

2010 SW Conference on Disability

Using Microswitch Technology to Enhance Early
Communication for Children with Significant
Disabilities



Social Foundations of Communication

...Differentiate self from others

...Differentiate other people from objects

...Attachment to other persons

...Comprehend role of other people as social agents

Cognitive Foundations of Communication

...Contingency awareness

...Memory

...Internal representation of experience

The recognition of the association
between one's behavior and
environmental outcomes is critical for
future learning.
(Watson, 1966)

Learned Helplessness

(Seligman, 1975)

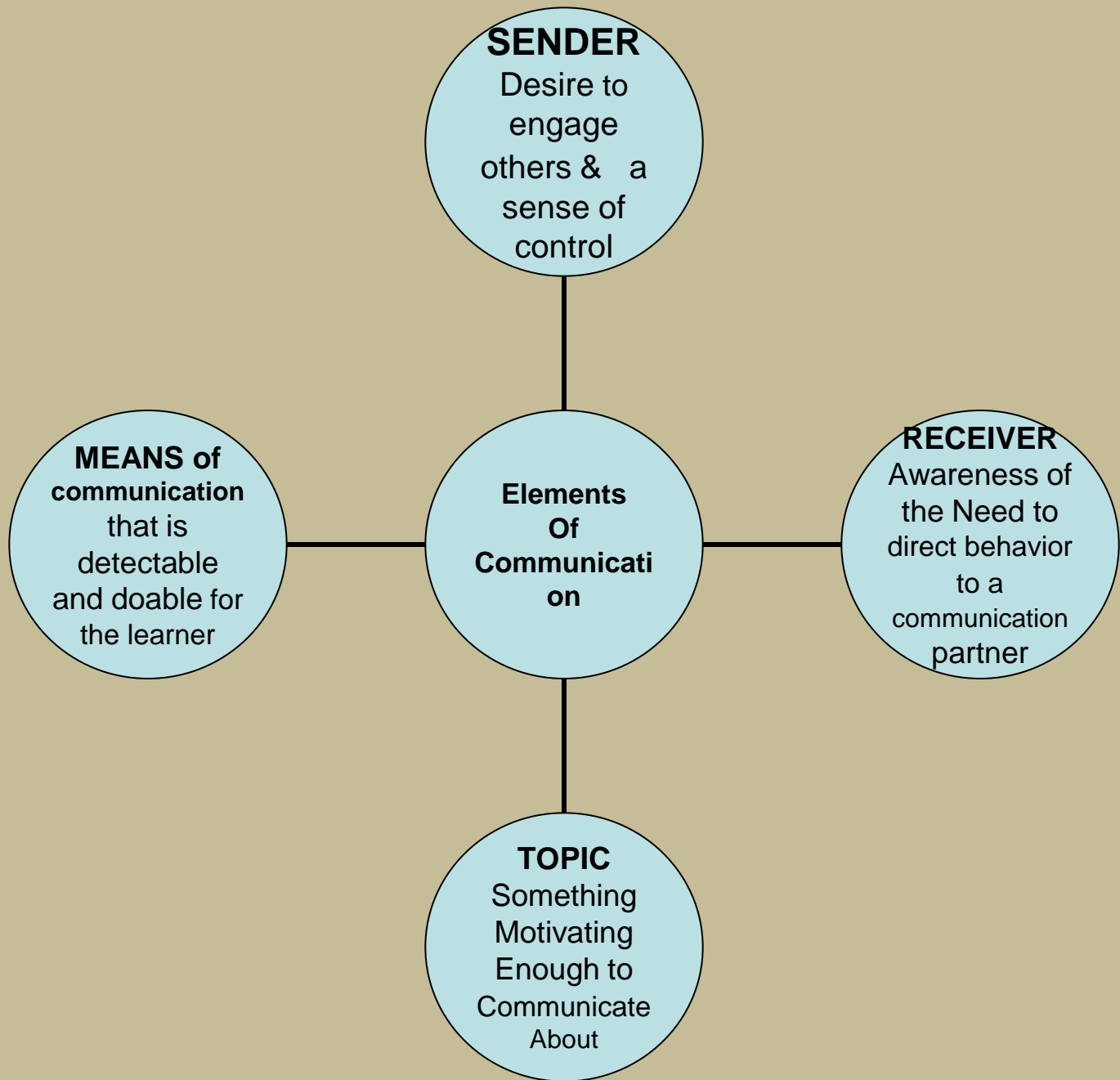
- A profound lack of perceived control over the environment may result in the loss of motivation to effect changes in their world
- This sense of helplessness can impede future learning
- May ultimately result in depression

