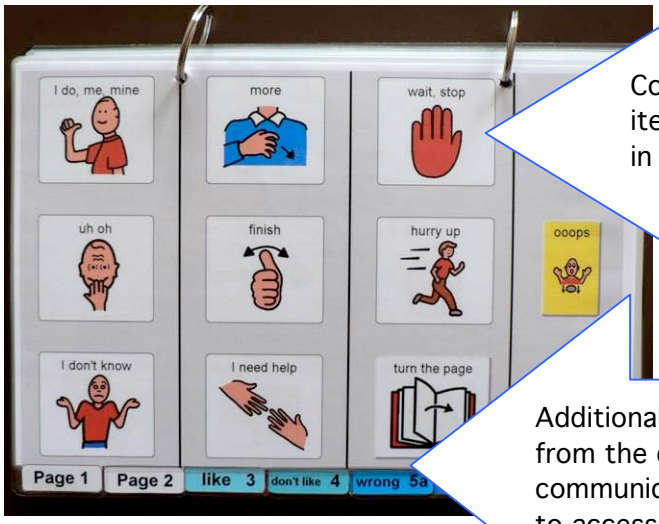
- **Consider the multiple modes of communication available to the individual.** Some vocabulary may be more effectively communicated by the individual using another mode of communication. For example, if an individual can intelligibly speak "more" there would be little need to also include it on the first page of their PODD communication book. The availability of the same vocabulary in multiple modes may be required to intelligibly communicate with different partners, e.g. the individual can sign *more*, but this is only intelligible to people who understand sign. Words that can be intelligibly spoken may also be included in the individual's PODD book to facilitate sentence production. The practical features of using a non-electronic aid may also make it more desirable to teach the individual another mode of communication to express certain messages. For example, it can be more effective to express *HELLO* using eye-gaze and vocalisation as by the time a partner comes close enough to read the non-electronic aid they have often already said HELLO.

- **The labels on verb symbols include irregular past tense** as experience suggests that this assists partners to recognise the relationship between these words and the possibility to use the same symbol for all verb tenses (as indicated by an operational button or hint). Regular past tense –ed, and present progressive –ing are not written as separate words on the label as these relationships appear to be more transparent.

A graded, developmental progression exists across the different page sets, with increasing complexity of pragmatics, semantics, morphology and syntax. **The information file provided with each page set in this resource describes the language included in that PODD communication book.**

A number of features of PODD communication books support the use of a broader range of vocabulary for individuals at earlier stages of communication and language development. These features include:

- The pragmatic branches with predictive links assist communicators to locate vocabulary in the communication book. The communicator only needs to respond to the items presented at each level and relevant options appear automatically. For example, the page of pragmatic branch starters presents the communicator with options such as *I want something*; *I like this*; *Something's wrong.* When the communicator who wants something responds to this page by indicating *I want something*, options of what they may want automatically appear.
- The vertical presentation of vocabulary on different pages allows for larger vocabularies to be readily accessible to the communicator and partner when the individual can only manage a more limited number of items on each page.
- More vocabulary can be made available for partners to provide receptive input (model or assist understanding) than the individual is currently able to expressively use. Locating this extra vocabulary may require partners to use more complex navigation routes, e.g. categories index, whilst the individual uses pragmatic branch starters to access a more limited vocabulary to meet their current expressive communication requirements. This extra vocabulary, to provide receptive input, is in effect "hidden" in the vertical arrangement of the communication book on pages the individual does not access when expressively communicating.



Communicator presented with only 9 vocabulary items at one time. Vocabulary is always located in the same position in the PODD book.

Additional vocabulary is always available, but "hidden" from the current view, on other pages in the communication book. Routine pathways used (modeled) to access vocabulary on other pages.

- The use of routine (patterns) to support learning for individuals who have complex challenges is well recognised.

In a PODD communication book vocabulary is consistently available in the same location. This routine placement of vocabulary can assist individuals to learn symbol meanings and allows some individuals to use placement cues to support their communication. Experience also suggests that this routine placement can assist some individuals to manage more items on a page. There is also a consistency to what symbols they will have available to communicate. This supports the individual's learning to initiate and generate communication in different situations.

Lists

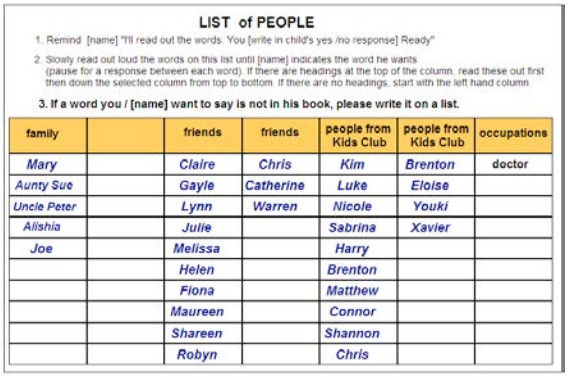
Lists are included in every category/section of a PODD communication book.

1. Lists enable the inclusion of more fringe vocabulary without substantially increasing the size and weight of a communication book. This is particularly useful in sections where there is a large number of possible fringe vocabulary of proper nouns. For example, many individuals who use AAC have a very large potential vocabulary of people's names (extended family, friends, neighbours, professionals, carers, etc.). To include a photograph or pictograph representation for all of these names would add many pages to a communication book. Familiar partners can often use "20 questions" to discover who the individual is talking about given a general hint, e.g. *friend*, but unfamiliar partners have no idea of the possible options. The inclusion of all these names on a list allows the individual to use these names with all partners.

2. Lists enable the addition of new vocabulary "on the spot". Everyone can add new vocabulary to the communication book whenever the need arises. Communication book instructions encourage all partners to write new words onto the list whenever "a word you / [individual's name] want to say is not in his/her book, please write it on a list." In addition to providing individuals with ready access to the vocabulary they require, when they require it, this use of lists:
   - reduces the frequency of hard copy changes to the communication book, e.g. adding new pictographs and replacing pages
   - provides substantial data on the individual's vocabulary requirements when updating or customising communication books
   - provides data on the strategies individuals and their partners use to categorise vocabulary, i.e. which section they are looking in to find particular word. This information may suggest the need for specific training in how vocabulary is organised within the PODD book and/or the need for vocabulary to be included in multiple locations.

In one-page opening PODD communication books, an operational button *go to the list* is located on the last page in each section and most sub-categories. The list is positioned on the back of the page previous to the page with the *go to the list* instruction.

In two page opening PODD communication books, lists are generally placed on the left side of the last page in each category/section.



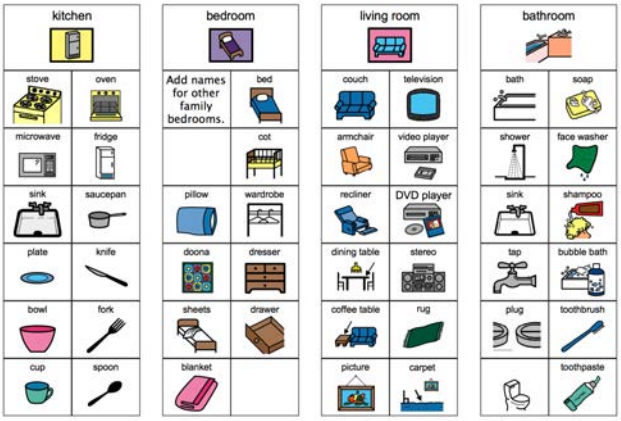
LIST of PEOPLE

1. Remind [name] "I'll read out the words. You [write in child's yes /no response] Ready"
2. Slowly read out loud the words on this list until [name] indicates the word he wants (pause for a response between each word). If there are headings at the top of the column, read these out first then down the selected column from top to bottom. If there are no headings, start with the left hand column.
3. If a word you / [name] want to say is not in his book, please write it on a list.

family		friends	friends	people from Kids Club	people from Kids Club	occupations
Mary		Claire	Chris	Kim	Brenton	doctor
Aunty Sue		Gayle	Catherine	Luke	Eloise	
Uncle Peter		Lynn	Warren	Nicole	Youki	
Alishia		Julie		Sabrina	Xavier	
Joe		Melissa		Harry		
		Helen		Brenton		
		Fiona		Matthew		
		Maureen		Connor		
		Shareen		Shannon		
		Robyn		Chris		

Lists are usually accessed via partner-assisted auditory scanning, although some individuals with precise targeting may choose to directly point to items on the list. 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:

- for individuals who experience difficulty understanding the spoken word and use partner-assisted visual or auditory plus visual scanning to access the list
- to enable partners who cannot read to use partner-assisted auditory scanning
- for an individual who has precise targeting but is currently unable to read.



The lists need to be able to written on with whatever writing tool the partner can readily locate to immediately add new words to the list. On laminated PODD books, blank list spaces to add new vocabulary are usually printed onto stickers which are attached over the top of the 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).

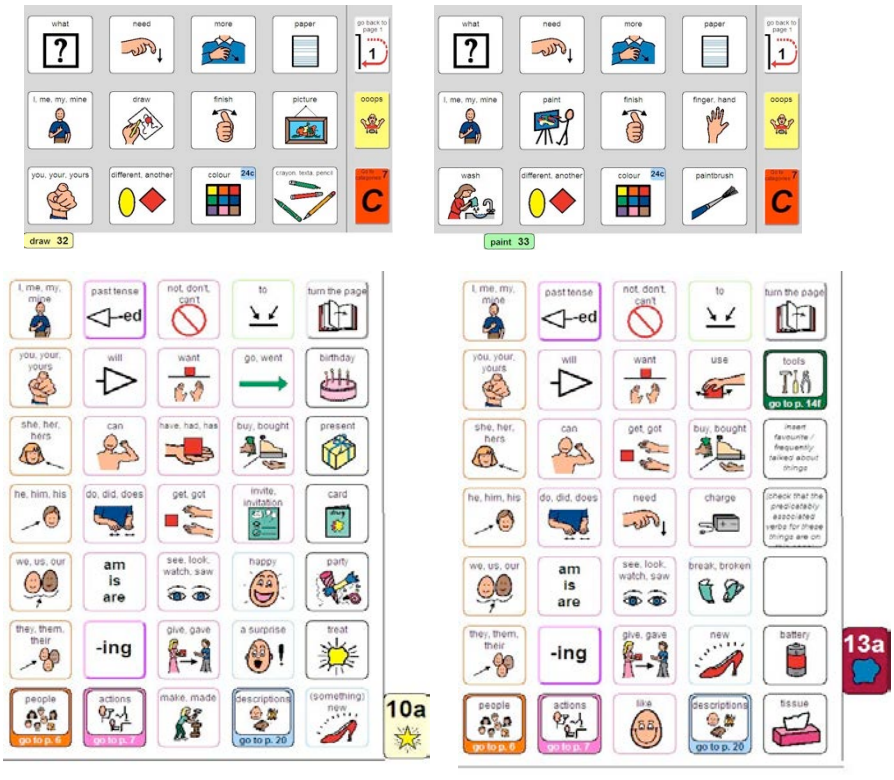
Vocabulary may be included in multiple sections and on multiple pages within the one section to increase the efficiency of communication:

- 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. A number of strategies are used in PODD books / page sets to facilitate the efficient location and use of vocabulary within a section. **Different page layouts are often required to support the use of an alternative access methodology.** See the section on *Access methods and Presentation* for more specific information on page layout accommodations for each alternative access method.

1. Repeated vocabulary is located in the same position, or at least in a similar area, on different pages. With various combinations of vocabulary across different categories, it is not always possible to place repeated vocabulary in the exact same position on every page. Routine placement of vocabulary can facilitate the development of more automatic motor patterns to access frequently used vocabulary and navigation buttons.



2. Similar types of vocabulary are grouped together on the page or within each section. The groupings are primarily according to parts 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. The choice of whether to use semantic associations or alphabetical order is influenced by a number of factors.

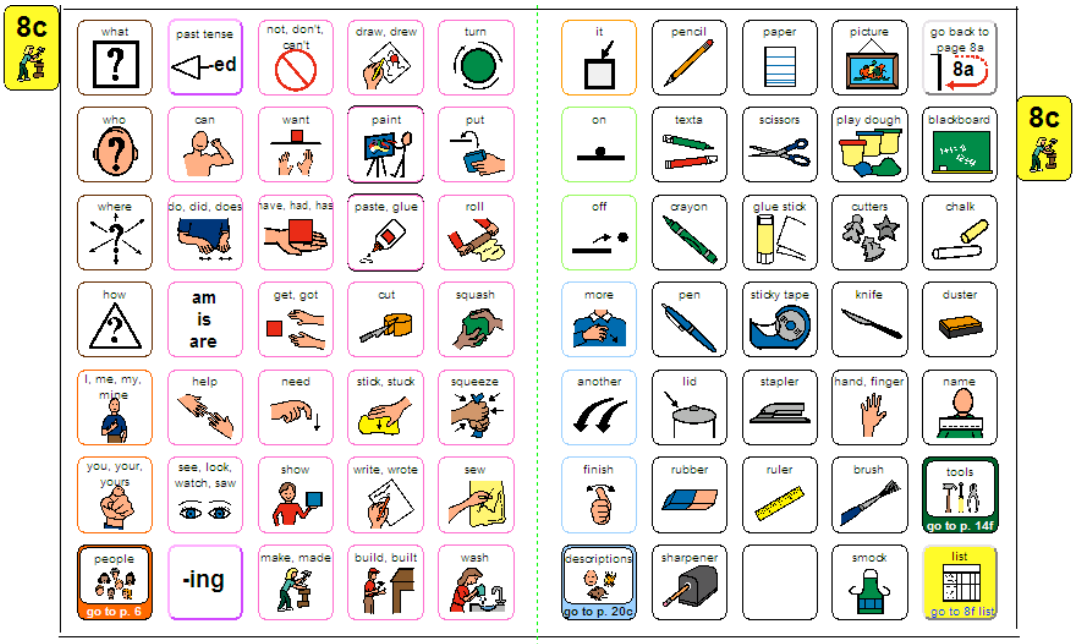
   - Are there obvious semantic associations within this group of vocabulary? Meaningful semantic associations are often more obvious for noun and adjective vocabulary but tend to be more abstract for other parts of speech.
   - Using alphabetical order to locate vocabulary is often slower. It refocuses attention onto the written word, reducing the use of the pictograph shape and colour cues which can assist with the speedy location of vocabulary on an AAC grid display. Experience also suggests that even very literate individuals may rely on self talk (saying the alphabet aloud or in their head) to cue themselves into an alphabetical order. Many people (partners) do not notice that words are in alphabetical order unless it is pointed out to them in some way.
   - Individuals can use semantic associations prior to the development of alphabetical skills.
   - Semantic associations can facilitate the efficient use of predictably associated vocabulary when organising a general group of vocabulary over multiple pages. For example, organising a large noun vocabulary in a health section with the appointment related vocabulary on one page with predictably associated words such as *go, visit, see*, and the pain/sore and health things (e.g. *bandaid, ointment*) vocabulary on the same page as *put on, take off* and body parts.

   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 in complex syntax PODD communication books, e.g. verb and opinion vocabulary.

3. Groupings are arranged into columns to facilitate the visual scanning of the group of words to locate the specific word. Visually scanning a column uses vertical (up/down) eye movements. Visually scanning across a row requires both horizontal (left/right) eye and head movements. We typically arrange written words into columns when the task requires finding a specific word within a group of words, e.g. lists of names on a noticeboard, a camp requirements list. The left-right presentation is generally used for reading a connected text.

4. Vocabulary is positioned to facilitate sentence building in English word order from left to right across the page. This enables smoother visual and motor movements to locate vocabulary on the page as it minimises the need to zig-zag and back-track movements to create sentences. 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). This layout may support the use of more complete (syntactically correct) sentences.
The ordering of vocabulary within a part of speech grouping also attempts to follow 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.



5. The button borders are coloured according to the part of speech to assist with the visual location of vocabulary on complex displays using direct pointing access.
   - Wh-question words – brown
   - Subjects – orange
   - Verbs & negative – pink
   - Prepositions & conjunctions – green
   - Determiners & pronouns – orange
   - Adjectives, adverbs & number – blue
   - Nouns - black

   This colour coding of cell borders is not used for all PODD books / page sets.
   - The cell borders on page sets designed for coded access are coloured to support the access methodology, i.e. to identify the column for each word.
   - Colouring individual cells within a column on pages designed for partner-assisted visual scanning could detract from the column identification and add visual complexity to page.
   - Cell borders are not coloured in PODD communication books for individuals who require visual presentations with higher contrast and reduced complexity.

   The templates for one-page opening page sets with fewer items on each page do not have coloured borders because:
   - highlighting the border may add to the visual complexity (distractibility) of the display for the individuals with complex learning challenges who use these page sets
   - locating vocabulary on the page is not significantly enhanced by the use of coloured borders when there are less items on the page
   - the colour coding is less likely to cue syntactical learning for individuals at the earlier stages of language development.

6. Navigation and operational buttons look different from vocabulary buttons. PODD uses different borders to highlight the location of *go to...* page link buttons and operational commands.

7. The ease and speed of access is considered when positioning high-use items. Customisation of the PODD books / page sets may be required to suit the movement abilities for individuals who use direct access. PODD books / page sets designed for the use of partner-assisted scanning consider the positioning of items to enable faster access to the most frequently used vocabulary. Ease and speed of access needs to be balanced with other strategies to support ease of visual scanning and sentence production.

The information file included with each page set describes the specific features of the page layout for that PODD book.

Organisation of vocabulary across multiple pages

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

- the time requirements for effective message transmission
- the possibilities for meaningful sub-category groupings
- the predictably associated vocabulary items used with each word
- the frequency of vocabulary use, with more commonly used items positioned on the first page of a section. When using partner-assisted scanning, some locations on the left side of the second page in a section may be faster to access than some locations on the right side of the first page. The information files for books designed to use partner-assisted scanning include illustrations of the speed to access different locations on the pages in a section.

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. There needs to be a balance between repeating predictably associated vocabulary to reduce the number of page turns to communicate a message, and filling so many spaces with predictably associated vocabulary that extra page turns are needed to access that section's vocabulary.

Generally:

- vocabulary which is primarily used to start sentences is positioned on the first page of the section or category
- vocabulary that is positioned between two words on the one page is included on that page
- 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.

Selection Set: Access methods and Presentation

A range of PODD communication books to suit different selection methods and presentation will be included on 3 separate template resources:

1. *Direct Access* templates
2. *Alternative Access* templates set
3. *Alternative Visual/Auditory Presentation* templates.

The *Direct Access* template resource includes PODD communication books designed for direct pointing with a whole hand, finger or tool. Some of these page sets can also be modified to accommodate *pick up and give/show* access methodologies.

The *Alternative Access* template resource, still in development for Mind Express, will include PODD communication books designed for:

- Eye-gaze
- Partner-assisted visual scanning (PAVS)
- Combination access methodologies:
  - direct pointing to a section plus partner-assisted visual scanning
  - eye-gaze to a section plus partner-assisted visual scanning.
- Coded access
  - Colour coded access (CC)
    - Eye-gaze / direct pointing to a section, colour code for the column and partner-assisted visual scanning to select the item within that column
  - Full coded access (C)
    - Eye-gaze / direct pointing to a section, colour code for the column and number code for the item within that column

The *Alternative Visual / Auditory Presentation* resource still in development for Mind Express, will include PODD communication books designed for individuals who experience challenges using the standard visual symbol displays used on the other template resources. The alternative presentation may use:

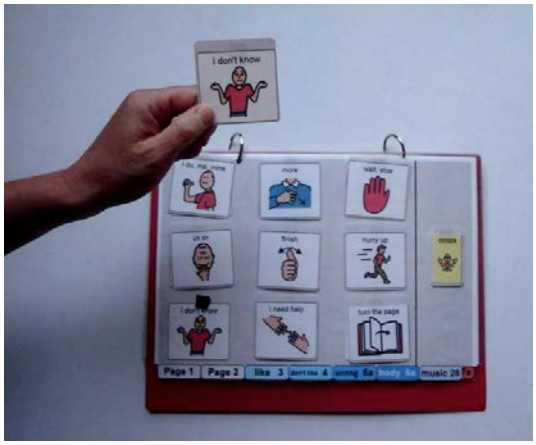
- Auditory symbols (spoken word)
- High Contrast (reduced visual complexity) visual symbols
- Auditory plus High Contrast visual symbols

PODD communication books with alternative visual / auditory presentation included in this resource are designed for:

- Partner-assisted auditory scanning (PAAS)
- Partner-assisted auditory plus visual scanning (PAA+VS)
- Direct pointing to high contrast symbols.

Pick up and give/show

A *pick up and give/show* access methodology can be useful for individuals who benefit from directly passing the symbol to their partner and/or constructing sentences on a strip. Directly giving symbols to a partner can assist individuals who have difficulty understanding the communicative intent of pointing. Partners may also use this method, picking up and showing one symbol at time, to provide receptive input to individuals who experience difficulty visually following a point and/or managing the visual complexity of the whole display.



A double copy of symbols assists the cards to be replaced at their point of origin. This assists communicators and partners to locate vocabulary more efficiently to communicate messages.
Detailed construction files to modify page sets for pick up and give/show access are included with the relevant PODD communication book templates.

Pick up and give/show communication books have a number of practical limitations including:

- The additional symbol cards and Velcro® adds considerable weight and thickness to the communication book.
- The physical process of picking the symbol up can take additional time and requires reasonable fine motor control.
- Additional time is required to replace symbols in the communication book, in the appropriate space, after each message.
- Additional time is required to place individual symbols on a sentence strip and then replace them in the communication book.
- Conversational turn-taking (with multiple turns on the one topic) may be limited as communicators and partners spend time handling the symbols, possibly distracting them from the conversational content and exchange.

The relative advantages of this access method need to be weighed against these practical limitations. This option is only recommended when the process of picking up and giving/showing an individual card is essential to the individual's successful communication.

The development of direct pointing access is encouraged as soon as possible to support more efficient communication exchanges.

Consider the use of an electronic dynamic display communication device with a message window to enable the individual to see/hear the whole sentences at one time.

Alternative Access

Alternative methods to select items from communication boards and books include eye-gaze, partner-assisted scanning, combination and coded access. These access methods are not new. These methods to access communication boards were developed and frequently used prior to the availability of speech generating devices.

The smart-partner operating system of non-electronic communication aids can provide many benefits for people who have significant physical and multiple challenges. However, with the increased involvement of partners in the operation of non-electronic alternative access, it is vital that operational procedures are in place to support the individual's communication autonomy, and their accessibility to communicate with multiple partners.

Operational procedures developed for alternative access to PODD communication books aim to:

- Support the individual's communication autonomy
- Support accessibility to communicate with multiple partners and reduce the reliance on a few highly skilled partners
- Minimize the possibility of partner influence on the communicator's message.

Refinements to the layout of the PODD book are also required to support more intelligible and efficient communication using the specific alternative access method.

Eye-Gaze

Eye-gaze directly to an individual item on the page can be a relatively fast method of access. A key feature of effective communication using direct eye-gaze to a communication book / board (non-electronic eye-pointing) is the partner's ability to see the communicator's eyes and discriminate between looking to locate an item and looking to select an item. One key difference between eye-gaze to static and dynamic displays is the need to look around the display to orientate to the current page and locate items on a changing display before using eye-gaze to point to the item. Eye-pointing to a PODD book requires more than the ability to just look or gaze at a symbol. It also involves the partner looking where the communicator is looking and a strategy to support partner discrimination of "looks to locate" the symbol and "looks to select" the symbol.

It is usually necessary to teach individuals and their partners a routine procedure, agreed upon sequence of eye-movements, to clarify the difference between looking to find a symbol and looking to select a symbol.

The three steps in the sequence include:

1. Visually scanning the display to locate the symbol
2. Looking to partner to indicate readiness to select item (and check partner's attention)
3. Eye-point to select the item.

Partners verbally outline this process to support communicator - partner agreement on the purpose of different looks during the process. A standard wording for this process when

performing full models and during communication supports the development and use of sequenced eye-movements for direct eye-gaze communication.

After the communicator has looked at a symbol, the partner points to where they saw the communicator look and reads the label out loud. This provides the communicator with the opportunity to indicate if the interpretation was incorrect. It is useful for the individuals to have a quick method to provide the partner with feedback that they have made a MISTAKE reading their eye-gaze. Shaking the head to indicate NO is the most efficient option. The PODD templates designed for direct eye-gaze access include alternative side panels with OOPS (mistake) on the opposite side from other operational commands for individuals to more efficiently provide partners with feedback on errors. (Other optional side panels are also available with OOPS on the same side as NO if the individual is using left-right eye-gaze to indicate YES or NO). Requiring confirmation of every eye-gaze slows down the rate of communication, requires additional activity/effort from the individual to communicate their message and may make it more difficult for them to remember their original message or where they were up to in their message. When the communicator has finished their message, they stop looking at the display.

On static eye-gaze boards, e.g. Etran alphabet boards, a copy of the display is often repeated on the back of the board for partners to read the message from the back. In a PODD communication book the symbol and label are NOT copied onto the back (partner's side) of each page. One key difference between eye-gaze to static and dynamic displays is the need to look around the display to orientate to the current page and locate items on a changing display before using eye-gaze to point to the item.

Duplicating the display on the back of each page is NOT recommended:

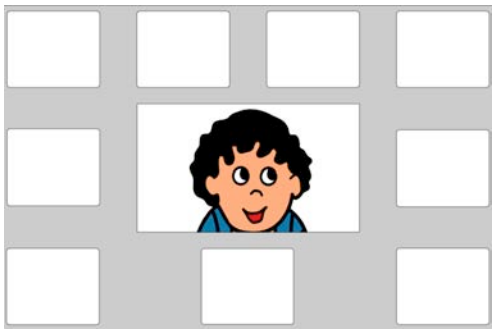
- Extra paper adds to the weight of the communication book that the partner frequently needs to hold up in space.
- The space available for LISTS on the back of pages within each section is reduced. LISTS are an important feature in PODD communication books and the need to look for the required LIST in another part of the book significantly compromises their use.

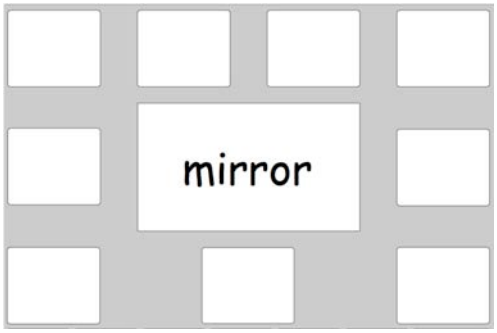
The symbol label may be written for partner use in the appropriate position on the back of each page. However this is not really necessary in a PODD communication book as the partner frequently needs to look to the front of the page as they handle the book to change pages anyway. It is easy to just position a finger on the area where the individual looks and then move the book to look at the symbol/word in that position. This also has the advantage of reducing possible partner influence on the message, as the partner does not know which symbols/words the individual is looking towards as they read the direction of the eye-gaze.

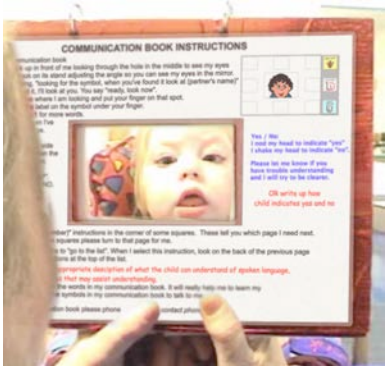
Following PODD principles to keep the communication book at a manageable size for use and transport in daily environments and physical positions, a PODD eye-gaze communication book is kept to an A4 / US letter paper size. An A4 / US letter size also reduces the need for individuals to move their head to look towards the edges of the display (as is necessary with a larger, say A3, size eye-gaze display). Reducing the range of head movements required to eye-gaze is particular useful for those individuals with cerebral palsy who exhibit set patterns of movement associated with head movements (e.g. ATNR, STNR). The disadvantage is that on a smaller display it is not possible to discriminate eye-gaze to as many areas. Nine symbols are the most items that can be easily discriminated using direct eye-gaze on an A4 / US letter size display.

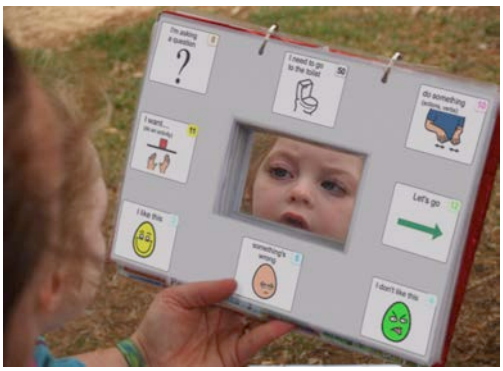
Vocabulary placement / page layout in a PODD communication book to suit direct eye-gaze access

- The page layout of a direct eye-gaze PODD book is primarily designed to increase the ease / speed of the partner's reading of the communicator's eye-gaze
- A hole in the centre of communication book supports partners to read the direction of the communicator's eye-gaze.
- A mirror can be placed at the back of the book to support partners who are positioned to the side or behind, to read the individual's eye-gaze. An adjustable communication book holder can be used to modify the angle of the communication book and mirror to suit the partner's position to view the individual's eyes. The construction files for the direct eye-gaze PODD books provide detailed instructions for attaching the mirror and making the cover a stand.





