Stepping Stones to Switch Access:
Teaching Switch Access for Communication and Learning
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Speaker Disclosure

• Linda Burkhart is a private consultant and presents trainings around the world. In addition, she has a small home business for several books and software titles she has authored.

Who might use switches for access to communication and learning?
• Physical challenges
  • that limit direct selection through pointing
  • with additional visual challenges that may limit size and complexity of vocabulary on an AAC system
  • plus need for multiple access methods due to physical position, fatigue, environmental factors, strategic competencies, and preference

There is more to using switches than getting a child to “hit the switch”

Going on a Switch Hunt?

STOP!
Myth: “We just have to find the perfect switch placement.”

Reality: We have to find some good possible switch placements and provide opportunities for the child to learn how to use them.

Its Not About Finding the “Perfect Switch Site”

Its About Finding the Best Switch Sites to Learn to Use

No One Starts with Automaticity of Movement

Motor Skills are Learned

Learning is impacted by:

*the ability to perceive differences

*make sense out of the nonsense

(Anat Baniel)

When you do something fast, you can only use motor skills that you have already developed to automaticity....
You cannot improve or refine your motor patterns without slowing down and attending to what you are doing.

When a child’s only option is to use a current automatic motor pattern:
- Automatic movement patterns will not get better in quality, simply through repeated use.
- Attention to movement is required for learning.
- Supports and Learning are needed to:
  - Begin in a healthy position.
  - Learn to move in a healthy pattern.

Using two switches without timing is frequently easier and leads to development of more controlled refined movements than using one switch with timing demands.

Teaching Switch Access:
- Before being able to use switches for learning, individuals need to develop automaticity for switch use.
- Learning to use a switch to the point of automaticity for access is a process.

Automaticity is a Level of Skill Where You No Longer Have to Consciously Think About Performing that Skill.

The Juggling Act and Working Memory.
Always Balance Cognitive and Motor Difficulty

Juggling Explains Inconsistency of Performance

Parallel learning for development of autonomous, independent communication

Team plans long term direction and works on skills in parallel

Focus on one component or skill within each activity, or part of activity

- Reduce motor load for difficult cognitive, language and academic tasks
- Reduce cognitive load for motor learning tasks
- Teach switch access as a separate but parallel skill to language and academic learning

“Non-Electronic” partner-assisted scanning Communication Book for Communication

- Reduce motor load
- Reduce vision load if needed
Non-Electronic Academic Modifications

Writing with the Alphabet “adapted pencil”

- Testing adaptations
- Reduced quantity of work

Develop Motor Control and Active Positioning

- Reduce cognitive load
- Reduce language load
- Reduce vision load if needed

Switch Play to Develop Motor Skills for Switch Access

- Reduce cognitive load
- Reduce language load
- Reduce vision load if needed

Vision Development for CVI

- CVI Range (Roman-Lantzy)
- Appropriate adaptations
- Reduce motor, cognitive, and language demands
- May or may not work on vision during communication or when focused on motor learning

Eventually: Combine Motor, Language, Academic and Vision Skills to Operate a Communication Device and Technology for Learning

What Does Research Say About Learning a Motor Task?

- Initiation of intent must come from within the child
- Problem solving opportunities for trial and error
- Practice and repetition with a purpose
- Thousands of repetitions with variation

Hanser and Burkhart
Why Hand-Over-Hand is not as effective as Self-Directed Exploration


Developing Automaticity takes practice: Thousands of Repetitions with Intent, Purpose, and Variation

Motivation Provides Intent

Natural Context Provides Purpose and Variation

Empty praise is NOT helpful

May make it hard to perceive differences

Who Likes to be Told What to Do?

What do we do to kids all day long?
Who Likes to be Told What to Do?

Limit telling the child what to do

Provide Strategic Feedback instead of Direct Prompts

Feedback is Critical to Motor Learning

• Appropriate and perceived feedback
• Immediate
• Develop a neurological loop (intent to action)
• Be strategic and clear with feedback
• Sometimes be quiet and let the child problem-solve with the switches

Don't Build an External Prompt into the Motor Loop

The Power of Modeling! Take a Turn - Instead of Prompting

Teach Peers to Model

Stability and Active Position Important Components

• Active weight bearing on pelvis
• Moving forward slightly
• Learning to actively rotate and/or shift weight - even if only slightly
• Grasp bar (teach child to actively desire and participate in stabilizing and moving themselves)
• Control often begins at the head when body is actively engaged with gravity
Proximity (sensor) Switches can respond to subtle movements without extra force applied to activate them.

Proximity Switches and Splashtop or TeamViewer

Switches are connected to the computer and displayed on iPad.

