

## Effects of a Visual Immersion Experience on Communication in Autism: An Update

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## Introduction

- History of using visuals at CHB
- Visual approach to communication now commonly accepted
- Need for research and further development of this approach
- Longitudinal field study initiated in October, 2009



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## Purpose

- Investigate potential effects of a visual immersion experience on communication and language development
- Refine and expand visual instructional approach
- Identify barriers to implementation and determine solutions
- Train others



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## Curriculum Framework

- 7 Communicative Operations
  - Protesting/Refusal
  - Organization/Transitions
  - Requesting
  - Directives
  - Commenting
  - Questions
  - Social Pragmatics
- Generally considered non-hierarchical



## Design

- Exploratory case study design (ongoing)
  - Uncommon design in field of speech language pathology
- Visual immersion experience implemented across all key environments
  - Home
  - School
  - Community
- Train the trainer model
  - Field director serves as team leader and communication “expert”
  - Trained parents, home aids, family friends
  - Trained teachers, classroom assistants, peers



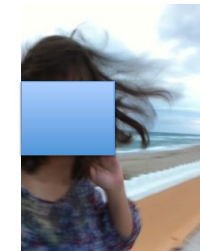
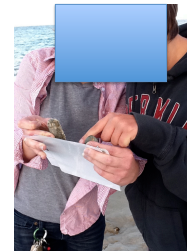
## Design cont.

- Highly intensive project
  - Participant observation in the field (4 days/week)
  - Direct testing and intervention (4 days/week)
  - Discussions with research team (weekly or bi-weekly)
  - Formulation of hypotheses, testing, reformulation and re-testing
- Results from first 2 years for participant 1 reported



## Participant 1: BC

- Age: 19 years (17 at study commencement)
- Diagnosis: Autism (moderate-severe)



## Procedure

- Gather baseline data
  - Language/communication skills (7 operations)
  - Routines
  - Preferences
  - Mentor goals and concerns
- Develop goals (ongoing)
- Create and implement materials; train mentors (ongoing)
- “Handoff” to mentors; continue to track progress and consult as needed (ongoing)

## Data Collection and Analysis

- 3 data sources
  - Field notes
    - Observations (participant observer)
    - Parent/mentor report (conversations, emails)
    - Data from direct intervention activities
  - Video clips
  - Surveys (completed by key mentors)
- Data analysis
  - Quantitative (Video clips, **surveys**, performance measures across the 7 operations)
  - Qualitative (observation; **analysis of field notes** and video samples)
    - Constant comparative method (Glaser & Strauss, 1967)
      - Compare incidents applicable to each category
      - Integrate categories and their properties
      - Delimit the theory
      - Write the theory

## Agenda

- Report on data from 4 operations:
  - Protesting/Refusal
  - Requesting
  - Directives
  - Comments
- Discuss implications for programming and instructional approach
- Conclusions, implications and next steps

## Baseline Characteristics

- Comprehension
  - Use of context clues
  - Physical/gestural assistance
- Expression
  - Primarily physical in nature
  - Use of scripted language; echolalia
  - Initiated relatively infrequently
- “Easy-going;” no behavioral concerns
- History of instruction
  - Instruction primarily provided verbally
  - Introduced to VOL – “not effective”
  - Prior experience with PECS, Mayer-Johnson symbols
- High level of interest in visuals

## Protesting/Refusal

Definition

### Protesting/Refusal

Behavior that expresses objection, disapproval, or rejection of an environmental stimulus.

## Protesting/Refusal

Baseline

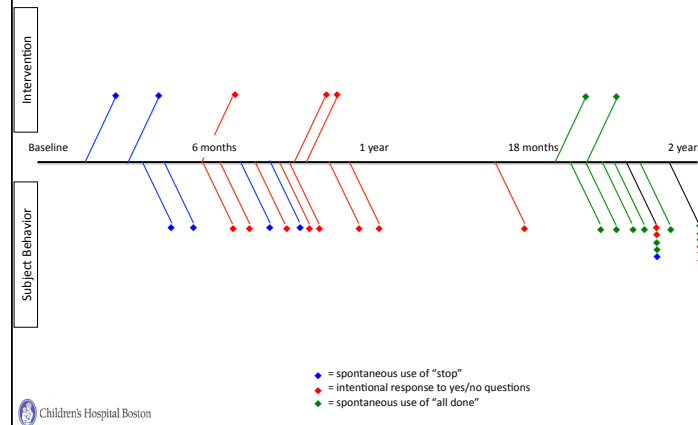
- Protesting primarily physical in nature
- Relatively infrequent
- No tools/strategies available to support protesting
  - Yes/no questions
- Concerns about over-compliance

