Autism and Augmentative and Alternative Communication: Research-based and Promising Practices

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Topics to Consider Today:

- Definition and features of ASD and AAC
- Evidence-Based Practices in AAC
  - Functional Communication Training, PECS, Visual Supports, Activity Schedules
  - Augmented Input Strategies
  - Speech-Generating Devices (SGDs)
  - Keyboard Communication Systems

Myths about AAC and Autism

- **AAC will inhibit or preempt the development of speech.**
- **AAC is not needed if an individual with ASD has speech.**
- **If AAC is provided to an individual with ASD, he/she will use it.**
- **If an individual is provided with AAC and does not use it within a certain time frame he/she will never use it.**
- **No and low-tech are better options for people with ASD.**

Learning Characteristics in ASD

- Cognition
- Visual processing
- Multiple cue responding
- Stimulus over-selectivity
- Affective & Social Learning
- Sensory Issues
- Motor Planning: motor movements including speech

Autism and Mental Retardation

(Edelson, 2006)

- **Autism and Intelligence Timeline**
- **Reviewed 215 articles (1937-2003)**
- **74% of claims non-empirical sources**
- **53% of 74% not traced to any data**
- **Empirical data was from developmental or adaptive scores rather than cognitive scores**
  - **Language based**
  - **Unanswered questions considered wrong**

Autism and Motor Impairments

- Kanner (1943) & Asperger (1944)
- 100% of Sample children with ASD had below average gross or fine motor skills
  - (Provost, Lopez, & Heimer 2007)
- 41% of children 2-6 with ASD had oral motor or hand/muscle apraxia
  - (Ming, Brimacombe & Wagner, 2007)

Autism and Motor Planning

- Atypical “Reach to Grasp” Movements
  - (Rhinehart et.al. 2005)
- Atypical Movement Preparation
  - (Mari et.al, 2003)
- Impaired Motoric Preparation & Initiation
  - (Rhinehard, Bellgrove, et.al., 2006)
- Impaired Movement Toward Goal
  - (Vernazza-Martin, et. Al., 2006)

Autism and Co morbidity with Affective Disorders

- **Oppositional-Defiant Disorder**
- **Obsessive-Compulsive Disorder**
- **Anxiety Disorder**
- **Psychosis**
- **Selective Mutism**

Communication and ASD

- **50% with no functional language**
- **Limited to requesting and refusing**
- **Inconsistent patterns of language expression**
- **Unique developmental sequence of language skills**
- **Symbolic language (speech or sign) sometimes emerging in adolescence**
- **Functional spontaneous communication is key in facilitating quality of life outcomes (NAS, 2001).**

What is Augmentative and Alternative Communication? (AAC)

- **NO pre-requisites required**
- **Compensates for or replaces speech**
- **Multi-modal**
- **Provides supports for *development* of language**
- **Includes no-tech, low-tech, high tech**
- **Unaided and Aided AAC**

Interface of AAC (aided) and ASD

ASD	AAC
Visual processing	Uses visual medium
Motor planning	Requires less motor skill
Multiple Cue Responding	Scaffolding for complexity
Social difficulties	Buffer and bridge
Interest in inanimate objects	Uses tools & technology

Aided vs. Unaided AAC

(Millar, Light & Schlosser, 2006, Mirenda, 2003)

- Unaided - Manual Signs
  - Requires good fine motor abilities
  - Unlimited vocabulary
  - Portable
  - Not readily comprehensible
- Aided - SGDs, communication boards, keyboards, email
  - requires lower fine motor skills
  - more readily comprehensible
  - Not readily portable

  - ***Neither Aided nor Unaided have been found to be superior to the other!***

Effects of AAC on Speech Production in Children with ASD

Schlosser & Wendt, 2008

- Systematic review 1975-2007
- Stringent criteria for inclusion
  - Calculation of % non-overlapping data (SSD)
    - 20/22 data sets- PND between 80-100%
  - Calculation of effect size (group studies)
- Peer-reviewed journal or approved dissertation
- Included SSD and Group Studies
  - 5 PECS, 1 Manual Sign, 3 SGDs

AAC does not inhibit speech production; most studies showed AAC effected modest *increases* in speech

(Schlosser & Wendt, 2008)

Autism and Aided AAC: What are the Evidence-based Practices?

- Functional Communication Training
- Picture Exchange Communication System
- Augmented Input Strategies
- Speech Generating Devices

Evidence-based Practice: FCT with Aided AAC

- Functional Communication Training
  - PCS, objects, SGDs, Ideographs
  - Views all behavior as communicative
  - Replaces aberrant behavior with communication
  - Must be efficient, acceptable and recognizable
  - ***FCT produced "immediate, substantial and sustained" decreases in aberrant behavior (Mirenda, 1998)***

I need a break.

I need help

I want some chips.