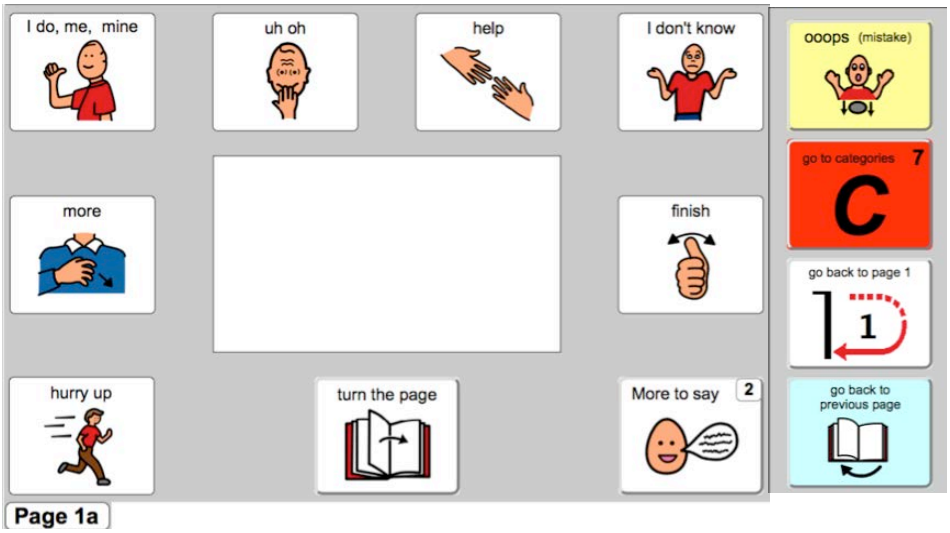




- Symbols are spaced around the edges of the display to support the partner's interpretation of the individual's eye-gaze. Note that when looking at symbols in the top half of the display the communicator's eyes are completely open, but when looking to the bottom half the eyelid covers part of the eye. This makes it more difficult for partners to interpret different eye positions when the communicator is looking down so there are fewer symbols positioned along the bottom of the display.

- For some individuals, discriminating eye-gaze between the two central symbols in the top row can be more difficult. If this is the case, the partner can identify that it is "one of these two" and then use partner-assisted visual scanning to determine the specific symbol.

- Positioning of items around the edges of the page (i.e. not in a grid) makes precise positioning of vocabulary in left to right in English word order more difficult. There is however an attempt to generally locate items so that sentences are constructed in left-right/top-bottom direction to support partner's ease of locating and accessing symbols using direct pointing to model.



- To support faster readability of the individual' eye-gaze, concept pairs that might be confused in a given context are also placed at a distance (on opposite sides of the page).
- The operational instructions to TURN THE PAGE or GO TO LIST are located in the centre bottom of the page for easier access to more quickly access more vocabulary in a section or on a list.
- As there are limited spaces on each page that can be easily discriminated using direct eye-gaze, other operational command symbols (OOPS, CATEGORIES, GO BACK TO PAGE 1 and GO BACK TO PREVIOUS PAGE) are located on a side panel attached to the back cover of the book. Communicators may eye-gaze far to the side towards the side-panel, reach towards or touch the side panel. Partner-assisted scanning would then be used to access specific items on the side panel. Note that as the operational commands are on the side panel, not the page, it is necessary to use a more general command to *GO BACK TO PREVIOUS PAGE* instead of the more specific instruction to go back to the numbered "a" page of a section used in other PODD books.

Considerations for selecting non-electronic eye-gaze as an access technique

Important considerations in selecting to use this direct eye-gaze PODD book are:

- Can the individual (learn to) produce the sequence of movements for intelligible eye-pointing with a range of partners?
- Can the individual (learn to) intelligibly eye-point to the 9 areas on the display?

It is also useful for the individual to have (learn) an efficient method to indicate the partner has made an error reading the selection.

There are some individuals who can intelligibly look to only four or six items, e.g. up, down, left, right, and/or to the four corners of a display. While in the past PODD communication books with only 4 or 6 items on a page were made, they were found to have some critical disadvantages including:

- Lots of TURN THE PAGES to locate vocabulary, slowing communication and increasing partners comments on the inefficiency of communication.

- Less items on a page leading to increased challenges for partners using the book to provide receptive input.
    - Lots of "hidden vocabulary"
    - Not sure what options they are selecting from, especially in relation to selecting appropriate pragmatic branches and categories
    - Increases working memory load for the communicator (and partner) with lots of interference (space between the actual message words) as more page turns and operational commands are required to form a complete message
    - Reduced space on each page for predictably associated vocabulary.
- Reductions of vocabulary included in the book are often made in an attempt to reduce the number of page turns in a book with only four – six items per page. This makes it less likely that the words the partner or communicator wants to say are there, for autonomous communication at any time, when they try to use book to communicate. This reduces instances of successful communication.

PODD communication books have been found to need to have AT LEAST 9 items on a page to support efficient, autonomous communication for the partner and communicator.

RECOMMENDATION: If an individual can only intelligibly eye-gaze to less than 9 items on each display, consider the individual's ability to learn to use a PODD communication book designed for partner-assisted scanning, combination, eye-gaze and partner-assisted scanning or coded eye-gaze access.

Some individuals can look towards items on a display, but experience difficulty efficiently coordinating or learning the sequence of movements required for intelligible non-electronic eye-gaze. The ability to establish communicator-partner agreement on the difference between a look to locate and a look to point is essential to minimize the risk of partner influence on the message. These individuals may be more autonomous and intelligible using a PODD communication book designed for partner-assisted visual scanning or a combination of eye-gaze to a section and partner-assisted scanning.

The differences between the capabilities of a partner and an electronic device reading eye-gaze mean that some individuals use different methods to access their non-electronic and their electronic AAC systems.

- Electronic devices can accurately and reliably use timing of gaze hold on an item to determine the difference between looking to locate and looking to select. Most devices also have the capability to provide visual feedback as to when the item is likely to be selected, providing time for the communicator to move their eyes off that item if they were just looking. Human partners do not have this degree of accuracy, reliability or incidental feedback. These individuals may use eye-gaze to access a PODD page set on an electronic speech generating device and partner-assisted visual scanning, combination eye-gaze plus partner-assisted scanning or coded eye-gaze access to their PODD communication book.
- Partners can sometimes read eye-gaze by individuals who have difficulty calibrating an electronic device for accurate reading of eye-gaze (due to a variety of factors related to the individual's eye movements and head position). These individuals may use direct eye-gaze, combination eye-gaze and partner-assisted visual scanning or coded eye-gaze access to their PODD communication book and switch scanning to access a PODD page set on their electronic speech generating device.

ALWAYS select the options that provide the best opportunities for the individual to develop AUTONOMOUS COMMUNICATION at any time.

Partner-assisted scanning

Partners provide scanning by showing/pointing and/or speaking the names of items to access non-electronic communication aids. The communicator responds to each scan by indicating yes and/or no.

One movement to accept or two movements to accept and reject?

- **One movement to accept,** i.e. a signal to indicate "YES" when the required section/column/ item is indicated/spoken by the partner. This is similar to automatic scanning using a switch. The communicator does nothing until the required option is indicated. This option requires the partner to provide an appropriate pause time between each scan. The communicator needs to be able to consistently produce their "YES" movement within the identified pause time. This pause time needs to be clearly identified for the partner in the communication book instructions. It is usually written as a specified number of slow counts or seconds with a suggestion that the partner count silently in their head between each scan. Using one movement to only accept, the partner is in control of the rhythm of the scan. This can increase the risk of partner influence on the communicator's message if the partner unintentionally varies the speed of their scan based on what they think the communicator is saying, e.g. quickly scan over items they do not think the communicator is likely to say, and pause for a long time on the item they think the communicator will want to select. Using only one movement to select, the communicator needs to focus and concentrate on the partner's scanning as any distraction may cause them to miss the vocabulary they need to select for their message. This level of concentration can become quite cognitively fatiguing. Experience suggests that less familiar partners also feel more confident of the communicator's responses/message when the communicator also does a specific movement to indicate "NO, not this one".

- **Two movements to reject and accept.** The communicator uses two differentiated signals to reject ("NO") or accept ("YES") every section/column/item in the scan. This option requires less skill from the partner by eliminating the timing element. The communicator is in control of the rhythm of the scan. The partner will not continue scanning until the communicator signals either an acceptance or rejection of that section/column/item, so internal or external distractions may slow the process of scanning, but do not result in the communicator missing the item they require. This also often increases the confidence of less familiar partners as they can rely on the communicator to respond to each item. It is less cognitively fatiguing for the communicator, as they do not have to maintain concentration whilst waiting for the section/column/item they require. However, it does require the communicator to produce two differentiated movements, and the increased activity may cause physical fatigue for some individuals.

Partner-assisted scanning may be:

- **Visual** – The communicator relies on visual recognition of the symbols. The partner scans by showing or pointing to sections/columns/items with a finger or light without verbally labelling the symbols. The partner may verbally cue their point by saying "This section?", "This column?" or "This one?" When communicators are more experienced using visual scanning, their familiar partners may not say anything as they scan the display. Templates to make PODD communication books designed for partner-assisted visual scanning (PAVS) are included on the *Alternative Access template resource*.

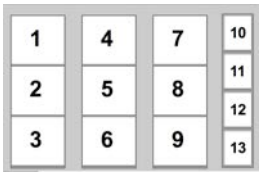
- **Auditory** – The partner reads out loud the labels for each symbol or a group of symbols. The communicator relies on their understanding of the spoken words. Partner training to use auditory scanning needs to emphasise reading out the labels (as a speech generating device would) and NOT asking the individual a series of questions. For example, scanning the labels MORE, FINISH, I DO, HELP. Asking the question "Do you want MORE?", instead of scanning by just reading the label MORE, may be confusing for a communicator who does want more, but was actually planning to ask for HELP. The answer to the social question is YES (because I do want more), but the response to the scanned word MORE is NO (I do not want to select that word). Templates to make PODD communication books designed for partner-assisted auditory scanning (PAAS) are included on the *Alternative Visual / Auditory presentation template resource*.

- **Auditory plus visual** – The partner both shows/points to and reads out loud the labels for each symbol. The communicator may rely on their understanding of the spoken labels or visually recognise the symbols. Auditory plus visual scanning may be used with individuals who have challenges visually discriminating between symbols, but may be developing some visual skills to use symbols (e.g. cortical vision impairment). Templates to make PODD communication books designed for partner-assisted auditory plus visual scanning (PAA+VS) are included on the *Alternative Visual / Auditory presentation template resource*.

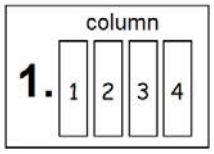
Scan patterns used in PODD communication books include:

Linear scanning

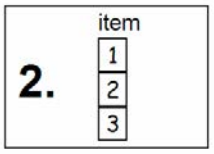
- The partner scans each item one at a time.
- The page layout supports scanning from the top left square, down the left column, then down each column in a left to right order. The numbers in this diagram illustrate the order each item is scanned.



Column/item scanning (also known as column-row scanning)

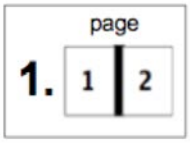


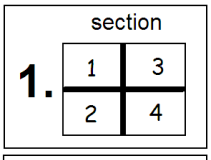
1. The partner scans each column, beginning with the left hand column and moving right across the page.



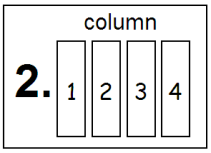
2. When the communicator indicates "YES" to a column, the partner then scans each item in that column from top to bottom.

Section/Column/Item or
Page/Column/Item scanning
(also known as group/column/row)

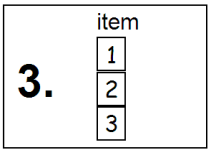




1. The partner scans each page or section in turn (see numbers in diagram)



2. When the communicator indicates "YES" to a section, the partner then scans the columns in that section beginning with the left hand column and moving right across the page.

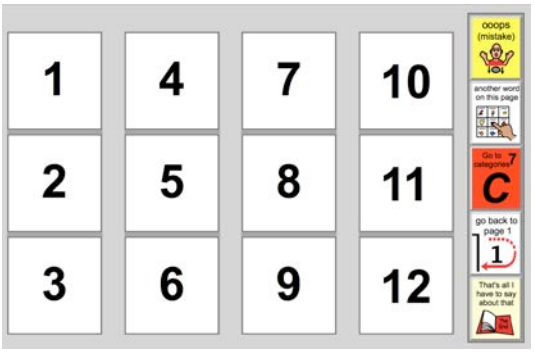


3. When the communicator indicates "YES" to a column, the partner then scans each item in that column from top to bottom.

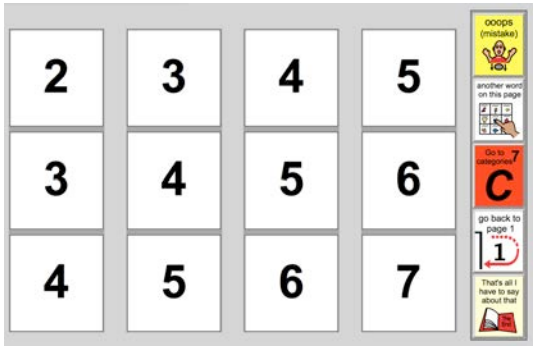
The number of movements (or pauses and movements if using only one movement to accept) the communicator needs to make to select an item depends on the location of that item on the page. This results in greater variability in the speed of access to different areas of the display depending on the scan pattern used.

The numbers on these graphics indicate how many scans (pauses or responses) are required to access different areas of a display using partner-assisted scanning.

12 per page partner-assisted visual scanning (PAVS) PODD book ("A" page)

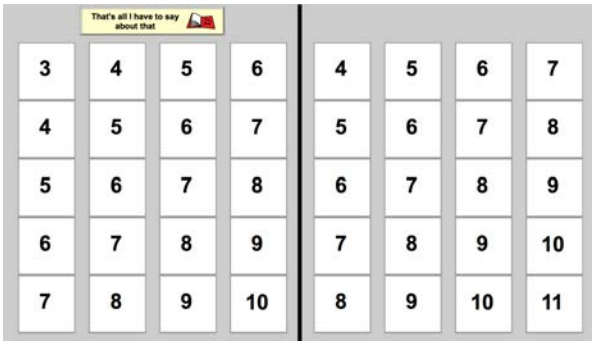


Linear scan (one at a time)



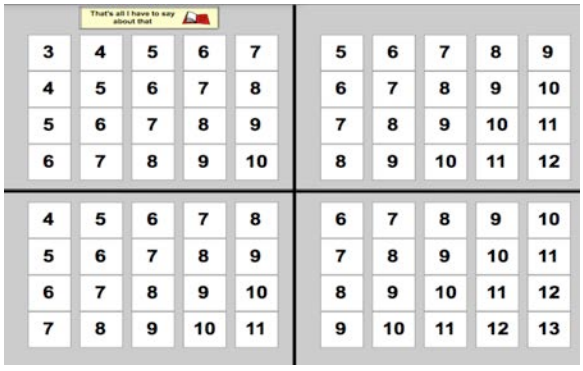
Column-item (row) scan

40 per page PAVS PODD book



Page-column-item scanning

80 per page PAVS PODD book



Section-column-item scanning

Partner-Assisted Visual Scanning (PAVS)

PODD communication books designed for partner-assisted **visual** scanning have vocabulary organisations and page layouts to suit the requirements of individuals who can **manage the visual complexity of an entire page opening** to visually locate the required symbol. Using visual scanning, the communicator initially looks across the whole page to locate the required symbol (with their eyes). They then wait or reject sections/columns and items until they see the scan reach the section/column/item that includes their selected word. PODD books designed for **visual scanning**, are **not** recommended for anyone who has visual challenges managing the complexity of a whole page or requires pull-off columns to view only one or a few items at a time. These individuals will require a PODD book specifically designed with a page layout (word order) to suit partner-assisted auditory plus visual scanning.

It is vital that partners do not read out the label of the words for individuals learning to use visual scanning. The addition of the auditory cue, especially reading out every word in a column, adds additional time to the scan and hearing all the words the communicator does not want to select can interfere with working memory.
The addition of the auditory cue can also cause individuals:

- to stop looking to locate symbols on the page (waiting to hear the word)
- to stop looking to (learn to) discriminate the visual symbols
- to rely on the spoken word (auditory scan) to communicate.

Additional errors, or inefficiencies, can result when the communicator relies on the auditory cue and does not look across the whole page to initially locate the symbol visually on a page set designed for partner-assisted visual scanning. For example, they will not be able to select TURN THE PAGE as a first option in the scan if they have not already looked across a page to determine whether the required word was on that page or not. Long term consequences for individuals not learning to look for and visually discriminate symbols because they have become dependent on their partners routinely reading out the label include:

- Unable to progress to use PODD books designed for page-column-item or section-column-item PAVS with more items on the page. It is not practical to read out loud all of the items in a larger section or on the whole page. It would also significantly add to the working memory requirements to remember the message.
- Unable to use combination eye-gaze or direct pointing plus partner-assisted visual scanning access because the first look or touch needs to be done based on visual recognition and location of symbols.
- Unable to use coded access methods as these rely on visual recognition and location of symbols.
- Unable to recognise and locate symbols on an electronic speech generating device using eye-gaze or switch scanning without an auditory cue (for columns and items).

Operational controls for partner-assisted visual scanning

The communicator using partner-assisted scanning is dependent on the partner to scan the book in order to communicate their message. Skilled partners often informally ask users "Do you need another word?" or "Do you have more to say?" However, observation reveals that less skilled partners do not immediately know what to do after a single word is selected. Skilled partners are also frequently observed to be inconsistent in their checking for more words, often based on when they think they have heard an intelligible message.

Additional operational commands are required to enable communicators to manage the partner's continuation of scanning and signal the completion of their message.

In one page opening PODD communication books designed for partner-assisted visual scanning access, the following commands are included to control the partner's scanning:

- ANOTHER WORD ON THIS PAGE
- THAT'S ALL I HAVE TO SAY ABOUT THAT

These are in addition to the commands used for navigation and provide feedback to partners in the operational column for all PODD one page opening books.

The operational buttons have been very carefully positioned in the operational column in an order that supports more efficient communicative use with less chance of communication breakdown, e.g. OOPS is first, because if the

communicator has selected the wrong word they are likely to need to scan the same page again. However if ANOTHER WORD ON THIS PAGE is selected prior to OOPS, the partner is likely to think the next word is an additional word in the sentence, not a correction.

The **rule** for using the operational column commands in a one page opening partner-assisted scanning book is ***"After the communicator indicates a word that does not include an instruction to turn to another page, automatically scan the items in the operational column, one at a time from top to bottom".*** The operational column is also scanned (as a whole column) if the communicator has indicated NO to all of the four previous columns on that page.

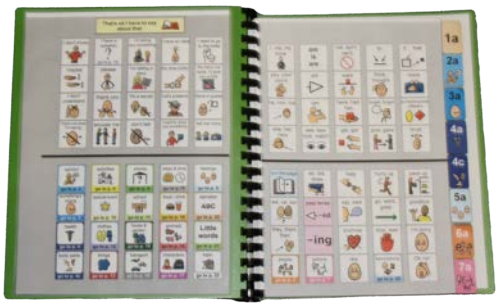
In two page opening PODD communication books designed for partner-assisted visual scanning access, one operational button, *THAT'S ALL I HAVE TO SAY ABOUT THAT,* is located at the top of the left hand side page on every page opening to instruct the partner to re-scan that page or finish scanning. The procedure for using this operational command is: *THAT'S ALL I HAVE TO SAY ABOUT THAT*

- becomes part of the scan pattern after the individual indicates a word that does not include an instruction to turn to another page.
- is used to tell the partner that the communicator has finished their current message.

Note that the wording of the command to finish scanning is THAT'S ALL I HAVE TO SAY ABOUT THAT, not a question such as "Do you have more to say" or "do you need another word?" The wording THAT'S ALL I HAVE TO SAY ABOUT THAT has been selected so that the same pattern applies to all the scans, i.e. NO (rejection of the item) moves the scan on to the next section/column/item and YES (acceptance of the item) selects the item and/or finishes the scan. Using the more social questions would reverse this pattern (i.e. the social answer YES would move the scan on to the next section/column/item).

2 page-column-item visual scanning, 36 PAVS PODD book

2 page-column-item visual scanning
40 PAVS PODD book



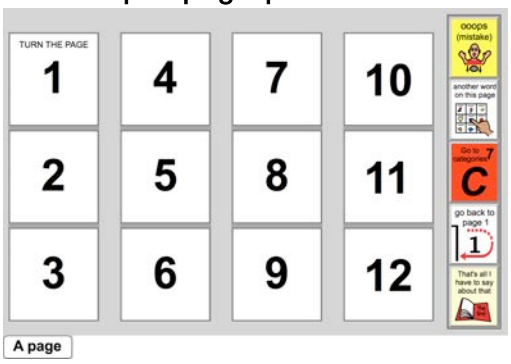
4 section-column-item visual scanning
80 PAVS PODD book

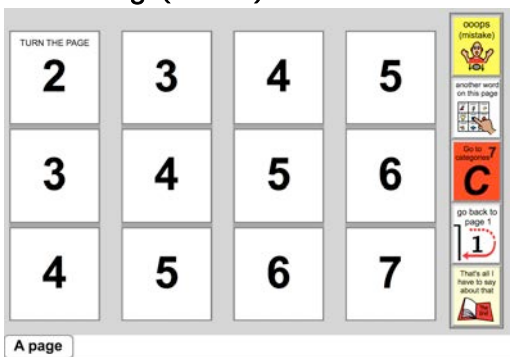
Vocabulary placement / page layout in a PODD communication book to suit partner-assisted visual scanning

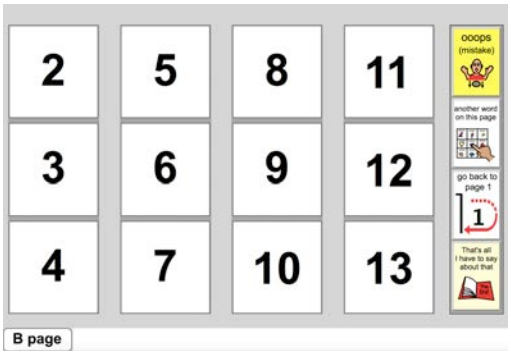
The *information file* included for each PODD book outlines the specific vocabulary placement and page layout features for that PODD communication book. The following descriptors generally apply to PODD books designed for partner-assisted visual scanning.

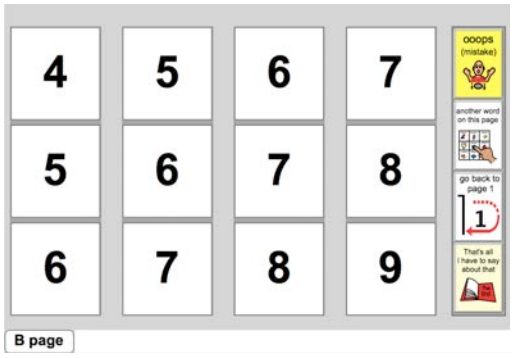
- Vocabulary items are positioned on the page with consideration to English word order and the relative speed of access to each button when using partner-assisted visual scanning.
- Operational commands such as *MORE TO SAY* and *TURN THE PAGE are positioned* in the faster to access locations on a page opening to increase the speed of access to vocabulary on other pages in a section. The communicator needs to independently look at all the items on the page to decide if the word is / is not that page. If the word is not on that page then the location of TURN THE PAGE supports the communicator to more quickly instruct their partner to go to another page.
- The location of TURN THE PAGE as the first item scanned on a page means that some items on the second page in a section require the same or less scans to access as items on the first page. This is also taken into consideration when positioning items within a section to support most efficient access based on vocabulary usage patterns. For example,

12 per page partner-assisted visual scanning (PAVS) PODD book







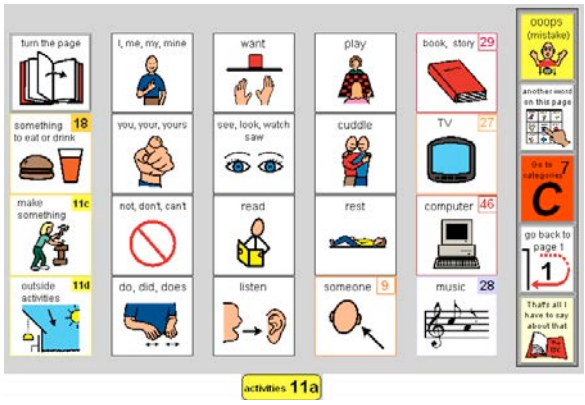


Linear scan (one at a time) **Column-item (row) scan**

- Other vocabulary items are positioned on the main pages:
  - To facilitate sentence construction in English word order from left to right across the page.
  - Within semantic/syntactic grouping in a section, there is an attempt to place more frequently used vocabulary in the fastest access spaces.
  - There is an attempt to place similar vocabulary options in the same column – for easier comparison and selection.

- In the one page opening PODD PAVS books designed for individuals at earlier stages of language development, sub-category and associated page links are positioned after the predictably associated vocabulary used to start sentences using words from all pages in the section. This encourages use of the predictably associated vocabulary to form sentences. In the 20PAVS expanded functions PODD book, optional "scan order" pages position all sub-category and associated page links to the faster to access location in the first column before the predictably associated vocabulary. This requires the communicator to have more knowledge of their PODD book vocabulary organisation and to look across the page to locate predictably associated vocabulary they require for a sentence before deciding to move to a sub-category page.

Main template page



Scan order page layout

In the two-page opening PODD books designed for PAVS, sub-category and associated page links are usually positioned under TURN THE PAGE.

Partners learning to operate partner-assisted scanning PODD are juggling two roles: being the interactive partner and operating the scanning. It is therefore helpful to provide partners with some clear rules for scanning to minimise the risk of partner influence on the communicator's message and support the operation of scanning in a predictable manner that will support the communicator's ability to use their automaticity to scan and focus on their message and interaction. .

Partner rules for scanning

- Clear your brain of possible messages while scanning
- Follow the order of the scan
- Use the same words and gestures to identify the section/page, column and item.
    - Section or page – whole hand move on then off the section/page as you say "THIS SECTION" or "THIS PAGE"
    - Column - single finger swiped down column (from top to bottom) as you say "THIS COLUMN"
    - Item – single finger point and hold on the side of item as you say "THIS ONE"
- Do not read out the labels on the symbols
- Keep rhythm of scan even. Do not vary the intonation or volume of your voice or the speed of your scan (for individuals using one movement to accept, make sure to count the recommended pause time in your head).
- Follow the rules for scanning the operational column

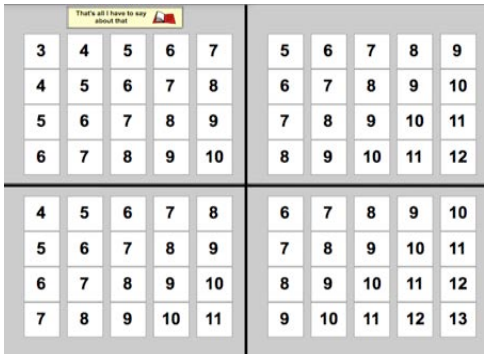
- Keep scanning until the communicator indicates “THAT’S ALL I HAVE TO SAY ABOUT THAT”.
    - Just collect the words the communicator selects without editing questions, social comments or responding to the message.
- Only after the communicator has indicated they have finished their message does the partner resume their role as the interactive partner:
    - Interpret meaning from key words as required
    - Expand / recast
    - Request clarification (“tell me more”)

Combination access

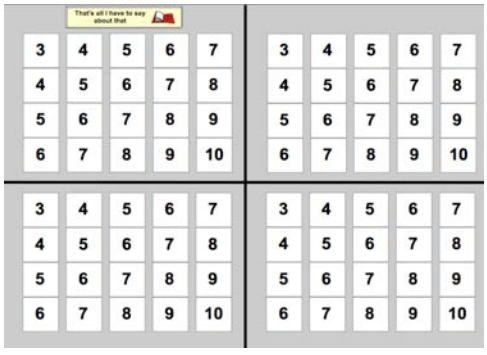
Combination access involves using direct hand pointing or eye-gaze access to a group (section or column) of symbols and then using partner-assisted visual scanning (linear or column-item) to select the specific item within that group. Combination access is used to increase the range of vocabulary available on the one page for individuals who can directly indicate a limited number of positions via direct pointing or eye-gaze. Using either eye-gaze or direct pointing to indicate a group (or column) of symbols reduces the number of movements required to select items in some locations on the page. For example,

80 partner-assisted visual scanning PODD book

The numbers on this graphic indicate how many scans are needed to access different areas of this two page opening display using section-column-item partner-assisted visual scanning.



