



## Language Learning and AAC

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ISAAC Canada  
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Special Education/AAC Specialist

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Honorariums for presentations and trainings

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Work with children, families and teams privately

Volunteer consulting to AT Vendors and product developers



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## Gayle Porter - Disclosure

- Co-founder & consultant- CPEC Melbourne, Australia
- Private Speech pathology practice
- Developer, Copyright & Trademark owner of PODD communication system resources
- Receives royalties from sales of PODD resources
- Honorariums for trainings on a range of topics



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## Questions

- What does **neurological research** teach us about how language is learned?
- How does the process of **typical spoken language** learning **inform interventions** for **aided language** development?
- How do we **differentiate the language learning** experiences required by individuals who **rely on AAC for expressive communication only** and those who also **rely on AAC to support receptive understanding**?
- How can we create **language learning environments** that privilege **interaction** and **meaning making**?
- How does **extending language in the classroom** *differ* from **supporting early language development** through **naturalistic interaction**?
- How can we help to **ensure students who need AAC** are appropriately accommodated for their **current stage of language development**?

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What does neurological research teach us about how language is learned?

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## How Many Neurons?



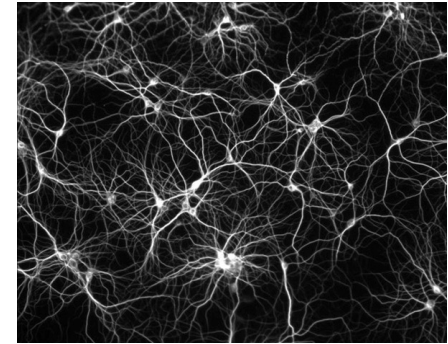
How Many Connections?

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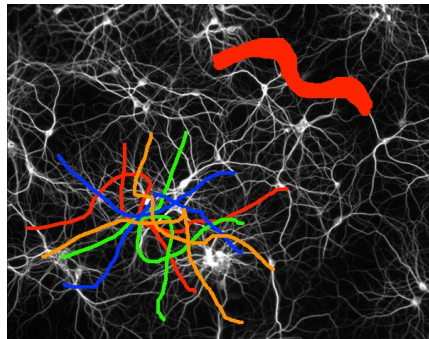
## Neurologically, Learning is:

- Strengthening Existing Connections
- Adding New Connections by Association
- Discarding Unused Connections

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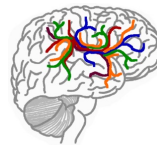
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“What Fires Together Wires Together”

“Use it or Lose it!”



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New information must be saved  
as a connection to known  
information



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Language concepts from Experiences that *are connected to each other* are stored in Neural Networks / Cognitive Schema

- These become the “hooks” to connect new information
- Once established, these operate in the background
- However, attention to any aspect immediately gives the person access to everything they have connected to that concept

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Learning and memory are contingent on being able to retrieve the information when needed for function

When language is learned within natural contexts, it will be more easily retrieved in related contexts

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### Typical communication and language development

- Happens during real life interactions in natural environments
  - Natural gestures, spoken language of community
  - Contextual information
- Language acquisition is driven by the desire to communicate
- Language develops as people strive to
  - work out the meanings of other people's messages
  - communicate in a way that helps others understand their messages during daily interactions.

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### Meaning Making

Alant, 2017

- The core of communication is the basic ability to
  - (a) pay attention to the other
  - (b) be receptive to the other in interactions.
- The deeper aim of communicating is meaning-making between two people and developing friendships
  - extends beyond our ability to send and receive messages

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Communication partners actively strive to jointly construct meaning with the child.

- Vygotsky (1962, 1978) Zone of proximal development
- Bruner (1983) Scaffolding.