I want the Quiet Room

Evidence-based Practice: PECS

- Systematic sequential protocols
- Exchange a symbol for a desired item
- Expressive communication only
- Acknowledges communication partner
- Approximately 1/2 children developed speech
- (Bondy & Frost, 1994; Lancioni et.al, 2007)

Evidence-based practice: Speech Generating Devices (SGDs)

- **Low-tech (1 - 32 cells, single & multi-level)**
- **High-tech**
- **Summons attention of communication partners**
- **Model for speech**
- **Used alone or with other aided AAC**
- **Schepis, Reid & Behrman, 1996; Schepis, Reid, Berhman & Sutton, 1998)**
- **Augmented input model (SAL, Romski & Sevcik, 1996, 2006, 2008).**

Speech Generating Devices

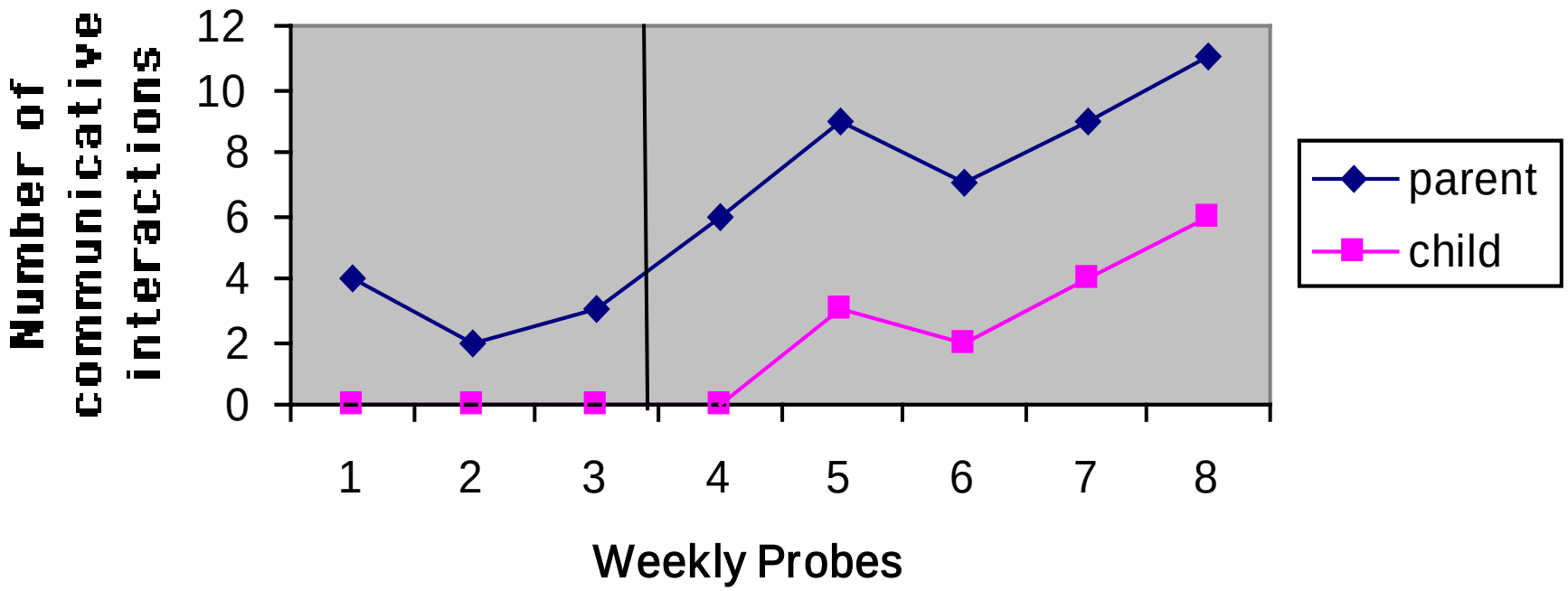
- **Use of SGD was not immediately preceded by prompt** (Datillo & Cammerata, 1991, McGregor et.al, 1992; Schepis et.al, 1996; Schepis et.al, 1998).
- **Use of SGDs increased communicative behaviors such as vocalizations, words, gestures** (Sigafoos, Didden & O'Reilly, 2003; Schepis, Reid, Behrmann & Sutton, 1998).

Evidence-based practice: Augmented Input Strategies

- Communication partner essential
- Receptive language training (INPUT)
- AAC viewed as legitimate language
- Natural Aided Language, System for Augmenting Language, Visual Routines, Aided Language Modeling
- **Effective in increasing spontaneous communication** (Cafiero, 1995, 1998, 2001, 2005; Dexter, 1998; Acheson, 2006; Light & Drager, 2005; Drager et.al. 2006, Romski & Sevcik, 2006; Romski et.al., 2008).

