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How should a normal language acquisition (NLA) model be used when working with children who use AAC systems?



That question has been addressed repeatedly in the AAC literature, starting in 1992, when Sima Gerber and Arlene Kraat outlined a range of issues regarding the use of a developmental model of language acquisition with children using AAC systems. Jan Bedrosian, in 1997, continued the discussion, exploring questions about the language development of young children with severe speech impairments. Ann Sutton (2008) expanded the conversation with a discussion of language acquisition theories with AAC implementation applications. Finally, Martine Smith (2015) reflected on the state of the science and future research directions in understanding the language development of individuals who required AAC systems.

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Ann Sutton (2008). Language acquisition theory and AAC intervention, SIG 12 Perspectives on Augmentative and Alternative Communication, Vol. 17, 55-61.

Martine Smith (2015). Language development of individuals who require aided communication: Reflections on state of the science and future research directions. Augmentative and Alternative Communication, Vol. 31, No. 1.

Much of the discussion about using normal language acquisition information with children with no or low speech is differentiated by whether or not normal language acquisition (NLA) is used as a *judge* of a child's language skills or as a *guide* to AAC intervention.

Most authors express caution about <u>judging</u> a child by NLA standards for a variety of reasons:

- "Late" Introduction to AAC: Most children using AAC systems are introduced to AAC later than the age of three. This puts the child using AAC at a disadvantage in demonstrating key language skills by the "normal" age milestones.
- Expressive-Receptive Language Disparity: A NLA model evaluates a child's stage of language development based on expressive language, not receptive language. However, there is often a huge disparity between expressive language production and receptive language

skills among children using AAC systems. This is another way in which the child using AAC is at a disadvantage demonstrating language milestones.

- Externally Selected Vocabulary: Children using AAC systems have externally selected vocabularies. Other people are choosing the words to include on the AAC system. They can only practice word combinations based on the words that others have provided to them. If the AAC system is noun-based and/or provides a limited range of words from all word groups, the child can produce a limited amount of generative language. In addition, if the externally selected vocabulary does not include any morphological markers (e.g., verb endings, etc.), the child is limited in his/her ability to practice morphology.
- Modeling & Modality Mismatch: The normal language acquisition model assumes a
 "typical" situation of a child hearing verbal language models and then practicing spoken
 language. In the absence of consistent, intensive modeling on the AAC system, a child
 receives no clear model of how to communicate using the AAC system. The child using an
 AAC system experiences a mismatch between language input (spoken language) and
 expected language output (AAC system).

There are many external variables that affect the path of language acquisition for children who use AAC systems. However, there is no research that definitely shows that children who require use of AAC systems <u>do</u> or <u>do not</u> follow the normal path of language acquisition. Therefore, it is recommended that, in the absence of clear research, to use the principle of the *least dangerous* assumption: **Use Normal Language Acquisition information as your <u>GUIDE</u> in designing an AAC system and implementing AAC intervention.** Normal Language Acquisition (NLA) can guide intervention in all areas of communication and language development.

- Semantics: What words do typically developing children use?
- Pragmatics: Why do typically developing children use those words? What are their reasons for using them?
- Syntax: What word combinations do typically developing children make?
- Morphology: What endings do typically developing children put on words?

Semantics: The WORDS on the AAC system

The family, teacher, or therapist working with the child who uses an AAC system needs to have a vision of where they are going in terms of AAC and language development. Without this vision, development of an AAC system is too often drive by "immediate needs," with the support team continually scrambling to make yet another board or to program yet more vocabulary for yet another activity or event in the child's life. What you often end up with is (1) an AAC system full of nouns, but deficit of language and/or (2) an AAC system that lacks a systematic organization of words. Plus, this cycle of board making and vocabulary

programming is never ending, with most of these boards and new vocabulary used for a day, or week, or month. It does not build long-term, life-long language skills.

However, when the focus is on providing a **planned** set of **high frequency**, **re-usable** vocabulary, then you can concentrate on teaching language that provides the child with real communicative power. These kinds of words are called **core vocabulary** words and they are the words that are useful across a broad number of events or activities. They are words you need your entire life.