*“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

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### Von Tetzchner, 2017

- Children are *active language investigators* but cannot create language independently; *they need guidance from a language-supportive environment*
- Language is not imitation and repetition, but creative *construction* based on *language experiences*
- Children gradually internalize the communicative practices of the *culture* by *observing and interacting with* adults and children

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## The Language environment

*"Language development is a social process, and the language environment is where language is both learned and practised."*

von Tetzchner, Martinson & Stadskeiv, 2025 p. 357

- Children engage in **social interactions**
- Learn the functions of communication and language during **interaction with more competent members of the language community**
- **Quantity and quality** of these interactions will influence development
- **Reciprocal adaptation** of communication partners

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## Parents & others

- Use spoken language to communicate throughout the day
- Expect that their child's behaviours are meaningful
- Respond to their child's behaviours as meaningful
  - typical vocal and gestural movements
- Naturally respond to the child's communication expanding the message towards the adult form
  - linguistic map, recast
  - Shape more specific behaviours over time

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## Parents & others are generally

- Competent users of the spoken language, gestures & body language of their community
- Have intuitive knowledge of their communication system
- Teach the complex skill of communication as they go about their daily life

*It is the family's own system of communication that they are "passing onto" their child.*

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## Children generally

- Have ample opportunities to observe and practice
- Receive natural (meaningful) feedback about their attempts at communicating
- Gradually work out what communication is about and how to use it.
- Develop and refine language to communicate specific meaning
- Integrate all the skills they require

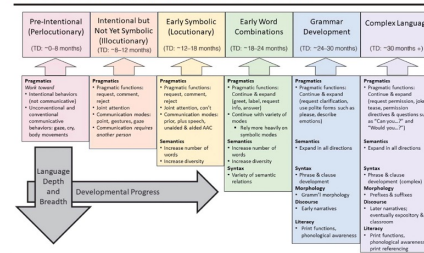
**Learning to understand and use language is a process!**



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## Develop pragmatics, semantics, syntax and morphology over time

Figure 1. Developmental model of early expressive language acquisition. TD = typically developing.



Binger, Harrington and Kent-Walsh, 2024, p. 35

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## Children typically begin school at 5 or 6 years of age with complex language

- Purpose of school is to extend world knowledge
  - Learning new vocabulary as part of that process
  - Vocabulary teaching is integrated into learning about the subject
    - All teachers are language teachers
- Learn to spell and read words (already known and new)
- At this stage, existing language, along with multimodal experience, is used as part of teaching of new vocabulary meanings

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## Aided language development

When children are introduced to aided augmentative and alternative communication (AAC) to assist with expressive communication, the ultimate goal is the same for all children: to provide access to the same languages that are spoken and written within that child's community."

Binger, Harrington & Kent-Walsh, 2024, p.33

"Grounding AAC approaches in a model of typical language development—with a focus on learning to use the vocabulary, linguistic rules, and narrative conventions of their community—supports these fundamental goals".

Binger, Harrington & Kent-Walsh, 2024, p.33

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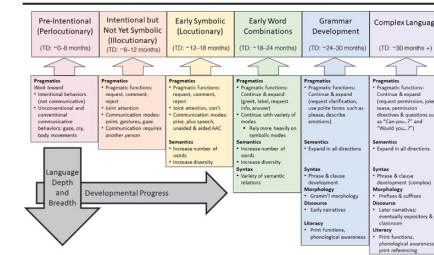
"Typical *spoken language developmental norms and trajectories* can be used as *models for aided language development* and can help guide clinical decision making. These guidelines inherently help to ensure that clinicians promote all aspects of language development with children who have complex communication needs—not just pragmatics and semantics."

Binger, Kent-Walsh, Harrington & Hollerbach, 2020, p. 318.

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## Develop pragmatics, semantics, syntax and morphology over time

Figure 1. Developmental model of early expressive language acquisition. TD = typically developing.