## Protesting/Refusal

Goals

- Establish a means of symbolic protesting
  - Safe
  - Socially acceptable
  - Universally understood
- Increase frequency of protesting

## Protesting/Refusal

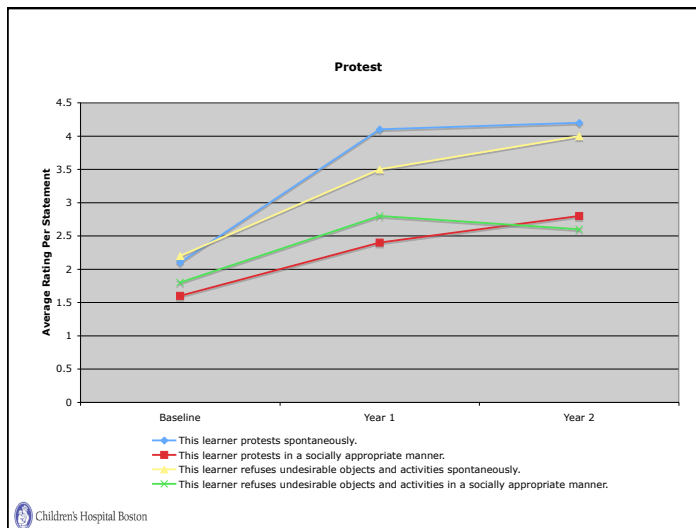


## Survey Data

- Administered at 3 time periods
  - Baseline,
  - End of Yr 1
  - End of Yr 2
- 5 respondents
  - 3 primary caregivers
  - 1 home assistant
  - 1 program instructor
- 59 statements -- each rated on a scale from 1 (strongly disagree) to 5 (strongly agree)

## Surveys: Topics Covered

- Language and Communication
- Overall Engagement and Initiation
- Skills Acquisition and Independence
- Mood / Overall Happiness
- Mentor Competence and Confidence



## Protesting/Refusal

### Summary

Baseline	Current (year 2)
•Primarily physical in nature	•Continued physical protesting; addition of symbolic protesting (speech, visuals) <ul style="list-style-type: none"> <li>•Stop</li> <li>•No</li> <li>•All done</li> </ul>
•Relatively infrequent	•Increased frequency of spontaneous protesting (multiple mentors and environments)
•No tools/strategies available for eliciting information	•Mentors now better able to elicit information more effectively <ul style="list-style-type: none"> <li>•Yes/no questions</li> </ul>
•Concerns about over-compliance	•Mentors report increase in protesting

## Requesting

### Definition

#### Requesting

Expressing a desire for objects, activities, people, affection, attention, recurrence, assistance, and information/clarification.

## Requesting

### Baseline

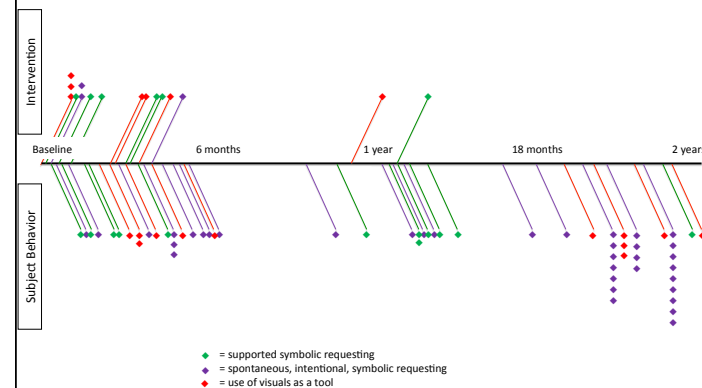
- Spontaneous requesting primarily physical in nature (occasional use of scripted phrase)
- Relatively infrequent
- No tools or strategies available for eliciting information
  - Yes/no questions
  - Choices
  - Open-ended questions
- Caregivers would like to see greater frequency of expressing preferences