Contingency Awareness

- Nonsocial (Object)
- Social (People)
- Both Important
- Each require a different understanding on the part of the child
- Non-Social contingencies are more predictable than are social

Meaningful Contingency Learning Experiences

- prepare the child to demonstrate learning in subsequent opportunities of response contingent learning (Finkelstein and Ramey, 1977)
- Serve to motivate the child to seek out additional opportunities to demonstrate such control and mastery



Awareness

- Of self, people, and objects
- Of ability to control
- Of topics

Communicative Intent

- The understanding that specific behaviors directed toward another person may convey meaning and may result in a specific response
- Realization of the need to engage another in order to communicate

World Knowledge

- Experiences in the world
- Understanding relationship between you and things in the world
- Developing preferences and motivations

Memory

- Storing and retrieving information
- Remembering experiences
- Remembering what you need to do to communicate

Symbolic Representation

- A degree of relatedness between the symbol type and the referent or topic
 - Concrete
 - Abstract
- Necessary to move communication beyond the present

<p>I. Preintentional Behavior</p>	<p>The child’s behavior is not under his own control. It is in reaction to things (such as feeling hungry or wet or sleepy). Parents interpret the child’s state from his general behaviors, such as body movements, facial expressions and sounds.</p>
<p>II. Intentional Behavior</p>	<p>The child’s behavior is now intentional (under the child’s control), but she does not understand that “If I do this, Mom or Dad will do that for me”—in other words she does not communicate intentionally yet. Parents continue to interpret the child’s needs and desires from her behavior, such as body movements, facial expressions, vocalizations and eye gaze.</p>
<p>III. Unconventional Communication</p>	<p>The child uses pre-symbolic behaviors <i>intentionally</i> to express his needs and desires to other people. They are called “unconventional” because they are not socially acceptable for us to use as we grow older: they include body movements, vocalizations, facial expressions and simple gestures (such as tugging on people).</p>
<p>IV. Conventional Communication</p>	<p>The child uses pre-symbolic behaviors intentionally to express her needs and desire to other people. “Conventional” gestures include behaviors such as pointing and nodding the head “yes”. We continue to use conventional gestures as adults to accompany our language. Note that many of these gestures (and especially pointing) require good visual skills and may not be appropriate for children with severe vision impairment.</p>
<p>V. Concrete Symbols</p>	<p>Symbols physically resemble what they represent in a way that is obvious to the child—they look like, feel like, move like or sound like what they represent. Concrete symbols include picture symbols, objects used as symbols (such as a shoelace to represent “shoe”), certain “iconic” gestures (such as patting a chair to say “sit down”) and sounds (such as making a buzzing sound to refer to a bee). Children with severe physical impairments may access picture and object symbols through the use of a mechanical device or by pointing, touching or eye gaze.</p>
<p>VI. Abstract Symbols</p>	<p>The child uses abstract symbols such as speech, manual signs, or Brailled or printed words. These symbols do not look, feel, or sound like what they represent. They are used one at a time.</p>
<p>VII. Language</p>	<p>The child combines symbols (any sort of symbols) into ordered two- or three-symbol combinations (“want juice”, “me want juice”), according to grammatical rules. The child understands that the meaning of word combinations may differ depending upon how the symbols are arranged.</p>

<p>I. Pre- intentional Behavior</p>	<p>The child's behavior is not under his own control. It is in reaction to things (such as feeling hungry or wet or sleepy). Parents interpret the child's state from his general behaviors, such as body movements, facial expressions and sounds.</p>
<p>II. Intentional Behavior</p>	<p>The child's behavior is now intentional (under the child's control), but she does not understand that "If I do this, Mom or Dad will do that for me"—in other words she does not communicate intentionally yet. Parents continue to interpret the child's needs and desires from her behavior, such as body movements, facial expressions, vocalizations and eye gaze.</p>