I want 	more 	please 	open 	thank you 	yummy 
sit down 					yucky 
share 					trash 
wipe face 					upset 
wait 	drink 		cookies 		finished 

Number of Communicative Initiations and Responses: Parent and Child with and without NALS



apple

pretzel

free time

fan

raisins

rub

drink

cookies

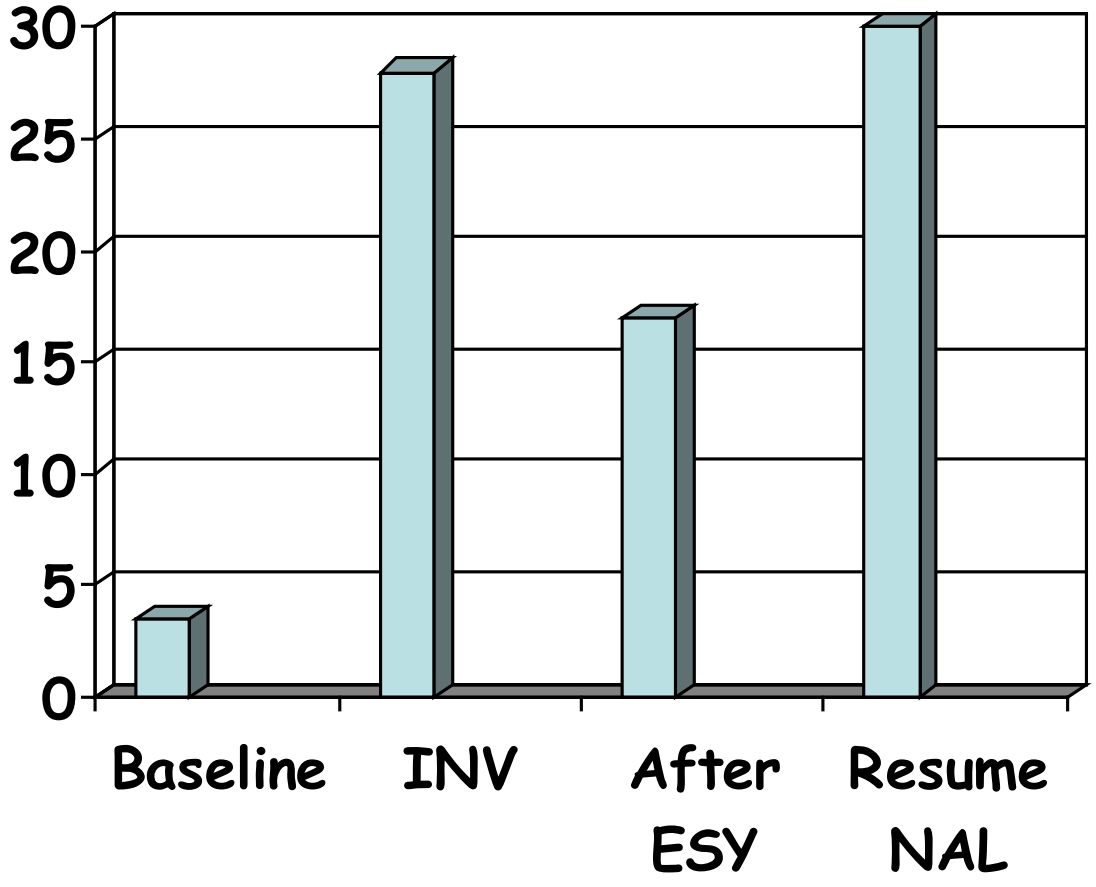
bathroom

no 	good job 	I need help 	please 	more 	thank you 	yummy 	yucky 	yes 
I want 	eat 	sit 	pour 	cooking spoon 	plate 	pancakes 	upset 	free time 
my turn 	drink 	wait a minute 	spread 	frying pan 	fork 	cereal 	waffles 	hungry 
	set table 	taste 	sit 	toaster oven 	spoon 	bowl 	butter 	thirsty 
	serve 	wash dishes 	hot 	honey 	napkin 	syrup 	wash 	finished 