The long-range plan is to end up with a useful vocabulary of approximately 300+/- core vocabulary words on the child's communication device. From this solid basis of vocabulary, additional words can be added based on the child's continued language development, as well as the child and family's interests, needs, and activities. These words will serve the child well throughout his/her school years and remaining life. They are a worthwhile investment of time and learning experiences.

At the end of this handout, there are references on selecting core vocabulary, as well as a list of recommended vocabulary. For children with severe cognitive and/or multiple disabilities, the list of recommended vocabulary can guide you in selecting an appropriate, albeit reduced, core vocabulary.

Pragmatics: The JOBS done by the words on the AAC system

Imagine you own a company called "Language Development, Inc." The purpose of this company is to development language. As you set up your company, you decide (1) what jobs need to be done and (2) who's going to do those jobs. If the job that needs to be done is to evaluation choices, then you want to hire the words "good" or "bad." If the job is to repeat an action or increase the amount of an object, then you want to hire the words "again" or "more."

The chart below shows some of the jobs (called "functions") that need to be done and example words, used by typically developing children, which do the jobs. A well-selected AAC core vocabulary will fulfill most of these functions of language. This well-balanced vocabulary ensures that the child using an AAC system has the opportunity to learn how to communicate for a variety of reasons, experiencing the power of language to meet a range of his/her communication needs.

When Talking with Mostly One Word

Functions Form

Greet hi, hello, names of people

Part bye bye, goodbye

Request Assistance help, do

Recurrence more, another, again
Naming-Labeling toy, drink, (names of things)
Existence this, that, there, look, see

Nonexistence no, away, gone
Disappearance away, all gone, gone

Rejection no, stop
Cessation stop, different

Comments like, dirty, big, naughty (other adjectives)

Vocatives mama, dada, baby
Directive go, help, stop, different
Associative big, hot, pretty, up

When Starting to Put Together Two or Three Words

Functions Form (vocabulary examples)

Greet hi + person, hello + person

Part bye bye + person

Request Object or Action (want, get, find) + substantive word, want that, get more

Request Information why, what's that, where go, what doing

Request Assistance (help) + another word

Recurrence (more, another) + substantive word, do again
Existence (this, a, the, that, it, there) + substantive word
Nonexistence (no, away, all gone) + substantive word
Disappearance (no, away, all gone) + substantive word

Rejection no + substantive word

Cessation no + substantive word, different + thing

Comment like that, that mine, you funny

Directive get that, help me, stop it, do different
Associative (big, hot, pretty) + substantive word

Agent-Action daddy hit, me read

Action-Object get that, read it, get some, want one,

Agent-Object mommy book, me that

Possessive mommy book, my book, that mine Locative that thing, go store, on chair, get up

Attributive big one, red thing

Experiencer-State me read, me love, me want

Agent-Action daddy hit, me read

Action-Object get that, read it, get some, want one,

Agent-Object mommy book, me that

Possessive mommy book, my book, that mine Locative that thing, go store, on chair, get up

Attributive big one, red thing

Experiencer-State me read, me love, me want

Syntax & Morphology

The typically developing child doesn't talk with one word for years and years and years. By the age of 3, most typically developing children are becoming quite proficient at combining words into phrases and short sentences. They are learning the rules of their language for the correct order of words, which is called syntax. They are also learning how to change the endings of words, turning the word "eat" into "eating," the word "big" into "biggest" and the word "one" into "ones." Learning how individual words "morph" or change is called "morphology."

Typically developing children learn the rules of syntax and morphology without formal instruction. The theory is that they learn the rules through exposure, trial and error, modeling, correction from others, and more and more and more modeling of the spoken language.

Specific information on the details of syntax and morphology development, including the "stages" in which typically developing children progress, is typically drawn from research conducted by Roger Brown and when discussed, is referred to as "Brown's Stages." The references below can be reviewed for more information on Brown's Stages.

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Bowen, Caroline. (1998). Brown's Stages of Syntactic and Morphological Development. Charts can be retrieved from: https://speech-language-

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BIG IDEA: Pragmatic and syntactical development is made possible ONLY when a child is given access to core vocabulary words.

Ground Zero for language development for typically developing children and for people who use AAC systems is <u>access to core vocabulary</u>. On the next couple of pages of this handout are vocabulary lists to reference in your work with people who use AAC systems, plus a form to help you plan how you will use core vocabulary in classroom activities.