This graphic illustrates how the first movement look or point to the section, with combination eye-gaze or direct plus column-item partner-assisted visual scanning reduces the number of movements/scans required to access items in the second, third and fourth sections.



There are two PODD books included on the *Alternative Access templates* resource that have been specifically designed to use a combination of eye-gaze or direct pointing plus partner-assisted visual scanning - the 16 Eye-Gaze plus partner-assisted visual scanning expanded functions and the 16 Direct plus partner-assisted visual scanning expanded functions PODD books.

16 D+PAVS expanded functions
Combination access – Direct + PAVS

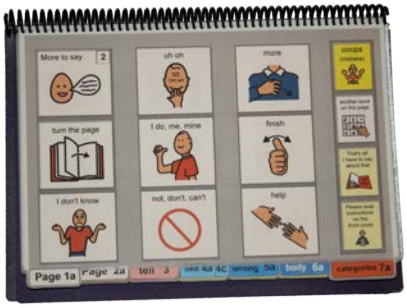
16 EG+PAVS expanded functions
Combination access – Eye-Gaze + PAVS

Vocabulary placement and page layout in a PODD book specifically designed to suit combination access.

- Operational commands such as *MORE TO SAY, TURN THE PAGE* and *GO BACK TO PAGE ...* are usually positioned separately or in pairs to increase speed of access.
- The page layout is influenced by the need to cluster vocabulary together on the page, i.e. vocabulary is presented in groups rather than columns.
- Similar types of vocabulary are clustered together on the page according to part of speech, meaningful semantic association or alphabetical order.
- The vocabulary groups are positioned on the page with an attempt to support English word order from left to right across the page. This enables smoother visual and motor movements to locate vocabulary on the page as it minimises the need to zig-zag and back-track movements to create sentences.

Note that the clustering of symbols into groups for combination access increases the visual complexity of the display. Make sure during the assessment process to not only check that the individual can see symbols this size, but that they can also manage closely spaced groups of symbols.

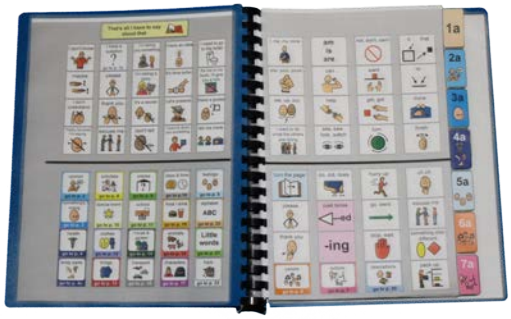
Other PODD books designed for partner-assisted visual scanning can also be used with combination access. For example:



Direct pointing to columns + PAVS
9 PAVS expanded functions

Eye-Gaze or Direct pointing to columns + PAVS
40 PAVS key word

Eye-gaze or direct pointing to pages (side panel) + PAVS – 36 PAVS key word



Eye-gaze or direct pointing to sections + PAVS
64 PAVS expanded key word **100+ PAVS complex syntax**

Note that the operational command "THAT'S ALL I HAVE TO SAY ABOUT THAT" is not needed when communicators are using combination access. As the first move is a direct point or eye-gaze to the section, the communicator can independently continue their message (point or look again) and terminate their message (stop pointing or looking). This command is usually kept in the book, as many individuals who use combination access also use full partner-assisted visual scanning some of the time to suit personal, physical position and environmental conditions which make the direct eye-gaze or pointing more difficult. Vocabulary is also positioned on the page with consideration to the speed of access to different items using partner-assisted visual scanning in addition to supporting English word order from left to right across the page.

The information files for all of the PAVS PODD books on the *Alternative Access templates* resource provide more detailed descriptions on how that book can be used using eye-gaze and/or direct pointing plus partner-assisted visual scanning. Considerations for selecting to use combination access, versus other access methods, to select items for each PAVS PODD book are also discussed

Coded access

Coded access in PODD communication books involves the communicator using a separate pointing or eye-gaze display to indicate the column and/or row placement of an item. In PODD books, the columns are represented by colours and the rows are given numbers. In full coded access the communicator indicates both the colour and number of the item on the eye-gaze or separate pointing display (similar to providing a map reference grid).

The sequence used to indicate items using a full coded (C) access PODD book is:

1. Initially look at or point to one of the four sections (quadrants) on the page opening
2. Then indicate the colour of the column in that section using either:
   - eye-gaze to the coloured squares around the edges of the PODD book cover or
   - direct pointing to coloured squares, usually on a separate display
3. Finally indicate the number of the item (row) in that column using either:
   - eye-gaze to the numbered squares around the edges of the PODD book cover or
   - direct pointing to numbered squares, usually on a separate display.

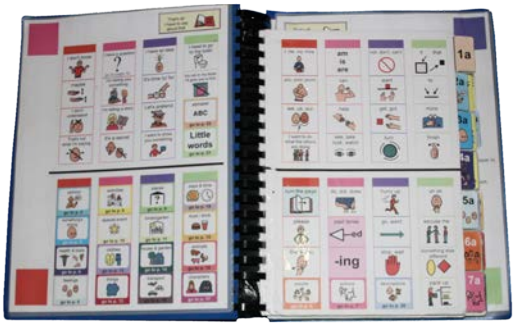
80 C expanded key word

100+ C complex syntax

Some PODD books are designed to use the colour code for the column and then partner-assisted visual scanning to identify the item within that column. The sequence used to indicate items using a colour coded (CC) access PODD book is:

1. Initially look at or point to one of the sections (quadrants or pages)
2. Then indicate the colour of the column in that section using either:
   - eye-gaze to the coloured squares around the edges of the PODD book cover or
   - direct pointing to coloured squares, usually on a separate display
3. Finally use partner-assisted visual scanning to select the item within that column.

40 CC key word

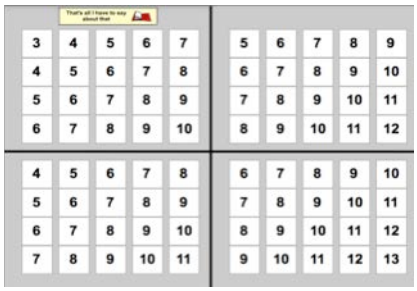


64 CC expanded key word

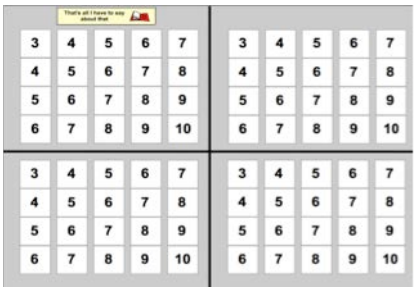
Communicator-partner agreement is vital to the intelligibility of coded access. It is necessary to agree what each look or touch means. Therefore, when using coded access the partner will say out loud where they are up to in the sequence, e.g. “section”, “colour”, “number”, before the communicator makes a selection. Note that as the person points directly to the section using direct pointing colour code, it is often not as necessary to say “section”. The partner then verbally states (and may point to) what they saw the communicator select, e.g. “This section” (as they touch it), “red”, “four”. It is not necessary, and too time consuming and fatiguing, for the communicator to confirm each selection. It is necessary for the **communicator to have an efficient method to indicate NO when the partner has made an error reading their selection**. This is generally achieved with a headshake or other gesture to indicate NO. If the individual is unable to produce an efficient intelligible gesture to indicate NO, or use left/right eye-gaze to indicate YES and NO, there are optional pages in template folders for full and colour coded access PODD books to provide a symbol for MISTAKE, UNDO. See the accompanying *information file* for more specific descriptions of the options for each PODD book.

Coded access increases the speed of communication to a larger number of symbols on a page opening for individuals who are only able to directly target a few/fewer items on a page using eye-gaze or direct pointing.

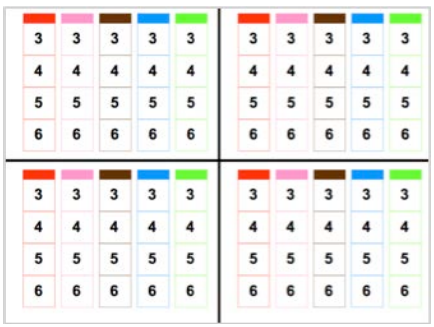
The numbers on these graphics indicate how many movements (look or point) plus scans are needed to access different areas of a two page opening display with 80 items on the page opening using a range of access methods.



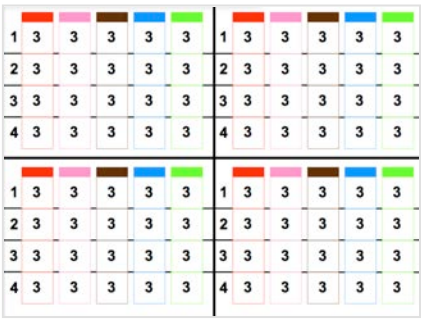
Page-column-item PAVS



Combination Access: Eye-Gaze/Direct pointing to page plus column–item PAVS



Colour coded plus PAVS



Full Coded access
All spaces on the page require the same number of movements to select

Operational requirements for full and colour coded access

Both full and colour coded access relies on working memory to remember the code and perform the sequence required to convey it to the partner.

Full coded access requires the individual to have established recognition of written numbers to use the number code. Determining the number code for the item (row) requires the individual to look back across from the item they are selecting to the numbers written on the left side of the section. This can be more challenging for items in the right columns in each section. It is often easier for individuals learning to indicate the number code to begin doing this for items in the first (red) column that is positioned closest to the numbers on the page. The colour code is easier to determine, as the border of each item is the colour of the code.

The need to perform multiple steps in sequence to select an item using coded access increases the operational competencies required. It will be easier to use coded access if the individual has already developed some competencies using combination direct/eye-gaze and/or partner-assisted visual scanning, before they are required to sequence multiple access techniques involving different movements, behaviours and operational conventions.

Both full and colour coded access are easier to use when communicators are familiar with the PODD language organisation and do not need to also concentrate on learning communication and language skills.

Neither full nor colour coded access is recommended as the **first option** for anyone who is:

- New to the PODD language organisation.
- Needing to focus their attention on using and developing their communication and language skills. Limited working memory may be reallocated from focussing on using new communication and language skill when individuals need to utilise these resources to remember and convey the code or focus on sequencing eye-gaze/direct pointing to page, eye-gaze/direct pointing to colour and eye-gaze/direct pointing to the number or partner-assisted visual scanning for the item.
- Still learning to produce movements for eye-gaze/direct pointing access. It is best to develop some degree of operational competency and intelligibility using the movements and procedures for the selection method before needing it to provide a code.

When an individual is still learning the PODD language organisation and symbol vocabulary required for interactive communication, a coded access PODD book may initially be used via:

- Section-column-item partner-assisted visual scanning (PAVS)
- Combination eye-gaze or direct pointing to the section, plus column-item PAVS
- A full coded access PODD book may initially be accessed using colour coded access, eye-gaze or direct pointing to a section and to the colour code for the column and then PAVS to identify the item in that column.

The colour added to columns for coded access also increases the visual complexity of the display.

Vocabulary placement and page layout in a PODD book specifically designed to suit coded access.

- Although use of the full code means that all spaces on the page require the same number of movements to select, vocabulary is still positioned on the page with consideration to the speed of access to different items using section-column-item partner-assisted visual scanning in addition to supporting English word order from left to right across the page. This is because many individuals using coded access, also use full partner-assisted visual scanning some of the time to suit personal, physical position and environmental conditions which make the direct eye-gaze or pointing more difficult.

- Note that the operational command "THAT'S ALL I HAVE TO SAY ABOUT THAT" is not needed when communicators are using coded access. As the first move is a direct point or eye-gaze to the section, the communicator can independently continue their message (point or look again) and terminate their message (stop pointing or looking). This command is usually kept in the book, for those times when the individual uses partner-assisted visual scanning to access their PODD book.

Alternative Visual / Auditory Presentation

Alternative Visual/Auditory Presentation PODD communication books are designed for individuals who experience challenges using the standard visual symbol displays. The alternative presentation may use:

- High Contrast (reduced visual complexity) visual symbols
- Auditory symbols (spoken word)
- Auditory plus High Contrast visual symbols.

Alternative visual presentation PODD communication books use the PCS high contrast visual symbols. These symbols were developed in consultation with Linda Burkhart and Gayle Porter to provide options for individuals who require higher contrast between symbols and reduced visual complexity in the symbol. Guidelines for desirable characteristics in the development of these symbols included:

- Wherever possible, maintain similarity to the existing PCS symbol for that vocabulary item to support the fluency and automaticity of partners who need to learn to communicate with multiple individuals whose AAC systems may include either high contrast or regular PCS symbols.
- Increase visual contrast
  - Use colours for symbols that will contrast with a black background for the symbol button (cell). A black background places the visual focus on the symbol.
  - Contrast colours and shapes used in symbols from the same semantic group that are likely to be adjacent on a communication display or on the same page in a communication book. Especially ensure that symbols with a similar shape are a different colour. The aim is to enable symbols to be discriminated based on gross features such as colour and shape and not require more refined visual focus onto finer lines or internal details.

- Reduce the visual complexity of each symbol
    - Reduce the number of colours used in each symbol. The aim was to use only one to two colours per symbol.
    - Use solid shapes for symbols. Solid shapes are much easier to see. Thinner lines in a symbol require more visual focus (accommodation).
    - Reduce the number of details in the symbol. For example, no hair on people, bold main element instead of adding arrows, no extraneous background detail.

In PODD communication books, the visual complexity of the symbol button (cell) is also reduced by using pale grey text for the label, instead of bright white, on a black background.

Individuals might benefit from alternative visual or auditory presentation of symbols in a PODD communication book due to:

- Cortical visual impairment (CVI). As cortical visual impairment is a neurological condition, it is the most common reason that an individual with complex communication needs may require the use of alternative visual and/or auditory presentation of symbols. Many of the accommodations to the visual presentation of symbols in PODD communication books have been made with consideration to common characteristics of CVI and strategies recommended to support individuals with CVI to (learn to) use their vision. Roman-Lansky (2007) provides a detailed description of the characteristics of cortical visual impairment.

- Visual perceptual and visual attention challenges. Some individuals are observed to experience challenges or differences in the way they use their vision, but do not necessarily have CVI or a diagnosed visual impairment. For example, some individuals with severe sensory processing disorders are observed to use fleeting or sideways looks to AAC displays and look away to point to the display. During dynamic assessment it has been observed that some of these individuals can more effectively locate high contrast symbols on the symbol grid. This is most likely because the high contrast symbols can be discriminated and located on the symbol grid using gross colour and shape variation and do not require the more sustained visual focus and attention to locate and discriminate between the regular PCS symbols.

- A range of other visual impairments that may result in an inability to use visual symbols or a benefit to using high contrast reduced visual complexity, symbols. Note that some individuals will require different accommodations to visual symbols to suit their specific visual capabilities. Some individuals who can independently move their hands and discriminate fine tactile differences may also benefit from tactile cues or Braille added to their PODD communication book.

Individuals who require alternative Visual/Auditory presentation of symbols may use a range of access methods. Determining the most effective access method for an individual often requires consideration of both physical and visual requirements as part of a dynamic assessment process. Alternative Visual/Auditory presentation PODD communication books have been developed for the following alternative access techniques:

- Direct pointing to high contrast symbols (with or without auditory or tactile cues).
- Partner-assisted auditory plus visual scanning (PAA+VS)
- Partner-assisted auditory scanning (PAAS)

Visual complexity of AAC displays

AAC displays can be very visually complex. The visual complexity of a display depends on:

- the number of items to be viewed at one time
- the spacing (crowding) of items on the symbol grid. Closely spaced symbols significantly increase visual complexity.

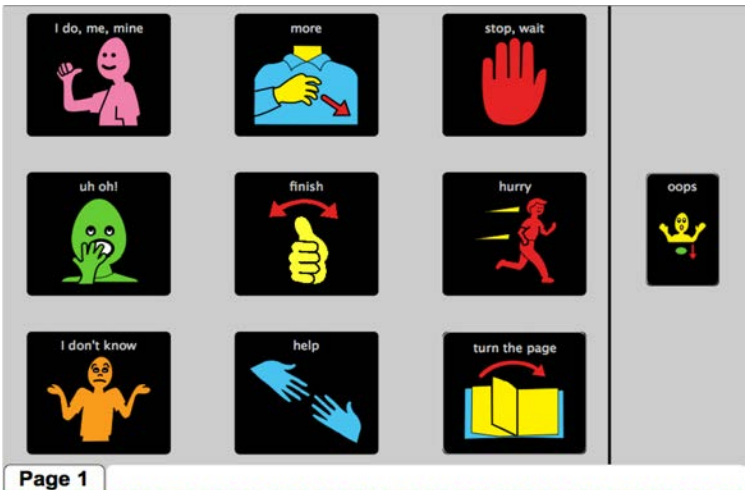
The visual complexity of the AAC display can be an issue even for individuals with mild CVI or visual perceptual challenges. The number and spacing of symbols on the display is frequently more of an issue than the size of the symbols for individuals who have CVI.

The aim is **to reduce the number of items viewed at one time without compromising range of vocabulary available for communication.**

For individuals who have visual challenges we need to remember that the primary purpose for a PODD communication book is to support communication throughout the day. Some vision strategies can be used some of the time, but for practical reasons, you may not be using them all the time. Emphasis should be on frequent communicative interactions with supports for vision use when reasonable. Don't hold the individual back in the area of communication development because of vision deficits

Direct pointing to high contrast symbols

Direct pointing to high contrast symbols may support communication for individuals with visual attention and perceptual challenges in addition to individuals with identified visual impairments. These PODD books have the same general layout as the direct access books at the same language complexity, but high contrast PCS symbols replace the regular PCS symbols.



Individuals who have visual challenges are more likely to be able to use direct access PODD books with high contrast symbols with a the page layout where:

- the symbols are spaced (not crowded) on the display
- there are less symbols on each page

Strategies individuals may use to manage the visual complexity of the display and locate vocabulary on the page opening include:

- Bringing their head closer to the page, as this functionally reduces the area of the display they are seeing at one time.

- Using **partner-assisted auditory cues** to assist them to locate words on the display. In this method the partner reads out the label on a symbol the communicator touches. The communicator selects the item by either removing their finger from the page, tapping the symbol or indicating acceptance of the last item. It is preferable if the communicator learns a standard order to touch items. Given the vocabulary organisation and page layout of PODD communication books, the most effective order is beginning at the top of the left hand column and then moving down that column before moving to the next column (as per the order illustrated by the numbers in this diagram). Over time the individual learns the location of frequently used symbols (especially the consistent location of operational commands such as TURN THE PAGE) and can point directly to those symbols.

- Adding **tactile cues** (or Braille) to the display. Note that it is necessary to have the fine motor skills to actively move the hand and fingers over a surface in order to discriminate tactile cues. Individuals with sensory processing challenges will also experience difficulty using tactile cues and they may become a sensory distracter.

Auditory plus visual partner-assisted scanning

The primary reason why an individual requires an auditory plus visual partner-assisted scanning PODD communication book is because they are experiencing difficulty using their vision to scan a complex array of symbols and discriminate between the symbols to locate the word they need to say. These individuals require a reduction in the number of visual symbols presented at any one time and additional auditory information (spoken label) in order to support their selection of words (symbols) using partner-assisted scanning. **Auditory plus visual partner assisted scanning may be used with regular or high contrast symbols.** Many individuals who use an auditory plus visual scanning partner-assisted scanning PODD book with high contrast symbols, could effectively use auditory scanning alone to communicate. The addition of the visual symbols is often more about supporting the individual who has CVI to develop and use their vision than enabling communication.

Vocabulary placement / page layout in a PODD communication book to suit auditory plus visual partner-assisted scanning.

There are a number of additional factors that need to be considered in the design of PODD communication books for auditory plus visual partner assisted scanning. These include:

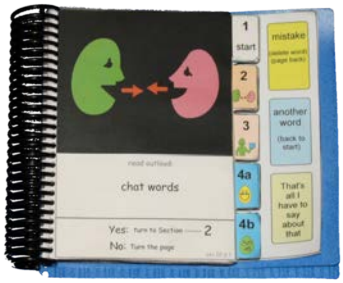
- **The selection set includes the partner's speech.** There needs to be a difference between the partner's social speech and their operational (selection set) speech. Partners will need supports (instructions and layout) built into the design of the system to support their (learning to) use operational speech.

- Partner learning to use this access methodology may be supported by starting with one-per-page book which includes very clear instructions. The one-per-page layout supports partners to learn to scan, sequentially, in order, rather than randomly present symbols as they guess (as they might do if using a single pick up and show symbol layout). **When the individual is relying on auditory scanning, the order that symbols are presented is the page layout.** Changing the order is the same as moving symbols around on a visual display.

- The layout of the one-per-page book, turning pages like a traditional book, is also more familiar and efficient for the partner to operate and allows for slightly larger symbols. While the one-per-page layout supports the communicator's expression using auditory plus visual scanning, it makes it more difficult for partners to locate vocabulary for direct or partial models. Therefore, a pick up and show version of the book (with 9 on the page) with the same vocabulary is given to support partner direct modeling. The communicator has a one-per-page book for expressive communication and partner full models and a 9 per page pick up and show companion book for partner direct models.

Early functions linear Auditory plus Visual scanning

1 per page book **Companion book**



- A one/few at a time auditory plus visual **presentation of the selection set is partial, transient and temporal.** Unlike the communicator who can look around a whole page opening and see what other vocabulary will be scanned by the partner on this page, the communicator who is only presented with one or a few auditory plus visual or visual symbols at a time, is unlikely to be aware of what other vocabulary options are coming up on the page unless they can remember every item on the page (based on experience, internal language and memory capabilities). The communicator will usually need to see/hear every option in order on the page before they can decide to change the page.

- Due to the need to say the name of each item / item in a column on the page prior to deciding if they need the next page, the "chat" words generally found on the first pages of a PODD communication book are subcategorized into a "chat / quick words" section (2). The first page of the book is the branches page in a one-page opening PODD book.

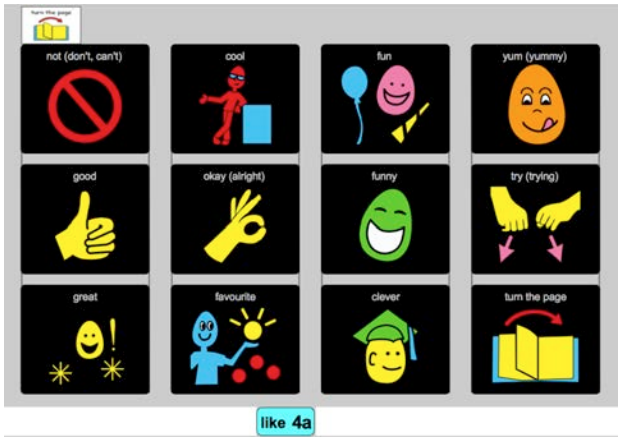
- In order to increase the size of the symbols on the page, the operational commands are located on a side panel. As the commands are usually auditory (not visually) scanned,

commands to scan the page again, go to categories, back to page 1 and back to the previous page are sub-grouped under the general command ANOTHER WORD. This speeds up access to THAT'S ALL I HAVE TO SAY ABOUT THAT.

12 expanded functions Column-item Auditory plus Visual scanning Branches on first page - Operational commands on side panel

The need to hear/see each individual symbol on the page, with an inability to see all of the following options also influences:

- The operational command TURN THE PAGE needs to be located in the last position to be scanned on a page, even though this is the slowest position to access, to enable the communicator to hear all of the options prior to going to another page. The exception to this is for communicators who have excellent knowledge and memory of the location of vocabulary in their PODD communication book - they may prefer these instructions to be in both the first and the last scanned locations on a page. As this occurs after some experience using the book, TURN THE PAGE stickers can be added above the first column once the communicator becomes familiar with a page.



- Vocabulary with possible semantic associations are grouped together in columns to help manage the difficulties of transience (may provide the communicator with additional memory/recognition supports).

- HI/HELLO may be included – as it is more difficult to use eye-gaze to greet

- There is an increased use of sub-categories to support more efficient access to vocabulary on other pages in a section. Care needs to be taken that any other words on the first page that could be included in a sub-category are scanned before sub-category link is scanned.

- Lists are used more frequently to provide individuals with access to additional vocabulary to accommodate for difficulties discriminating between visually similar symbols, visual

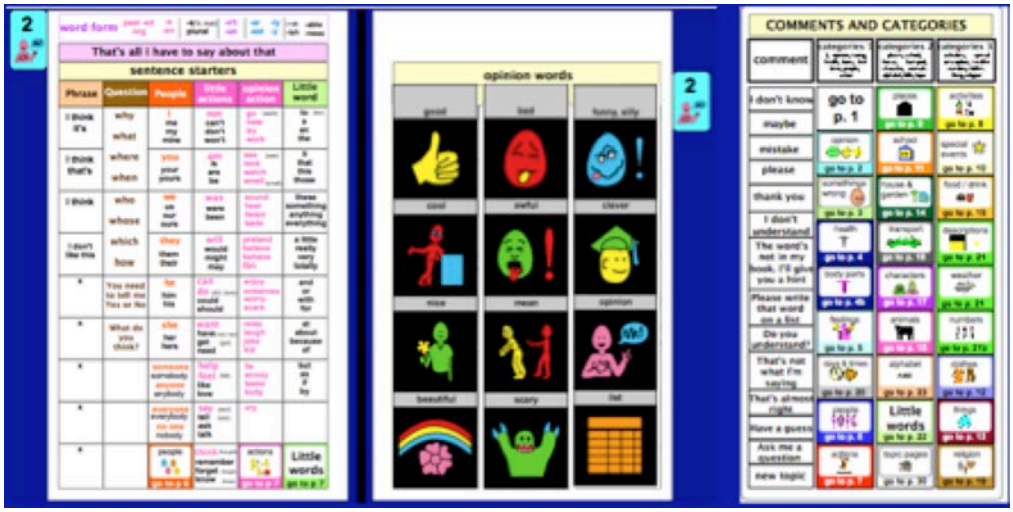
fatigue and/or concern over the number of pages (thickness and weight) of a communication book with fewer items on a page and/or pull of symbols or columns.

As the language complexity increases in the PODD communication book, it is not possible to continue to provide visual symbols of sufficient size for all vocabulary. At this stage more items in the PODD communication book are presented using auditory only scanning.

It is extremely slow and challenging for working memory to listen to every word in the book read out loud via auditory scanning when the language complexity and vocabulary increases beyond an expanded functions PODD book. In order to accommodate for these challenges, Key word, expanded key word and complex syntax PODD communication books designed for auditory or auditory plus visual scanning use a strategy of associated vocabulary word groups. Using this strategy, only the key word for the associated group of words is scanned during the first level scan with other associated vocabulary only scanned when that item is selected (see the example below).

Using this approach requires the communicator to be very familiar with the patterns of the PODD vocabulary organisation and use their memory of where vocabulary is located in their PODD book. Unlike individuals using partner-assisted visual scanning, eye-gaze or direct access who can see all the items on the page and use recognition of symbols, detailed knowledge of the PODD organisation is critical to successful communication for individuals using PODD communication books with more language complexity. For this reason it is not possible to skip to a more complex PODD book designed for auditory or auditory plus visual scanning regardless of the receptive language or cognitive skills of the individual. It is recommended that all individuals begin with a one per page early functions book, even if only for a short time, then move through the different levels of language organisation to learn the patterns required to locate the "hidden" vocabulary in the books with larger vocabularies.