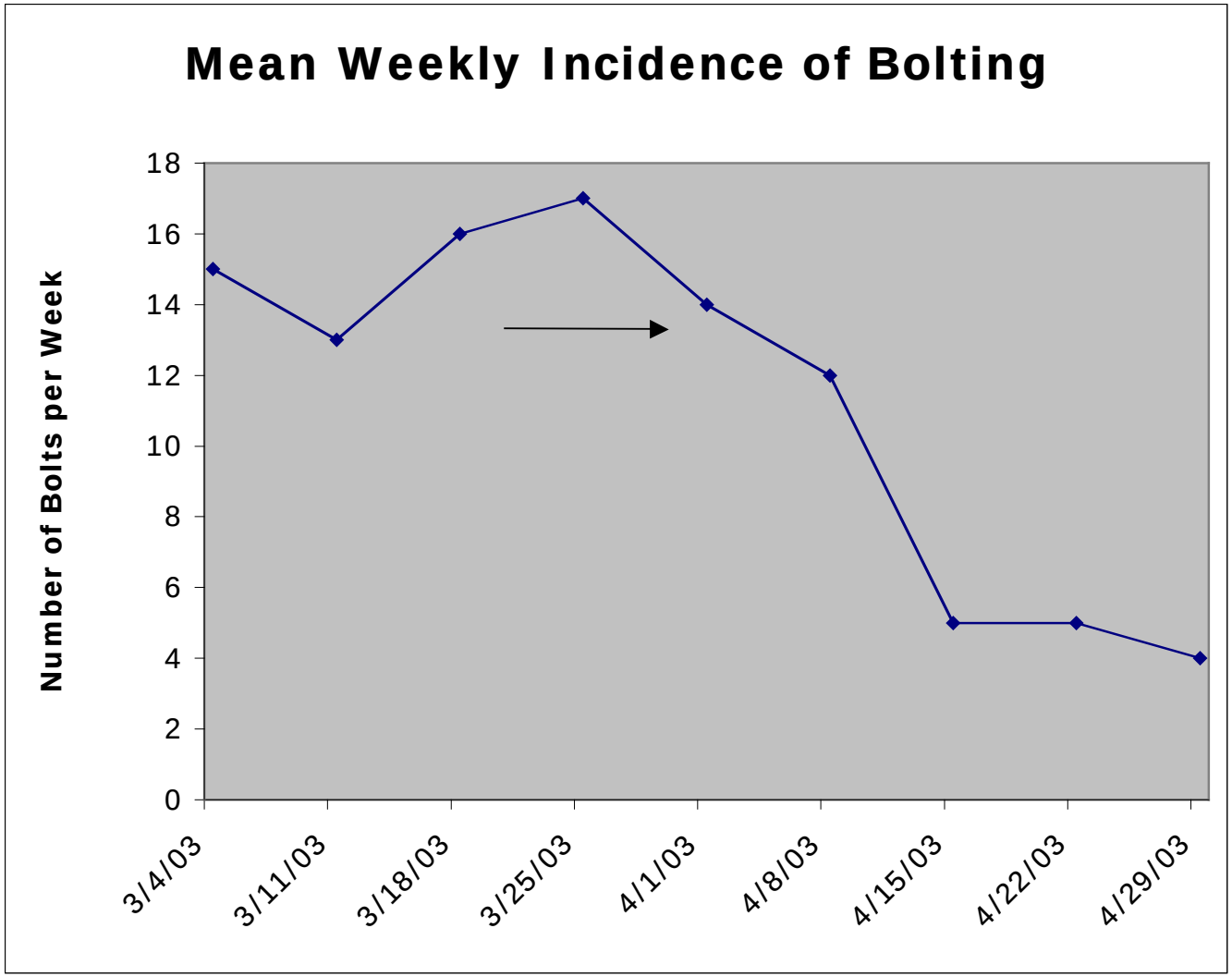
Timothy- Natural Aided Language Intervention

- Increased augmented communicative input (visual symbols) from 9 to over 60
- Engineered all environments and activities for communication
- All staff trained in Natural Aided Language

Number of PCS Initiations with Natural Aided Language Intervention



Charting “Bolting” (standing up, leaving instructional group without directions to do so)



SGDs & Autism: Toddler Study

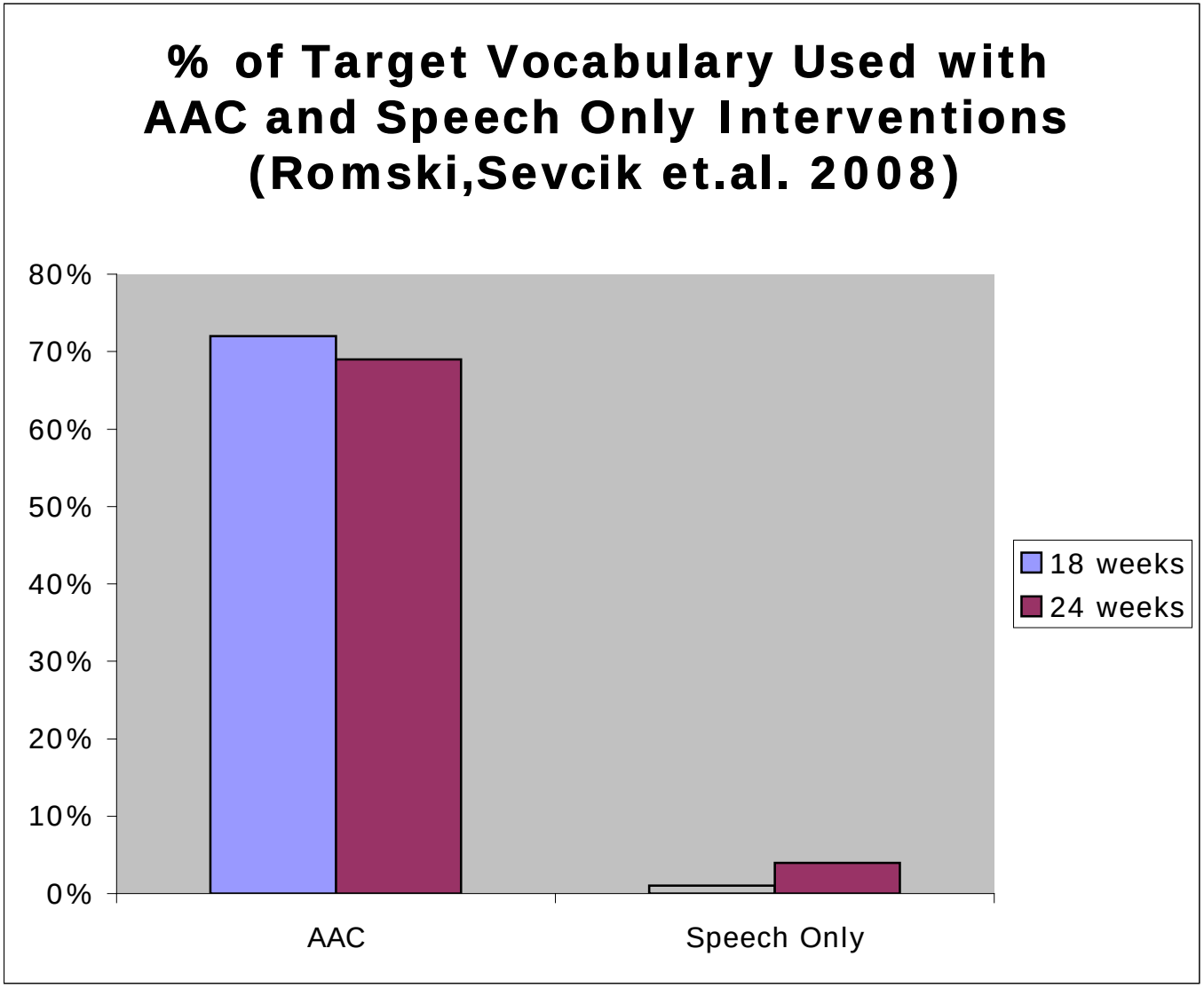
Romski, Sevcik, Smith, Barker, Folan & Barton-Hulsey, 2008