We know that children with severe disabilities especially those including visual impairment

- May not demonstrate eye contact ,gaze, and facial expressions characteristic of the child born without disabilities
- We know that these behaviors are key elements of the early connection between child and parent (Siegel-Causey, Ernst & Guess, 1987)
- We know that this may cause the caregiver of such children tremendous difficulty in establishing a communicative base (Fraiberg,1977)

- The caregiver confronted with signals from the child that are difficult to detect or interpret may produce fewer and fewer responses to the child's behavior, feeling that they cannot connect with their child (Schweigert,1989)
- “The failure to establish mutually satisfying communicative interactions during these critical months is difficult to remedy and may affect social interaction negatively”. (Rowland, 1984)

Children who have the means to act on and
learn from their physical environments in more
conventional and independent
ways

Children who have the means to communicate and engage their social world using more conventional strategies

Children whose means of engaging their
social world is limited or whose signals are
difficult
to read

Children whose means of acting on their
physical world is
greatly restricted

Questions about your student's motor responses

- **(Readability)** Is the behavior clear enough to ensure consistent interpretation by others?
- **(Do-ability)** Can the child easily and repeatedly demonstrate this behavior, or is it very difficult motorically for him to do so?
- **(Applicability)** How compatible is this behavior with meaningful and acceptable communication interaction?

Questions to ask before you begin using the microswitch technology with your learner

- Is the activity educationally valid?
- Can it be taught directly?
- Would Microswitches be appropriate?

- (adapted from York, Nietupski & Hamre-Nietupski. 1985, *A Decision-Making Process for Using Microswitches*)

Uses of Microswitches

- To adapt **recreational and leisure** materials for use by learners with orthopedic impairments
- To teach **motor skills** by giving reinforcement when correct response or position occurs
- To teach **cognitive skills** such as contingency awareness, discrimination, matching
- To allow learners with orthopedic impairments to **control the physical environment** such as turning on the lights or blender
- To allow individuals with severe orthopedic impairments to **participate in a regular activity** independently to some degree

Uses (cont'd)

- To enable individuals with severe orthopedic impairments to produce **communicative behaviors**:
 - To gain attention
 - To augment natural forms communication that may be less effective

Misuses

- **No clear functional objective** for using them
- **Their use diverts attention** from the purpose for which they were designed
- The switch and “independent play” it results in, becomes **an excuse to ignore the user.**

Desired Outcome

- Assist children to develop and use behaviors to control their social environment
- Assist the environment to become more contingently responsive to the child's communicative behaviors

Assessment:
*Early Communication
and Microswitches*

Communication
Skills

Student
Preferences

Student
Motor Response

***Natural
Behaviors or
Microswitches**

Design Instruction

```
graph TD; A[Design Instruction] --> B[For children who enjoy social interaction]; A --> C[For students who prefer non-social interactions];
```

For children who enjoy social
interaction

For students who prefer non-social
interactions

Monitor instruction

```
graph TD; A[Monitor instruction] --- B[Design of Intervention]; A --- C[Preferences and student interests]; A --- D[Targeted Response *Switches?];
```