Top Words Used by Toddlers

In Banajee, M., DiCarlo, C., & Buras-Stricklin, S. (2003). Core Vocabulary Determination for Toddlers, *Augmentative and Alternative Communication*, 2, 67 – 73

1.	all done-finished	9. mine	17. that
2.	go	10. more	18. the
3.	help	11. my	19. want
4.	here	12. no	20. what
5.	1	13. off	21. yes-yeah
6.	in	14. on	22. you
7.	is	15. out	
8.	it	16. some	

Not all of these words might be the "first words" you put on a child's AAC system (e.g., the, is); however, most of them should be included on initial vocabulary sets.

Expression of this initial vocabulary could be "said" through a variety of modalities. For example, if the child has a reliable way to say "yes" and "no" through gestures, body language, or facial expressions, the words "yes" and "no" might not be included on an aided AAC system, such as a manual communication board or simple voice output device with limited keys or memory.

Gail Van Tatenhove's Clinical List of Core Vocabulary (Based on AAC Research and Clinical Practice)

First 10	Words:	9.	down	15.	eat	5	8.	who
1.	all done	10.	get	16.	feel	5	9.	why
2.	different	11.		17.	get	6	60.	you
3.	help		good		give			•
4.	mine		help		go	Addi	ng	More Words
5.	more		here		good			afraid
6.	not-don't	15.	1	21.	happy	2	2.	after
7.	stop	16.	in	22.	he-him-his	3	3.	afternoon
8.	that	17.	it	23.	help	2	١.	am-is-are-be
9.	want	18.	like	24.	here	5	.	and
10.	what	19.	little	25.	1	6	ò.	ask
		20.	mine	26.	in	7	' .	because
First 20	Words:	21.	more	27.	it	8	3.	before
1.	again	22.	my	28.	like	9).	body
2.	all done	23.	not	29.	little	1	0.	bore(d)
3.	all gone	24.	off	30.	make	1	1.	boy-man
4.	away	25.	on	31.	me	1	2.	bring
5.	different	26.	out	32.	mine	1	3.	buy
6.	do	27.	put	33.	more	1	4.	call
7.	go	28.	some	34.	my	1	5.	can
8.	help	29.	stop	35.	not	1	6.	change
9.	here	30.	that	36.	now	1	7.	cold
10.	1	31.	there	37.	off			color
11.	it	32.	up	38.	on	1	9.	confused
12.	like	33.	want	39.	out	2	20.	count
13.	mine-my	34.	what	40.	play			day
14.	more	35.	you	41.	put	2	22.	dress
15.	not			42.	question	2	23.	dumb
16.	stop	First 60	Words	43.	read			easy
17.	that	1.	again	44.	sad			fall
18.	want	2.	all	45.	she-her-hers	2	26.	family
19.	what	3.	all done	46.	some			fast
20.	you-your	4.	all gone	47.	stop			father-dad
		5.	away	48.	tell			favorite
First 35	Words:	6.	bad		that			find
1.	again	7.	big		there			friend
2.	all done	8.	busy	51.	thing			full
3.	all gone	9.	come	52.	this			fun
4.	away		different		turn			girl-woman
5.	bad		do		up			goodbye
6.	big		don't		want			guess
7.	do		down		what			hard
8.	different	14.	drink	57.	where	3	88.	have

39.	hear
40.	hold
41.	home
42.	hot
43.	how
44.	hungry
45.	hurt
46.	idea
47.	job
48.	know
49.	later
50.	leave
51.	let-let's
52.	listen
53.	live
54.	look
55.	lose
56.	love
57.	mad
58.	maybe
59.	mean
60.	medium
61.	morning

62.	mother-
	mom
63.	myself
64.	name
65.	need
66.	nice
67.	night
68.	one
69.	other
70.	over
71.	person
72.	pet
73.	place
74.	please
75.	pretty
76.	problem
77.	ready
78.	ride
79.	right
80.	same
81.	say
82.	scary
83.	school
84.	see

85.	share
86.	sick
87.	silly
88.	sing
89.	sit
90.	sleep
91.	slow
92.	soft
93.	sorry
94.	start
95.	stinky
96.	stuff
97.	surprise
98.	swim
99.	take
100.	talk
101. 1	eacher
102. 1	:hank you
103. 1	hese
104. 1	hey
105. 1	:hink
106. 1	hirsty
107. 1	:hose
108. 1	ime