- Retrospective analysis
- 3 groups of 20 toddlers: 14ASDs
- Parent training in stimulating speech
- Group 1- no AAC, speech supports only
- Group 2 - aided AAC, focus on comprehension (augmented input)
- Group 3 - aided AAC (augmented input) focus on input and child's output

System for Augmenting Language

(Romski & Sevcik, 1996)

- Speech-Generating Device
- Relevant Lexicon/vocabulary & visual/graphic symbols
- Teaching through natural communicative exchanges
- Communication partners integrated SGDs into their own spoken language


% of Target Vocabulary Used with AAC and Speech Only Interventions (Romski,Sevcik et.al. 2008)
80%
70%
60%
50%
40%
30%
20%
10%
0%
AAC
Speech Only
18 weeks
24 weeks

System for Augmenting Language Results:

- Children who received ACI or ACO Interventions were able to communicate using symbols after 18 sessions and generalized & maintained this language at home.
- Children in SCI group could produce only few words by 18 sessions and had no conventional way to communicate while learning to speak.

- “…results of related studies in Natural Aided Language, Aided Language Modeling and System for Augmenting Language provide preliminary support for the suggestions that language modeling with symbols in natural contexts may be a viable language intervention for young children with ASD” (Mirenda, 2008).

Non-activity specific Communication Displays and Devices

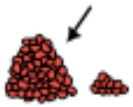
- Motor planning?
- Core vocabulary?
- Device with capability for increases in vocabulary and communicative function
- Motor memory or visual discrimination?
- Preliminary data

Core & Fringe Vocabulary: both are required for communication

- Core
  - More open ended
  - Applicable to many situations

- Fringe
  - Specific to a particular activity
  - Vocabulary size across activities can be enormous

Core

I want 	more 	stop 
my turn 	need help 	yummy 
you 		I don't wan 
uh-oh 	I don't know 	finished 

Fringe

on 	waffle 	hot 
spread 	cream 	toaster 
butter 	syrup 	sprinkle 
plate 	honey 	sugar 

8 Location Phrase-based Core Vocabulary

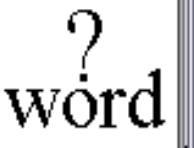
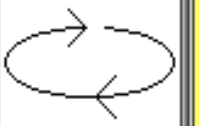
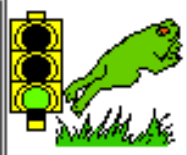
hi 	I don't understand 	I need help 	something different 
yes 	more 	Write it 	Good bye! 

AAC Systems: Visual Discrimination or Motor Memory?