Stepping Stones to Switch Access - Strategies to Provide Children with Developmental Problem Solving Experiences

Step 1: Single Switch: Cause and Effect

Child begins to associate an intentional movement with the ability to cause something to happen.

Begin with Accidental Switch Activation

Working on Cognitive Part not the "Correct" movement.

Cause and Effect Learning vs Recreation and Leisure

Momentary / Direct / Short vs Longer Entertainment
Mind Express
Steps Before Step Scanning
Cause Effect Direct
(Burkhart)

Step 1: Single Switch:
Cause and Effect
Technology Features: Immediate response to effect, momentary or direct effect (plays and stops concurrently with switch activation and release), or short effect (plays only 1-6 seconds upon switch activation)

Rad Sounds
(RJ Cooper)

Switch Accessible Boombox & Step Scanning App
(Judy Lynn)

Basic Cause and Effect

Downloading Videos
(sites and Apps are always changing)

- On computer: YTmp3.cc
- On iPad: iCab App
- For creating animated gifs from videos: EZGIF.com

Step 2: Single Switch:
Multiple Locations
Multiple Functions

Child understands simple cause and effect but needs practice intending and executing a movement for different purposes or locations
Single Switch - Multiple Locations

• Create little problems to solve to work out what does this do? How can I use it?
• Try different switch sites - beginning with direct or momentary activation
• Not to find “perfect” switch site, but find possible sites to learn to use

Step 2: Single Switch: Multiple Locations / Multiple Functions

Technology Features: Immediate response for short effect upon switch activation

Single Switch - Multiple Functions

Battery Operated Devices with a Purpose or Function!

Give Switch Toys a Purpose

Expanding Possibilities

Co-Planned Sequenced Social Scripts

Burkhart and Musselwhite
**Gotalk Now Plus**

**Co-Planned Sequenced Social Script Template**

[https://drive.google.com/open?id=18YvNO7cBoR6LGFYbX9IzHnXJHEuE9Q](https://drive.google.com/open?id=18YvNO7cBoR6LGFYbX9IzHnXJHEuE9Q)

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**Spinner Games**

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**Use Recipes (Accessibility) on iPad to assign a gesture such as spinning to a switch**

[Spin the Bottle (original) App](http://bit.ly/2DOIEUD)

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**Free PowerPoint Spinner adapted by Fio Quinn**

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**Hats, Blocks, Who is Hiding Steps Before Step Scanning (Burkhart)**

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**Let the child explore and provide strategic feedback**
Step 3: Two Switches / Two Functions

Discrimination and Problem Solving

Technology Features:
Immediate effect for switch activation.
Second switch interrupts first effect.

Move to two switches two functions as quickly as possible

Increase Cognitive Engagement

A Reason to Problem-Solve

“Throw it to me!”
Make the Penguin kick the ball

Build it up!
Make the Pig knock down the blocks

Try Smaller Switches

Increase focus and discrimination

Recessed and/or Angled Switches
Loc-Line Switch Mount
Easily adjust position of switches
Modularhose.com

Super Switch Hitter and Switch Jam
Marblesoft/Switch in Time

Mind Express
Steps Before Step Scanning:
Two Switches (Burkhart)
www.star-at.com

Building Blocks

Inclusive Technology
Switch Skills for 2 - Set 1
also some on helpkidzlearn.com

Judy Lynn: Learning Two Switch Step Scanning & Step Scanning App
Switch Applicator
- Inclusive TLC
- Programmable and Music Modes

Types of Scanning
- Automatic Scanning
- Inverse Scanning
- Step Scanning with a Delay
- 2 Switch Step Scanning

Why Two Switch Step Scanning? vs. Automatic/Timed Scanning?

Eliminate Timing (Timing requires automaticity)
You need to slow down to learn the graded movement

Active vs. Passive
Scan does not move if attention shifts or wanders
- Requires less demand on concentration
- Allows for for possible distractions
- Encourages appropriate social pragmatics to relate to others who might talk to them during the scanning
Two Switch Step Scanning: Allows Child to Pace his Own Processing Time

Child is in control of the timing

Once automaticity is achieved, then some individuals move to timed scanning and some continue to use step scanning

Some Kids Just “Get it” Other Kids Need to Learn it

Kids who understand the concept of Step Scanning, skip Stepping Stone #4 and move on to Stepping Stone #5

Step 4: Move, Move Get or Learning to Two Switch Step Scan

Technology Features: Two switches but only one switch is active at a time. Switch 1 moves an item along a path. Switch 2 is not active. Each switch activation moves the item closer to the end of the path. Once the item arrives at destination, the first switch ignores the input while the second switch becomes active and selects the item at the end of the path.