Design of
Intervention

Preferences and
student interests

Targeted Response
***Switches?**

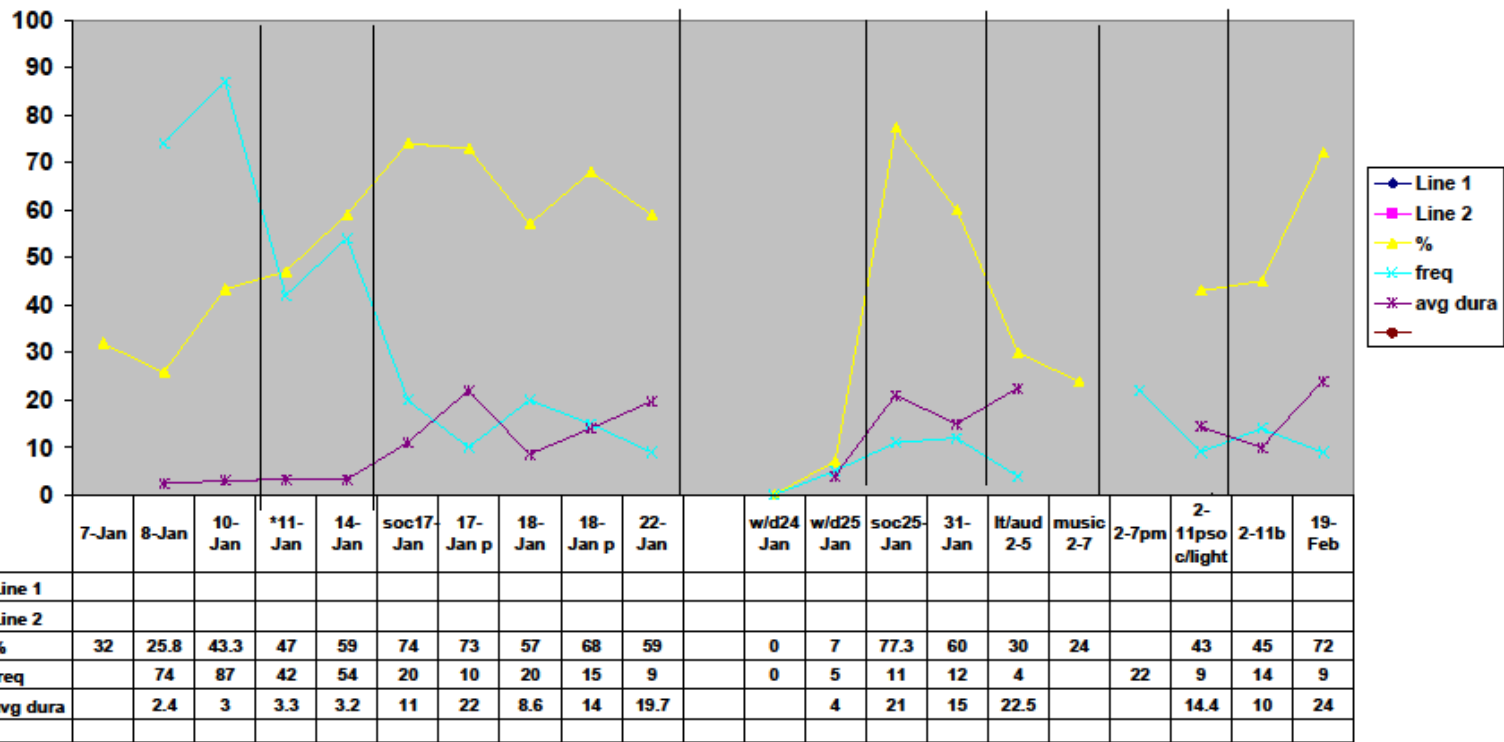
Criteria for Success

- Objective measure of child performance
 - Performance is contrasting to baseline or other condition
- Durable (replicable) performance
 - It's more than a one time thing for the learner
 - Performance can be repeated on subsequent probes
- Collateral evidence
 - Other indicators of child's understanding of control as may be found in affective/emotional responses, tone, levels of alertness



Other Data Analysis Considerations

- Mean rate of performance per phase
- Response duration data
- Trend of performance
- Educational Significance of the data
- Other concerns or potential influences



