Autism is exploding at an alarming rate

from an incidence of one in 150, to the latest statistics of one in 38 children (with some data reporting a 17-fold increase). Resources are pouring into research and intervention to address this serious public health issue. In spite of greatly enhanced resources, outcomes for those most severely disabled by autism (many of whom are non-verbal) remain as bleak today as 40 years ago, when institutionalization was the norm. Indeed, for non-verbal individuals with autism, quality of life has not significantly changed (Iocono, Johnson & Forster 2009).

AAC Meets ABA:
Natural Aided Language Interventions
for Individuals with
Autism and Complex Communication Needs

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Applying AAC Interventions to Individuals with Autism

Applying AAC interventions to individuals with autism represents one of the most challenging, if not THE most challenging work for AAC practitioners. As a group, these children, adolescents and adults appear difficult to motivate, find new tasks aversive, often do not initiate any communication, and have aberrant behaviors and motor planning difficulties that mask cognitive and communicative competence.

Prior to 2006, it was assumed that a large percentage of individuals with ASD were also cognitively delayed. This was an evolving assumption that came from large-scale misrepresentations of scores on adaptive measures that were labeled as cognitive measures. In addition, many testing instruments were language based and relied on verbal responses, further skewing results. (Edelson, 2006). More practitioners and families are realizing that their initial hunches about limited communicators with autism are true: "there is something in there" and that there is far more potential than current instruments can measure. This new information has profound implications for the AAC practitioner.

What works?

The National Academy of Sciences (NAS) report Educating Children with Autism (2001), identified empirically validated treatments for children on the autism spectrum. One of the most effective strategies found was Applied Behavioral Analysis (ABA). There are many strategies that fall under the ABA umbrella: Incidental Teaching, Verbal Behavior, Discrete Trial Training and Pivotal Response Treatments. Pivotal Response Treatments (PRT) is the strongest of all ABA strategies, with over 200 published and 400 ongoing studies (Koegel & Koegel, 2011).

Since 2001, there has been a growing body of research validating AAC interventions for individuals with autism, however, the most robust and conclusive research still exists in the behavioral areas. Most behavioral communicative interventions address speech only or labeling in tabletop settings. PRT addresses language as a skill set that must be addressed naturally in real settings.

The National Research Council (2001) also named the features of effective ASD programs and included parent and teacher training, data-based instruction, play and leisure, and access to typical peers, planned repeated learning opportunities and emphasis on functional spontaneous communication. Two of these areas, functional spontaneous communication and planned repeated learning opportunities, have strong applicability to AAC interventions.

What is ABA?

ABA is a system of treatments in which behaviors are taught through rewards and consequences. Progress is carefully measured and interventions modified accordingly. (Koegel & Koegel). ABA includes the following methodologies: Incidental Teaching, Pivotal Response Treatments, Verbal Behavior, Natural Aided Language and Discrete Trial Training.

PRT is a developmental and behavioral approach that provides opportunities for learning within the context of the individual's natural environment.

PRT is a merging of the traditional ABA with naturalistic interventions. PRT evolved from Lovaas' discrete trial training where control was clearly in the hands of the teacher or facilitator. With discrete trial ABA it was possible to teach spoken words as isolated responses, but it was not possible to teach language and communication, which by nature, is dynamic, co-constructed exchange of perspectives, thoughts, ideas, wants and needs. The complexity of language could not be addressed in a simple stimulus-response format. The original term for PRT was Natural Language Paradigm (Koegel, O'Dell & Koegel), 1987). Through the Natural Language Paradigm dramatic increases in vocabulary were elicited.

Pivotal behaviors are those behaviors that have global positive effects on other behaviors rather than isolated skills that are demonstrated in one environment only. Pivotal skills are those skills that, when acquired, generalize more readily to different environments, activities and communication partners; and when targeted, lead to large, collateral changes in other, often untargeted areas of functioning and responding. PRT is primarily a "speech only" intervention, however, the procedures and protocols for PRT represent the best principles of communication interventions, including accountability protocols for data collection (Koegel & Koegel, 2006). Pivotal Response Treatments were expanded to address other core pivotal behaviors, including motivation, self-initiation, self-management and responsivity to multiple cues.

PRT interventions use shared control, communication partner choice, contextual reinforcers, contingent reinforcement, and mixture of acquisition with maintenance skills with a predominance of maintenance skills to maintain motivation. All reasonable attempts to communicate are reinforced. PRT is more than an isolated intervention, it is a "way of being" for a communication partner that can be implemented throughout the day, rather than for a fixed 25-40 hour-per-week time period.