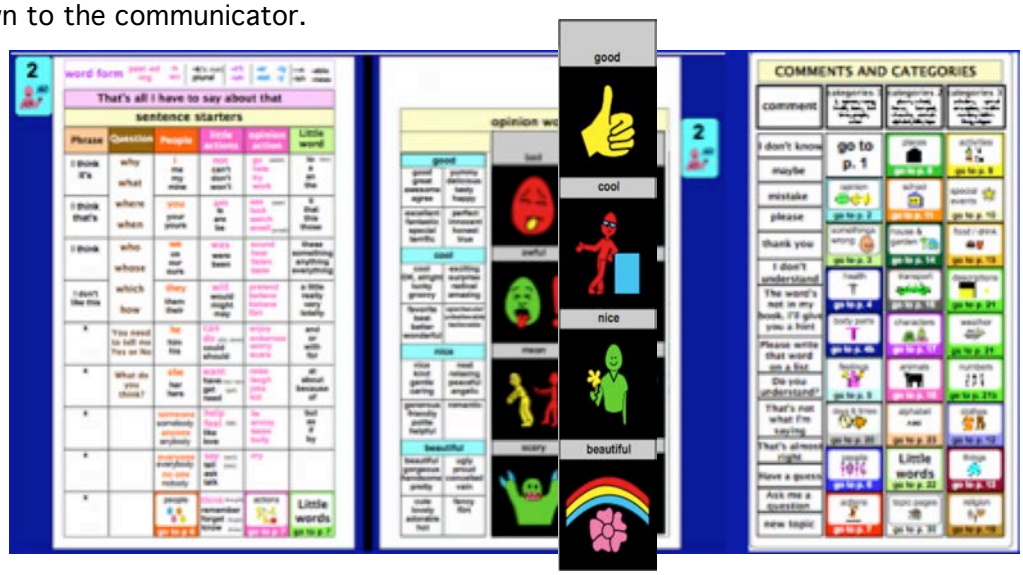
For example:
Complex syntax auditory plus visual scanning PODD communication book



Using this book the first level scan is:
COMMENTS AND CATEGORIES – SENTENCE STARTERS, MAIN WORDS

When the communicator selects MAIN WORDS, the next level scan is the first column.
GOOD, COOL, NICE, BEAUTIFUL.

In an auditory plus visual scanning book, this column can be pulled off and the visual symbols shown to the communicator.

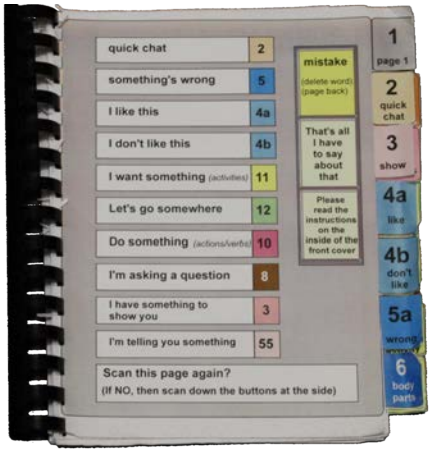


When the communicator selects GOOD, the next level scan is the first group of words under that symbol GOOD, GREAT, AWESOME, AGREE.

When the communicator selects that group the words would be scanned again one at a time so the communicator can select the required word.

Presenting the visual symbols “off” the page adds another level of complexity to the communication book operation for the partner, i.e. to pull off and show each symbol / column. It also adds weight to the communication book.

Auditory only partner-assisted scanning



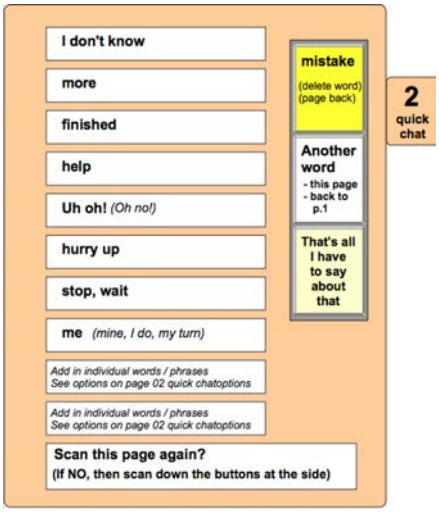
The factors that need to be considered for the design of auditory only presentation of the symbol set with partner assisted scanning are very similar to those for auditory plus visual partner-assisted scanning PODD communication books. The auditory only presentation does not provide the communicator with the additional visual stimulation, but also does not require the partner to handle the presentation of the visual symbols in addition to scanning the spoken words on a list. Auditory scanning PODD books are also smaller and lighter than the corresponding visual plus auditory scanning PODD book providing the same complexity of language.

Auditory only presentation provides reduced point of focus for joint attention during the interaction. Partners can also experience more difficulty understanding why they need to provide a model when the individual does not need to learn the visual symbols. It can be helpful to remind people that individuals still need to experience models of their communication system used because general social speech only

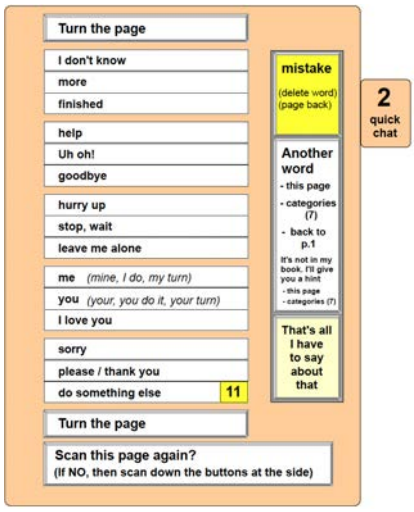
assists with word meaning but does not assist learning how to express these messages using an auditory scanning PODD communication book. For example:

- to locate vocabulary in system
- how to use pragmatic branch starters
- how to auditory scan
- how to initiate use of auditory scanning system
- what you can say using auditory scanning
- strategies to manage limitations of system
- speed, conversational flow, use of multiple modes

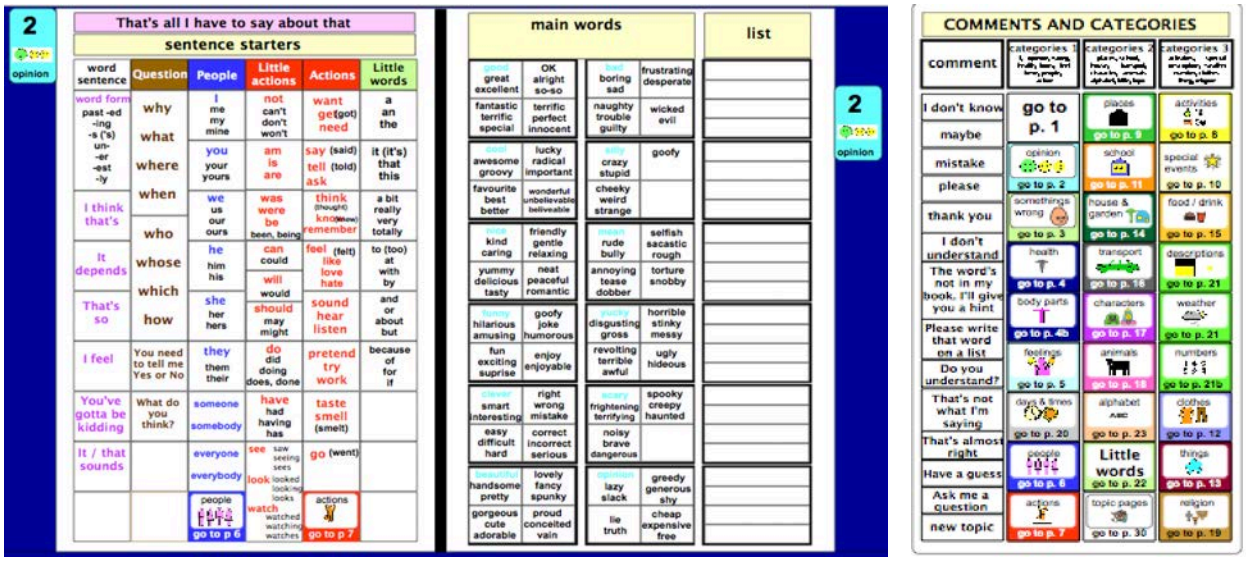
Auditory scanning may be linear, group-item (instead of column-item) and section-group item. Identification of the groups to be scanned together is achieved with increased spaces between the groups of words.



Linear scan page layout



Group-item scan page layout



Section-Group-item scan page layout

Teaching – learning strategies

Aided language acquisition

Learning to communicate involves more than symbols, aids and techniques. Communication entails learning what to say, when, to whom and how. Competent communication requires learning to select the most effective method to say lots of different things, with many partners, at all times, in any situation.

The availability of an appropriate PODD communication book assists to set the stage for communication, but it is really **the use of the system in the individual's daily life that enables communication interaction and development to proceed.** People learn to communicate and use language during genuine interactions in their daily lives, not from technology or a communication aid.

The assessment and intervention strategies recommended for use with PODD communication books support the aims and desired outcomes of using AAC outlined previously, which is:

- to problem solve how each person can most effectively meet their varied communication requirements with habits for communication at any time and
- to achieve the outcomes of communication autonomy, communicative accessibility and communication competence.

These concepts are used as quality indicators and outcomes measures. For every intervention selected for use with a PODD book / page set, it should be possible to identify how this strategy further supports the development of communication autonomy, accessibility, competence and habits for communication at any time. All interventions should enhance the individual's ability to meet their varied communication requirements, more intelligibly,

The teaching – learning strategies used with PODD systems emphasise the following:

- **Problem solving how the individual can most effectively meet their varied communication requirements in their daily life.** This includes the individual's use of multiple modes of communication and eventual learning to select the most effective mode to communicate their message in a given situation.

- **The intrinsic and extrinsic factors that contribute to communication competence for people who use AAC** (Light, 1989; Light, 2003) including:
    - sufficient linguistic, operational, social and strategic knowledge, judgement and skills
    - psychosocial factors such as motivation, positive attitude toward their AAC systems, confidence and resilience
    - ability to meet a range of communication demands with varying social roles and interaction goals
    - environmental supports, policy, practice, attitude, knowledge and skill of partners and systems.

- **The development of communicative autonomy**, with the use of prompts and cues which engage the individual as an active participant in their own learning. The style of interaction needs to convey to the individual the positive expectation that they can communicate and are learning to be responsible for their own language production. This includes the knowledge, judgement and skill to develop their own communicative intentions and messages, to initiate communication and intelligibly express their message in a range of situations.

- **The importance of communication accessibility** with communication partners learning all they require to support the individual's autonomous use of AAC and effectively scaffold their communication during the acquisition period. The understanding that communication happens all the time and AAC requires the development of habits that enable communication to happen all the time as an integral component of the individual's daily life.

The teaching–learning strategies selected for use with PODD communication books reflect current theories of the processes involved in language acquisition. Research into the processes involved in aided language acquisition, as opposed to symbol teaching practices, is an emerging field of study. Many authors call for the possibility that

"The acquisition of alternative communication forms can be understood within a general developmental framework and the theories of language development in general may also be applied to these forms. In principle, it is only the form and not the function that distinguishes alternative communication forms from speech. However, vocal and non-vocal language forms may differ in both their underlying processes and the environmental conditions that together influence the paths children take to communication and language."

von Tetzchner & Grove, 2003 p.9

The following points outline possible influences in aided language acquisition based on knowledge/theories of the processes involved in typical language development.

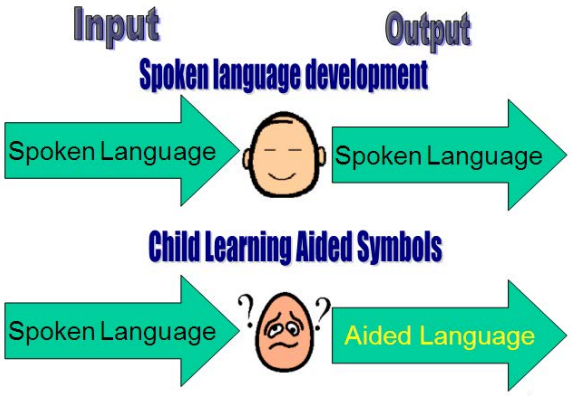
1. The role of a language learning environment – people learning to use AAC need to experience models of their language used to communicate

Von Tetzchner (1997, p.9) refers to the "difference between their own expressive (and for some also receptive) language and the language used by significant people in their immediate surroundings" as a crucial characteristic of language acquisition and use for children learning to use AAC.

A review of established theories on the processes involved in typical language development, lead von Tetzchner & Grove (2003) to note that all theories imply the existence of an environment of language users necessary to support the child's development of communication and language to a greater or lesser extent. There is a general assumption that children are surrounded by examples of others using the communication and language systems they are learning. Children learning their first spoken language are immersed, from birth, in a rich environment of language users, modelling the pragmatics, semantics and syntax of their language. These models occur not only when people are speaking directly to the child, but also when others are communicating in the presence of the child and from the media. Limitations in a child's language development are usually expected when their language learning environment has been compromised in some way.

The importance of participation in an environment with experiences of a language used interactively is also reflected in immersion approaches to second language teaching.

The opportunity to be truly immersed in an environment using aided language is rare.
Individuals learning to use aided symbols frequently experience a significant discrepancy between the language used by others in their environment (speech) and the language they are expected to use.



In these circumstances, individuals must problem solve how to use a language that they have rarely seen used to communicate. The language of aided symbols using a PODD communication book has different parameters to the dominant language the individual hears spoken to them. Whilst the communicative intents and concepts to be expressed are the same, the conversational pragmatics and conventions, the representations, the modality, and even the syntactical forms vary. The final product is similar to the utterances of the dominant spoken language, but the processes required to construct a sentence using a PODD book / page set are different.

For example, to produce the English sentence *"Mum and I went to the beach last Friday"* an individual using a PODD may need to produce the aided language utterance, *"I'm telling you something, It's already happened, People, mum and I, go to categories, places, go (went) to the beach, go to categories, days & times, last, turn the page, Friday".*

To initiate this message, the communicator will also need to have learned a procedure to attract and maintain a partner's attention. If the communicator is using an alternative access methodology, such as eye-gaze, partner-assisted auditory or visual scanning, or a coded access methodology, there will be additional exchanges with their partner inherent in the operation of the system. For example, partner-assisted auditory scanning requires the partner to verbally list words and the communicator to indicate yes/no to each option. This may involve a number of exchanges to express each word.

This discrepancy between the languages used for receptive input and expressive output, requires people learning to use AAC to translate their experiences of how others use spoken language into a different language form for expressive communication. Whilst independent translation may be possible for some individuals who have complex communication needs, it definitely adds complexity to the challenges inherent in developing expressive use of aided language for most learners.

Von Tetzchner & Grove 2003 proposed the existence of two main developmental paths for individuals with complex communication needs, based on their varying comprehension of spoken language.

1) Individuals who have intact comprehension of speech may use their pre-existing, conceptual knowledge to support their learning of aided language. This is similar to second language learning. These individuals will still require models of the aided language to learn the unique usage and characteristics of this language, but can map their existing knowledge of language concepts and structure onto the new form.

2) Individuals who have very limited comprehension of spoken language will need to acquire aided language without the ability to refer to a pre-existing knowledge of speech. This requires the independent creation of a meaning system with AAC language forms. The processes involved would be similar to first language learning with multiple models of language use required to develop a meaning system.

The individual's current understanding of language has been found to be the critical factor in determining how much receptive input is required before they initiate expressive use a PODD book or page set on a speech generating device to autonomously communicate. Individuals who have limited understanding of spoken language have often required two to three years of quality receptive input, to create a meaning system in the alternative form, prior to self-initiated generative expressive communication. During this time they may have initiated using of their PODD book to express some, very frequently modelled, meaningful messages in familiar contexts. Interestingly, the complexity of the navigation pathway or language appears to have less influence on the messages these individuals selected to express than the frequency that message was modelled. Difficulty learning to understand spoken language may be due to severe hearing impairment, auditory processing challenges, specific language impairment or significant cognitive challenges. Individuals with more significant cognitive challenges may find it easier to learn to understand graphic symbols (pictographs) because they are visual, static and provide more processing time compared to speech which is auditory, transient and very abstract.

It is vital that we provide these individuals with many opportunities to learn their language before we expect them to use it. Early expectation (demands) to use the PODD book before the individual has received sufficient models has been observed to result in behaviours of concern such as kicking the book away, closing the book, avoiding eye-contact and interaction. Individuals who have difficulty understanding others frequently exhibit anxiety, especially if they realise that others are telling them to something, but do not understand what it is.

In the words of one teenager whose first language was graphic symbols (due to deafness)

"When I was a little girl I cried all the time. I was scared when people came to help me because I didn't understand what people were saying. When I learned to understand my communication book I felt happy, proud and safe". Sabrina Kustreba, 2007

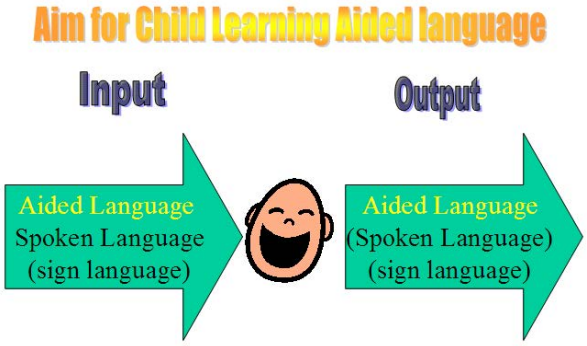
This message was generated using spelling on speech generating device when she was 13 years of age. As a young child she had required approximately three years of receptive input using graphic symbols to learn language before beginning to initiate use of her PODD book to expressively communicate more than an occasional, familiar, in context message. Notice her emphasis on the importance of learning to understand to help her feel safe.

We need to provide individuals learning aided symbols as a first language with more vocabulary for other people to provide meaningful receptive input in their daily lives. As they may require years of receptive input before using the system expressively, the selection of their initial PODD communication book is made to suit their needs for receptive language input in a visual form.

Being able to view a whole message in the message window of an electronic speech generating device has additional advantages for individuals relying on visual symbols to learn language. Therefore, early availability of an electronic device for receptive input in addition to the PODD communication book is recommended.

All individuals require opportunities to experience their language by others to express genuine messages in natural environments. Aided language stimulation (Goossens', Crain & Elder, 1992); the System for Augmenting Language (Romski & Sevcik, 1992) and Natural Aided Language (Cafiero, 1998*)* emphasise the provision of receptive input in the AAC modes as the basis of intervention.

The aim is to create a language learning environment with more balance in the modes of communication used for receptive input and those the individual is learning to expressively use.



The intervention approach used with PODD systems is <u>aided language stimulation</u> with an aim to create an aided language learning environment that supports the development of autonomous communication at any time.

<u>What does the research evidence tell us about the effectiveness of Aided language stimulation interventions?</u>

Research has now demonstrated that aided language stimulation techniques can support individuals of various ages and disabilities to expressively use graphic symbols (Sennot, Light and McNaughton, 2016; Barton, Sevcik, & Romski, 2006; Beck Stoner, & Dennis, 2009; Binger & Light, 2007; Bruno, & Trembath, 2006; Cafiero, 2001; Dada, & Alant, 2009; Drager, Postal, Carrolus, Castellano, Gagliano & Glynn, 2006; Goossens', 1989; Harris, & Reichle, 2004; Jonsson, Kristoffersson, Ferm & Thunberg, 2011; Romski, Sevcik, Robinson & Bakeman, 1994; Romski, Sevcik, Robinson, Mervis, & Bertrand, 1995).

Many of these studies have reported on relatively short periods of aided language stimulation and /or immersion in only a few situations using a limited or situation specific vocabulary. The outcome "expressive use of aided symbols" can have different connotations and outcome criteria. As many of the research studies were, by necessity, of shorter

duration they often measured the participants learning to use a limited range of targeted symbols. As noted by Light and McNaughton (2015) "*Traditionally AAC research and practice had focused on small measurable goals for these individuals*."

When the long-term outcome is directed towards autonomous communication, rather than symbol learning and use, then we need to collect information on the individual's use of the AAC system to express self-determined messages in multiple situations without prompting – to meet their own varied communication requirements. We also need to gather information from the individual and their social networks whether the use of AAC enhanced the quality of their lives.

"Ultimately, the goals of AAC intervention must be that the children and adults with complex communication needs have the opportunity to live happy and fulfilled lives where they are able to participate fully in education, employment, family, and community life; where they are safe and secure, and have access to needed services; where they are respected and valued for who they are; where they have a chance to develop friendships and intimate relationships; and where they have the opportunity to make meaningful contributions to society ".

(Light & McNaughton, 2015. .p 3)

A true aided language learning environment (immersion) would provide individuals with numerous models of symbols used to express a full range of communication intents, messages, and topics that naturally occur during interactions in all contexts, throughout the day (Mirenda, 2008; Porter & Cafiero, 2009). Scientific research evidence on the effects of more intense immersion in an aided language-learning environment on the long–term development of autonomous communication is not yet available for any language organisation or AAC system. Clinical and personal accounts from people who use AAC and their communication partners have demonstrated that individuals who received aided language stimulation intervention using the PODD communication books and page sets for speech generating devices, have grown to be young adults who are autonomous communicators.

2. Language acquisition is driven by the desire to communicate – aided language needs to be used for genuine communicative purposes

"the function of communicative abilities is to solve communicative challenges."
von Tetzchner & Grove, 2003, p. 14

"..the adults who plan and adapt the language environment of children who use alternative means of communication should be providing models of language use in their own form. Moreover, these should be used for genuine communicative purposes, in all types of everyday settings and when the children are very young."
Renner, 2003, p.79

The drive to communicate with others is an important factor in language acquisition. Language generally develops as children strive to work out the meanings of other people's messages and communicate in a way that helps others understand their messages during

daily interactions. It is important that aided language is used for genuine communicative purposes in the individual's daily environments.

This concept also has broader implications for individuals learning to use aided language. As aided language is not always the most efficient mode to communicate a message, the communicative need to use aided language to express a message will vary.

For example, there may be little communicative need to use pictographs to request, when pointing or eye-gaze to the real object in the environment effectively communicates the message to that partner and is much more efficient when the object is present. The use of pointing and/or eye-gaze to objects may also be more flexible as it can be used to request things which others have not predicted and/or provided a pictograph to express.

A genuine communicative purpose for an individual to use aided language requires not only a message they need to express, but a need to use aided language as the most effective method to communicate that message in the current situation. **Aided language interventions need to address unmet communicative challenges.**

Low motivation to use aided symbols is often observed in individuals, their families and support personnel when aided symbols are provided only for communicative purposes that are more efficiently achieved using other modes.

3. Skilled communication partners actively strive to jointly construct meaning with the individual. A range of strategies are used to scaffold the individual's successful communication and use of language in the acquisition period.

"adults, rather than just presenting what needs to be learned, support children's own active striving to communicate. They do this by participating in activities with joint engagement, attributing communicative meaning to the children's actions (overinterpretation), guiding children in expressing themselves and negotiating meaning (Schaffer, 1989; Tomasello, 1999; Wood et al 1976)."

von Tetzchner & Grove, 2003, p. 23

Communication partners perform an active role in the communication process as they strive to understand and assign meaning to the individual's attempts to use language to communicate.

Vygotsky (1962, 1978) proposed that children develop language by solving communicative challenges in collaboration with more competent users of the language. He introduced the concept of a zone of proximal development to describe 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 individual and the form of structured guidance provided by the partner. It is this collaborative functioning that is thought to be the "unit responsible for developmental change" (Letto, Bedrosian, & Skarakis-Doyle,1994).

Bruner (1983) used the term, scaffolding, to refer to this structured guidance and collaborative functioning seen when young children and their caregivers communicate. Any strategy that supports the individual's successful communication of their own messages through their own efforts can be regarded as scaffolding. The partner actively seeks to understand what the individual is attempting to communicate and puts in place any additional supports required to enable the individual to communicate according to their own intentions.

von Tetzchner & Grove (2003) suggest that scaffolding should not only help the individual communicate better in particular situations, but also function to support and encourage the active role of the individual as a learner and influence the processes underlying language development.

Review of the literature on typical communication and language acquisition reminds us that partner supports are the norm during language acquisition with independent, more autonomous communication developing over time as children acquire language competence.

Assessment and Intervention - Where to begin?

"The attitudes and expectations of people in the environment may to some extent influence all children's language development, but they may be critical for children who use alternative forms because these children depend on the means and opportunities provided by professionals."

von Tetzchner & Grove, 2003, p.15

Cress & Marvin (2003) and Romski & Sevcik (2005) discuss some of the beliefs and myths about AAC use with young children that have influenced clinical practice. Despite a lack of empirical support, and sometimes in the presence of empirical evidence to the contrary, some of these beliefs may exclude young children from AAC supports. Romski & Sevcik (2005) present arguments refuting these 6 myths:

MYTH 1: AAC is a "last resort" in speech-language acquisition
MYTH 2: AAC hinders or stops further speech development
MYTH 3: Children must have a certain set of skills to be able to benefit from AAC
MYTH 4: Speech-generating AAC devices are only for children with intact cognition
MYTH 5: Children have to be a certain age to be able to benefit from AAC
MYTH 6: There is a representational hierarchy of symbols from objects to written words (traditional orthography).

Romski & Sevcik (2005)

These myths about AAC use and aided symbol acquisition have not only been used to restrict access to AAC services, but have also influenced the type of AAC supports provided for developmentally young individuals to learn. For example:

- A belief in the representational hierarchy myth may lead to individuals at the earlier stages of communication development being inappropriately restricted to photographs of nouns (transparent representations) to make choices, with no opportunities to learn to use graphic symbols for other communication intents. Individuals may be excluded from learning a means to communicate other, typically acquired early, "first words" vocabulary because it is more difficult (abstract) to represent with a photograph e.g. GO, COME, STOP, NO, HELP, MORE.

- A belief that individuals need to demonstrate a certain set of skills prior to the introduction of AAC language modes may also limit the type of aided language supports provided. For example, a belief that individuals need to demonstrate an ability to choose between two symbols prior to exposing them to a broader range of symbol vocabulary for learning via receptive input.

These, and other, myths can become self-fulfilling prophesies as learning aided language is very dependent on, and limited to, the opportunities provided by the professionals in their environment. This can create the following "catch 22" situation in assessment and intervention.

- Aided language does not naturally exist in the environment:
    - The individual cannot spontaneously uptake something that is not there.
    - Professionals intervene - provide aided language based on their expectations of what's possible.
- The individual can only demonstrate ability to use what has been set up for use:
    - Uptake may be influenced by a variety of factors.
- Others can only be influenced by the individual's use of what has been set up to use.

The different communication behaviours of some individuals who have complex communication needs, and movement patterns of individuals with significant physical challenges, may further influence the input naturally provided by others.

An initial focus on receptive input provides individuals with opportunities to learn, over time, how aided symbols are used to communicate. It also provides parents and professionals with opportunities to observe the individual's response to this mode of communication and discover, over time, the strategies which will enable the individual to communicate more effectively.

Dynamic assessment

Vygotsky (1978) argued that assessments where the examiner does not actively intervene provide data only on the individual's past history and present functioning, but not their potential for learning. Dynamic observational assessment (Olswang, Bain & Johnson, 1992; Porter, 1997) addresses this limitation as the examiner provides models, cues, instructions, prompts and feedback during interactions with the individual. This provides additional information as to the factors which may influence success or failure and suggests strategies to facilitate development or functioning. The intervention–assessment gap is bridged.

The aim of dynamic assessment for individuals who have complex communication needs is to identify possibilities to enable the individual to most effectively meet their varied communication requirements. It is vital that the assessment gathers data about the effectiveness of the individual's receptive and expressive communication:

- for a full range of developmentally appropriate communication intents and functions
- with a range of communication partners
- in a range of environments and, for individual's who have physical challenges, a range of physical positions
- for the varied activities of their daily lives.

Experience suggests that informants are frequently more skilled at identifying intelligibility issues and instances of communication breakdown than they are at identifying limitations in the range of communication functions expressed by the individual. Informants often experience more difficulty identifying what an individual is **not attempting to communicate**. The comment, "I understand everything he says", needs to be followed up with the questions, "So what is he saying?"; "What is he not saying?" and "Who is he talking to?".

Observation of the individual interacting in their natural environments with key communication partners is preferable, but not always possible. It may be necessary to contrive situations and activities that provide opportunities for genuine communication interactions (Lahey, 1990; Wetherby & Prutting, 1984; Iacono, Carter & Hook, 1998). In these situations it is important to ensure that opportunities for the individual to initiate communication for a range of functional purposes are created. Remember the only communication function observed in response to a question is *answering*. The *prompts and cues* section in this resource includes strategies to provide opportunities for individuals to initiate communication.

The procedure used for dynamic observational assessment for AAC varies depending on the individual's current communication skills and previous interventions, but generally includes the following:

Observation of the individual interacting with key communication partner(s).

This observation aims to ascertain how the individual is currently communicating as well as provide some insight into the individual's physical, sensory, social-emotional and cognitive requirements for communication. This observation notes:

- What the individual does.
- What other people are doing which may support or limit the individual's communication.
- Any environmental factors which may support or limit the individual's communication.

For example, the set up and partner interaction in the following play situations provide the child with very different communication opportunities which results in different communicative behaviours being observed.

1. *Playing with the fire truck, long sitting on the floor between mum's knees, back to mum, no physical or aided language supports in place. Mum talks about what they are doing as*

she assists Peter to reach out his hand and push either the truck or the siren. Peter appears to enjoy this play as he is looking at the truck and laughing at the siren.