session

Promote Progress

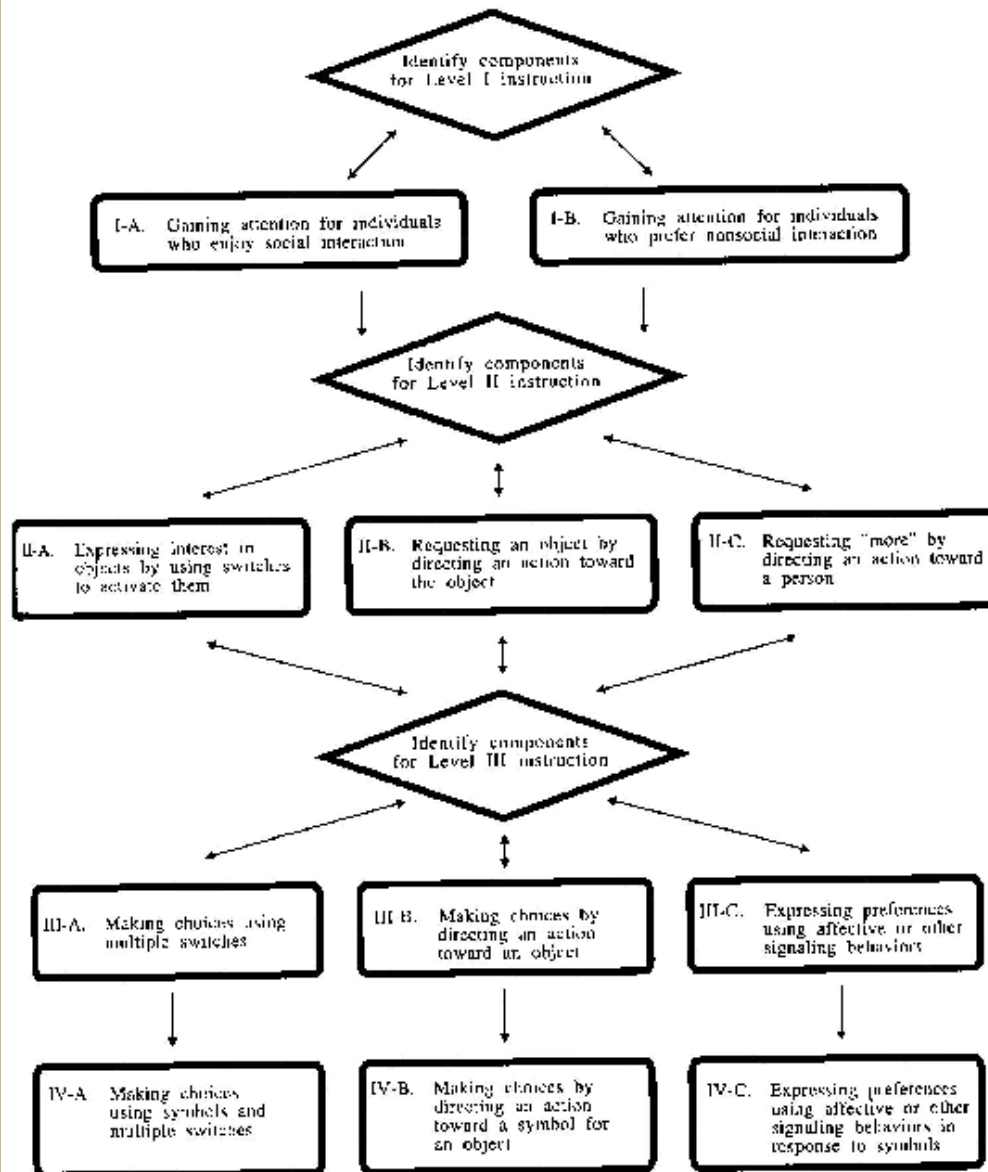
```
graph TD; A[Promote Progress] --- B[Generalization: Settings Partners]; A --- C[Expanding Communication: Topics/choices]; A --- D[Future Plans: other communication behaviors, *switches? functions, Symbols];
```