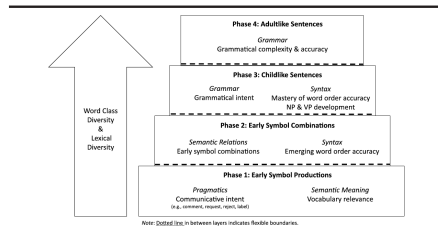


Binger, Harrington and Kent-Walsh, 2024, p. 35

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## Current AAC communication & language?

Figure 1. Graphic Symbol Utterance and Sentence Development Framework. NP = noun phrase; VP = verb phrase.



Binger, Kent-Walsh, Harrington & Hollerbach, 2020 p. 320.

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## Aided language

- Not a distinct language
- It is a different mode / representation to generate the dominant spoken language
  - Speech output devices
- Language-based goals that are similar (if not identical) to goals identified for children who rely on spoken language, with a focus on all of the usual language domains: pragmatics, semantics, syntax, and discourse.
- ? Influence of the different form on the language developmental process, e.g.
  - Representation, multimodality
  - Speed of communication
  - Access method
  - Vocabulary available in the system, organisation of vocabulary for use

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## Aided language differences

Stadskleiv, et al 2022

- Aided language does not naturally exist in the environment
- Asymmetry between language input in spoken language and output in aided language



- Aided communicators dependent on expressive means provided by others

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### 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

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### For individuals with Complex communication needs

- Need to infuse AAC possibilities, including aided language modes, into our interactions with people who (are learning to) use AAC
- Interacting with the person using multiple modes of communication in natural environments.

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### Interaction is critical for communication & language development

- Family and friends will continue to be the critical influence on the child's communication and language development.
- However, **these interactions will now also need to incorporate the use of alternative forms of communication.**



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### Interaction is critical for communication & language development

- Immersion in the alternative form effectively supports individuals learning to use AAC
  - Partners are faced with learning to communicate in a foreign form that they have most likely never experienced or seen used by competent users of AAC.
- Natural interaction patterns may be compromised as partners attempt to manage a new AAC system.

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

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### Intervention - Others model AAC

- Aided language stimulation (Goossens', Crain & Elder, 1992)
- System for Augmenting Language (Ronski & Sevcik, 1992)
- Natural Aided Language (Cafiero, 1998)
- Aided language modeling (Drager et al, 2006)
- Aided AAC Modeling (Binger and Light, 2007, Biggs, Carter & Gilson 2018)
- AAC Modeling (Sennott et al, 2016)
- Augmented Input (Allen et al, 2017)

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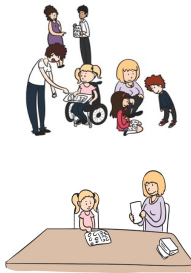
### Intervention - Others model AAC

- Interventions that include modelling may have distinct features  
(Sennott, Light & McNaughton, 2016; Allen et al 2017)
- Sennott, Light & McNaughton 2016 differentiate
  - AAC modelling where the partner uses the AAC system in the context of naturalistic communication interactions
  - Instructional modelling where the teacher models an instructional target.

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## Types of Models

- General receptive input
  - Variety of genuine messages
  - Natural contexts
  - Genuine interaction
  - Immersion
- Instructional modeling
  - Modeling as a prompt or cue



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## Instructional Modeling (prompt or cue)

- Another models a possible "message/turn" in a natural situation
  - Opportunity, but no expectation that the person will produce the modeled message at that time
- Model a targeted "message/turn" in a set up situation
  - Expectation that the person will produce that specific message
  - The model is a prompt to "GET THEM TO SAY IT"
- Mand-model
  - Say "..."
  - Person is expected to imitate the model

Porter &amp; Burkhart

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## Communicatively accessible language environments

von Tetzchner, Martinson &amp; Stadskeiv, 2025

- Provide the individual with means of communication they can understand and use
- Significant people in the environment
  - Understand individual's expressive language
  - Use a language mode the individual understands
- Communication is met with communication (rather than praise or rewards)
- Opportunities for using AAC and learning through communicative problem solving