## Requesting

### Goals

- Provide tools that will help others to gain information about wants and needs ("supported requesting")
  - Intentional choices
  - Response to yes/no questions
  - Open-ended questions regarding preferences
- Increase frequency of spontaneous, symbolic requesting
- Expand requests semantically and syntactically

## Requesting

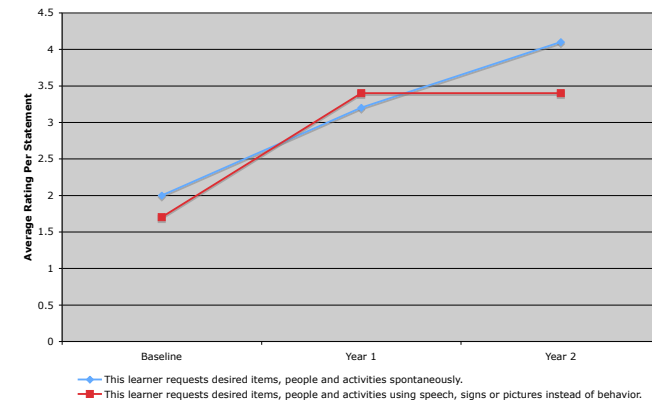


## Requesting

### Syntactic Development

Syntactic Structures Used Spontaneously to Make Intentional Requests	
Year 1	Year 2
I want + O	I want + O
N	N
Want + V + O	Want + V + O
Want + more + O	Want + more + O
My turn	My turn
	Adj. + O
	V + O
	I want + V
	V
	Adj.

### Request



## Requesting

### Summary

Baseline	Current (year 2)
<ul style="list-style-type: none"> <li>Spontaneous requesting relatively infrequent</li> <li>Spontaneous requesting primarily physical in nature</li> </ul>	<ul style="list-style-type: none"> <li>Increase in overall spontaneous requesting</li> <li>Able to request using symbolic means</li> <li>Use of varied syntactic structures and parts of speech to request; indicative of generative language growth</li> </ul>
<ul style="list-style-type: none"> <li>No tools or strategies available for eliciting information               <ul style="list-style-type: none"> <li>Yes/no questions</li> <li>choices</li> <li>Open-ended questions</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>More tools now available for eliciting information               <ul style="list-style-type: none"> <li>Yes/no questions</li> <li>Choices</li> <li>Open-ended questions</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Caregivers would like to see greater frequency of expressing preferences</li> </ul>	<ul style="list-style-type: none"> <li>Mentors report increase in requesting behavior</li> </ul>

## Directives

### Definition

### Directives

Language used to control the behavior of another. There is an implicit understanding that a specific directive will be obeyed. Instruction is both receptive and expressive in nature.

## Directives

### Baseline

- Able to follow select routine-based, single-step directives in context
- Reliance on gestural and physical support for comprehension of novel directives, complex directives, or familiar directives given out of context
- Comprehension of nouns and some frequently used verbs a relative strength; difficulty with comprehension of more abstract concepts and complex syntax
- No/minimal directing of others (using physical or symbolic means)
- Visual instructional tools show promise at tabletop but not yet effective in natural environment.
- Mentors would like to see improvements in following directives and directing others