Generalization:
Settings
Partners

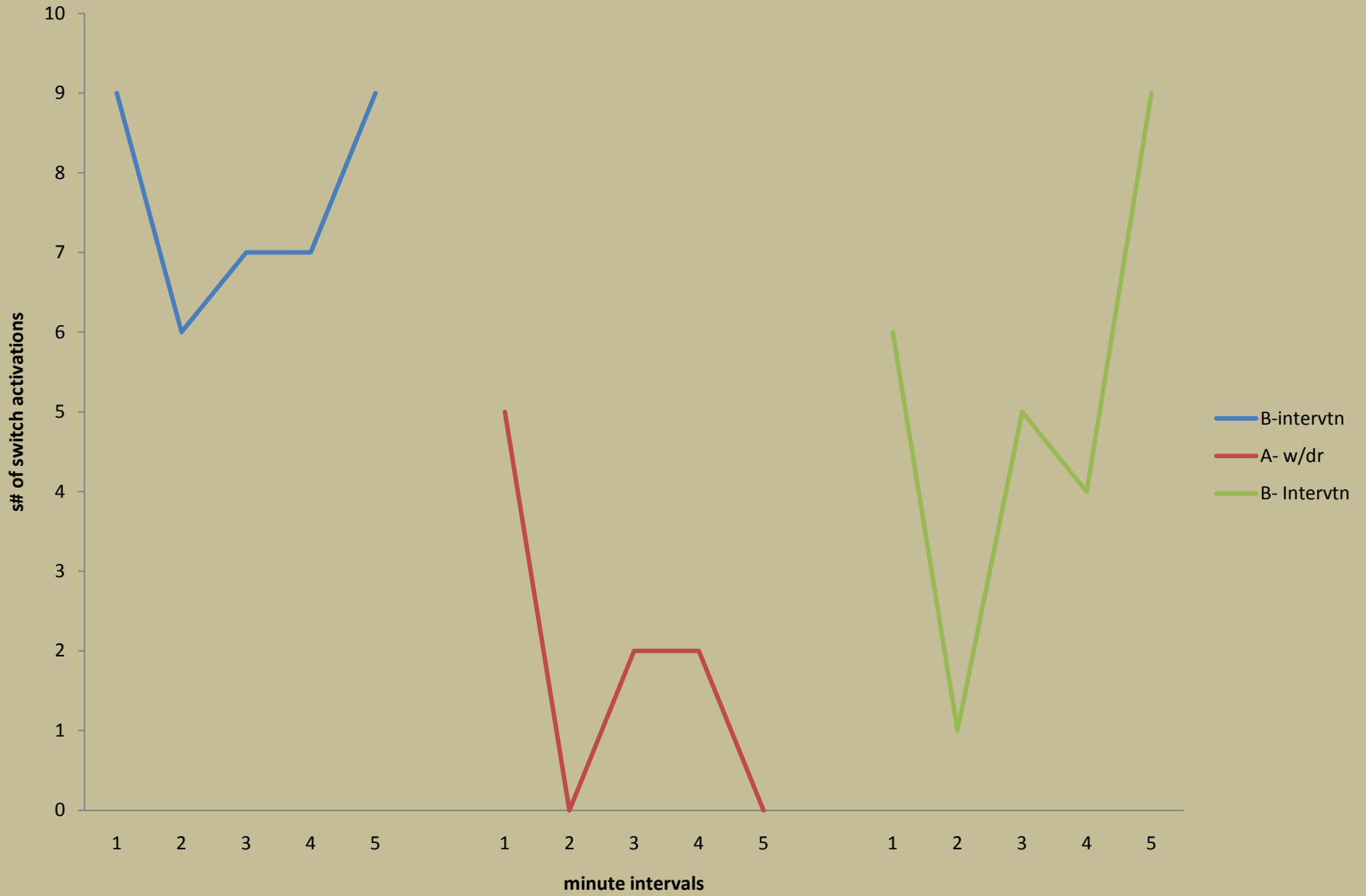
Expanding
Communication:
Topics/choices

Future Plans:
other communication