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"AAC intervention is therefore more than teaching the individual some form of AAC – the wider aim is to create a language environment that supports the individual's communicative problem solving and development and use of AAC."

von Tetzchner, Martinson &amp; Stadskeiv, 2025, p 357

## Communicatively accessible language environments

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## Purpose of AAC

To enable the person to meet all of his/her **varied communication requirements** as

- intelligibly
- specifically
- efficiently
- independently
- in as socially valued a manner as possible

**To understand others and to be understood.**

Porter, 1997

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## Problem solving possibilities

- **Problem-solve how** each **individual** can meet their **varied communication requirements**
- Different modes of communication may be more or less effective to communicate
  - different types of messages
  - in different situations
  - with different partners
- Choose the most effective method to "get our message across"

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### Multi-modal interactions Communication accessible environments

- Always two-way interaction
  - both partners focused on understanding each other and being understood
- Includes any mode of communication the individual may (learn to) understand and use
  - Not just language forms (sign, aided symbols)
  - Includes body movements, facial expressions, vocalisations, gestures, actions in the environment, objects of reference, behaviours, pointing (eye or hand) informal scanning, etc
    - Individuals with sensory and motor challenges – different movements for communication

Porter, 2025

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### Multi-modal interactions Communication accessible environments

- Significant people in the environment
  - Use multiple modes of communication to support the individual to understand
  - Understands the individual's multi-modal expressive communication
  - Use modes of communication the individual may learn to express themselves
- Opportunities for using AAC and learning through communicative problem solving

Porter, 2025

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### Multi-modal interactions Communication accessible environments

- Language develops as people strive to
  - work out the meanings of other people's messages
  - communicate in a way that helps others understand their messages during daily interactions.
- AAC language modes need to be used for genuine purposes throughout the day
- Opportunities for using and learning AAC language modes through communicative problem solving

Porter, 2025

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### Three Functional Group of People who need AAC von Tetzchner, Martinsen & Stadskleiv, 2025

<p>"Expressive Language Group"</p> <ul style="list-style-type: none"> <li>- May understand oral language well but lack the ability to express themselves with language</li> </ul>	<p>"Supportive Language Group"</p> <ul style="list-style-type: none"> <li>- Developmental – use AAC for awhile move to speech</li> <li>- Situational – use or require AAC in some situations</li> </ul>	<p>"Alternative Language Group"</p> <ul style="list-style-type: none"> <li>- Little to no comprehension of spoken language</li> <li>- Require AAC for both receptive and expressive language development</li> </ul>
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### Two main developmental paths in aided language learning see von Tetzchner & Grove 2003

1. Individuals who understand (spoken) language
  - Can map new form onto existing meaning system
  - Similar to second language learning
2. Individuals who have a very limited or no comprehension of spoken language
  - Need to acquire a communication system without reference to spoken language.
  - Independent creation of a meaning system with AAC language forms.
  - Similar to first language learning.

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### Understands spoken language Second language learning path

- Needs less examples of graphic symbol use before using expressively
- Other people use graphic symbols during interactions to support the individual learning to expressively use the AAC system
- Prioritize messages the individual might want to say

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### Does not understand spoken language first language learning path

- Needs lots of examples of graphic symbol use in multiple contexts to work out language meanings before using expressively.
  - May take years of use of graphic symbols in natural environments
- First focus needs to be on supporting the individual's understanding of others.
  - Vocabulary for partners to use
  - Reports of feeling unsafe, anxious, confused
  - Behaviours observed include avoidance & distress

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### Graphic symbols as a first language

*"How I learned and achieved the language of graphic symbols was a very long confusing and frustrating time.*

*Just because people pointed to a picture didn't mean I magically understood what they meant. I had to learn the meaning of the symbols."*

Kustreba & Porter (2018) Graphic symbols as a first language revisited: When AAC is needed for receptive language. ISAAC conference

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### Graphic symbols as a first language

*"This took a long time to do. It did not happen just because someone showed a picture to me once or twice but rather because people used the displays all the time modelling to me. It takes repetition and time to work out what the symbols and words mean."*

Kustreba & Porter (2018) Graphic symbols as a first language revisited: When AAC is needed for receptive language. ISAAC conference

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### Supporting understanding

Partners need to approach every interaction with the questions

How can I support you to understand my message?