2. *Playing with the fire truck, long sitting on the floor between dad's legs, side on to dad, no physical or aided language supports in place. Dad comments on what is happening in the play, e.g. "That's a funny sound", and describes what Peter is doing. He pauses (10-20 seconds) before physically assisting Peter to reach out to the toy to push either the truck or the siren. After 3 turns, Peter moves his right arm up. Dad assigns meaning to this saying, "Oh you want to push the siren again". Peter turns his head, looks at dad and smiles. Dad interprets this as "Yes" and helps him to activate the siren. Peter turns his head, looks at dad and smiles. Dad says "That was fun" and pauses. Peter turns his head to look at the fire truck and then turns his head to look at dad. Dad assigns the meaning "Oh you want to do it again".*

Gather supplemental information.

It is important to remember that direct observation in a limited range of situations only tells us about the individual's communication in that situation, at that time.
Communication is extremely variable depending on the individual's motivation and intention to communicate a message at a given time, the partner, situation and activity. Communication modes and messages can also be context dependent for some individuals. It is therefore not possible to rely on direct observation alone to gain a true picture of an individual's communication. There is a need to gather supplemental information reflecting a broader range of the individual's communication capabilities from informants who interact with the individual in a range of situations.

It can be useful to structure discussions with informants by using a profile (such as Dewart and Summers, 1995) that ensures a full range of communication functions are considered.

Interact with the individual using a range of strategies to extend communication skills.

At this stage the assessor interacts with the individual using any strategy which may be beneficial to enable the individual to communicate more effectively. These strategies may support physical, sensory, cognitive, social-emotional or linguistic aspects of communication. In fact any intervention strategy that could scaffold the individual's communication may be trialled in order to observe its effect on their ability to communicate.

These interactions may occur during any of the individual's routine activities and/or it may be necessary to create contexts for these interactions.

When selecting activities consider:

- the communication possibilities in the activity, including the possibilities to add communication temptations (Iacono, Carter & Hook, 1998)
- the opportunities to express a range of communicative intents
- the frequency of communication in the activity, i.e. the amount of interaction between people inherent in the activity versus the individual silently interacting with the objects/toys
- the influence of the individual's physical position on their movements to communicate
- the individual's age and interests
- the availability of appropriate aided language vocabulary/displays.

It is vital that **receptive input in a range of AAC modes is introduced at this stage for all individuals** who have complex communication needs.

As already discussed, individuals cannot be expected to demonstrate the use of something they have never experienced. As yet we do not have any evidence-based measures or tools which reliably indicate readiness for AAC language modes for individuals who have complex communication needs. Indicators used to suggest the emergence of spoken language in typically developing children are particularly unreliable for those who have sensory and/or motor challenges. These individuals may not have the movement abilities to intelligibly use the gestural modes generally relied on as indicators of intentional communication.

We actually need to introduce AAC language modes before we can determine how effective they may be to support an individual's receptive and/or expressive communication. Individuals who have sensory-motor challenges may also require the introduction of strategies to support their movement and position to communicate. Exploring, suggesting and teaching possible movements that can be used to communicate is usually required to determine possible communication strategies for those who have complex sensory-motor challenges.

Identify key learning requirements and hypothesise on specific strategies to address these requirements.

After an initial assessment, it is beneficial to identify the individual's main learning requirements to enable more effective communication. There is a focus here on issues that affect participation and communication across a range of functional purposes in a range of situations. Suggested strategies to be implemented (trialled) are written for each learning requirement. This provides a useful summary for the individuals family and/or support personnel of the things they have to remember and address as they interact with the individual in daily life. It is important to explain to partners that in the early stages of the assessment - intervention process, the suggested strategies may need to be changed as more detailed information on what supports the individual's communication is gained. The *Appendix* includes example summaries of key learning requirements.

Intervene - observe – intervene – observe.

Dynamic observational assessment is an ongoing process. Whilst it is used to inform planning for intervention, it is not a linear process. The assessment is continuous with intervention directed towards the developmental process. Different strategies may be tried, found ineffective and abandoned in this process. This intervention – assessment may need to occur over many months for individuals who have complex challenges in order to provide sufficient teaching – learning time to adequately assess the probable effectiveness of a particular strategy. Family and support personnel may need to be prepared to try strategies over an extended period of time, with no certainty of success. Changes are usually required on the quest to discover the range of strategies needed for more efficient, intelligible, specific, independent and socially valued communication to enable the individual to most effectively meet their communication requirements.

Materials for dynamic assessment

It is necessary to have a range of generic aided language displays and/or PODD communication books available for trial as part of the dynamic assessment. The range of aids needs to allow for observation of the individual's response to different:

- complexity of language (communication intents, semantics, syntax)
- access methodologies
- page layout, symbol size, contrast and spacing, number of symbols on the page, etc.

The specific range of displays required will depend on the individual's age, interests, abilities, difficulties and the possible design strategies that may support their learning. The suggestions below focus on the materials required to provide sufficient information to select and develop an appropriate PODD communication book to suit the individual's requirements. A variety of other equipment is also used during dynamic observational assessment to discover the full range of multi-modal strategies that may be implemented to support the individual's communication and language development, e.g. speech generating devices, switches, splints, positioning supports.

Organisations may wish to make a set of generic PODD communication books to use in the dynamic observational assessment process. The cost and time involved to make (standard print quality and laminate) this set of communication books, will be off-set over time by repeated trial use with many individuals. However, it is not always possible to have a full set of PODD communication books available for trial and substantial information can be gained about an individual's response to, or use of, different access methodologies, symbol types and page layouts using single level displays.

Activity displays for favourite games or toys and common daily routines and general interaction displays (for between activity interactions) are very useful resources. Depending on your client group, for each activity make multiple displays with varying:

- complexity of language
- symbol size, spacing and number of symbols on the page, e.g. 9, 12, 16, 20, 32
- symbol colouring, including high contrast
- access methodology, e.g. direct point, pick up and give/show, partner-assisted scanning, eye-gaze and/or coded access. (It is possible to use the same page layout for direct point and pick up and give/show, and add lines to a direct access display for partner-assisted scanning.)

Other useful materials for use with the activity displays include:

- a range of supports/holders to position the aided displays
- separate cards or choice-making displays to select preferred activities.

The information gained from trial with single level displays is used to help narrow the selection and customisation of an appropriate PODD book. A generic or draft copy of the "most likely" PODD communication book is used as part of the dynamic observational assessment to inform the development of the individual's own system. Experience has shown that it is extremely difficult to predict all of the individual requirements prior to actually using the system.

The use of a generic or draft PODD communication book for a period of time in the individual's daily environments:

- allows intervention to begin without the need to wait for the process of designing and making a customised communication book to be completed
- provides feedback on the appropriateness of the selected page set, e.g. access methodology, symbol type, layout, complexity of language
- assists with the selection of specific (fringe) vocabulary. On-the-spot strategies to note additional words and required changes include the use of sticky notes, list pages and stickers
- reduces the instances of time wasted creating customised books that are found to need major review.

Creating an aided language learning environment

"An environment which supports the acquisition of alternative language forms does not seem to come naturally." von Tetzchner & Grove, 2003, p. 13

There are 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 vocabulary available

Engineering the environment is the term used by Goossens', Crain & Elder (1992) to describe organisation of aided vocabulary in the individual's environment. They described the use of multiple activity-specific displays physically placed in the environments where these activities occurred.

A PODD communication book is likely to be only one element of the individual's total AAC system. Most people also use other non-electronic options to suit specific purposes (e.g. specific activity/topic displays). They may also have access to an electronic speech generating device (SGD) and/or use sign and gesture and/or speech to effectively meet some of their communication requirements.

Engineering the environment involves planning to ensure the individual has access to the range of supports they require to most effectively communicate in all situations. Engineering the environment with aided symbols involves the following steps:

1. Identifying the individual's communication requirements.

2. Identifying the most effective mode(s) to meet these communication requirements. An individual may require multiple modes to express the same messages. Consider:
    - the range of modes the individual is able to use.
    - the modes their partners are able to understand.
    - the message to be expressed. How specific does the message need to be? Language is usually required to express messages more specifically.
    - the physical nature of the situation and position of the individual. Specific note is made of how this affects the access methodologies the individual can use and the type or size of aid that will fit into the environment.

3. Making the aided symbols available for individuals use and their partners to model:
    - identify the type of display/aid to suit the communication requirement, e.g. use of electronic or non-electronic PODD for generally useful vocabulary, activity/topic displays for specific, low frequency situations/topics
    - design and make displays/program devices
    - position the AAC aids for easy access in the individual's environment
    - store the situation/topic displays for easy retrieval.

In a PODD communication book, vocabulary is "engineered" vertically within the dynamic display, rather than spatially around the environment.

This facilitates the availability of aided symbols in multiple, including novel, environments as the PODD communication book is transported from place to place with the individual. The success of engineering the environment using a PODD communication book is therefore dependent on the implementation of strategies to transport the communication book with the individual; to ensure it is readily accessible for use in all places and at all times.

It is vital to work with families, support personnel and the person who uses AAC to establish the **habit that AAC system is always available**. This requires constant reminders and vigilance to ensure that having the communication system with the individual at all times - out of bags and in sight - does indeed become a habit.

Strategies found to support the development of this habit include:

- Communication partner education sessions on the purposes of communication and the function of AAC to support the individual's independent communication. In these sessions it is useful to note that putting a communication system away:
  - implies to the individual that you are not expecting them to have anything to say
  - may imply that communication only happens at certain times, as directed by someone else when they make the AAC system available
  - increases the effort and motivation required to communicate, as the individual or their partners have to take time to retrieve the system as well as communicate the message.
- Repeatedly model the placement of the individual's communication system with them at all times. Always take the time to retrieve an absent communication book before beginning an activity.
- Verbally note the absence of a communication book, e.g. "Oh, where is your communication book?" "Oh, how can we communicate now?" If possible provide a back up, general system to "make do" when it is not possible to retrieve the individual's system.
- Establish rules using catch phrases. Having a range of different phrases that are frequently used allows partners to select one they can relate to, for example,
  - "See the person, see their communication book"
  - "Leave your communication book wherever you put your mouth down."
- Start early. At the beginning of aided language intervention provide a general interactive display for partners to carry with them and use at all times, in addition to the use of activity displays engineered spatially in the environment.

Engineering the environment involves providing vocabulary to meet both today's functional and tomorrow's developmental requirements.

Check that you have provided appropriate vocabulary:

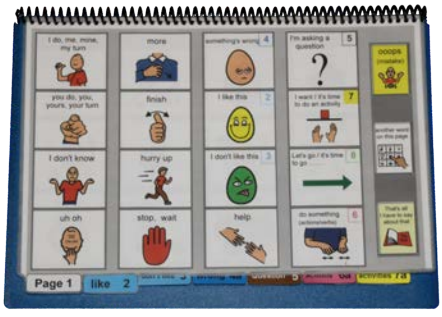
- for the partner to provide receptive input and/or the individual to expressively communicate
- to express a range of intents and messages, in a range of environments and activities throughout the day
- to enable the individual to meet their varied communication requirements, express a range of developmentally appropriate communication intents
- to further develop receptive and/or expressive communication and language skills.

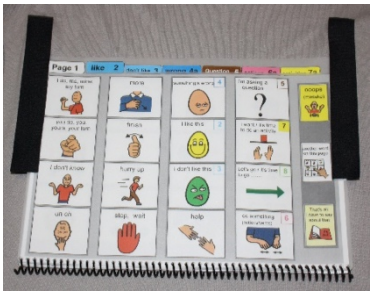
The templates for PODD communication books included in this resource assist by providing a structure for developmentally appropriate vocabulary selection. It will be necessary to select and customise an appropriate PODD book to meet the individual's functional and developmental communication requirements. Suggestions and spaces for additional, individual specific, vocabulary are included on the templates and in the information file provided for each book.

When working with groups of individuals who are learning to use PODD communication books, it can be useful for the teachers/therapists/assistants to have their own group communication book. These communication books are primarily used to talk to the whole group.

The early functions group book can be a useful introduction for staff learning to use a PODD language organisation across the day to communicate with their students.
The expanded functions group book allows for a teacher to manage the needs of a mixed group of individuals who are learning to understand/use personal PODD books at different language levels. Vocabulary and navigation pathways are included in this group book to model the language for PODD communication books from early functions to expanded key words. There are no activity displays in the group communication books as the teacher can easily switch to separate activity, topic and subject displays within their classroom and it reduces the size and weight of the book to be carried everywhere by the teacher. (See the information and construction files for the group books for a more detailed description).

Group books may also be used in classrooms as part of the dynamic assessment process to model language to individuals who have not as yet got their own personal PODD book.





Aided language stimulation

"..the adults who plan and adapt the language environment of children who use alternative means of communication should be providing models of language use in their own form. Moreover, these should be used for genuine communicative purposes, in all types of everyday settings and when the children are very young."

Renner, 2003, p.79

Aided language stimulation attempts to recreate the conditions known to stimulate expressive spoken and sign language development for individuals using aided symbols.

Individuals learning to use AAC need to:

1. see **models** of their system of communication used interactively by other people to communicate real messages in real situations

2. have multiple **opportunities to practise** communicating real messages in real situations – with appropriate **scaffolds** as required for successful communication
3. **receive natural feedback** as to the effectiveness of their communication
4. have their messages **expanded** by other people using modes of communication they will be able to use to communicate more effectively.

Receptive Input

People in the individual's environments need to use the AAC system, in addition to speech, as they talk to the individual and to other people in the individual's presence. It is important that individual's learning to use aided language receive models for the whole process of communicating using their AAC system. Receptive input using AAC teaches the individual more than just "this pictograph means this". Using the PODD communication book for genuine communicative purposes in the individual's natural environments also teaches concepts that are important for the pragmatic use of their system such as, "Oh I can say that using...."; "This is the type of context I can say it in"; "That's how I go about taking up my turn to say that in this situation." Other people using the AAC system can also assist the person to develop a positive self-esteem as they experience that this way of communicating is valued and responded to by others.

The aim is to provide the individual with rich models of people competently using their AAC systems to interact. Basically, anything the communicator needs to learn to do for competent use of their AAC system needs to be modelled by others in their environment. This involves modelling operational, linguistic, social and strategic knowledge, judgement and skill. For example, models of multi-modal communication assist learning to select the most

appropriate mode to suit the communication purpose. Individuals will also benefit from models of what to do when the word is not in their book, with demonstrations of how to use a hinting strategy and models of what to do when they make a mistake.

The use of verbal referencing can highlight the process for using a PODD communication book by stating what the partner is doing and why they are using this strategy. For example, saying out loud, "looking, looking" as they look for a symbol on a page, then "The words not on this page, I'd better turn the page" as they point to the *turn the page* symbol and turn the page. "Oh no, the word's not here. I need a different category" as they point to the *go to categories* operational button and turn to the categories page to select a different category saying "I think the word .... might be a thing" as they point to that category.

Receptive input using aided language may also be used to support an individual's understanding of other people's messages as well as to stimulate expressive language. If the primary aim is to support an individual's understanding of language then the receptive input focuses the individual's attention on the meaning of the aided language messages.

Less verbal referencing would be used to describe the operation of a system with individual's who experience significant challenges understanding spoken language.

A range of strategies can be used to indicate the aided symbols depending on what helps the individual to attend to the communication and the method they will eventually be able to use. You can:

- point to the symbols with your finger
- use a small torch to highlight the symbols
- pick up and show individual symbol cards which have been attached to the PODD book using Velcro®.
- use the alternative access technique a individual is learning in order to specifically model how they can indicate symbols on the display, e.g. partner-assisted scanning, eye-gaze.

For practical purposes different techniques are often used at different times, e.g. point with your finger when the small torch has been misplaced; only use a slower alternative access technique when time allows. Whilst it may not be the ideal technique, the individual will still be receiving models of what they can say and when they can communicate using their communication system.

Individuals do not always have to be intently watching or attending all the time to make modelling worthwhile. Peripheral views of modelling, whilst less effective to learn the meaning of each symbol, still provide useful experiences of when and how their AAC systems can be used to effectively interact with others.

Conventions for modelling using a PODD communication book

- Use the dynamic display to interact for genuine communicative purposes.
- Model the individual's method of initiating communication.
- Always begin modelling on the front page and use the branch pathways and operational symbols, i.e. follow the numbers, to express your messages.
- Speak aloud the label on the symbol as you point.
- Regularly recap the message thus far. As you turn to the next page you can verbally repeat the message so far, "So, I'm telling you something that's already happened, mum and I went ..... as you turn to the places page."
- Repeat the message in normal spoken English at the end.
- Verbally reference what you are doing to operate the PODD communication book and/or use strategic competencies.
- Use the individual's method of access some of the time.

Remember that individual's will learn to use their PODD communication book in the way they experience others using their system to communicate.

Different ways to model using an Alternative Access PODD book

Full model

The partner models everything the communicator would need to do using their access method. For example: using partner-assisted scanning, every scan the partner will do and every Yes/No movement the communicator will do to use the book.

Some full models are needed to provide the individual with examples of HOW they could use their PODD book to communicate. Individuals who cannot directly point to the display need examples of access methods they see themselves capable of learning - to see the PODD book as something they could use, i.e. stimulate their understanding that "I could do that!" A full model also demonstrates the procedures they will use to access their communication book. Verbal referencing is used to highlight the processes/procedures involved in communicating using the alternative access technique.

It is often easier for the individual to observe two other people using the communication book via an alternative access technique, i.e. one person performing the partner role, the other producing the same responses as the communicator uses to express a message using the alternative access technique. This allows the individual to observe both sides of the conversation and access methodology at a time when they are not also trying to focus on either their own or their partner's message.

Direct Model

Using a direct model, every item the individual needs to select is pointed to, but none of the processes used to select the item using the alternative access technique are used. For example; using partner-assisted visual scanning the communicator would need to select the following items to express their message, SOMETHING'S WRONG, TIRED, ANOTHER WORD ON THIS PAGE, GRUMPY, THAT'S ALL I HAVE TO SAY ABOUT THAT. These items would all be pointed to for a direct model. The use of direct models

- Increases the range of functions, messages modelled using PODD book (linguistic, social, strategic competencies)
- Emphasises the path/words needed to express the message. Reduces the verbal/visual clutter of the access method between the targeted items and highlights the items the communicator will be looking for and select.
- Does not model HOW the individual could express self using PODD book (operational competencies).

Part model

This is a combination of a full model and a direct model. The alternative access method is used only on the page/pages containing the message words. Direct model is used to indicate the vocabulary links (branches, operational buttons). For example: using partner-assisted scanning, say and show SOMETHING'S WRONG, turn to the something's wrong page and scan SICK (shaking my head no), HURT, SORE, PAIN (shaking my head no), TIRED (shaking my head no), GRUMPY (nodding my head YES), THAT'S ALL I HAVE TO SAY ABOUT THAT.

No book talk

This is a strategy developed by parents to model the language structure of the book without actually using the book, usually when they are occupied doing something else like cooking or driving a car. They just talk through all the items that would be selected, e.g. "I'm telling you something, It's going to happen, I need a People word, the whole family, go back to categories, Places, are going to the movies, go back to categories, days and times, tonight.

When to use what?

Most of the time partners will use a direct or part model. Initially, new partners are taught to begin providing receptive input using a direct model. As fluency using the PODD language organisation increases, partners can add in some full models.

Try to use the opportunities when two other people are present to model the full process of communicating using the alternative access PODD book. One person performs the role of the partner; the other person performs the role of the communicator using alternative access to express their message. The individual who is learning to use alternative access can watch them interact using their alternative access method.

Videos demonstrating the relevant procedures for full, part and direct models are available for the different access methods on the relevant template resource.

Providing opportunities for the individual to communicate

In order to communicate using aided language a person requires:

- reasons to communicate and life experiences that provide something to communicate about and topics for conversation
- the vocabulary available to express their messages with opportunities to have learned how this aided vocabulary can be used to communicate
- additional time to communicate, including sufficient pause time to initiate a communication interaction or their turn in an interaction
- someone to communicate with - partners who provide the individual with opportunities to communicate according to the their own, autonomous intentions.

Individuals who have complex challenges (physical, sensory, cognitive and/or language) generally require additional time to initiate communication. The time required to organise their body and move, process the input and generate a message can result in them missing the opportunity to initiate a turn in fast moving conversations. An individual's opportunities to communicate may be further limited by:

- lack of a clear method to initiate communication (request communication aid)
- limited expectations that they can, or will, communicate.

Individuals may need to be taught a method to initiate communication and partners taught to provide time, observe for, and respond to these initiations. A number of strategies may be taught to initiate communication and request the communication book. Some of these strategies include:

- vocalisation, where possible, to attract the attention of a partner
- look at the partner to indicate who they are talking to
- looking or reaching to the communication book (often dependent on others to ensure the book is always in sight of the individual)
- wearing an "*I need my book*" / "*I have something to s*ay" wristband. The individual lifts up their arm and/or looks at the wristband to initiate use of the communication book.

Partners may also need to be sensitised to respond to the individual's very subtle initiations of communication, such as stilling, looking, vocalising, body movement. In the early stages of intervention, prior to the development of clear methods to initiate communication, it is suggested that partners respond to any behaviour that looks like the individual may have something to say. This is done on the basis that it is better to provide an opportunity for the individual to communicate and find they had nothing to say, than it is to miss initiations when they do have something to say.

The use of verbal referencing can assist the individual and others to learn what behaviours are interpreted as an initiation. For example a partner may say, "*You're looking at me, do you have something to say?"* as they offer the individual their communication book. If the individual does not respond, or indicates NO, the partner acknowledges "*No, you don't have anything to say".*

It is important to clearly convey the **expectation that the individual can (learn to) communicate their own messages.** Conveying this expectation involves both providing the individual with opportunities to communicate and not taking over their responsibility to communicate their own messages.

Some individuals, and their support people, may have developed habits whereby the individual takes no responsibility for communication. Other people may take total responsibility for the expression of the individual's messages either directly or via suggestions and yes/no questions. Partners often develop a habit of asking an individual a lot of questions with an aim to involve them in the conversation in some way. Altering these interaction patterns (habits) to increase the use of open-ended comments and encouraging pauses often requires a concerted effort. Partners often benefit from an explanation of how asking questions restricts the individual to responding to other people's ideas and topics and limits their opportunities to generate their own ideas and topics.

Individuals who spent their early years without any, or only very limited expressive language, may have learned that they do not initiate turns in interactions - that they wait for someone to come up with ideas for them. These individuals may require the use of stronger prompts and cues in order to learn to be a more active communicator.

Scaffolding interactions

As already noted, partners typically play a very active role supporting the individual's communication in the early stages of communication and language development. Partners support the individual's communication by actively problem-solving what the individual may be trying to say, assisting them to work out how they could say the message and suggesting strategies. In the early stages of language development, messages are often co-constructed with the adult heavily supporting the individual's communication. As the individual's language abilities increase they become more independent communicators.

Scaffolding interactions which support early aided language use and acquisition focus on:

- interacting with the individual
- assisting the individual to understand your messages
- actively striving to understand the individual's messages
- supporting the individual's own active striving to communicate their message
- assisting the individual to discover and use strategies to communicate their own messages (active participation and problem-solving)
- providing the individual with clear natural feedback related to the effectiveness of their communication to transmit their message.

General strategies to scaffold interactions include:

- **Joint engagement.** Joint engagement involves both following the individual's focus of attention and interest to support the successful communication of their own messages and the use of strategies to assist the individual to follow their partner's focus of attention, to attend to and understand their partner's messages.

- **Attribute communicative meaning.** Partners actively strive to understand what the individual is attempting to communicate and assign meaning to the individual's actions. At the earliest stages, partners respond to any behaviour that may possibly communicate meaning. Initially partners use all available information, including contextual information and their knowledge of the individual, to work out the most likely meaning that can be assigned to these behaviours. Over time, partners will gradually require clearer, more intelligible, movements and more specific messages before they interpret the message (shaping behaviours towards the competent adult form).

- **Suggesting strategies, guiding individuals to express themselves.** This is a common feature of all AAC interventions. Making aided language displays available can in itself be regarded as suggesting a strategy. A range of strategies may be suggested to enable an individual to successfully communicate their message through their own efforts. These include, but are not limited to, suggesting:
  - **a method of communication,** e.g. *"look at me if you want a turn"; "I don't understand, maybe you could use your communication book to tell me", "head down and up for yes or side to side for no"; "It's hard to point when you're lying on your tummy, what about I scan your book and you tell me yes or no".*

  - **a method to achieve more intelligible communication,** e.g. "*I'm not sure if that was yes or no, your head moved to the side and down, try again head down and up for yes or side to side for no*"; *"Your hand is between two squares, slide your hand up or down", "You're leaning over to the side, maybe check how you are sitting, feet flat, bottom back....".*

- **the types of words that may help communicate a message**, e.g. "*I can see you are upset, maybe you're telling me something's wrong or I don't like this"; "I don't understand, you said, me house, maybe an action word would help me understand".*
- **words they could use to express a message that is not intelligible to another partner,** e.g. a child has used their PODD book to say *"I bee scary"*, you understand this message as you were with the child at the time. However, the person they are communicating to does not understand what they are saying. Rather than just telling the whole story for them, you assist the child to locate the words they need in their PODD book to relate the whole story *"I went to visit a bee farm. The bees flew around my wheelchair. I thought it was very scary".*

- **Negotiating meaning.** Backward and forward negotiation to establish meaning is a common feature of communication using key-word sentences. Partners may need to suggest multiple interpretations of the communicator's message until they receive a positive response from the communicator. This is an easier process once communicators have a method to indicate yes/no to confirm or deny the offered suggestions. Prior to this, the partner frequently has to rely on informal behaviours that indicate acceptance or rejection of their interpretations. Partners may suggest that the cmmunicator provide additional information to help them understand, e.g. *"Can you tell me who it's about?"*. Clarifying questions or statements may also be required to check the partner's understanding of the message, e.g. "*You're talking about something that happened at school*", "*Is this about the movie*?". Using a PODD communication book, partners may also assist the communicator to navigate to pages of vocabulary that may assist them to interpret the message, e.g. pragmatic branch starters, tense clues, categories section, a particular section in the PODD system.

The assignment of meaning to any behaviour that may be communicative appears to be more difficult for some partners when communicators are using an aided language system. This reluctance to assign communicative meaning until the partner is sure that the communicator intended to communicate that meaning is indicated by frequent questioning "*Did he/she really mean that*?" and checking with requests for repetition and clarification. Overuse of these checking behaviours can significantly interfere with the communication process, distracting both the communicator and their partner from (enjoying) the interaction. It appears as if a higher standard to clearly convey intention is sometimes applied to aided language than is generally applied to other modes of communication such as speech or sign.

It is important to assist partners to assign meaning to any use of aided language that may be communicative in order to support the individual's learning during the earliest stages of communication development. It can be helpful to remind partners that:

- We don't require children to clearly articulate spoken words before we respond to their meaning. We initially respond to approximations such as *di* for drink, then over the next few years gradually require children to say the word more clearly before we respond.

- Learning to use clear movements to access a communication display may take some time. We need to initially respond to less clear movements to help an individual learn to communicate. We need to teach, and then require, more intelligible, specific movements over time.

- In early development, we even respond to and interpret babble as communication. individuals may also "babble" with their aided language system as they explore and experiment with its functional use. This "aided language babble" provides an opportunity to socially interact with the individual, demonstrate the communicative function of aided language and practise operating the aided system, i.e. the same functions as "speech babble" serves in speech development.

- Responding to the individual's attempts to use their aided language system provides them with opportunities to learn. Responding to a message the communicator did not mean provides them with opportunities to experience the effects of communicating. Continual questioning, checking or asking for repeats is unlikely to stimulate learning and can interfere with the communication process. Some individuals find these interruptions too frustrating and/or time consuming to be bothered trying to communicate. Other individuals become confused by the complexity of the partner's (spoken) questions.

- Partners usually become more sure of the communicators intentional, meaningful use of aided language systems over time. Repeated examples of the messages "making sense" given the context and the individual's signals indicating they are contented with our responses to their messages, generally confirm the meaningful use of the aided system.

- All young children make up stories. Children do not always communicate messages they are able to say according to an adult agenda. It is important to discourage people from constantly "testing out" the validity of children's communication.

Natural feedback

Providing communicators with clear, natural feedback is part of any scaffolding interaction. Natural feedback always focuses on the partner's understanding of the message. Natural feedback provides communicators with:

- opportunities to learn how partners observe and interpret the meaning of their behaviours, whether or not they intended their behaviour to communicate a meaning

- information to evaluate the effectiveness of the strategies they used to communicate their intended message.