- Visual Discrimination
  - Strong visual processing
  - Supports literacy
  - Requires huge number of icons/symbols
- Motor Memory
  - Speech is motoric; AAC should be too
  - Promotes more “automaticity”
  - Training essential

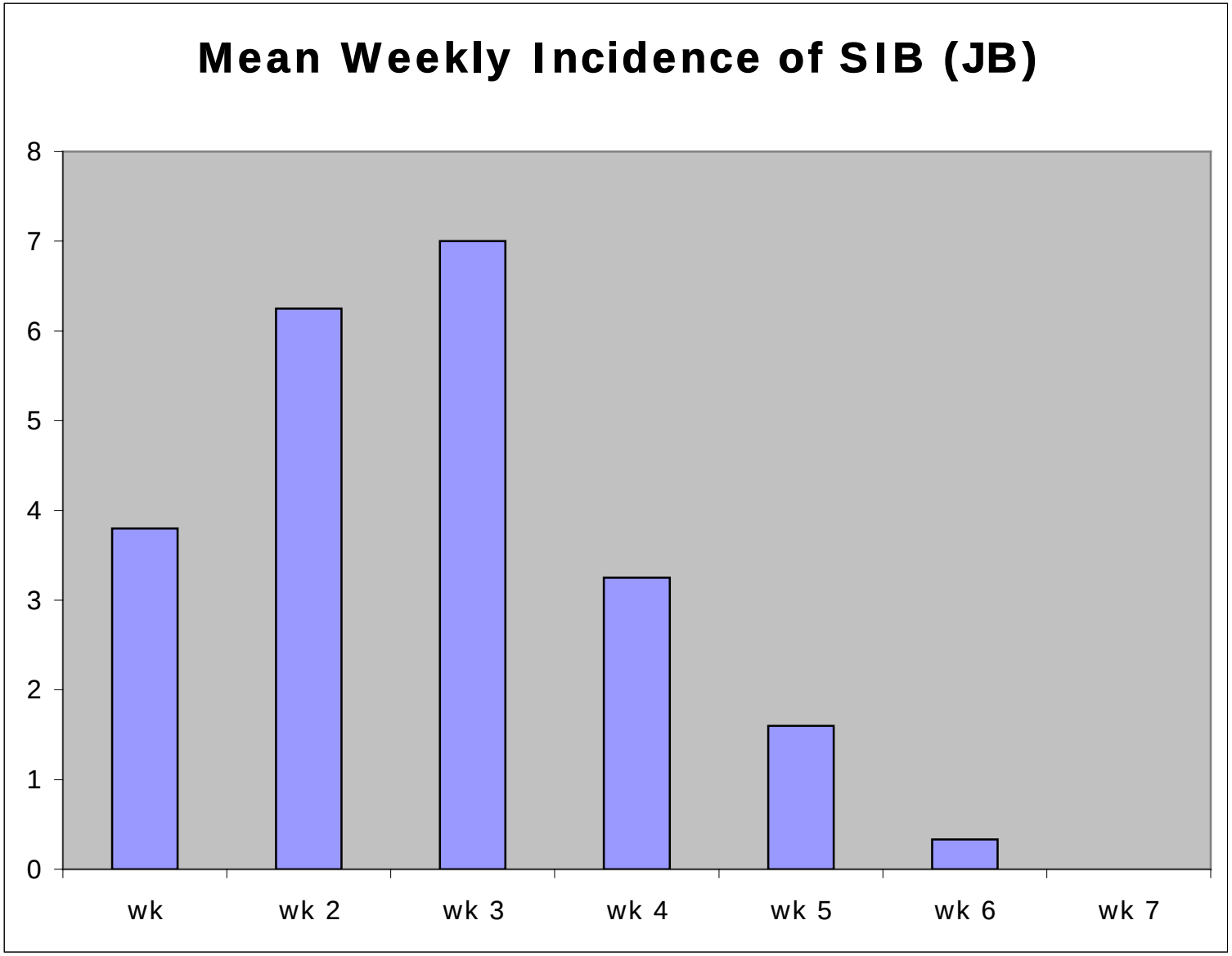
Case Study: Jacob

- 6 years old
- 3 years of no-tech communication boards, books, wallets
- “barking” as primary requesting behavior
- emergence of SIB
- introduction of High-Tech AAC
  - Springboard
  - Training of communication partners