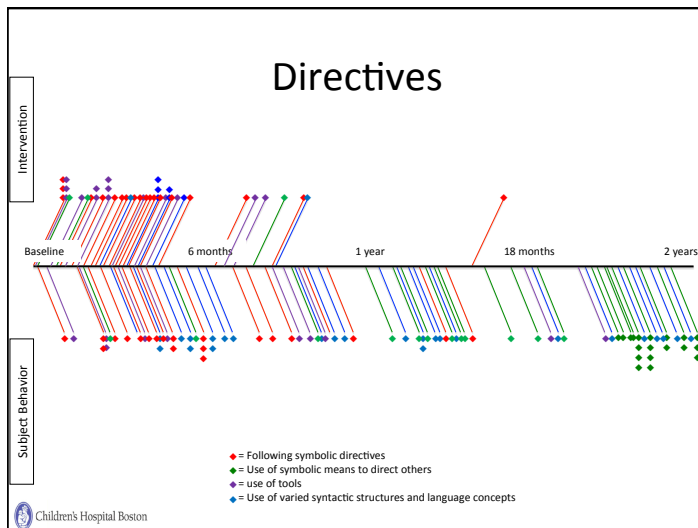
## Directives

### Goals

- Increase ability to follow directives
  - Provide tools to support comprehension
  - Build receptive language skills
- Establish ability to direct others using symbolic means



## Directives



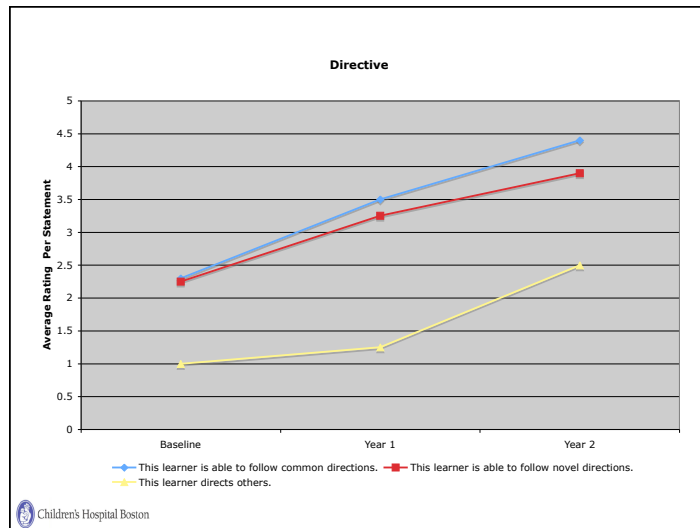
## Directives

### Syntactic Structures Used in Spontaneous Comments

Year 1	Year 2
V	V Adj. V + O N + preposition + O







**Directives**  
Summary

Baseline	Current (year 2)
<ul style="list-style-type: none"> <li>•Able to follow select routine-based, single-step directives in context</li> <li>•Reliance on gestural and physical support for comprehension of novel directives, complex directives, or familiar directives given out of context</li> <li>•Comprehension of nouns and some frequently used verbs a relative strength; difficulty with comprehension of more abstract concepts and complex syntax.</li> <li>•Visual instructional tools show promise at tabletop but not yet effective in natural environment.</li> <li>•No/minimal directing of others (using physical or symbolic means)</li> <li>•Mentors would like to see increased ability to follow directions and directing of others</li> </ul>	<ul style="list-style-type: none"> <li>•Increased ability to follow novel directives and decontextualized, familiar directives</li> <li>•Increased knowledge of vocabulary and syntactic structures</li> <li>•Proficient in use of tools within instructional and natural contexts</li> <li>•Ability to direct others has emerged (particularly with visual supports)</li> <li>•Mentors report increase in ability to follow directions</li> <li>•Mentors report increased directing of others</li> </ul>

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**Commenting**  
Definition

**Comment:**

A behavior, gesture, or vocalization that represents an ***intentional attempt to share information*** with a communication partner about the external environment (e.g., objects, events, sounds, smells) or internal states (e.g., opinions, emotions, physical comfort).

**Pre-comment:**

A behavior, physical reaction, gesture or vocalization that ***suggests something to the receiver*** about what the learner is thinking, feeling or sensing, but that is ***not intentionally shared*** with a communication partner. Pre-comments often require inference/interpretation on the part of the communication partner. They serve as the foundation for true commenting.