behaviors, ***switches?**
functions, Symbols

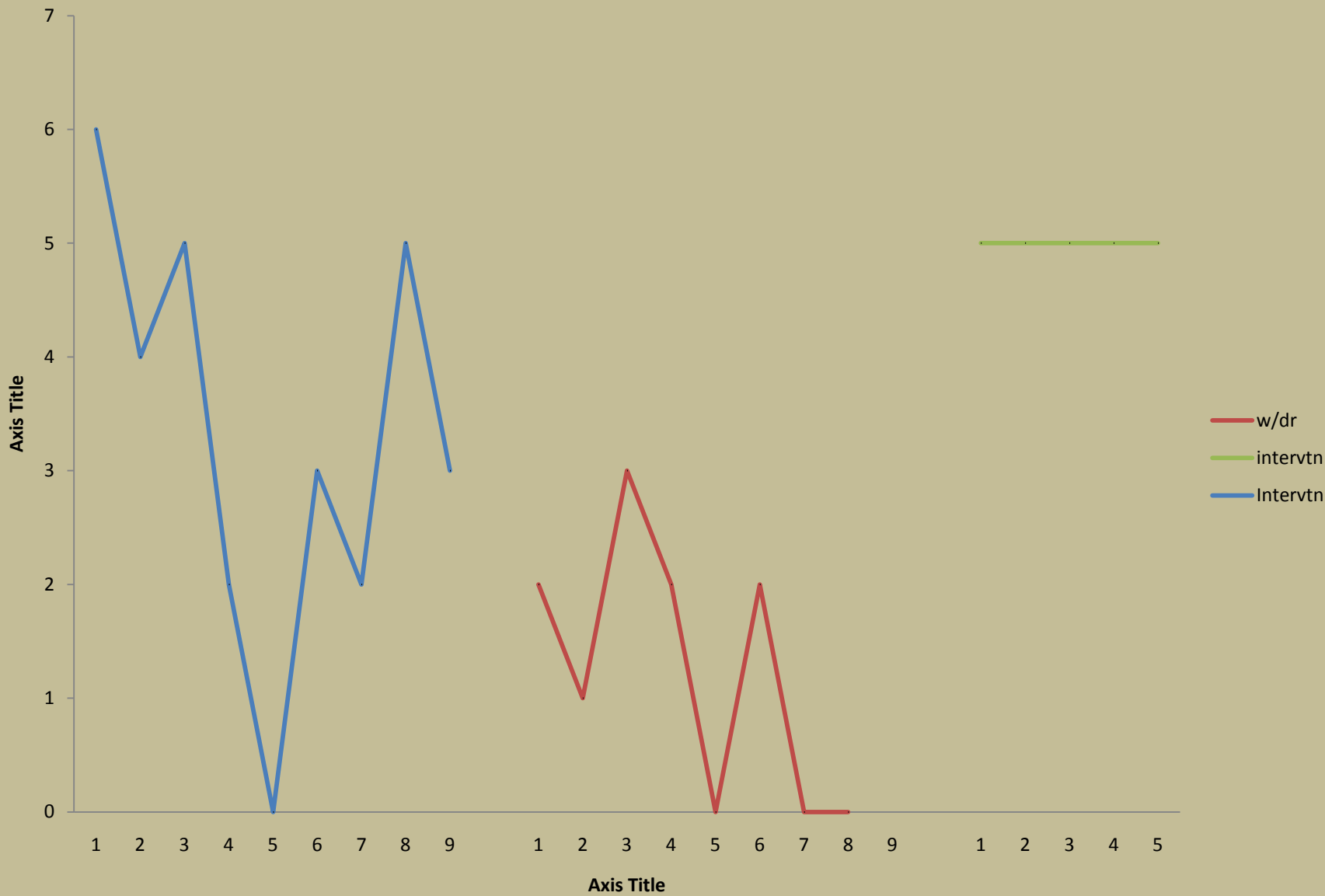
Early Communication Process

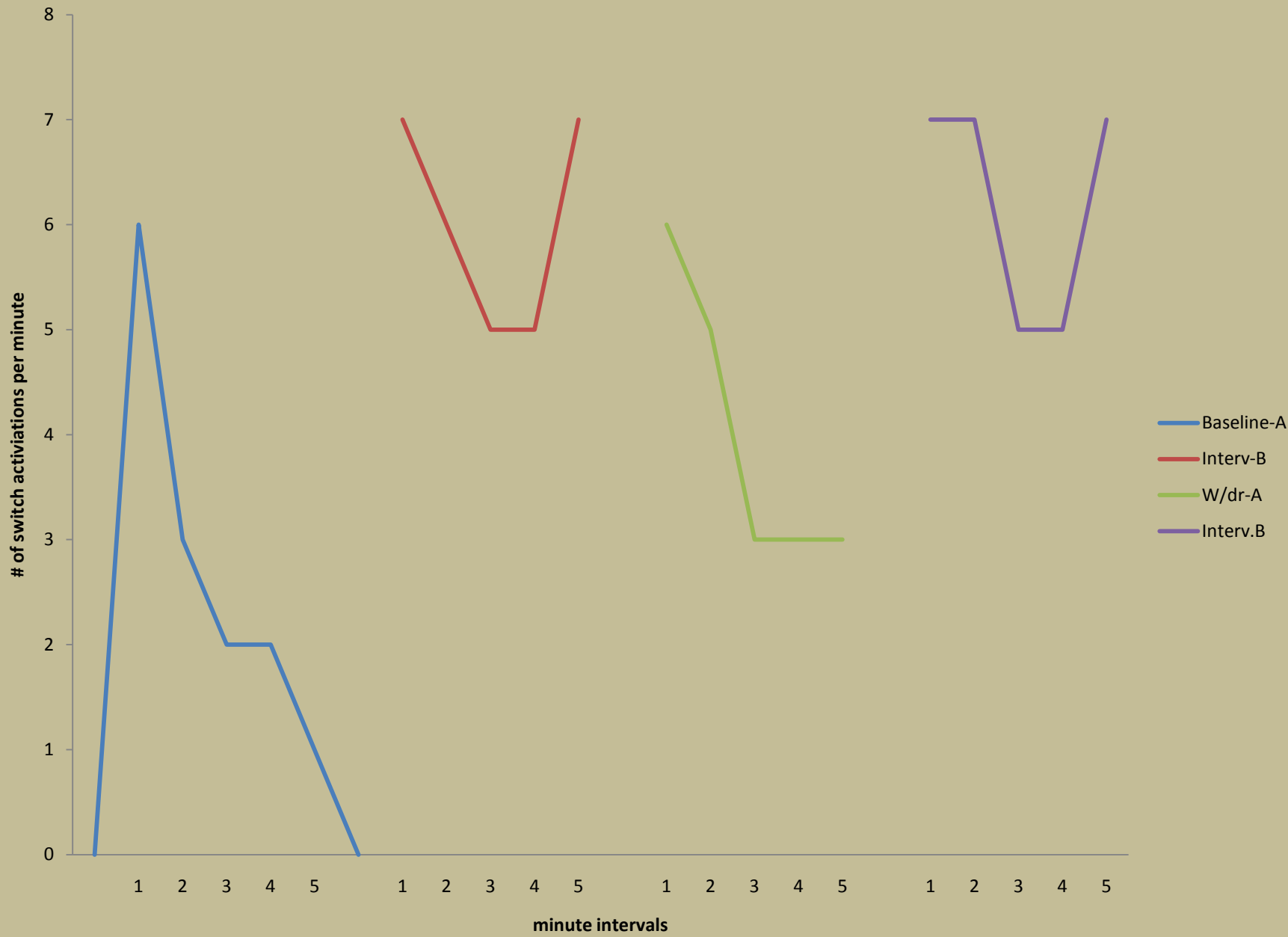