Synthesis of the Natural Language Paradigm (PRT) with Aided Language Stimulation

In 1995, the principles and accountability of the Natural Language Paradigm were applied to low-tech AAC interventions, defined as Aided Language Stimulation (Goossens', Crain & Elder, 1992). Aided Language Stimulation, (ALgS) is receptive language input with the expectation, without pressure, that expressive language will occur. ALgS was primarily implemented with low-tech communication boards, however, the principles are applicable to all tech AAC, from picture cues to dynamic display devices to keyboard communication. In this model, the speaking communication partner takes an active role and augments spoken language with visual symbols or words. Other Aided Language strategies include Aided Language Modeling (Drager, Postal, Carrolus, Castellano, Gagliano, and Glynn), System for Augmenting Language (Romski and Sevcik, 1996) and Natural Aided Language (Cafiero, 1995). Each of these strategies is based on the active role of the communication partner. In these models, the symbolic language on the tool or device is viewed as a second language, and therefore, the communication partner pairs his/her speech with the language on the AAC – augmenting verbal input with visual input. This strategy applies not only to the use of picture symbols but also to written and typed (keyboard) language.

Natural Aided Language (NAL) is the synthesis of ALgS and PRT (Cafiero, 1995). Natural Aided Language, like traditional ABA strategies, defines observable, measurable outcomes, for both speaking and non-speaking communication partners and uses data to guide the course of the AAC intervention. Natural Aided Language assumes a mutuality and collaboration of communication partners, the "shared control" of PRT.

THE CHALLENGE: Integrating PRT into AAC Interventions Through Natural Aided Language

Motivation

As in PRT, NAL addresses the need to target motivation. The speaking communication partner identifies those high value reinforcers that are chock full of language opportunities. Note that reinforcers need to be varied and can change; a high value reinforcer may become less preferred and even aversive. Assessment occurs regularly with reinforcer assessments and sensory preference inventories. These target activities, persons, toys and tools and items that will be the context for communication. Using what is most valued to the communication partner will insure a level of engagement.

Available Robust Vocabulary

AAC tools are prepared with enough vocabulary to provide robust language stimulation through aided language/augmented input, Vocabulary should include nouns, verbs, descriptors and prepositions. Terminating vocabulary, such as "I'm finished," is included so that the non-speaking partner has that control. Robust vocabulary is necessary whether the AAC is a voice output device, a communication notebook, PODD or keyboard. Providing access to robust vocabulary is a statement of belief in the communicative potential of the non-speaking communication partner.

Preparation

When the reinforcing toys and activities are identified, the observable, measurable communication behaviors can be defined. Availability of two or three of the identified activities enables choice-making and an additional communication opportunity.

Communication Targets

For the completely non-speaking, early communicator, the target may be a first spoken word or word spoken on a device, an exchanged text or picture cue, or an activated single switch device. Other targets include combining two words as a response, combining two words as a spontaneous utterance, answering or asking "wh" questions.

Communication Opportunities

The obvious potential communication opportunities are identified, and the practitioner will create and define other opportunities while being open to any serendipitous communication opportunities that will inevitably come up when control is shared between communication partners.

Present Levels of Performance: Baseline

Present levels of communication are determined (baseline) for the identified targets. Videotaping is a great way to determine these levels; they can be reviewed, rewound and studied. Often, sadly, our non-speaking communication partners elicit language that we miss in real time and discover on video.

Know Your Communication Partner

Familiarity of the communication partner in a relaxed, low demand environment is important. If the practitioner observes and casually interacts often enough, the AAC interaction will be more enjoyable, relaxed and effective.

Prepare the Environment

All toys and activities should be ready and available. Target items should be "delivery-ready" when the student requests it. Have at least two of these items ready to use. This prevents loss of focus or interest. Also, lack of readiness can create a situation where a communicative behavior is not rewarded immediately. Considering the principles of ABA, it is important that the reinforcement occur immediately after the target language occurs. Minimize environmental clutter to promote engagement in target items/activities and discourage non-goal directed wandering.

Be a Prepared Communication Partner

A prepared communication partner has an intimate knowledge of the architecture of the tool or device and knows where core and fringe vocabulary are located. A prepared communication partner has developed fluency in using the tool or device so providing augmented input is natural. (See The Natural Aided Language Planner).

A Prepared Communication Partner:

√	Is familiar with the non-speaking partner
√	Identifies reinforcing activities, toys, items
√	Identifies language/communication targets
√	Identifies, creates, communication opportunities4
√	Identifies PLOPS, codes baseline
√	Prepares AAC tool
√	Learns architecture and vocabulary of AAC tool
√	Prepares environment

THE CHALLENGE: Integrating PRT into AAC Interventions Through Natural Aided Language

Get Your Partner's Attention

The first task of the speaking communication partner is to get the attention of the apprentice AAC user if that user is not focused. For young communicators, high fives, tickles, exaggerated facial expressions and tempting with target toy or item are effective. For adolescent and adult communicators, activating target item, visibly enjoying target item, physical proximity and ebullient greetings can also help focus attention.