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**Commenting**

Baseline
<ul style="list-style-type: none"> <li>•Commenting primarily physical in nature</li> <li>•Occasional use of scripted language (basic needs, emotions)</li> <li>•Some strong foundational skills in place, but not applied for purposes of commenting               <ul style="list-style-type: none"> <li>•Able to label familiar nouns, verbs and colors</li> </ul> </li> <li>•Mentors believe that appropriate commenting is an important social pragmatic skill and would like to see more of it</li> </ul>

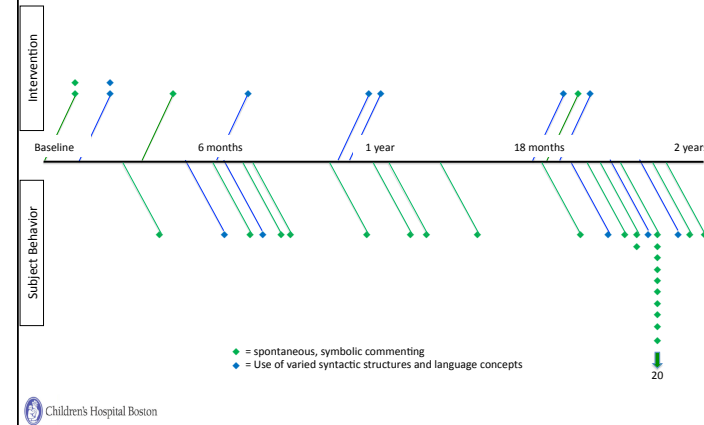
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## Commenting

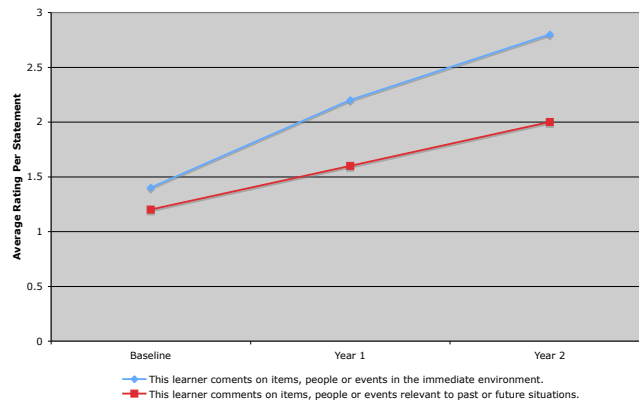
### Goals

- Establish spontaneous, symbolic commenting
  - Sensory experiences (e.g., sights, sounds, body temperature)
  - Basic needs
  - Opinions and emotions
- Expand comments semantically and syntactically

## Commenting



### Comment



## Commenting

### Summary

Baseline	Current (year 2)
<ul style="list-style-type: none"> <li>• Commenting primarily physical in nature</li> <li>• Occasional use of scripted language</li> <li>• Some strong foundational skills in place, but not applied for purposes of commenting               <ul style="list-style-type: none"> <li>• Able to label familiar nouns, verbs and colors</li> </ul> </li> <li>• Mentors believe that appropriate commenting is an important social pragmatic skill and would like to see more of it</li> </ul>	<ul style="list-style-type: none"> <li>• Increased frequency of spontaneous, symbolic, unscripted commenting</li> <li>• Mentors report increase in commenting</li> </ul>

## Patterns

- Intervention led to change
- Skills maintained in absence of direct instruction
- Fading use of visuals over time
- Generalization to multiple environments and mentors
- Increased semantic and syntactic knowledge across multiple functions
- Comprehension precedes expression



## Conclusions

- Visually immersive environment has a positive effect on language development and communication
  - Change noted across 7 Operations (4 reported here)
  - Growth in both comprehension and expression
  - Improvement noted across environments and mentors and operations, according to multiple sources of data
- 4 ingredients crucial to success:
  - Understanding
  - Buy-in
  - Coordination
  - Knowledge and skills (technical skills, understanding of communication)
- Development of generative language seen beyond so-called “critical period”
- Technology was a critical component of implementation



## Implications and Next Steps

- This service delivery model is labor intensive but offers possibilities.
  - Critical ingredients must be present
  - Smaller scale implementation
- Next steps:
  - Continue to develop this model
  - Explore possibilities for further implementation



## Questions?

Thank you!