What modalities can I add to my speech to support your understanding?

- Demonstration
- Gesture
- Objects of reference
- Sign language
- Aided language (graphic symbols, written text)

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Initial focus of intervention:  
Communication partners learning to interact,  
adding AAC possibilities to create a  
communication accessible environment



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### Communication partners learning to interact using AAC

- **Shared understanding of purpose of AAC**
- **Insight** – complex communication needs
- **Motivation** – Why?
  - See how using AAC can add to the individual's (family) life
  - Long term implications for the future
- **Inspiration** - Knowledge of possibilities

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### Start with a shared understanding

- Beliefs, concerns and questions (asked or not) influence uptake of AAC, understanding of communication
- Aim to develop a **shared understanding** of important concepts
  - Communication is multi-modal, we all use AAC
  - Communication is complex
  - Communication for varied purposes
  - Interaction of child and partner in typical development of communication and speech
  - AAC will not prevent speech development
  - What is important to the individual is autonomous communication
  - Learning communication, language & speech happens during genuine, daily life interactions and takes time

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### Partner training to learn AAC language modes

- Sign**
  - To learn the handshapes for each word, fingerspelling, combining signs into sentences
- Single meaning graphic symbol systems**
  - Written labels accompany each symbol
  - Learn the patterns to locate vocabulary in the language organisation e.g.,
    - Page layout
    - Navigation
- Multi-meaning Icon systems**
  - Page layout
  - To learn icon sequences for words

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### Developing fluency to use AAC modes during natural interactions

- Whole system available from the beginning, but grade expectations for how much of the system the partner will use throughout the day.
- Learn to use an AAC system by using the AAC system
  - Sensory motor learning
  - Repeated production of similar patterns develops automaticity
    - Practice with intent, purpose and variation
    - Meaningful communication (not drills)

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### Developing fluency to use AAC modes during natural interactions



- Avoid detailed instructions and explanation
- Instructions about AAC strategies are complicated
- Focus on remembering and correctly implementing the instructions distracts from natural interaction

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### Practice in the real world

- More competent partners scaffold the new partner's interaction with the individual
- Model and coach new partners during genuine interactions

**Model and Coach  
In the mess of the real world**

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### Build on partner's natural skills

- Partners naturally provide linguistic maps in spoken language
  - A linguistic map is the natural response to the individual's message that uses language to clarify partner's understanding and provides an example of how this message could be expressed using language. E.g. toddler lifts up arms, mum says "Oh you want to get up"
  - Provides opportunities to experience how their message can be communicated using aided language without demanding they say it.
- Add using the person's AAC system to map language onto their informal communication.



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### Build on partner's natural skills

- Within conversational discourse, partners naturally respond with a spoken recast or expansion of the individual's message based on their understanding of the meaning
  - Recast – repeat some of the individual's words and adds new information (maintains the basic meaning)
  - Expand – repeat what the individual says adding missing words to make it more grammatically correct
  - Typically done without interrupting the flow of conversation.
- Recasts and expansions provide feedback and additional information
  - How to communicate the same intent more specifically or intelligibly
  - May correct or add to the message
  - Expanding on their language use
- Add using their AAC system to recast and expand the individual's message during conversation

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### Simple information for partners

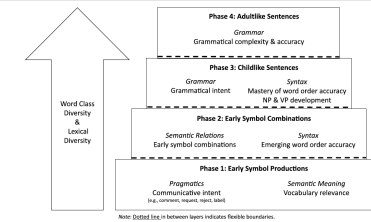
*“Remember to use the person's AAC system, not just speech, when you respond to their communication.”*

*“Responding using their AAC system will help them learn their language”*

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### Current AAC communication & language?