This feedback may be the partner's natural response to the communication, e.g. the partner thinks that the communicator is saying "*I don't want it"* and therefore removes the object. Partners may also provide the communicator with more specific feedback by:

- Reauditorising - the partner says each phrase, word or letter out-loud immediately after the communicator indicates it.

- Verbally referencing what they observe the communicator do, e.g. "*You're looking at me, you're looking at I DO, you're looking back at me".* This strategy provides communicators with clear feedback as to what behaviour or movements the partner is observing and responding to. This strategy is especially helpful for individuals who do not receive clear sensory feedback of their body in space, have difficulty with eye-hand co-ordination, have difficulty controlling movement and/or moving only one body part at a time (associated movements). For example, a child may be intending to point to the symbol *hurry up*, but the verbal reference *"you're looking at help"* provides them with feedback that the partner is attending to the direction of their eyes, not where they are placing their hand.

- Stating the meaning they assigned to a movement or behaviour e.g. *"You're telling me you don't want it"*

- *Recapping* - the partner repeats all the words the communicator has indicated (thus far). This is also a useful strategy to assist the communicator and partner to keep track of longer messages, especially when the rate of communication is slow and/or required multiple page turns in the PODD communication book.

- When the communicator has finished producing their message, the partner rewords the message, as they understand it, using full spoken English.

Expansion

Expansion involves responding to the communicator's message with a model of how to communicate that same intent more specifically. Expansions model the next step towards the competent adult form. Expansion is different from a simple verbal recapping in that the partner does not only speak the more complete message, but also models the expanded message using modes of communication the communicator is learning to use, e.g. expands the message using the individual's PODD communication book.

Additional scaffolds - prompts and cues

For some individuals receptive input and general opportunities are all that's required to stimulate spontaneous, expressive use of their PODD communication book. Other individuals require additional scaffolds, prompts and cues, to stimulate expressive communication within ongoing interactions. It is important that these prompts and cues are NOT used in the initial stages of intervention. Individuals should be provided with at least a year of quality receptive input to learn to understand their language and communication system before partners are focussing on expressive use. Individuals who do not have a previous understanding of spoken language may require a significantly longer period of receptive input to gain sufficient experiences of their language used within meaningful contexts to create a meaning system (language) using the alternative form.

Interactional prompts and cues aim to support the individual learning spontaneous, self-initiated communication. Prompts and cues may be required to support the individual to:

- recognise opportunities to take a turn or initiate communication
- think of possible messages to communicate
- identify/use specific words or behaviours appropriate to the context
- use more specific, efficient, intelligible or socially valued methods to communicate their message.

Prompts and cues are selected and used in such a way as to:

- support and encourage the communicator's role as an active learner
- influence the processes underlying communication and language development
- stimulate the communicator's learning "what to say, when, to whom and how" in their daily life environments, i.e. to recognise and use naturally occurring cues to initiate communication or take a turn, ideas of what to say, knowledge of how to say it in different situations, recognise when it's OK to say it in a specific environment/ situation.

It is important to consider the effect of a prompt/cue on the individual's learning about the functional uses of their AAC system to support their own autonomous communication. Prompts and cues should never demand that the individual communicates a targeted message determined by another person, but rather support the individual's autonomy to communicate according to their own intentions. Prompts and cues also need to be used in a manner that supports the integrity of the interaction and doesn't interfere with the discourse.

Consider the following:

Does the prompt/cue make communicative/pragmatic sense to the individual?

It is unlikely to make sense to a communicator if a partner prompts them to communicate a message that the partner obviously already knows. Prompts and cues should be used in a way that at least maintains the illusion that the communication being prompted is actually transmitting a message to the partner. For example, verbally prompting a child "*You need to tell me in your book if you want a cuddle*" does not support the child's learning to understand that a communication book can help you communicate messages to other people. The child may begin to think *Why bother using a communication book - they already know what I'm trying to say!* or *Using the PODD book is just another task I have to do*. In contrast, pretending that you do not understand their message and verbally prompting *"I don't understand what you want, maybe you could use your communication book to help me"* is more likely to result in the individual learning that the purpose of their communication

book is to help people understand their messages. It also makes little sense when the same person who asks a question, prompts the response.

Does the prompt/cue maintain the integrity of the discourse?

Verbal prompts/cues add another turn into the main discourse. This can interfere with the original pattern of the speech act pairs. For example, the following discourse has a speech act pair of comment/acknowledgement:
Dad: *"This chocolate is delicious" (*comment)
Child: "*It's really nice*" (acknowledgement)

However, if a question is used to prompt the child's utterance, the child's speech act loses its relationship to dad's comment and becomes a query/response with the prompter's verbal cue.
Dad: *"This chocolate is delicious" (*comment)
Dad: "*What do you think about the chocolate?"* (query)
Child: "*It's really nice*" (response)

If the child's utterance is in response to a direction to communicate, the speech act pair becomes directive/compliance with the prompter's direction.
Dad: *"This chocolate is delicious" (*comment)
Dad: "*You tell me what you think about the chocolate?"* (directive)
Child: "*It's really nice*" (compliance)

These subtle changes in the type of speech act pairs stimulated by verbal prompts and cues alter how the individual can learn to take a turn in a conversation. If questions and directives are repeatedly used to prompt, the individual will only have opportunities to learn how to respond and comply. Light, Collier & Parnes, (1985 a, b, c) noted that a high proportion of aided language use by the children in their study was in response to questions and directions with a tendency to forfeit non-obligatory turns.

Prompts and cues are selected for use with the PODD communication books with an aim to maintain the integrity of the original speech act pair and ensure that the individual has opportunities to learn and practise using a variety of speech acts including taking non-obligatory turns.

Does the prompt/cue support the individual's learning to initiate communication?

The use of prompts and cues needs to support the individual's initiation to communicate their own ideas and topics. Gradually reducing the intensity, or intrusiveness of the prompt/cue supports the individual learning to independently initiate communication. The aim is for the individual to eventually initiate communication given an appropriate context and a pause in the conversation.

Least-to-most prompting hierarchy

It is helpful to view prompts in a hierarchy, from prompts that are least intrusive to the natural pragmatics of the discourse to those that are most intrusive. This hierarchy assists partners to only provide the intensity and type of prompt the individual requires to successfully communicate in a given context. An individual may need additional cues when the situation is less familiar or challenging new learning. The cues required to support

successful communication in each situation become less intrusive over time until the individual is able to successfully initiate their message given only the cues we all use to communicate, i.e. a pause and an appropriate context for the message.

Least intrusive to the natural pragmatics of discourse

- time delay, contextual cue (encouraging pause)*
- expectant pause*
- environmental / gestural cue *+
- indirect verbal cue * +
- search light cue * +
- direct verbal cue * +
- assisted scanning * +
- momentary light cue +
- fixed light cue +
- another models response +
- verbal referencing + (?*)
- accomplice suggestion +
- physical prompt (providing opportunity to shape) +

Most intrusive to the natural pragmatics of discourse

Partner * or Accomplice + prompt
(Goossens', Crain & Elder, 1992; Department of Education, 2001; Porter & Kirkland, 1995)

Partner or accomplice prompt?

Some cues are provided by the communicator's partner (the person they are interacting with at the time), but other cues are more effectively provided by a second person, the individual's accomplice (Porter & Kirkland, 1995). The accomplice works with the communicator to provide them with experiences successfully communicating at a more complex level than they are currently able to achieve alone. The aim is to provide the individual with successful experiences using AAC which they can then use as a basis for learning more independent communication.

In Vygotskian terms, an accomplice plays a significant role providing structured guidance as a more knowledgeable skilled person. This collaborative functioning, the individual and accomplice working together, stimulates the developmental process in the individual's zone of proximal development. Goossens' et al (1992) use the term secondary facilitator to refer to people performing this role in group programs where the primary facilitator is the teacher or person leading the group interaction.

The use of an accomplice also assists to maintain the pragmatic integrity of the interaction. Prompts and cues can be provided by someone (the accomplice) who already knows the individual's message, to support their communication with another person who does not already know the message. It is important that the accomplice always observes for the individual's attempts to initiate communication and ensures that the message they are accomplicing is something the individual wants to say, e.g. checks with the individual " *Do you want to say .....?*".

There are five main situations when accomplice prompts and cues may be used.

1. The accomplice assists a communicator to problem solve and successfully communicate a required message. For example, an individual is asked their name and the accomplice assists them to locate the answer in their PODD communication book.

2. The accomplice has "read" the communicator's informal message, e.g. body language or pointing, and assists the individual to problem solve/use a mode that will be more intelligible to another partner. For example, a child is smiling and looking at a game and the accomplice assists the child to communicate *I WANT A GO* (using their PODD communication book) to the other children playing the game.

3. The accomplice knows the communicator's message and has confirmed with them that they want to communicate this message (probably with a yes/no question). For example, a friend has asked the child to a party. The accomplice prompts the child to relate this exciting message to mum when she comes to pick them up.

4. The accomplice suggests an idea of what the communicator could say at a given time to contribute to a conversation. For example:
   - Someone has just told an individual that it is their birthday today, the accomplice could suggest that they may like to say *HAPPY BIRTHDAY* or ask *HOW OLD ARE YOU?* or *WHAT PRESENTS DID YOU GET?*
   - The child has just completed an assigned task in class, the accomplice could suggest that they tell the teacher *I'M DONE* or ask *WHAT SHOULD I DO NOW?*

5. The accomplice assists a communicator to problem-solve how they can communicate their message more intelligibly, efficiently, specifically or in a more socially valued way, i.e. assists to solve, or prevent probable communication breakdown. For example, an individual is attempting to use a sign approximation with a new friend. The accomplice may comment that the new friend doesn't understand sign and/or provide a search shadow light cue onto the individual's PODD communication book.

Description of commonly used prompts and cues

Time delay, contextual cue

Time delay and contextual cues are what usually prompt people to communicate, i.e. a pause in the conversation to know that we can have a turn now and contextual cues to provide us with "something to say". People who have complex communication needs are likely to require a longer pause (often 10 to 20 seconds) to organise themselves to initiate communication using aided language. At the earliest stage of intervention, encouraging pauses of longer duration may be used to provide the opportunity, without any indication of a demand or requirement, for the individual to initiate communication. If the individual initiates communication during this pause time, the partner follows their lead in the interaction. If the individual does not take up the opportunity to initiate communication, the partner continues with the interaction.

Expectant pause

An expectant pause is an exaggerated time delay with encouraging facial expression, eye-contact, eye-gaze, and body postures suggesting "*It's your turn now*". An expectant pause is used to highlight, "*Hey you could, or should, say something now*", without saying anything. To cue a communicator more specifically to use their PODD communication book to take a turn, exaggerated looking towards the communication book can be added to an expectant pause. This suggests that you are waiting for the individual to say something using their communication book. In order to use this cue, the communicator must already have all the competencies required to generate and communicate their message. This cue is particularly useful for individuals who do not recognise that they could contribute to conversations or participates in interactions. This could be due to previous life experiences with limited expectations for them to communicate, limited access to an AAC system with robust language, other people speaking for them and/or learned passivity.

Environmental / Gestural cue

Indicating or moving a person or object in the environment can be used to highlight what the person may want to communicate about. For example, obviously touching or flicking your hair. Without saying anything may stimulate an individual to comment on your new haircut.
An environmental or gestural cue highlights *Hey here is something you may want to talk about* without saying anything. Indicating or placing the individual's PODD book in front of them is also an environmental cue that they may want to *say something now.* In order to make use of this cue, the communicator must already have all the competencies required to generate and communicate their message. This cue is again useful for individuals who do not recognise that they could contribute to conversations or participate in interactions.

Verbal cues

Verbal cues can be used to "set the stage" for communication, to assist an individual with ideas of what to say and/or the process (movements) needed to communicate their message.

Indirect verbal cue

This verbal cue focuses the individual's attention on an event that provides them with a reason to communicate. The words do not directly indicate what to say, but highlight the context for communication. The individual needs to generate their own message if they choose to take up this opportunity to communicate. An indirect verbal cue states "*Hey this happened*", inferring "*Do you have something to say about that*?" In order to make use this cue, the communicator must already have all the competencies required to generate and communicate their message.

Direct verbal cue

A direct verbal cue contains a more explicit clue as to what the individual might say, i.e. an appropriate message given the context. This cue does provide ideas of what the individual may choose to say (or not), but the communicator would need to have all the competencies required to communicate that message.

Verbal referencing

Verbal referencing can be used as a prompt to support the communicator's problem-solving and production of movements to communicate. The verbal reference outlines the process for communicating the message. For example:

- assisting a communicator to use an intelligible method to attract their partner's attention with the following verbal reference *"I look at ....., I make a noise, I look at my (I have something to say) wristband"*
- assisting a communicator to intelligibly use eye-gaze to access their PODD communication book with the following verbal reference "*I look around (at all the symbols), I look at (partner), and I look at the one I want, ready LOOK NOW".*

This use of verbal referencing can also assist a communicator to learn how to use self-talk to independently use the required movements/movement sequence for more intelligible communication.

Accomplice suggestion

An accomplice may suggest ideas of possible messages the communicator could say in a given situation or a way that the communicator could more successfully communicate their message. The accomplice may, or may not, also provide support for the communicator to navigate through the PODD book to locate the required vocabulary to communicate the suggested message.

Shadow light cues

Goossens', Crain & Elder (1992) describe the use of a small flashlight or penlight to cue an individual to use their aided communication symbols without using verbal or physical prompts. They describe three levels of providing shadow light cues, with each level adding additional cues to the individual.

Search light cue

When an opportunity arises for the individual to communicate something, and they have not taken up their turn in response to the time delay/contextual cues, a light is shone in a "zig-zag" fashion over all of the display, or maybe on the section that contains the relevant word on a complex display. It is a prompt to "say something" without defining what the something may be. This can be useful at times when the individual is able to formulate their own messages, but is not initiating the use of this skill. It leaves what the individual says very open.

Momentary light cue

When there is a specific message that could be communicated in a given situation, the light is shone onto the target symbol for a brief 2 second period. This is like suggesting "*Hey you could say this*" without interrupting the flow of the interaction or demanding that the communicator says that specific message.

Constant or fixed light cue

When the communicator and their accomplice have identified and agreed on a message, the light is constantly shone or repeatedly flashed onto a targeted symbol. This cue can be used to assist the individual to navigate and locate the symbols required to communicate the agreed upon message.

Momentary and fixed light cues can also be used to support an individual to produce whole, syntactically correct, messages for specific, agreed purposes. For example, a child needs to ask their teacher "*What do I need to do now?"* but does not currently have the syntactical abilities to independently construct this message. Light cuing can enable the communicator to successfully communicate this message directly to their teacher as they point to each word highlighted by their accomplice.

Light cues may also be used to highlight operational buttons, pragmatic branch starters and category names to assist an individual to learn to navigate to appropriate pages in their PODD communication book.

Assisted scanning

When a communicator has indicated a desire to say something but is uncertain of where to locate the required vocabulary, partner-assisted auditory plus visual scanning can be used to assist them to locate the required symbol. The label for each symbol is spoken as the symbol is visually shown to the communicator (pointed to with a light or finger, picked up and shown). The communicator either indicates the one they want to say immediately, when it is said, or waits until all items have been scanned before indicating their message.

This strategy is particularly useful when introducing a new PODD communication book with individuals who have sufficient understanding of spoken language. This strategy can enable an individual to expressively communicate using their PODD communication book before they have learned to independently discriminate and locate the required visual symbols. It is easier to immediately use an AAC system via auditory scanning when the communicator already knows the meaning of the symbols, i.e. the spoken word. This strategy can also assist individuals to learn the symbols and vocabulary organisation of the PODD communication book provided they are looking at the book while the partner or accomplice is scanning the items.

It is important to clearly differentiate this use of partner-assisted auditory plus visual scanning as a prompt or cue, from the use of partner-assisted auditory plus visual scanning as an access method. As noted in the *partner-assisted visual scanning* section of this book, there are longer term consequences if individuals stop looking at and learning the visual symbols because their partners routinely add the auditory cue to scanning. The partner or accomplice's cue to use assisted scanning as a prompt or cue is that the communicator has been looking for a symbol on the page. Maybe they have scanned through an entire page without selecting anything. The partner or accomplice would then suggest, "Maybe you would like me to read out the symbols for you".

Another models the response

If the individual does not take up an obvious opportunity to communicate, another person or a helping doll can model that message. This ensures that created communication opportunities do not become unsuccessful with unfilled pauses and also provides a model to develop the individual's knowledge of what they could say. The individual may also choose to imitate the model (remember that this type of imitation is common in typical language

development). This prompt provides the individual with both ideas of what they could say and models of the process of how they could communicate this message.

Physical prompts (providing opportunity to shape)

Co-active movements and physical prompts can be used to provide an individual with an opportunity to observe the results of performing a particular action to communicate a specific message. The co-actively produced movement provides an opportunity for the individual to experience successful communication as the partner assigns meaning and responds appropriately to the message. The prompted movement is shaped into communication by the partner's response to the message. The aim is that successful experiences will stimulate the individual's understanding and desire to attempt to repeat the behaviour to more independently communicate the message. Physical prompts should therefore be directed towards movements that the individual is capable of producing independently. This is a very intrusive prompt. It is generally only used when individuals have little idea of the communication process, and other prompts have not been strong enough to stimulate the production of the communicative behaviour. The aim is always to move as quickly as possible to less intrusive prompts encouraging independent production of messages. When using this type of prompt it is accepted that the physically prompted communication may not be the individual's autonomous message. Physical contact with a moving body part is generally avoided when using a PODD communication book or device due to issues such as the risk of assistants (unintentionally) influencing the message, lack of confidence and questioning of others as to the origin of the message, co-dependency of the individual with a few skilled partners or accomplices, and the possible effect on the development of the individual's self-image as an independent, autonomous person.

Remember that the purpose of using language is to communicate and interact with others.

Enjoy interacting!

Creating additional learning opportunities

Learning to use a PODD communication book generally occurs with the implementation of the previously described aided language stimulation strategies during the usual activities of daily life. The creation of an aided language learning environment significantly reduces the need to create specific opportunities or activities to teach communication and language skills. For example, when people in the environment routinely model and provide opportunities to use aided language when getting dressed and playing dress up games, there is little need to create special activities to learn the symbols for clothing items or to sort items into a clothes category. These learning opportunities are inherent in the routine activity of getting dressed as people use symbols to talk about and select clothes and use the category index in the PODD book to access this vocabulary.

A 13 year old girl who has cerebral palsy and competently uses a complex syntax, coded access PODD communication book and PODD page set on a DynaVox® speech generating device told me that she could not remember ever being taught to communicate. She began exposure to aided language stimulation at approximately 1 year old, began using choice and activity displays soon after and received her first PODD communication book at approximately 18 months of age. When asked how she learned to communicate she had no idea. She was sure no one had ever taught her to use AAC. "*I just learned it*". She could not remember ever not being able to communicate.

Does this indicate that she is acquiring language as we all do, during real communication interactions, without ever being aware that we are being taught?

An aided language learning environment is critical to provide for individuals to learn the pragmatic use of their language in natural contexts. As for children developing spoken language, some individuals learning to use aided language benefit from supplemental language therapy in addition to the language stimulation and experiences gained communicating during genuine interactions in their natural environments. Given that, even in the best circumstances, individuals are unlikely to experience the quantity of models or opportunities to practise using aided language that their peers learning spoken language receive, they may benefit from more intensive opportunities to learn new skills.

Opportunities may be created by:

- Including additional activities in the routine to provide targeted opportunities to model and practise communicating specific messages. This includes the addition of any activity designed to stimulate language development, e.g. a question and answer game, round-robin story telling, story and theme activities targeting particular vocabulary and language concepts.

- Bringing together groups of individuals who use AAC and their key communication partners to problem-solve and practise skills to meet specific communication requirements. For example, using varied language to comment on another person's message, ordering in a restaurant, how much information do you need to understand my message?

Developing operational skills

Sensory–motor control is generally considered in AAC assessment-intervention as a component of operational competence (Beukelman & Mirenda, 2013; Light, 1989; Light, 2003; Treviranus & Roberts, 2003). Operational capabilities assessments for people who have physical challenges typically stress the need to evaluate the operational requirements of different AAC modes and access techniques in relation to the person's current movement capabilities. Suggested interventions to accommodate for movement challenges frequently emphasise the need for positional supports to maximize an individual's control of movement and strategies to teach access methodologies. Most strategies appear to focus on maximizing operational competence given the individual's current sensory-motor function. Beukelman and Mirenda (2013) describe the possible limitations of this focus as sacrificing long-term efficiency for short-term gains. They suggest a more balanced approach including readily accessible AAC approaches using current operational capabilities and "a systematic motor or speech therapy program to train more complex skills"(p. 239). Treviranus & Roberts (2003) emphasise the need for practice to acquire motor skills for skilled performance.

An exclusive focus on current movement capabilities may be especially limiting for individuals who have severe sensory-motor challenges as we typically rely on early gestural communication to assess early cognitive and communication abilities. Even observational assessments and profiles generally rely on the assessor (or the informant) understanding the individual's movement patterns. Expressive communication requires movement of some type. Intelligible expressive communication is dependent on some degree of motor control to grade movement. A typical developmental approach would suggest that gestural modes of communication would emerge prior to language. Porter & Iacono (2007) reported on the difficulties applying published criteria that don't account for severe physical and/or sensory impairments to identify intentional communication. They suggested that working to increase the consistency of movements for communication and teaching more conventional or agreed upon methods of communication may be required in order for individuals who have physical and multiple challenges to demonstrate underlying competencies.

From a developmental perspective it can be helpful to consider the individual's need to learn specific movements for communication in the same way as children learn to articulate speech sounds for spoken language. All children begin speaking using word approximations that often only their primary caregivers understand. They may have unintentionally discovered these sound productions or attempted to imitate the speech of others. With practice speaking over time (many years), receiving meaningful feedback, guidance and encouragement to try to speak more clearly to be understood by more people, most children develop sufficient sensory-motor control for mature articulation. Other children require additional learning opportunities with graded, structured practice to develop these skills (articulation therapy).

Likewise individuals with complex sensory-motor challenges will require opportunities to learn, over many years, the sensory-motor control required to produce intelligible gross/fine motor movements for communication. They will require models of how people can use AAC to communicate, including the movements they could use to access their PODD book or communication device. They will require opportunities to learn and practice using the movements they require for communication. This may include using their AAC system to babble and imitate others. Only very familiar communication partners may initially understand their movements for communication. They will require practice using their AAC

systems to communicate over time, receiving meaningful feedback, guidance and encouragement to produce more intelligible movements to be understood by more people.

Learning to produce intelligible movements for AAC will be complicated by:

- Underlying issues affecting posture, motor control and/or sensory processing resulting in significant challenges producing and/or grading movements for communication.
- Atypical or extraneous movements affecting the intelligibility of communication.
- Few, if any, models of people using these movements to communicate.

Spontaneous development of a movement you have never seen used to communicate, that may also require practice to learn, is unlikely. individuals who have severe challenges learning movement, due to conditions such as cerebral palsy, Rhett syndrome, severe sensory processing challenges, will need structured opportunities to learn motor control. They will require support to then generalise and apply these sensory-motor skills to problem-solve how they can most effectively communicate with others in a variety of functional positions, activities and settings.

The transdisciplinary team at the Cerebral Palsy Education Centre (CPEC) have developed the following approach to assessing and teaching movements for communication to individuals who have significant sensory and/or motor challenges (Porter, Cotter, & Carter, 2008; www.cpec.org.au).

In summary, the **general strategies to develop movements for communication include:**

- Developing our knowledge and understanding of the individual's (different) movement patterns. Identify the key movement issues limiting the individual's communication.
- Model potential movements for communication / AAC modes the individual may be able to learn during genuine interactions.
- Provide meaningful feedback to possibly communicative, spontaneous movements (behaviours).
- Develop underlying capabilities for posture and motor control.
- Teach and practice specific movements for communication.
- Accommodate for current sensory, postural and movement challenges.
- Capitalise on opportunities for the individual to communicate.

Understanding the individual's (different) movement patterns.

It is important to recognise that for individuals with significant motor and/or sensory challenges, their **movement is different, not merely delayed**. Developing the knowledge to understand the different movements and behaviours related to the individual's specific motor and/or sensory challenge is critical. As a result of these movement differences:

- Early communication / gestural movements may be absent, inconsistent or difficult to observe as intentional. Vocalization and speech sound production is limited by significant oral sensory-motor challenges.
- Variability of movement based on position, fatigue, emotional state, health, sensory input can lead to inconsistency in the movements the individual is able to use for communication.
- Atypical movements may be misinterpreted

It is important to remember that all **assessment is the observation of a movement response to a sensory input.** Internal processes such as cognition and language processing are inferred from the person's particular movement responses to carefully selected sensory inputs. Wrong assumptions may be made about an individual's cognition, language processing and communication intent if people do not understand these movement differences.

Key movement issues may include:

- atypical muscle tone
- set patterns of movement, e.g. flexor patterns, extensor patterns, ATNR (asymmetrical tonic neck reflex), STNR (symmetrical tonic neck reflex)
- the effects of gravity
- sensory processing
- disassociation (associated reactions/movements occur in other parts of the body when the individual attempts to move one part of the body)
- symmetry
- weightshift
- weightbearing
- fatigue
- motor planning (dyspraxia)
- stability.

These develop spontaneously in typical development and underlie all functional movement and posture. The grading of movement for more intelligible communication is dependent on these key movement issues being addressed.

Identification of the key issues limiting an individual's movements for intelligible communication:

- Provides information to support the planning of appropriate interventions.
- Supports partner's to develop a greater understanding of the individual's movements to more accurately interpret their communication.

Model potential movements for communication / AAC modes the individual may be able to learn during genuine interactions

We have already discussed the importance of providing receptive input using a PODD communication book as an initial strategy. It is not necessary to have determined how the individual will access the PODD book to begin aided language stimulation. Full models for a range of (possible) alternative access techniques may provide the individual with ideas of how they could communicate using the PODD book. Observing how the PODD book enables others to communicate may provide the individual with the necessary purpose they require to attempt (to learn) the movement.

Models of potential movements for communication extend beyond the use of the PODD book. Models of early communication behaviours will also support the individual to discover movements they can use for multi-modal communication. These models may include:

- Use of vocalisation and eye-gaze to attract attention
- The use of pointing to objects in the environment
- The use of eye-gaze to objects in the environment
- The use of partner-assisted visual scanning to select items in the environment
- The use of partner-assisted auditory scanning to select from a small group of options
- The use of partner-assisted auditory plus visual scanning to select items in the environment.

When providing these multi-modal models, it is useful to have two people for the individual to observe. One person takes the role of the communicator using the access method and the other person takes the role of the partner. It is really helpful for the partner to verbally reference what they see the communicator doing. For example,

- Vocalisation and eye-gaze to attract attention: "I hear Gayle making a noise and looking at me, I think she has something to say",
- Eye-gaze to objects in the environment: "Gayle's looking at me, she's looking at the biscuits, she's looking at back at me, Oh Gayle you want a biscuit".
- Use of partner-assisted auditory scanning: "BANANA, Gayle's turning her head from side to side, she's saying NO; BISCUIT, Gayle's moving her head down and up, she's saying YES. Oh Gayle wants a biscuit".

One person can perform both roles to model these multi-modal communication strategies.

Provide meaningful feedback to possibly communicative, spontaneous movements (behaviours).

"Children who rely on AAC need to experience the same kinds of feedback and alternatives that typically developing children do for equally confusing or inappropriate communication" (Cress & Marvin, 2003, p. 261)

It is easier to provide meaningful feedback when the partner understands the individual's key issues affecting movement. Respond to any possibly communicative movement, verbally referencing what you saw the individual do and what you think this means.

Our interpretations of the individual's attempts to communicate can sometimes be confusing for them due to issues such as reduced sensory feedback and/or associated reactions. Verbal referencing (saying out loud what you observed and how you interpreted this) is a useful strategy to more specifically provide the individual with feedback to understand their partner's response and perhaps attempt a clearer movement to clarify their meaning.
For example, "Oh you're looking out the window, you want to go outside". This is especially important to do with individuals who have set patterns of movement or difficulty with disassociation of movement. They may actually have been trying to reach out to something else and their head turning towards the window was an associated reaction.

Verbal referencing also assists individuals with sensory processing challenges who do not get accurate feedback from their body to know what movement they produced.
Is the partner looking where the individual intended? Is the individual moving in the way they think they are?

A more experienced partner stating their observations and interpretations out loud also assists new partners to learn to observe and appropriately interpret the individual's communicative movements.

Given models of a range of communication strategies, the individual may produce a behaviour that looks like an initiation of communication. These early initiations can provide clues as to the individual's preferred access method or potential movements for communication. What movements did they initiate?

It is important to note that the first expressive use of AAC is always initiated by the individual.

It is much easier to talk when you have something to say!