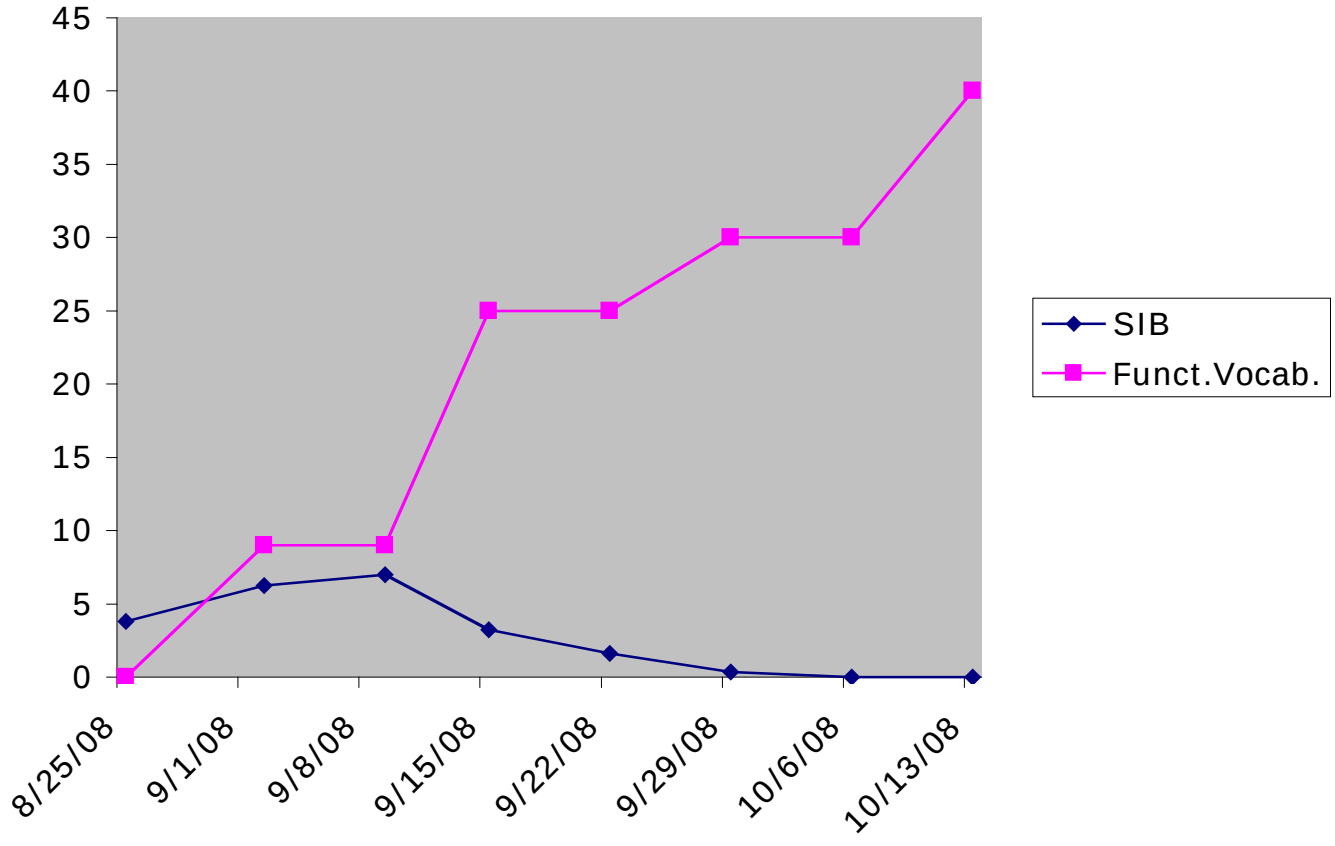
 NAME	 my	 is	 please	 that	to	 more	 what
 PAGES	 I	 play	 like	 get	 read	 put	 help
 ACTIVITY	 you	 want	 come	 FAMILY	 do	 go	 look
CLEAR	 it	 don't	 eat	 make	 drink	 feel	 stop

Jacob's Springboard™ Intervention

- Introduced Springboard during structured academic settings
- Communication partner viewed Springboard as Jacob's voice and ears & provided augmented input
- Navigation strategies were modeled naturally
- Jacob's requests were immediately acknowledged
- Incidences of SIB charted


Mean Weekly Incidence of SIB (JB)
8
7
6
5
4
3
2
1
0
wk
wk 2
wk 3
wk 4
wk 5
wk 6
wk 7