109.	tired
110.	today
111.	together
112.	tomorrow
113.	town
114.	try
115.	under
116.	use
117.	very
118.	wait
119.	walk
120.	wash
121.	watch
122.	way
123.	we
124.	when
125.	win
126.	work
127.	write
128.	wrong
129.	yesterday
130.	your

CONTINUE TO ADD MORE VERBS, ADJECTIVES, ADVERBS, PREPOSITIONS, CONJUNCTIONS

Other People/Living Things Words

- 1. aide
- 2. baby
- 3. babysitter
- 4. brother
- 5. bus driver
- 6. children
- 7. class
- 8. grandfather
- 9. grandmother
- 10. neighbor
- 11. OT
- 12. pet
- 13. PT
- 14. sister
- 15. SLP

School Words

- 1. activities
- 2. alphabet
- 3. classes
- 4. colors
- 5. days
- 6. months
- 7. numbers
- 8. seasons
- 9. shapes
- 10. weather

Vocabulary Reference List for Selecting Core Vocabulary

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PRACTICAL SUGGESTIONS FOR APPLYING THIS INFORMATION

- 1. When you are starting with a device with a limited number of keys (either because that's all the device has or all the child can handle), put words for broad language functions on the device and extended vocabulary (names of people, places, & things) on a manual communication board. In order to have words with MAXIMUM value across the most number of activities and communication settings, start by focusing on words that are used to MEDIATE or REGULATE activities (e.g., more, again, help, all gone, all done, different). Then add words that are used to COMMENT and RELATE (e.g., fun, good, bad, like).
- 2. If a child has a reliable way to say "yes" and "no," (or "hello" and "goodbye"), don't select these words as the first words on the AAC device.
- 3. While little children use "the" and "a" with high frequency, these are not high content or function words and don't need to be on an AAC device or board that has **limited keys**. This principle may apply to many other high frequency, but low content words, like "of," "to," "with," "by," "for," etc.
- 4. Begin to build a manual communication board, keeping motor planning and automaticity in mind. Always try to have a board with keys for at least 50 core words. For nouns, use a section that can be flipped or changed so that no matter what the activity, the same 50 core words are always available. There is a FREE board available at the Minspeak.com website which is designed with 50 core vocabulary words and a flip section for nouns. Download this 50-location board from: http://minspeak.com/teachers/InterventionPlanningArchives.php?PixonCommunicationBoards=1#. WASW jKZNOI.
- 5. After the first 50 words, the AAC system should grow in keeping with normal language development principles.
 - ☐ Make sure you continue to include words from a variety of word classes.
 - Do you have key pronouns (I, me, you, mine, he, she); verbs (do, put, make, let, get);
 negation (not, don't); prepositions (on, off, over, under); key question words (what, where); modifiers (gone, more, some, all); generic locations (here, there, away).
 - Verb phrase development depends on having access to main verbs, "little" verbs, and verb endings. You need main verbs with the widest range of function (e.g., do, put, get, give, make, let, try, like) and more specific function (e.g., eat, read, drink, read, color).
 - Some verbs cannot stand alone (e.g., "put'). They are combined with another word (e.g., preposition = put on, adjective = put more, adverb = put away, pronoun = you put it, determiner = put that). You have to have a variety of words available to combine with these verbs.

Noun phrase development requires more than names of things. Many times, the more
generic nouns have more usefulness in the context of the situation. Consider how you
can use these words: this, that, these, those, other, more, one, thing, any, etc.