The partner needs to respond to these early initiations, even if they are still unsure what movements the individual will be able to communicate.

Partners provide the opportunity to communicate in response to anything that could be an initiation of communication:

- Verbal reference the initiation, e.g. “I heard you make a noise, maybe you have something to say”; “You’re reaching for your book, maybe you have something to say”;
- Place the PODD book where they can point or begin scanning the book

Partners respond naturally to whatever the individual does:

- Verbal reference what you see them do
    - If they do not respond, say “No you don’t have anything to say” (with a vocal tone and facial expression that it’s OK, fine.)
    - If they reach to touch – say out loud any message that the communicator touches. If you are not sure where their hand is, say so.
    - If they look at the symbol, say “Oh you’re looking here” – point with your finger and say the label out loud.
- If you are scanning, respond to any movements that may indicate accept / reject with verbal reference of what you saw and the meaning you assigned, i.e. accept (YES) reject (NO).

Early initiations to expressively communicate may be:

- The individual just taking a turn in the interaction without a clear message
- Babble
- Individuals who understand speech may “fish” for a word by pointing at symbols until you say the word they want to select. This is often when they have heard you say the word when you were modelling in the PODD book, but they have had insufficient models to learn to identify and select symbol as yet.

Develop underlying capabilities for posture and motor control

Individuals require opportunities to learn to manage their key movement issues. Working with occupational therapists and physiotherapists, graded tasks and activities are created to provide opportunities for the individual to learn and practice sensory-motor control.

These tasks need to be meaningful to the individual and taught in a manner that activates the individual’s active participation and problem-solving to control movement to achieve a specified goal.

A range of equipment, interpersonal, and physical facilitations may be used to scaffold the individual’s successful achievement of this goal. Facilitations are always evaluated and selected in terms of how they support the individual’s learning to control their own movement.

Spoken language stating the intention (goal of the movement) and the process (movements) for achieving that intention can be a particularly effective facilitation to

support the individual's learning language (self talk) to regulate (problem-solve) their own movement. Language is then used to provide feedback, to compare the production with the stated goal. The language cues (self talk) learned to support motor control within these tasks can be applied by the individual and partners to produce movements for communication. (Porter & Kirkland, 1995; Hari & Akos, 1988)

Teach and practice specific movements for communication

It is then necessary to agree on a particular manner for the individual to communicate that is known and used by all partners. We are not waiting for or expecting a spontaneous development of movements for communication. **We are looking for movements to teach.**

Considerations for selecting movements to teach include:

- Communication into the future that is more:
    - Autonomous (communication at any time)
    - Accessible (range of partners)
    - Independent
    - Intelligible
    - Efficient
    - Specific
    - Socially valued.
- Access techniques and movements that reduce risk of partner (unintentional) influence on message.
- What are the possibilities (for learning) given individual's sensory and motor capabilities?
    - In what positions, situations, environments?
    - The individual may require different movements and access techniques in different physical positions.
- Who will understand it (without training)?
    - Intelligibility now in short term
    - How guessable / conventional for community understanding in long term?
- How efficient / easy will it be for the communicator and the partner?
    - Can the communicator initiate use or is it dependent on someone else setting up or holding materials?
    - Efficiency of message production
    - Interference with message (working memory)
    - Ease of partner learning and use in daily life
- Possible long term implications of frequently used movements
- The "cost of learning. It might be worth it for AARCH into the future!

Learning accept and/or reject movements for partner-assisted scanning.

People are often concerned that individuals cannot use partner-assisted scanning because they do not have a consistent YES/NO. It is important to understand that nobody consistently answers yes/no questions with only the words YES or NO. Why is Yes/No often seen as difficult to learn and inconsistent? It is because you cannot answer many yes / no questions with only the words YES and NO. People use a range of other vocabulary to answer these questions. For example, "Do you want a coffee?" may be answered with a range of other statements such as, "A tea would be nice"; "In a minute". The words YES and NO are used for multiple functions including to accept/reject, confirm/deny, agree/disagree and protest. To answer a random YES/NO question you need to understand the language and intent of the question, know the answer and have the vocabulary required

to answer. Individuals who use AAC will need access to other vocabulary including "I don't know"; "I don't understand"; "something else" and "get my book" to answer YES/NO questions. Scanning is more predictable. Scanning only requires a reject and an accept response to each item in the scan.

Therefore a first objective related to the development of YES and NO movements may be:

[name] will intelligibly (add specific movements) to indicate YES or NO to select (accept and reject) items during partner-assisted scanning.

In contrast an objective to answer random YES/NO questions would require more varied communication than just YES or NO. For example:

[name] will intelligibly answer YES/NO questions by (put in specific movements) to indicate YES/NO or initiate use of their AAC system to communicate "I DON'T KNOW", "I DON'T UNDERSTAND", request clarification or communicate another relevant message.

Aim to teach both a YES (accept) and a NO (reject) movement if at all possible as this:

- Allows the communicator to control the speed of the communication according to his ability to process and understand the options
- Requires less skill required from the partner by eliminating the timing element

Learning to use the conventional gestures of head nod and shake for YES and NO has significant accessibility advantages for individuals to communicate with less familiar partners.

The development of automaticity for motor skills requires practice with intent, purpose and variation. Individuals will frequently require structured teaching of and practice producing specific movements for communication ("articulation therapy").

Teaching specific movements for communication may involve:

- Opportunities for regular (daily) practice of the specific movements the individual is learning or refining outside of communicative contexts. It is important to practice movements when not trying to answer a question or communicate a message so that specific facilitations and feedback can be used, as it is agreed what movement is being attempted.
  - For younger children, songs and rhymes provide a purpose to practice the movement and a rhythm to facilitate movement.
  - Older individuals often just agree to practice the movement.
- Verbal referencing, teaching the individual to use self-talk to control movement and learn sequences of movements for example:
  - Self-talk for eye-gaze
    –I look around (I look at the choices)
    –When I've found it I look at (partner's name)
    –After they have looked (You're looking at me)
    –Look now
  - Self-talk for head nod (YES)
    –I move my head DOWN, DOWN, DOWN
    –I lift my head UP, UP, UP
  - Self-talk for head shake (NO)

–I move my head to the SIDE, SIDE, SIDE
–(I move my head to the MIDDLE, MIDDLE, MIDDLE)
–I move my head to the other SIDE, SIDE, SIDE

- Self-talk for using an "I have something to say" wristband to initiate
  - I make a noise (call out)
  - I look at (partner)
  - I shift weight onto one side
  - I lift up my arm (wave arm about)
  - I look at my wristband

- assistance to problem-solve more effective movements, accomplice suggestion
- physical facilitations

Accommodate for current sensory, postural and movement challenges.

Strategies to accommodate for postural, sensory and motor challenges, including equipment, interpersonal, sensory and physical facilitations, are introduced into the individual's daily environments as required to maximise the movements available for communication. However, it is critical to remember that communication happens at any time, including when the individual is not in a perfectly stable, supported position. We also need to teach partners how to support the individual's communication in a range of positions.

Capitalise on opportunities for the individual to communicate.

The grading and intelligibility of movements for communication will develop over time with frequent practice and natural feedback.

The movements that the individual needs to access their PODD book can also be practiced during daily life activities using informal modes of communication. For example,

- Eye-gaze to near and far objects in the environment
- Accept-reject movements for partner-assisted scanning
  - The process for partner-assisted visual scanning to objects is:
    - Initially show, or provide time for the individual to look at each of the options. The last option is always "SOMTHING ELSE", "THAT'S ALL THERE IS" or "I DON'T KNOW provided at the end of the scan.
    - Point to each item one-at-a-time (from left to right) as you say "This one"
  - The process for partner-assisted auditory scanning to objects is:
    - Initially list (verbally) all of the options. The last option is always "SOMTHING ELSE", "THAT'S ALL THERE IS" or "I DON'T KNOW provided at the end of the scan.
    - Point to each item one-at-a-time (from left to right) as you say "This one"

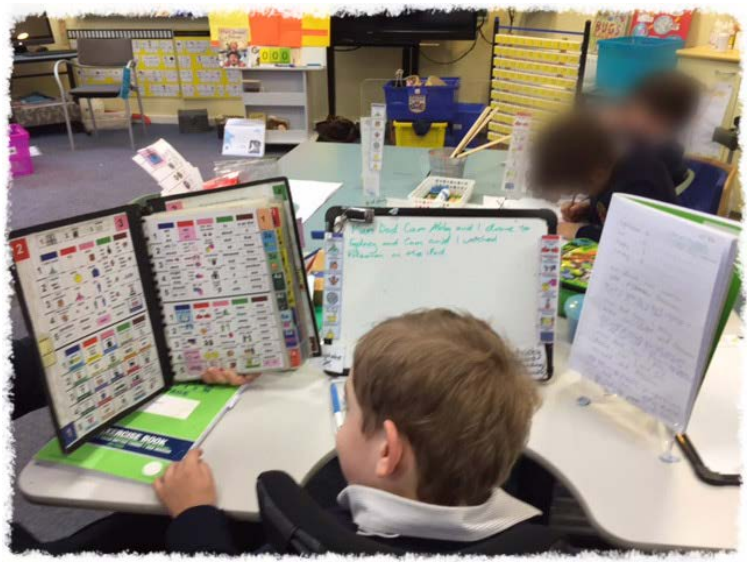
When developing movements for communication - **don't try to work it all out first!**

- Look for potential access methods
- Use generic templates for trial and error
- Think of it like 'articulation development' for AAC
- Put in place a variety of opportunities or options for response

Parallel learning

Individuals are juggling multiple sensory, cognitive, language and motor demands when learning to use aided language. It is important to create some balance in the relative complexity required for all of these demands. Parallel learning refers to the situation where you balance the relative demands by keeping some aspects of an activity easily within the individual's capabilities when adding new, more complex demands. In keeping with this concept, an individual may practise new, more complex, operational skills, e.g. access methodologies, movements, in activities where the language and/or non-movement, cognitive demands are relatively easy for them. For example, practise the use of a more complex access methodology using a single level activity display for a highly motivating activity.

This concept is often applied to developing the many skills required to use a speech generating device. For example, simpler speech generating devices and fun computer games may be used to practise the complex operational skills required to eventually use a more complex display with single or two switch scanning or electronic eye-gaze. At the same time, a non-electronic PODD communication book is used with partner-assisted scanning and/or eye-gaze to provide the individual with sufficient language to meet their functional and developmental communication requirements.



Communication partner training

The vital role of communication partners in supporting aided language development and successful use of a PODD communication book has been highlighted throughout this resource. The complexity of knowledge and skills required by different communication partners depends on their relationship with, and the skills of the individual. There are basically two types of partners:

1. **Those who require sufficient skill to interact with the individual.**
   These partners need sufficient knowledge, judgment and skill to understand the individual's communication, read their movements, use their communication access methodology, operate the PODD communication book and provide general opportunities for the individual to be an interactive participant. The partners of individuals 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 individual.

2. **Key communication partners who also need sufficient competency as "AAC users" to support the individual's communication and language development.** Children typically learn the complex skill of communication from their parents and other key communication partners as they go about their daily life. These partners are generally competent users of the language they are teaching and have "intuitive" knowledge of their communication system, e.g. common childhood simplifications. It is the family's own system of communication that they are "passing on to" their child.

   The difficulty for families and other key communication partners of individuals acquiring aided language is that they need to learn a new way of communicating. For many partners they are attempting to teach a language that they have never seen competently used to communicate.

   These partners need to develop similar competencies to support and teach the use of a PODD communication book as Light (1989) suggested for people using AAC, i.e. sufficient knowledge, judgment and skill in four areas:
   - linguistic competence
   - operational competence
   - social competence (sociolinguistic & socio-relational aspects)
   - strategic competence.

The provision of communication partner training is recognised as an essential component of all AAC interventions. Limited partner knowledge, skills and/or support is often noted as a cause of communication system abandonment, especially during periods of transition. Whilst the need for communication partner training is certain, our knowledge of the most effective strategies to teach partners is still developing.

The following ideas for communication partner training are based on experiences teaching communication partners to use PODD communication books since 1993. In addition to observing the practical effects of training on the partner's interaction with children and use of the PODD communication book, feedback on what assisted their learning has been sought from partners.

Immediate family members (McPhee & Porter, 1996; Porter, 2002) reported that the following contributed to their learning.

- 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 during an individual session.
- Video of children and partners using AAC (PODD communication book).
- Ongoing support, with information presented and assimilated in a graded manner.
- Written information to reinforce information presented at workshops.
- 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.

- Participation as a member of a group with other children and families learning to use AAC (PODD communication book).
- Supported use of the PODD communication book, i.e. a more experienced person accomplices the parent to communicate with their child. The experienced person may talk them through the process, use shadow light cues and other strategies to scaffold their successful communication using a PODD communication book with the child.
- Positive expectations that they and their child will (be able to) learn to use the system.
- 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 an individual session.
- 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. They reported that more vocabulary allowed for more frequent use of the communication aid, providing more opportunities to practise and develop skills, increasing their speed of communication and confidence.

- Partners often noted the value of meeting and observing parents and children who were already (further ahead) using a similar AAC system. Other parents and children have 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.

- Models of child and experienced people (parent, AAC specialist, experienced therapists, assistants, teachers and peers) competently communicating.
- Experiences interacting with the child (ongoing teaching/demonstration by child as they communicate using their PODD communication book).
- Lessons on how to use the PODD communication book, demonstration of vocabulary organisation, operational buttons, access methodology (friendly teaching).
- Class session where everyone uses abridged PODD communication displays (only pages with required 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 and access methodology.
- Class copy of communication book for additional practice when the child is not present. The adults could take this book home and practise, peers can use it to talk to each other and play using AAC.
- Assistance of a more skilled person to support (scaffold) a new partner's interaction with the child.

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"*

Partners often emphasized the **role of a skilled person supporting their interactions** with the child using a PODD communication book. This partner **scaffolds** the less experienced partner to successfully communicate directly with the child. Eventually partners, including peers, request assistance only as required. The skilled 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 the child.
- Talks partners through the process of using the PODD communication book, e.g. "*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. This was reported to increase the new partner's confidence to try.

Develop a shared understanding

It is important to ensure that all partners develop a common understanding of and belief about communication and the purpose of AAC to enable the individual to meet their autonomous communication requirements. The first step in any communication partner training is to develop a shared understanding of important concepts such as:
- Everyone communicates
- Communication autonomy
- Communication is multi-modal, we all use AAC
- Communication is complex
- We communicate for a variety of purposes
- Interaction of child and partner in typical development of communication and speech
- AAC will not prevent speech development
- Respond to all communication attempts as meaningful
- What is important to the individual is their autonomous communication
- Learning communication, language and speech happens during genuine, daily life interactions and takes time
- Communication happens all the time, whenever the individual has something to say, so we need to be ready for communication at any time.
- That communication is "messy". It is dynamic and raw; not edited and polished or performing a script. It is not a one-way process – it's dependent on the communication partner's responses; not all thought out ahead of time.

Establishing habits

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

- **Communication systems are always available**
  The importance of establishing habits to ensure the individual's personal PODD communication book (and other aids) are always readily available has already been discussed in relation to engineering the environment.

- **Expectations that the individual will participate in solving their own communication challenges:**
  - Responsible for message transmission
  - Allow the individual to express their own thoughts and messages, rather than merely respond (agree/disagree) to the ideas and suggestions provided by others
  - Avoid yes/no, "20 questions"

- **Providing receptive input using the individual's AAC system.**

Learning to understand the individual's communication

All PODD communication books include instructions for communication partners. These instructions include information on how to operate the PODD book, e.g. use the go to instructions, lists, and basic information on the individual's access methodology.

Experience suggests that this information is often sufficient to support the communication partner to understand the individual's communication without further training when the individual's:

- movements to communicate are readily intelligible
- access methodology does not involve the use of partner-assisted scanning or a complex coded access methodology.

Most partners benefit from opportunities to observe others model how partner-assisted scanning is used and opportunities for supported practise performing partner-assisted scanning, i.e. someone guiding them through each step of the scan.

Partner-assisted auditory scanning frequently requires more intensive teaching as partners need to learn additional skills to deliver the auditory scan using operational speech patterns without reverting to social speech patterns. Operational speech states the label for each item, or group of items, without changing the wording or using the intonation or expression of social speech.

Whilst partners are sometimes able to work out how to use a coded access methodology from the instructions, many partners feel more confident using these access methods after a few opportunities to observe others using the code and receiving guided practice.

More intensive opportunities for learning are often required with individuals who have not, as yet, developed readily intelligible movements for communication. Whilst the individual's movement may be obvious to partners who are familiar with how they move, it may be very difficult for unfamiliar partners to work out what movement the individual is intending to do.

In these instances the partner often needs to be taught which movements to attend to at a given time. Specific information analysing these 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. An experienced partner verbally referencing the movements they are responding to and their interpretation of these movements can also assist new partners to learn to recognise the individual's movements for communication.

Learning to provide opportunities for the individual to communicate

Providing opportunities and supporting the individual's active participation using AAC is often as dependent on the partners' attitudes and beliefs as it is to the knowledge of specific strategies to encourage communication. Strategies to educate partners to provide the individual with opportunities to be an interactive participant include:

- Examples of the individual successfully communicating in their daily environments and/or on video. This can help shift expectations.

- Education sessions including information and activities targeting:
    - understanding that communication happens all the time
    - identifying various communication intents and functions
    - identifying communication opportunities in daily environments
    - peer referencing communication requirements
    - multi-modal communication – specifically the methods used by the individual
    - providing time for the individual to communicate
    - general attitudes to difference and concepts of inclusion
    - ideas to make vocabulary available, e.g. filling in lists, providing words for specific topic displays.

- Simple handouts outlining the main strategies required to support the individual's communication.

Developing fluency to provide receptive input using a PODD communication book

Attempting to immediately say everything using a robust AAC system can be overwhelming. Conversely, partners have also reported frustration when restricted to a limited range of vocabulary. We have found that it is best to start with the whole PODD communication book, but help the partners to **learn to use the system in a graded manner.**

Current brain research shows that **learning patterns** is more effective for storing and retrieving information than learning isolated details. Focusing on learning and practicing patterns, instead of trying to memorise specific messages, helps people develop automaticity using a particular pattern to express various messages in multiple situations. Since partners have access to the whole system, they can control the speed at which they expand their fluency to include additional patterns.

Initially provide communication partner training sessions to introduce and explore the patterns used in PODD communication books.

Simple hints to use both one page opening and two page opening books are shared (separately) during this session.

HINTS for modeling a one-page opening PODD communication book

- Look at the symbols – use colour and shape cues
- Familiarise yourself with vocabulary on 1b.
- Follow the branches
- Think, what is the MEANING of the message (what is the message about, what is the intent) – then respond to the options appearing on each page
- DO NOT look for each word in turn in English word order - let the book guide you
- Speak aloud the label on the symbol as you point
- Regularly recap the message "thus far" (usually as you turn pages)
- Repeat the message in normal spoken English at the end
- Can't find a word – write it on the list
- Don't worry – you can always model OOPS
- Focus on learning patterns
- BE ZEN and let the book guide you!

HINTS for modeling a two-page opening PODD communication book

- Look at the symbols – use colour and shape cues
- Orientate yourself to the page layout :
    - location of operational and link buttons and high frequency (predictably associated vocabulary)
    - English word order
- Familiarise yourself with vocabulary on 1b
- THINK – what is the main content (topic) of message – go to that section and use predictably associated vocabulary.
    - The exception is if you need to begin sentence with a person's name - go to the people section first then to the section with the main content vocabulary
- Use operational commands and link buttons
- Speak aloud the label on the symbol as you point
- Use English word order (but not for every word in the sentence – point to the words available on the page in that section and just say the other words)
- Regularly recap the message "thus far" (usually as you turn pages)
- Repeat the message in normal spoken English at the end
- Can't find a word – write it on the list
- Don't worry if you make a mistake you can always use the communication management phrases and category links to fix it.

Participants are reminded that it's actually good for individuals learning to use a PODD book to see others make mistakes. It can encourage them to take risks with communication and language and provides them with ideas on how to solve communication breakdowns.

Practice for the one page opening books focuses on the patterns to express different pragmatic functions using the pragmatic branches. People are shown the pattern, e.g. the front page, how to give an opinion using the I LIKE THIS, I DON'T LIKE THIS or I THINK ITS branches, How to complain using the SOMETHING'S WRONG branch. They are then encouraged to think of what they could say throughout the day with the person they live or work with using this branch.

Practice for the two page opening books focuses on orientation to the page layout and finding the section to express specific sentences using the predictably associated vocabulary in the one section.

The following steps for building confidence and developing fluency with repetition are introduced. Partners may take as much or as little time as they require to develop their confidence and fluency at each step.

Step 1:
Carry the book with you. Problem-solve how you can have it with you for communication at any time, whenever the person has something to say.

Step 2:
Use the vocabulary on the first pages throughout the day .
Step 3:

Select one branch or pattern to add to the front page. *Opinions* are good as you can frequently give opinions throughout the day and repetition will help to build automaticity and fluency.
Step 4 +

Keep adding branches or patterns as your confidence and fluency improves.

The following strategies have also been found useful to support others learning to use a PODD communication book to provide receptive input.

- Experienced people provide
    - models using the PODD communication book to communicate real messages interacting with the person who uses AAC and other people in their environment.
    - Coach new partners to use the PODD book in daily interactions.

- Discuss the organisation of vocabulary.
  Involve key people in the selection and placement of vocabulary at the planning stage.

- Provide a copy of the individual's PODD book for people to practise/familiarise themselves with vocabulary placement and organisation. This is particularly important for people who only have access to the individual's PODD book / device when the individual is awake and with them. Many partners have commented that it takes the pressure off if they can practise by themselves.

- Expect others to use dynamic displays. Explain (probably repeatedly) that it just takes some time and practice.

Learning to provide specific prompts and cues

Teaching partners to use appropriate cues and prompts to scaffold the individual's communication includes:

- the partner recognising the need for a cue
- learning skills to perform the cues
- understanding the effects of different cues on the individual's developing understanding of the purpose of communication and how to communicate
- selecting an appropriate cue to meet the individual's requirements and gradually fading the use of cues to stimulate the individual's more independent communication over time.

The information on teaching learning strategies presented in this resource is shared with families as appropriate to their child's needs.

It is helpful to use video examples and/or demonstration of these cues in addition to explanations of each cue. In group sessions (workshops), scripted role play can provide partners with opportunities to practise using the prompts with appropriate feedback from the group facilitator. Viewing video of an experienced partner or accomplice using cues with discussion and explanation of how the cues are supporting the individual's successful communication and language development can also assist partners to understand the value and use of prompts/cues. A skilled partner can also scaffold a less experienced partner to use cues/prompts. Scripting the hierarchy of cues that may be used to stimulate a communicator's participation in a specific activity can also assist partners to understand, and generalise, the use of cues to support the individual's learning.

Selecting and customising a PODD communication book template

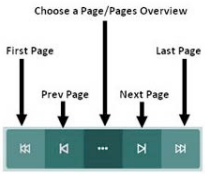
The *PODD communication book Direct Access Templates* resource for Mind Express includes PODD communication books designed for direct pointing with a whole hand, finger or tool. Some of these page sets can also be modified to accommodate *pick up and give/show* or *partner-assisted visual scanning* access methodologies. Detailed *information* and *construction files* for each access methodology are included with the relevant page sets. Videos illustrating the operational procedures for alternative access methods are included with the relevant PODD template resources.

Modifying the direct access templates for partner-assisted scanning has a number of limitations. The page layout in these templates is primarily designed to suit direct access and the operational controls and vocabulary placement do not accommodate for scanning. Consequently, some high use items, e.g., turn the page, are located in relatively slow-to-access positions. The templates included in the *Alternative Access* and *Alternative Visual/Auditory Presentation PODD communication book* resources use page layouts, vocabulary placement and symbol presentations to suit the specific requirements of different access methodologies and presentations.

STEP 1

Select a page set to trial with the individual (as part of a dynamin assessment). Open and view communication book templates and *Information file* for each book. The *General Description*, *Language, Layout, Navigation* and *Optional pages* sections of each *information file* support you to select a communication book to suit individual requirements.

When you open the PODD book files the first display will include instructions for use and links to the information and construction files for this PODD book. **You will need to go to MENU – EDIT (or press the F2 key) to view the pages.** Once you are in edit mode you can navigate between pages using the green toolbar at the bottom of the screen.



Consider the individual's:

- **Communication and language requirements**. The accompanying *Information file* outlines the communication intents and complexity of language included for each PODD book. **Remember to select a page set that allows room for learning.** Sufficient vocabulary is needed to allow partners to model and expand more complex communication and language. **Consider both receptive and expressive communication requirements.**

- **Physical skills.** What is the individual's ability to directly target a display?
  - What size and spacing of symbols will most effectively enable the individual to intelligibly and efficiently meet their communication requirements?
  - What type of PODD book will best suit the individual's movement? One and two page opening PODD books provide a more stable surface to slide a hand across. PODD communication books with a side panel can be difficult to stabilise on the lap or hold in space.

- **Will the individual need to use an alternative access method to meet their communication and language requirements?** If yes, you will need to use the *PODD communication book Alternative Access Templates* resource.

- **Visual skills**. Consider the size, spacing, contrast and number of symbols presented at one time (visual complexity).
  - **Can the individual use regular PCS symbols to meet their communication and language requirements?** If no, you will need to use the *PODD communication book Alternative Visual / Auditroy Presentation Templates* resource.

- **Environmental requirements.** Consider the places and activities where the PODD book will be used, i.e., all the time, in every position in the individual's daily life. How much space is available to position the PODD book? For individuals who have physical challenges, also consider the influence of different physical positions on their ability to intelligibly and efficiently access their PODD book. Do they need to use different access methodologies to communicate in different positions? Which PODD design will enable you to accommodate for more than one access methodology?

Also consider:

- The cognitive demands of different access methodologies. For example, an individual who currently experiences difficulty understanding the communicative intent of a point may be more successful with a *pick up and give/show* access methodology. Successful experiences communicating using this more cumbersome access methodology may support the individual's learning to understand and use pointing. Alternative access selection techniques often involve additional cognitive demands, e.g., memory, attention, sequencing, and may require additional conceptual knowledge, e.g., concepts of a group/column/row, to operate the system using group/column/row partner-assisted scanning. These extra demands need to be considered in relation to the individual's range of skills and the efficiency of different methods to meet communication requirements.

Remember that meeting the individual's communication and language requirements is the overriding factor determining selection of the PODD communication book.
Determine the language level the individual requires first, (e.g., early functions, expanded functions, key word, expanded key word, complex syntax) then determine the communication book style, access method and visual presentation the individual can use to access this level of language.

STEP 2

Trial the selected PODD book in the real world.
Make a <u>draft</u> copy of the communication book for trial:

- Open the construction file for the selected PODD book (select the *pick up give* or *scanning lines version* if required). Print this file for easy reference.
- Print out the page set in draft or greyscale (do not make any customisations at this point)
  - One page opening – cut around page tags
  - Two page opening – print double sided and cut tags (if single sided print, cut and paste pages back-to-back
- You will probably need to laminate the *pick up and give/show* symbols for trial. Other draft books you may not laminate.
- **Do not spend time customising the draft book.**

* Organisations may wish to make a set of generic communication books to use for trial. The cost and time involved to print in standard quality, laminate and make this set of books will be off-set over time by repeated trial use with many individuals. Sticky notes can be used to indicate vocabulary changes and additions on laminated pages.

STEP 3

Trial this draft, generic copy of the PODD communication book in the individual's daily environments.

- Other people and the individual[#] use the book to communicate messages throughout the day.
- Additional vocabulary needs and changes are highlighted during daily use.
- Encourage everyone to write missing vocabulary onto the appropriate page or sticky notes.
- Instruct others "If you can't find a word -
  - "write it on the page where you were looking for it"
  - "write it on a sticky note and attach it to the page where you were looking for it".
- Do not be concerned about vocabulary repetition. Although you may change the location of some vocabulary for efficiency or language purposes at a later date, this information provides insight into how others organise vocabulary and highlights the need for teaching partners about vocabulary organisation and/or placing words in multiple locations.
- The need for additional topic or activity displays or pages may become evident. For environment specific activities, you may need to create separate activity displays.
- Observe the effectiveness and appropriateness of this page set's:
  - Language
  - Access methodology
  - Size of book to suit environmental requirements
  - Page size and layout
  - Symbol size, number, spacing, and contrast.
- If the individual is able to use all the vocabulary and features in the trial PODD book, consider what they need to learn and whether a different page set with more vocabulary to develop communication and language skills would be more appropriate.
- **The time taken for this process may vary from a week to a few months** depending on individual circumstances and requirements. The aim is to determine the features and vocabulary required in the communication book to suit the individual's current requirements and to stimulate the individual's learning to communicate and use language more effectively.