Functional Vocabulary on High Tech AAC and Incidence of SIB



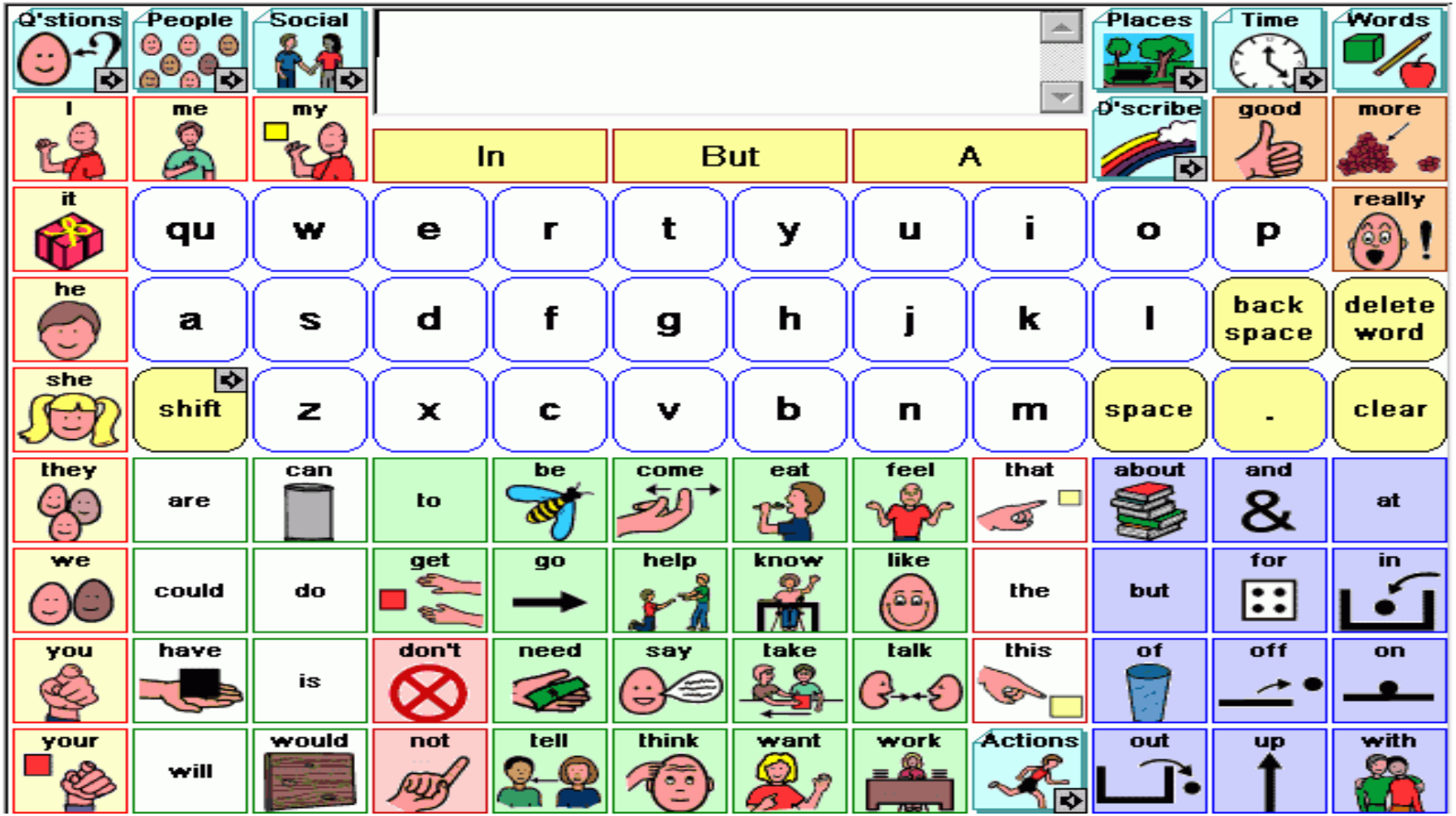
Observational Results: Jacob

- Used device during academics, meals, and preferred activities
- Navigated and found new vocabulary not previously modeled by communication partners
- Vocalized while activating SGD
- Continued to use and accept low tech for some receptive and expressive language
- Vocalized to make requests and engaged in SIB when Springboard was not available

Sample of SGDs Currently Used by Individuals with ASD

- Static display, multi-level devices (GoTalk, Tech Talk, Lingo, Talk Trac)
- Dynamic display devices (DynaMite ™ Chat PC, Proloquo2Go)
- Communication Programs
  - Unity
  - Picture Word Power & Word Power
  - Speaking Dynamically

Picture Word Power



Literacy *In* AAC

- Limited literacy opportunities for students with ASD
- Visual processing, hyperlexia
- Essential to acknowledge, honor, expand emerging literacy skills
- Target comprehension & communication

Keyboard Communication

- Adult Autism Advocacy Movement
- Keyboard Communication vs. “real time” communication
  - Wait time, coordinating listening & communicating
  - Mechanics of the device, positioning
- Note qualitative difference between our own spoken vs. written language
- Former speaking communicators as adults transitioned to AAC
- Model is the same; communication partner gives consistent augmented input.

Assessment Tools for AAC

- SETT (Zabala)
  - Student, Environment, Task, Tools
- **Social Networks** (Blackstone & Berg)
  - Circles of Communication Partners
- **Participation Plans** (Beukelman & Mirenda)
  - What does the student need to participate? What are the barriers? What AAC tools facilitate participation and eliminate barriers?

Critical Research Questions

- **How does a clinician match an AAC tool/strategy to the individual?**
  - **Entry level AAC: no, low or high tech?**
  - **Motor memory or visual discrimination?**
  - **Structured, direct instruction or aided language approaches?**
  - **Maintenance AAC: No-tech, low-tech or high tech?**

About Communication Partnerships:

- Communication opportunities are created by the communication partner.
- Speaking ***communication partner*** must view AAC as the voice and ears of the student
- Speaking ***communication partner*** must use the AAC device, pairing speech with AAC to acknowledge, repair, expand and model the language.
- Speaking ***communication partner's*** investment is essential for a successful AAC intervention.

What is the ultimate goal of AAC? *SNUG*

- ***Spontaneous***
- ***Novel***
- ***Utterance***
- ***Generation***
  - The ability to access individual words, expressions, and commonly used phrases.
  - Allows an individual to say anything, ***about*** anything at anytime.

Key Points

- **Augmented communicative input is key.**
- **Assumption of communicative potential regardless of and perhaps because of of behavioral issues**
- **AAC helps *develop* language.**
- **No Arbitrary timelines on AAC intervention**
- ***Functional spontaneous communication***

- “…in the immortal words of Mick Jagger, we ‘can’t get no satisfaction’ until we have figured out how to provide every individual with ASD with a viable, robust, flexible, and generative communication system that will support long-term language development.”
  - (Mirenda, 2008)