Stepping Stone 4: Learning to Two Switch Step Scan: Move, Move, Get

- For children who do not understand how step scanning works (some children may skip this step)
- For children who need more practice with both switches with a purpose
  - One switch becomes a “mover”
  - Second switch becomes a “getter”

Delay timer set to 1-2 seconds for mover switch

Fatigue

Step Scanning

- May be more physically fatiguing
- Provides multiple opportunities to practice switch use and develop motor control
- May help to develop endurance when learning to use switches

Timed Scanning

- May be more cognitively fatiguing
- Need to maintain focus
- Less physical fatigue - especially for degenerative disabilities
Learning Two Switch Step Scanning - Lesson 4 & Step Scanning App (Judy Lynn)

Mind Express Steps Before Step Scanning (Burkhart)

Steps Before Step Scanning

Switch Skills for Two Set 2 (Inclusive TLC)

also some on helpkidzlearn.com

Step 5: Two Switch Step Scan - Failure Free

No “Right” or “Wrong” Answers - Just a “Playground” to Explore with Good Strategic Feedback for the Child’s Selections
CAUTION:
Some People Have Redefined “Errorless Learning”
We are now using: “Failure Free with Feedback”
(Karen Erickson)

Step 5: Two Switch Step
Scanning - Failure Free with Feedback

Technology Features: Scanning does not begin until the individual activates switch 1. Activation of the first switch immediately interrupts any sound, animation or auditory cue and highlights the next item in the array. Switch must be released and reactivated to move to the next item. The second switch selects the highlighted item. Launcher features highly desired.

Launchers provide individuals with control and foster Problem Solving

http://tarheelgameplay.org

Individual Student Launcher (Mind Express)
Dress Up Book & Make a Monster

Failure Free Writing Notes (Mind Express)

Hey Jamie,
I want to be your friend.
I want to play a game with you.
I have some news to tell you. I went to a party.
Your friend, Ty

Co-Planned Failure Free Writing

My Story
I like riding my bike.
I like to eat ice cream.
I don't like stinky trash.

Failure Free Writing Notes (Clicker 7)

Make 3 Letter Words (Mind Express)

Step 6: Two Switch Step Scan for Clear Choices:
Activities for Increasing Accuracy and Cognitive Engagement - Moving to a specific target in an array
Leave some blanks in the array, to encourage selection of one targeted item

• Only do this with individuals who have had lots of experience with failure free step scanning
• Trying to teach child to select a specified target too soon in the process may discourage internal motivation

Step 6: Two Switch Step Scan for Clear Choices:

Technology Features:
Same as step 5 plus ability to have some cells scanned with only a sound or 'nope', 'more', etc. and then have a big effect for target selection: video, song, animation, etc.

Step 7: Practice for Increasing Accuracy with Two Switch Step Scanning

Some activities have correct and incorrect options, but also have good feedback for incorrect items

Simple Powerful Page Set

Partner-Assisted Scanning with iPad Apps

Pipe Cleaner Pointers
• Won't activate screen
• Clarifies what is being scanned
• Helps focus visual attention
• Child selects with yes/no head movements or 2 voice-output switches
**Partner Assisted Scanning on Apps - Word Wizard**

Technology Features:
Same as step 5 plus more specific content with clear feedback. Different selections have very different results.

**Step 7: Practice for Increasing Accuracy with Two Switch Step Scanning**

**Step 8: Automaticity Two Switch Step Scan Reducing Time for Success**

The child has now developed automaticity with switch access and they can focus on content and not just on activating the switches (Now, some individuals will be able to use automatic scanning).

**Listening Comprehension with Feedback (Mind Express)**

One per page PODD communication book
Learned to use yes/no head movements for partner-assisted scanning

Auditory Plus Visual Partner-Assisted Scanning - Item by Item
One Switch, then Two Switches
Multiple Functions

Play activities to develop switch skills - computer as well as remote controlled toys at home

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12 Expanded Functions PODD communication book with pull-off columns (group/item)
Auditory Plus Visual Scanning

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Simple, Powerful page set on SGD (Speech Generating Device)

- Similar vocabulary organization to his non-electronic communication book
- Most powerful (personally relevant) messages to say out loud
- A way to access his communication book

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SGD using 2 switches - time to babble and explore language

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Robust Language Page Set SGD and Robust Language in Communication Book

- Opportunities to generate novel messages to meaningfully communicate across the day

(His choice to use SGD or Book as desired in different contexts)

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Explored head switches to expand his options with robust PODD communication page set

Uses every day to speak and write

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Also uses increasingly complex language in his auditory plus visual scanning PODD book according to his preference, fatigue, context and position

Thanks!

I would like to personally thank all the individuals and their families for teaching me so much and also for generously allowing me to use photos and videos

Handout:
www.LBurkhart.com