- ☐ Make a plan for expanding the language available to the child on the AAC board or device.
 - o How are you going to add more pronouns?
 - o How will you give the child access to verb forms?
 - How important is it for the child to practice helper verbs like "am," "is," "are," "be,"
 "can," "will," or "should?"
 - o How are you going to help the child practice using plurals?
 - O How are you going to help the child use modifiers (both adverbs and adjectives) when building noun and verb phrases (e.g., I go now, that big one.)
 - o How will you expand prepositions?
- 6. Add words for PERSONAL needs. You are focusing on core vocabulary, but that doesn't mean that you ignore or avoid personal, fringe/extended vocabulary words.
 - a. Do you have words that represent things, activities or people that are motivating to the child?
 - b. Do you have words that are important to the child's personal needs, especially key people, health and/or safety concerns, and personal care vocabulary?
- 7. Use language modeling during activities with the child. The ideal way to model is directly on the child's AAC system. When the child says 1 or 2 words (e.g., "in"), use the child's AAC system to expand upon what the child said but adding a word to the beginning ("put in") or end ("in there"). Make sure you are verbally saying a short, complete sentence as you model key words for the child. And don't require the child to repeat what you modeled. You are exposing the child to language, not dictating what they are supposed to say.
- 8. Make visual supports that you can also use to model language and which the child can reference as a way to encourage two, three, and four word utterances. Consider purchase of a Natural Aided Language Board for students who have robust AAC systems (http://www.vantatenhove.com/naturalaidedlanguageboards.shtml) or download a free Pixon-based vocabulary wall chart from the Minspeak.com website for students using Pixon-based communication systems.
 - (http://minspeak.com/teachers/InterventionPlanningArchives.php?PixonCurriculumSupports=1#.WA5ZSzKZN 01)
- 9. Implement a prompt hierarchy to encourage the use of core vocabulary. Starting with modeling as your first prompt. If the child is not attending to your visual model, add a light or sound prompt to alert them to LOOK at what you are modeling. Consider the use of masking or highlighting as another way to help the child LOOK at and LOCATE the target word.

10. Develop intervention plans that encourage the use of core vocabulary across a wide variety of practical activities with a range of communication partners. One useful way to do this is to write simple "scripts." A script helps communication partners think about their role in the communication exchange and also how to organize and engineer an activity to promote the use of core vocabulary and generative language. This handout includes scripting instructions, a blank scripting worksheet, and a completed worksheet example.

SCRIPTING INSTRUCTIONS

- 1. Select your activity and list your language learning goal(s) and the vocabulary that helps meet that goal(s).
- 2. When gathering your materials for the activity, decide what core words might be used as a "referent" for the object(s) of the activity. For example, if making a pita pizza, the pita bread could be referenced with the word "soft" and the toppings with other descriptive words, such as shape, color, size, or texture.
- 3. When planning the flow of the activity, decide what you will say and do to engineer the activity in order to encourage use of the target vocabulary. For example, you might limit the amount of an item given to the student to encourage him/her to ask for "more."
- 4. List any additional vocabulary you will model during the activity. These words are not your specific target vocabulary that you hope your students will express during the activity. They are simply additional words to which you want to them to experience.
- 5. Note whether or not you will be using highlighting or masking as a scaffold to success.
- 6. List any additional teaching props or materials you might be using to help your students understand the language concepts and the symbols used for the target vocabulary.
- 7. Note anything else that you think is important to remember during the activity.

SCRIPTING WORKSHEET

Activity:		
Language Learning Goals:		
Target Student Vocabulary to Meet Goals:		
Materials Needed:	Referents	Core Words for Referents
Tentative "Flow" of the Activity:	How I will engineer the activity	in order to
Additional Vocabulary (to model and/or mediate interaction):		
Highlighting/Masking of Target Words:		
Picture Teaching/Props:		
Other:		

Scripting Worksheet Example

Activity:	Make a Smoothie			
Learning Goals:	 Initiate communication (interaction) Request recurrence of something (reason to communicate) Say the word "more" appropriately (vocabulary) Say the word "again" appropriately (vocabulary) 			
Target Student Vocabulary to Meet Goals:	more again			
Materials Needed:	Referents 1. almond milk 2. strawberry 3. banana 4. ice 5. blender	Core Words for Referents 1. sweet, white 2. little, red 3. long, yellow 4. cold, hard 5. loud, fast		
Tentative "Flow" of the Activity:	How I will engineer the activity 1. wait (timing) 2. withhold amount (sabotage)	 in order to 1. encourage student to initiate 2. encourage student to request more or again 		
Additional Vocabulary (to model and/or mediate interaction): put in go – stop drink				
Highlighting/Masking of Target Words:	Highlight words on Teacher Board of core vocabulary Use masking on each individual Student Board.			
Picture Teaching/Props:	Use "more" notes when put in each ingredient. Use "again" prompt when blending it around and around.			
Other:	Video and send link home for parents to see and replicate at home.			