B-A-B Spring 2010

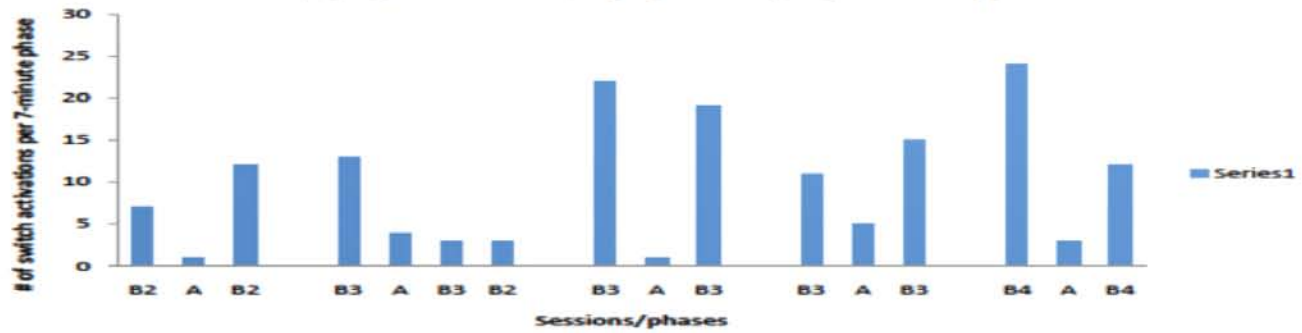


8/27 B-A-B





SC BAB
(B₂ light and vibr/B₃ light only/B₄ vibr only)



Early Communication Process