Figure 1. Graphic Symbol Utterance and Sentence Development Framework. NP = noun phrase; VP = verb phrase.



Binger, Kent-Walsh, Harrington & Hollerbach, 2020 p. 320.

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### Vocabulary & Organisation for language development

**Big enough to grow into (learn), but not so big they trip over it**

Goossens', Crain & Elder (1992)



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### Big enough to grow into (learn), but not so big they trip over it

- Development
  - Pragmatics
  - Semantics, syntax, morphology
- Aided language Stimulation
  - Supports others to provide receptive input using AAC to express genuine messages during interactions in any situation.
  - Conversational discourse using AAC
- Partner vocabulary requirements to support understanding
- Visual and motor access
  - Successful without concentrated effort on the operation
  - Juggling – When visual motor access is easier, individual can focus on communicating

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### Extending Semantics

- Life experiences with other people using modes of communication the individual will be able to learn.
- The individual understands spoken language (learning AAC as a second language)
  - Surrounded by spoken language
  - Need sufficient models of aided language symbols combined with speech to map the meaning of the graphic symbol onto their existing meaning for that word.
- The individual requires AAC to support understanding (learning AAC as a first language)
  - Will need sufficient, varied models of the aided language symbols in natural contexts to work out meaning of the words.

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### Extending Semantics strategies

- Need vocabulary available in aided form
  - Strategies to collect vocabulary
  - Teach individuals to ask for vocabulary to be added to system and/or add own words to their communication aids.
- Partners prioritize saying more unusual (new) vocabulary when using the AAC systems to interact
- Respond to the individual's messages with a recast, extending the vocabulary used

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### What about doing word definitions?

- We learn the meaning of words through contextual use
- There are many words we understand and use that we would have difficulty defining.
- Rarely remember word definitions for words we don't use or learn out of context
- At later stages of language development
  - May use existing language skills to define or clarify the meaning of new words during ongoing interactions
  - May teach individuals how to look up the meanings of new vocabulary they hear/see used in daily life or written text.

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### What is the purpose of syntax?

- To more **intelligibly** communicate your autonomous messages
- To more **specifically** communicate your autonomous messages in the words and style you choose
- To more **independently** communicate your messages (without the need for others to interpret)
- To produce more **socially valued** messages
- However, as each word takes time to produce for the aided language communicator – using full syntax compromises **efficiency**
  - Aided AAC users often reduce complexity of sentences produced during interactions, especially with familiar partners.

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### Experience of communicator ? Understand the need syntax

- Familiar partners, who know everything about the individual's life experiences
  - in the habit of interpreting key words
- "Helpful partners" take responsibility for understanding the message
  - 20 question guessing from key words
- Other partners do not understand the key words
  - Do not know enough about the individual to guess
- Individual may not have opportunities to learn why syntax is needed to support intelligibility or value communicating in own words

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### Extending Syntax & word morphology

- Time to produce sentence using aided language without interruption
- Partners interaction supports autonomous production of own messages



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### Extending Syntax & word morphology

- Partners prioritize using AAC system to produce sentence structures and word morphology the individual is learning
- Respond to the individual's messages expanding the sentence, adding missing words / word morphology markers to make it more grammatically correct
- Need vocabulary for the next stage of syntactical development in their AAC systems
- Vocabulary organization supports efficient combining of words into sentences

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### Multi-modal interaction - a parent's perspective

*"AAC is not a chore, it's the way you interact"*

*"Getting in the habit of making sure it was there where you might need it. Has to be there to communicate."*

(Evelyn Tsourlenes, personal communication 2015)

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**"No one taught me to communicate,  
I just learned it"**

(Kim at 13 years old).

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### Final Thoughts...



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### Thank You for Attending



If Time  
Permits...



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