Create Communication Opportunities

The language goal for any individual is defined by the acronym SNUG (spontaneous novel utterance generation). How to get there? This is one hierarchy to consider. Note that the most subtle prompt is one in which the student responds to the environment, rather than a verbal, physical or gestural prompt. Time delay/waiting is also an important part of creating a language opportunity. Time delay can occur between any of the communication prompts below.

Hierarchy of Communication Prompts

- Natural Environments
- Engineered Environments
- Environmental Language Prompts
- Tempting
- Asking
- Commenting
- Modeling
- Natural Environmental (no language)

1 Arrange the environment or sabotage the preferred toy or item to create a need for requesting or help.

2 Tempt the communication partner with the desired item is another indirect stimulus by creating interest.

3 Ask "why" questions regarding the item with the expectation that the communication partner will respond.

4 Integrate AAC into your verbal language: commenting, question asking.

5 Create scenarios for communication partner to ask "wh" questions.

6 Make your communicative input models for language learning

- Respond to communication with more communication. If your communication partner gives you a word, give that work back. In this way you acknowledge, reinforce and, in some cases, shape the utterance with more language. As in PRT, the reinforcement is contextually relevant; reinforcing language with acknowledged language rather than with "Good pointing," "Good using your device" or "Good talking."

- Give the word back with an additional word to model language expansion. For example, if your partner says: "Turn on," you respond with "Turn on the cd player."

- Create robust, frequent language opportunities; PRT protocols aim for at least one opportunity per minute.

- Prepare to follow your communication partner's lead, whether it is physically moving from one play item to another or simply changing a topic.

Accountability

An essential component of any AAC intervention is observable measurable outcomes and interventions that are guided by periodic analysis of progress. The first step in accountability is measuring the famous PLOP: present levels of performance. It is important to name the objective(s) for both communication partners. (The term "AAC user" is not used to distinguish one partner from the other, for in effective AAC interventions, both communication partners use the AAC for input and output).

Measuring Communication Partnerships

Accountability is important for all communication partners, speaking and non-speaking. What are the specific procedures and behaviors of an effective communication partner? (See Communication Partner Skillsheet)

Snapshot of Communication Partner Skillsheet	
+	Model
+	Reiterate and Give Back
+	Expand
+	Shape/Correct

Balancing Rigid ABA Strategies with Presuming Competence: The Art of Communication Partnerships

It is important to balance the strong accountability element of ABA with Ann Donnellan's ethical philosophy of presuming competence in any intervention for those with complex communication needs. Classic ABA protocols are firm with clear outcomes; communication objectives are clearly defined and strategies are identified to meet those objectives. PRT includes shared control and partner choice within its ABA parameters for more natural approach to language learning. This is the science of a PRT/NAL/AAC intervention. It is, above all, tidy and quantifiable, however, the practitioner should resist being hell-bent on reaching those outcomes at any cost. Attending only to the defined measurable outcomes can potentially veil real communicative intent and global communicative competence. Real communication is often spontaneously untidy and disorderly with breakdowns, repairs and surprising novel topic changes. The AAC practitioner should approach the individual with autism as a person with something to say, over and above those defined outcomes and available vocabulary. This requires

Natural Aided Language Communication Partner Checklist
AAC & PRT

Student_____ Partner_____ O bserver_____

Dates

	AAC with PRT Procedures				
1	Select and prepare relevant materials.				
2	Provide AAC.				
3	Get attention / focus student.				
4	Wait expectantly, use eye contact and body language.				
5	Tempt student with materials; activate key words on AAC.				
6	Make comment about target item with AAC, repeat and wait.				
7	Ask "wh" question and pair with AAC.				
8	Acknowledge any attempt to respond by reiterating with speech and AAC.				
9	Use interrupted behavior chain.				
10	Model correct response using speech and AAC.				
11	Withhold access to item until student uses verbal, vocal, AAC or gesture.				
12	Refocus as needed.				
13	Model communication with speech and AAC.				
14	Expand student verbal/gestural/ communication with AAC.				
15	Withhold item until student expands communicative request.				
16	Keep session pleasant and brief.				
17	Provide tool or prompt for student to end session.				
18	Use AAC to model ending of session.				
	# Achieved				
	%				
	Feedback Received				

Date	Comments

AAC/PRT Intervention Planner

Student_____

Communication Partner_____

Date:_____

Activity:

Target(s):

Materials:

Communication Opportunities:

Maintenance Vocabulary

Acquisition Vocabulary

Activity:

Target(s):

Materials:

Communication Opportunities:

Maintenance Vocabulary

Acquisition Vocabulary

flexibility and ongoing assessment. This is the heart and the art of the AAC relationship. Simple; but certainly not easy.

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