 # A PODD communication book may be made for an individual prior to them demonstrating expressive use of the system. A communication book may be developed to provide receptive input to support understanding and/or provide aided language stimulation with beginning communicators. In these instances, the selection and customisation of the PODD communication book is based on the partners' use and observation of the individual's attention to the partner's use.

STEP 4

You are now ready to **make the individual's customised PODD communication book based on the feedback gained from practical use.**

- Print the *Information file* included with that PODD book.
- Open the templates for the selected PODD communication book in Mind Express. (from the main menu select the type of PODD book, and then the specific book)
- Follow the instructions in the information file to customize and save a personal PODD book.
- Customise the page set to suit the individual's communication requirements using the *Information file* provided for that page set to explain that PODD communication book's features and options. The ***Sections Descriptions*** in the *information file* provide specific information to support customization for each section of the PODD book. Reading each section description prior to making changes will assist you to avoid some of the common pitfalls when customising, which can result in reduced effectiveness or functionality when using the PODD communication book.
- Remember that the final design should allow room for learning (modelling and expanding to extend the individual's current communication and language).
- **Remember to save each page**.
- Delete any pages or options that are not required.

STEP 5

- Print and make up the final communication book using the step-by-step instructions in the ***construction file*** provided for that PODD book.
- The construction files include suggestions and information that will assist you to avoid some of the common pitfalls that reduce the functionality and/or durability of the PODD communication books.
- Note that the methods suggested in the construction files for making PODD communication books have developed over time with lots of field testing by individuals using communication books in all daily environments.

STEP 6

Use the customised communication book.

- Continue to update vocabulary in the communication book as required.
    - Teach everyone to use **lists** to add extra vocabulary.
    - Teach people to use **topic pages** as required.
    - Replace or add pages as required.

Remember

Communication systems are never finished. Vocabulary requirements are not static. The individual's communication system will continue to be developed over time. Use the LISTS!

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Appendix

Example summaries of key learning requirements

The purpose of this appendix is to illustrate how the identification of an individual's *key learning requirements* can assist with the delineation of appropriate intervention strategies. Key learning requirements differ from objectives in the following ways.

- Objectives target specific learning outcomes and the strategies required to achieve these particular outcomes.
- Key learning requirements focus on the strategies required to enable the individual to participate and learn across a range of functions in their daily life. Addressing key learning requirements in the communication domain will enable the individual to more effectively participate and learn physically, socially and academically. Addressing a sensory-motor key learning requirement may be necessary to enable a individual to more effectively communicate.

An individual engages in many activities and functions during their day that are not covered by specific objectives. Identifying an individual's key learning requirements assists people in their environment to understand and observe what may be limiting their participation, problem-solve and implement strategies to support their active participation and learning throughout the day.

Each of the following examples is based on an individual. The specific requirements and suggested strategies reflect the needs of that individual and should not be generalised to other individuals. Individuals may have the same general learning requirement, with very different underlying challenges (requirements) and abilities. The strategies required to address these requirements would therefore be very different to achieve the same functional outcome.

These examples include:

- Key learning requirements (issues) identified as part of the initial dynamic assessment
- Key learning requirements identified to inform others of important issues and strategies to consider to maximise an individual's participation and learning throughout the day
- A few objectives to illustrate the subtle, but important, difference between objectives and key learning requirements.

Name: *Jason X* ***INITIAL DYNAMIC ASSESSMENT*** **Date: 03/02/06**

Key learning requirement: *Intelligible ways to communicate (use language) to express a range of meanings and functions*

Requirements	Suggested strategies
Jason currently has few strategies available to intelligibly communicate • Significant physical challenges (spastic quadriplegia) limit his ability to use gestural communication • The communicative meanings of his body movements can be difficult to interpret due to associated reactions (movements) in other parts of his body, e.g. when he reaches with his arm, his head turns to the side. • Oral sensory motor challenges limit his ability to produce speech sounds • No access to any alternative methods of communication, e.g. pictographs. Jason is able to clearly use eye-gaze to objects and people when his body and head are in a stable midline position. Partners are often out of visual range or behind him supporting him to sit (cannot easily turn his head to look around) making it difficult for him to always attract their attention to his eye-gaze. The intelligibility of Jason's eye-gaze is also influenced by associated movements in his head, arms and body. Jason vocalises to attract attention but this can quickly escalate to crying with associated body extension (? becoming frustrated). Jason needs to learn movements for more intelligible communication. His partners need information on how Jason moves (to identify intentional movement versus set patterns/associated movements in other parts of his body). Jason needs access to a language form that he can use, e.g. pictographs.	• Education and training to develop his communication partners' understanding of his patterns of movement and knowledge of key strategies to support more effective positions and movements (see key learning requirement for *stability and disassociation of movement* for more specific strategies) • Provide Jason with opportunities to learn an aided language form (pictographs) o Create an aided language learning environment (see key learning requirement for *models of communication forms Jason is learning...* for more specific strategies) • Teach Jason and partners the sequence of movements for more intelligible use of eye-gaze to objects and pictographs, i.e. o Look at the options o Look at partner o Look at the one you want • Provide opportunities for Jason to learn to stabilise his body to disassociate head movements from body movements for more effective eye-gaze and possible use of head movements to indicate YES and NO • Ongoing dynamic assessment for most effective access methods for Jason to expressively use aided language (pictographs) on non-electronic displays o ?eye-gaze display o ?partner assisted visual scanning • Ongoing dynamic assessment for most effective access methods for Jason to access speech generating devices o Switch positions o Opportunities to use single message devices o Opportunities to use switch to access computer games, operate toys, etc.

Name: *Jason X* ***INITIAL DYNAMIC ASSESSMENT*** **Date: 03/02/06**

- **Key learning requirement:** *Models of communication forms Jason is learning to use (e.g. pictographs) used by others to communicate genuine messages in his daily life (Aided Language Stimulation)*

Requirements	Suggested strategies
Jason requires opportunities to learn how aided language (pictographs) can be used to communicate for the same meanings and functions as spoken language is used in his daily environments. Providing this receptive input requires the creation of an aided language learning environment. • Availability of sufficient pictographic vocabulary for people in his daily environments to communicate what they would typically say (genuine messages) o A range of messages (vocabulary) o For a range of purposes o To talk to Jason and to talk to other people in Jason's presence o Multi-word sentences and questions. • Organising vocabulary (engineering the environment) to enable most efficient use of pictographs as possible. o At all times o To suit different places and physical positions, daily routine and play activities o To express different types of messages, e.g. to complain, comment, question, request... • Partners who have sufficient knowledge, judgment and skill to communicate using aided symbols.	• Multiple activity displays for partners to use during common daily routines and leisure activities o Sufficient vocabulary for partners to communicate a range of messages for various functions o Page layout initially designed for partners' access o Jason able to visually attend to and follow a point on a 12 per page display • Place these activity displays for easy access where the activity occurs (multiple copies for activities that occur in multiple situations) • PODD communication book to provide general vocabulary for communication at all times (including messages that are not specific to particular activities) o May introduce single level general interaction display for a few weeks to build partner confidence using AAC o Introduce generic direct access 12 per page expanded functions PODD book to enable partners to more easily express the range of messages they currently communicate with Jason o Partners to suggest vocabulary changes to suit their own and Jason's specific vocabulary requirements. • Communication partner training sessions o Discussion of why it's important to provide receptive input using pictographs even though Jason can understand spoken messages o Orientation to page layout and vocabulary organisation o Practise pointing to key symbols as they speak the whole message. o Expert models of how to use aided language during daily life activities o Supported practice using pictographs to communicate with Jason during daily life activities

Name: *Jason X* ***INITIAL DYNAMIC ASSESSMENT*** **Date: 03/02/06**

Key learning requirement: *Stability - disassociation of movement*

Requirements	Suggested strategies
Jason's ability to control movement of any part of his body to interact with his environment and communicate is significantly affected by: • Set patterns of movement – movement in one part of his body causes associated movements in other parts of his body. • Difficulty stabilising his body (weight bearing and weight shift, asymmetry, associated movements, reduced strength in trunk) These associated movements make it very difficult for untrained partners to determine what Jason is attempting to do (not sure which body part he is intending to move). He frequently turns his head as he attempts to move his arms, so the direction of his eye-gaze adds to the complexity of interpreting what he is attempting to do or communicate. He often becomes frustrated (crying and extending body back) when he unsuccessfully attempts to do something and when people misinterpret what he is attempting to do. Jason requires strategies to assist him (to learn how) to stabilise the non-moving parts of his body in order to (learn to) produce more accurate (successful) movements. People in Jason's environment need information to understand his movement difficulties in order to more effectively assist him to engage in activities and to understand what he is attempting to communicate.	• Education and training to develop understanding of Jason's patterns of movement and key strategies (below) to enable him to stabilise parts of his body in order to more successfully move one body part. • Motor learning to shift weight and weight bear (feet, hands and hips) to stabilise the non-moving parts of his body. • Motor tasks to develop his ability to move both sides of his body, as well as his arms/hands without turning his head (disassociate head from arms) • Motor tasks to develop trunk strength and proximal (internal) stability • Stable sitting positions with required supports: o Feet flat (? AFO's; shoes) o Bottom back (sticky mat under bottom, hip supports) o Use of hands for stability (grasp bar, arm wraps) o Supportive chair o Table at height which facilitates best hand use o Standing frame to develop weight bearing and trunk stability • Use of language (verbal referencing, self talk) to assist Jason to understand and control his movement. • Availability of modes of communication which Jason can learn to use to more intelligibly communicate using language (including complaining - reducing his need to use crying and body extension to communicate. o Pictographs (early function PODD communication book)

Name: *Eleanor V* ***TRANSITION TO SCHOOL*** **Date: 04/12/05**

Key learning requirement: *Understanding other people's messages (language) and following common daily instructions.*

Requirement(s)	Suggested strategies
Eleanor's ability to understand speech and language is significantly delayed. She has great difficulty processing spoken language due to auditory processing and receptive language challenges. Her current understanding of speech is limited to a few very familiar, frequently used, words and phrases, e.g. stand up. Visual information (gesture, pointing to objects, demonstration, sign, and pictographs) supports Eleanor's understanding of a broader range of messages. With the use of these visual supports Eleanor can understand and follow one-step instructions within familiar routines. Eleanor frequently exhibits anxiety in new environments and with changes in activities or her daily routine. She relies heavily on environmental cues to understand what is happening and what she needs to do. Her receptive language difficulties frequently result in her not understanding the auditory, spoken, messages people typically use to prepare children for activity and routine changes. She can become very distressed when others obviously expect her to do something but she does not know what she needs to do (i.e. she recognises that an instruction was given, that she is expected to do something, but she has not understood what the person said and has no idea what to do).	• **Add visual information to all spoken messages to support Eleanor's understanding.** o Ensure you have gained/directed Eleanor's visual attention prior to communicating the message. o Show/point to the object(s) you are talking about. o Demonstrate new activities – allow her to watch other children complete activities – prior to expecting Eleanor to do the activity herself o Use key word sign and gesture o Use pictographs • Partner training to use key word sign and gesture and pictographs to communicate with Eleanor. o ?Signs of the week for her class/ whole school o Class copy of Eleanor's communication book for children • Ensure required pictograph vocabulary is available for others to use o PODD communication book with Eleanor at all times o Add additional vocabulary to communication book o Multiple activity displays for daily routine activities o Pictograph schedule for daily routine o Make additional topic displays for curriculum content o Pictograph card library to store additional vocabulary (in folders) to access additional vocabulary on the spot o Pictograph publishing software on computer in Eleanor's classroom o Investigate getting a dynamic display speech generating device to show her vocabulary (can quickly program on the spot)

Name: *Daniel Y* ***TRANSITION TO SCHOOL*** **Date: 15/11/03**

Key learning requirement: *Access to sufficient language vocabulary*

Requirement(s)	Suggested strategies
Daniel has complex communication needs due to an oral sensory motor impairment (anarthria). Daniel needs to use Augmentative and Alternative Communication (AAC) strategies in order to communicate with language. He has a complex personal PODD communication book and a DynaVox speech generating device. He uses these AAC systems for both spoken and written communication functions. Daniel wears a wristband and lifts/looks at that arm, plus vocalises to initiate communication. It is important that Daniel is able to Ÿ Initiate his own topic Ÿ Ask questions Ÿ Express a full range of pragmatic functions Ÿ Communicate about a full range of topics Ÿ Express a broad range of vocabulary Ÿ Communicate more specifically using sentences Ÿ Generate his own messages (as opposed to responding to the ideas of others presented using Yes/No questions). Communication occurs all the time. At any one time communication may be the primary goal, a necessary component or an enhancing component of the activity. Daniel needs responsive communication partners who are observant of his initiations to communicate, value his way of communicating, understand the importance of Daniel talking for himself and allow time for him to actively communicate.	• Daniel's communication book and/or DynaVox must **always** be with him o Put on the table/floor where he is sitting in class o In the playground o In specialist classes and sessions o Methods to move AAC systems from place to place (DynaVox mounted on his wheelchair; book transported in bag on side of his wheelchair) • Daniel's wristband always on • Staff to be observant for any possible initiations of communication and ask Daniel if he has something to say. • Add words to the lists in his communication book/DynaVox to expand the range of his vocabulary generally available. • In every situation consider "What types of messages do his peers communicate in this situation?" Consider how Daniel can actively communicate these messages. • Create and use situation, topic specific and book reading displays (on the provided coded access grids and/or DynaVox) as required. • Partner training to add vocabulary to DynaVox. • Model use of communication displays - to increase Daniel's knowledge of the available vocabulary, sentence structure and "what to say, when to whom" • Expand Daniel's communication using his communication book – displays (expand key word sentences into more complete sentences). • Avoid "taking on the responsibility for the message" (e.g.: Yes/no questions; guessing; 20 questions; filling in the whole sentence").

Name: *Daniel Y* ***TRANSITION TO SCHOOL*** **Date: 15/11/03**

Key learning requirement: *Other people using Daniel's AAC systems to communicate.*

Requirement(s)	Suggested strategies
Daniel needs to use Augmentative and Alternative Communication (AAC) strategies in order to communicate with language. He has a complex personal PODD communication book and a DynaVox speech generating device. He uses these AAC systems for both spoken and written communication functions. He will require partners at school to learn to understand his communication using AAC. Daniel is not able to point directly to the symbols in his communication book (due to physical challenges). He uses a code and/or partner-assisted scanning to indicate vocabulary in his communication book. He uses single switch scanning to operate his DynaVox. Daniel also needs to see his AAC systems used by other people to communicate genuine messages in real situations throughout the day. Models of other people communicating in the same way can effect both the development of Daniel's communication and language skills and his emotional attitude to using a "different way" of communicating. When beginning school or a new class, children attempt to work out "what's acceptable in this new and different environment?" It is important that Daniel perceives that his AAC systems are an acceptable way to communicate at school and that the ideas and messages communicated using AAC are as valued as those communicated using speech.	• PODD communication book and DynaVox easily accessible throughout the day • Teach staff how to use Daniel's PODD communication book, including how to use both partner assisted scanning and coded access methods • Train staff to set-up switches and DynaVox for Daniel's independent use, operation and device management. • Different staff will learn to use his AAC systems with different levels of complexity. o Assistants need to become fluent users. o Other staff may learn to say a few things - mainly to communicate that they value Daniel's methods of communicating • All staff set an aim "I will learn to say .....using Daniel's communication book" (e.g. give opinions on his work) • Provide Daniel with natural verbal feedback as to the intelligibility of his message. • Expand Daniel's communication using his communication book - displays (increase his knowledge of how to be more specific) • Teach peers to use Daniel's book o Speech pathologist conduct a class session where all the children play games using aided language displays • Assistant to initially scaffold communication between Daniel and his young peers o Assist children to understand Daniel's communication. Use verbal referencing to assist children to see how Daniel communicates. o Encourage children to communicate directly with Daniel - re-direct their messages to Daniel.

Name: *Daniel Y* ***TRANSITION TO SCHOOL*** **Date: 15/11/03**

Key learning requirement: *Intelligible communication with new partners (teachers, assistants and peers when starts school)*

Requirement(s)	Suggested strategies
Daniel's severe physical disability can make it difficult for him to produce clear movements for communication. The clarity of Daniel's movements is influenced by his position and fatigue. • He needs to be in a stable symmetrical position, supported in upright postures. Daniel's head movements to indicate "yes" or "no" can be very small in range at times. • Reduced sensory feedback from his body limits his ability to self-monitor and grade head movements. • Verbal cues and feedback assist Daniel to produce clearer head movements. Daniel requires his partners to develop an understanding of how Daniel moves and to learn strategies to assist Daniel to assume positions which make moving easier for him.	• Training session with teacher and assistants prior to commencing school and sessions with o PODD communication book and SGD vocabulary organisation and page layout o Explanation and demonstration of his coded eye-gaze access o Video/demonstration of Daniel communicating with familiar partner verbal referencing his movements o Basic operation of DynaVox and set up for switches o Use of step communicator for quick participation. • Ensure Daniel is in a stable position to communicate (See stability key learning requirement). • It is often easier to interpret Daniel's eye-gaze and head movements when the partner is positioned in front and when his communication book is upright in front of him (not down on the tray). • Actively encourage Daniel to shake his head for "NO" and nod his head for "YES". Let him know that you are watching his head – model head movements. • Provide Daniel with verbal feedback re: the clarity of his movements, e.g. "I think I saw a little movement down. Can you do a big head movement?" • More knowledgeable people to assist others to understand Daniel's communication – use verbal referencing, e.g. "Daniel turned his head to one side – he is saying NO".

Name: *Daniel Y* ***TRANSITION TO SCHOOL*** **Date: 15/11/03**

Key learning requirement: *Stability, upright symmetrical posture*

Requirement(s)	Suggested strategies
Stability and upright symmetrical postures: • provide a stable base for movement • allow for ease of breathing and assist with maintaining respiratory health • promote independence with active movement • promote an interest in exploring one's environment • increase stamina by decreasing unintentional movement • increase ability to keep one's body still to move one part independently from the rest of the body • provide a stable base for active movement • enable more intelligible communication and socialisation with peers (head up and looking interested, people can see facial expression, better control of eye and head movements for communication) • Head up with chin toward chest is vital at all times to assist Daniel to safely swallow his saliva – to minimise pooling of saliva in pharynx and aspiration of saliva into lungs causing respiratory problems. **Stable symmetrical positions** **Sitting in chair**-Feet flat, bottom right back in chair, back straight, arm straight and two hands grasping (with wrists down), head up in the middle (chin tucked in) and mouth closed. **Long sitting (on wedge or in corner chair) -** Bottom right back, legs straight and apart, toes pointing up, back straight, arms straight and at the side with shoulders down, hands flat and down, push up through arms, head up in the middle (chin tucked in) and mouth closed. **Standing -** Feet flat, knees straight, bottom tucked in, back straight, arms straight and grasping (PUSH through arms), head up in the middle (chin tucked in) and mouth closed.	• Active position checks in all positions. • Give Daniel specific verbal feedback regarding his use of strategies to achieve stable position(s), comment on how it affects his ability to effectively participate and learn and on his safety. • Equipment - supportive Kelly chair, wooden corner chair for long sitting, sticky mat, arm wraps, leg splints, grasp bar, height adjustable table, standing frame, walker. • Appropriate table height so that elbows can rest on table. • Opportunities to develop skills for stability and weight shift (consult physiotherapist and occupational therapist). • Constant monitoring to ensure Daniel's head is never tipped back on his neck (making swallowing extremely difficult). • Use of supports and assistance to reposition head upright with chin towards chest, but not tipped too far forward. • Give Daniel specific verbal feedback regarding his position, comment on how it affects his ability to effectively participate and learn, e.g. "I tuck in my chin". • Equipment - supportive astride chair with shoulder, lap & torso fittings, arm wraps on, wooden corner chair for long sitting, sticky mat, leg splints, grasp bar for 2 hands, height adjustable table. • Opportunities to learn and develop motor control (consult physiotherapist and occupational therapist). • Aide or Daniel's helper to use a wheeled stool when assisting him to stand or assisting him at the tabletop.

Name: *Jack K* ***TRANSITION TO SCHOOL*** **Date: 10/12/06**

Key learning requirement: *Sensory processing (touch and movement)*

Requirement(s)	Suggested strategies
Intact sensory processing supports: • Ability to focus & attend • Engagement in activity • Increased level of personal comfort & feeling of safety • Ability to use AAC systems (reduced distractibility with sensory properties of equipment, increases his ability to focus on using the AAC system to communicate) • Appropriate ways of socialising with peers • Ability to organise environmental stimuli & process it for learning • Increased ability to explore environment • Ability to maintain a midline position, to weightshift and use parts of the body to stabilise and use one part of the body to function/move • Ability to target accurately and to maintain grasp. Jack is **highly sensitive to light touch**, and becomes over stimulated, "giggly" and excited when this occurs. Once over stimulated and distracted, he will sometimes seek out further distracting sensations. Jack **seeks additional movement (vestibular) sensation**. He responds well to repetitive linear movement. It calms him by providing predictable sensory input, especially if he is over-stimulated from other activity. Once in a calmer state, the movement assists him in organizing information he receives and processing it for learning.	• Avoid light touch, "wriggling" floor activities, e.g. in PE and play wrestling activities. • Provide deep pressure touch. Use long soothing strokes starting with the least sensitive parts of the body, e.g. hands, back of arms. • Use of a swing in a forwards-backwards plane will help Jack regain his composure if he has become over excited. • Environmental modification – ensure Jack's focus is maximised by having a clear work space with as few as possible items laying on the tabletop, i.e. avoid loose papers scattered pencils etc. • Consult with Jack's mother re: specific techniques, activities and environmental modifications which have been found useful to support Jack's participation and learning. • Active position checks in all positions. • Provide Jack with specific verbal feedback regarding his use of strategies to achieve stable position(s), comment on how it affects his ability to effectively participate and learn and his safety. • Include vocabulary in Jack's PODD communication book to enable him to request sensory activities when **he feels the need** for extra sensory input. • Add vocabulary to his PODD book to model the use of pictographs to comment on his sensory response to his environments and suggest strategies help him manage his sensory environment. This will assist Jack to understand and learn to actively participate in the self-management of his sensory needs. • Equipment - supportive chair sticky mat, grasp bar, height adjustable table.

Name: *Andrew Z* **Date: 14/02/07**

OBJECTIVE 1 *Andrew will use language (pictograph/speech approximation) to request objects, actions, assistance, recurrence (more), cessation (stop and finish), ask questions, give an opinion, protest and complain.*

Current Function	Learning Requirement(s)	Suggested strategies	Achievement
Based on observation and parent report (Dewart & Summers profile) Request object: Looks and smiles at the one he wants when offered choices. Will also look at person to attract attention and look at object. Request Action: Will look at person, may cry, person interprets meaning. Request for assistance: Cries and person interprets what help he needs. Recurrence: Looks at the object and / or the person. Cessation: Turns head / looks away, others interpret he has finished. Ask questions: not observed. Opinion: Look at person and smile, laugh, cry, facial expression – others interpret meaning. Protest / complain: Cry, may look at partner then look at what's wrong. May also push back, extend body. Really attended to use of pictographs during assessment session.	• Availability of language modes which Andrew can physically learn to use to communicate. • Control of movement to intelligibly communicate o A way of accessing communication displays (?eye-gaze/point) o Oral skills for speech approximations • Learn meanings of a range of pictographs and how to locate them in communication displays/ book. • Understand functional uses of language (pictographs) to o Request objects o Request actions o Request assistance o Request recurrence o Request cessation o Ask questions o Express opinions o Protest o Complain • Ideas of what he could say in a range of situations. • Knowledge that he can, and method to, initiate communication/use of pictographs. • Opportunities to communicate. • Expectations that Andrew can and will communicate his own messages. (i.e. not relying on adults to guess).	• Engineer environment to ensure sufficient pictographic vocabulary is available for others to model and Andrew to use o Multiple activity displays o PODD communication book • Others model the use of pictographs during conversation to express a range of messages for a range of functional purposes (aided language stimulation). • Verbal reference informal modes of communication, expanding message using pictographs. • Shaping attempts to communicate using language. • Use of simple speech generating devices to experience successful initiation of communication. • Providing opportunities & cues to communicate o Expectant pause o Verbal cues (direct and indirect) o Light cues o Assisted scanning (verbal + light) o Accomplice suggestion • Motor learning - stable position and movements for communication. • PROMPT intervention to develop speech approximations (stage 2). • Communication partner training in above strategies.	

Goal attainment scale

1. No progress – Much less than the expected level of outcome
2. Partially achieved – Somewhat less than the expected level of outcome
3. Achieved – Expected level of outcome
4. Achieved – Somewhat more than the expected level of outcome
5. Exceeded expectation – Much more than the expected level of outcome

Name: *Noel V* **Date: 14/02/07**

OBJECTIVE 5 *Noel will ask questions including What..., where..., when..., who... and why..... and use the "You need to tell me yes/no" cue.*

Current Function	Learning Requirement(s)	Suggested strategies	Achievement
Noel initiates communication by glancing at his communication book. This subtle initiation can be difficult for all partners to recognise. Noel has used the "I have a question" branch in his PODD communication book, but appears uncertain which question to ask when on the question page. Familiar partners can sometimes assist him to work out which question he wants using partner-assisted scanning. Noel often expresses pleasure (smiles) when his partner works out what question he is asking and then answers his question. .	• Desire for information. • Clear initiation of a turn to ask a question. • Understanding meaning of different questions (i.e. which question to ask to elicit a specific piece of information from his partner). • Knowledge of pictographs for a variety of questions. • Understanding the use of the "You need to tell me yes/no" marker. • Expectations that Noel can and will communicate his own message.	• Availability of pictographs to ask questions (communication book available all the time). • Partner training. • Models of question and answer exchanges between other people using Noel's modes of communication. • Helping doll model asking questions. • Frequent opportunities to practise asking questions. • Language activities using pictographs to emphasise the meaning of different questions and the answers they elicit. • Accomplice to prepare questions with Noel and support him to ask other people. • Assess for and teach agreed upon method for Noel to initiate use of his communication book that is more easily recognised by a broader range of partners. • Partners recognise and respond to Noel's initiations. • Communication partner training in above strategies.	

Goal attainment scale

1. No progress – Much less than the expected level of outcome
2. Partially achieved – Somewhat less than the expected level of outcome
3. Achieved – Expected level of outcome
4. Achieved – Somewhat more than the expected level of outcome
5. Exceeded expectation – Much more than the expected level of outcome

Name: *Alicia Z* **Date: 15/02/05**

OBJECTIVE 1 *Alicia will understand common daily instructions given to her in speech plus sign and/or pictographs.*

Current Function	Learning Requirement(s)	Suggested strategies	Achievement
Based on observation and parent report (Dewart & Summers profile) Alicia responds best to commonly used instructions when sign and / or single pictographs are used to support her understanding of language. Mum reports that she is only certain of Alicia's understanding for a limited range of frequently used meanings even with sign / pictograph support e.g. "STOP / WAIT", "NO". Alicia will follow a point to close objects some of the time (mum estimates approximately 20% of the time). Appears to understand that she needs to respond to questions such as "Where is ....?", generally begins looking around, but not to specific item.	• Other people using communication modes which Alicia can understand. • Availability of sufficient pictographic vocabulary for others to use. • Knowledge of meanings of different signs, pictographs, spoken words. • Consistent use of the same signals to represent specific words / instructions. • Understanding that she needs to watch and listen to her partner. • Understanding that she has to do something in response to partner request / instruction. • Understanding what it is she has to do. • Control of movement (motor planning) to indicate that she has understood (attempts to follow instruction).	• Identify targeted messages / instructions which are frequently communicated to Alicia. • Partner training o Understand Alicia's challenges understanding spoken language and need for visual supports o Teach targeted signs o How to use pictograph displays. o Practise using simple key word sentences and single step instructions o Establish habits to use signs and pictographs in all environments. • Availability of pictographs for partners to use. o Multiple activity displays in her environments o Early function PODD communication book (for partners to use) with Alicia at all times o All displays to have individual pictograph cards attached to show individually to Alicia. (reduce visual complexity – does not need to follow point) • Directly relate the language (speech/sign/pictograph) to what it represents (object/action) as you demonstrate what to do. • Reinforce meaning of language o Say (with sign / pictographs) o Help her to do and/or demonstrate what to do. o Say (with sign / pictographs) what she/someone else did (confirmation) with positive feedback.	

Goal attainment scale

1. No progress – Much less than the expected level of outcome
2. Partially achieved – Somewhat less than the expected level of outcome
3. Achieved – Expected level of outcome
4. Achieved – Somewhat more than the expected level of outcome
5. Exceeded expectation – Much more than the expected level of outcome