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Plan Organize Work Evaluate Reward Finish!: A Multi-faceted Occupational Therapy Program to POWER!© Executive Function

Permission

- Please note: Attendees are allowed to make copies of the POWER! Battery System and POWER! Battery Daily Chart for their personal use.
Objectives

1) List the EF skills from a developmental acquisition framework.

2) Describe the relationship between EF skills to emotional regulation, sensory processing, and learning style.

3) Explain how to utilize POW! And POWER! Strategies within family-centered or school-based pediatric practice by embedding into occupation-based interventions.

Executive Functions

- http://www.youtube.com/watch?v=efCq_vHUMqs

- “…set of mental processes that help connect past experience with present action” (NCLD, 2012, n.p.)

- Involve frontal lobe functions
EF Skills

- Planning/prioritization
- Response Inhibition
- Working Memory
- Emotional Control
- Sustained Attention
- Task Initiation
- Organization
- Time Management
- Goal-directed persistence
- Flexibility
- Metacognition

EF and Self-Regulation

- 3 Basic Dimensions (Miyake et al., 2000):
  - Inhibitory control
  - Cognitive/mental flexibility
  - Working memory
    - This is how we remember information, filter distractions, resist impulses, and sustain attention during an activity that is goal-directed, while adjusting our plan as necessary and avoiding frustration!

AKA: “OCCUPATIONAL PERFORMANCE”

EF = Occupational Performance

- Everything we do involves EF!
  - Infancy: Peekaboo, pat-a-cake, hiding games, fingerplays, conversations, copying/imitation games, simple role play
  - Toddlers: follow the leader, simple rules with active play, songs with movements, fingerplays/songs, rhymes with gestures, storytelling, imaginary play

Occupational Analysis

- Infant: How does peekaboo involve initial formation of EF?
  - Ashley is 9 months and enjoys playing peekaboo with Nana, as Nana places her hands over her face, Ashley waits, and Nana removes them to smile at Ashley, Ashley smiles back and indicates more with gesture.
**Occupational Analysis: Toddler**

- Toddler: How does imitative/symbolic play involve EF?
  - Max is 3 and is imitating his father, who is mowing the lawn, using his bubble blower push toy
    - Cognitive flexibility: open to learning and copying father, adjusting plan as needed
    - Inhibitory Control: resists urge to run around lawn or play other game, copies father’s moves rather than own interests
    - Working Memory: copying father by watching and copying in repeated sequence

**Developmental Sequence: Welsh (2001)**

- Cycle I: 18 mos-5 years
  - Inhibition, WM, simple flexibility
  - Primarily motor-related
- Cycle II: 5-10 years
  - Dramatic increase in tasks that require planning, WM, inhibition, self-monitoring
- Cycle III: 10-14 years (and on)
  - Emphasis on integration of processes

Development: Vygotsky

- **Zone of Proximal Development**: Optimized through scaffolding, just right challenge, and highlight of 3-7 is private speech. Likely to resurface with challenging or confusing tasks.


Pre-School Development

- 3-5 yr: Important period
  - Initial experience with resolving conflict
  - Changes in attentional systems
  - Dynamic period of growth
  - EF problems ↑ in neurodevelopmental disorders and other pediatric disorders

Environment and EF

- If attention is the basic building block of EF, THEN...Frontal lobe heavily depends on environment for emerging EF
  - Experience: expected development of frontal networks (slow pace (TC), dependent on environmental stimulation (ENV), and reliance on varied basic cognitive skills (CF)
  - THEREFORE: *Extremely vulnerable to dysfunction*


Change through Environment

- Nature of EF that makes it vulnerable is a source of untapped opportunity...
  - “AMENABLE TO ENVIRONMENTAL REMEDIATION”
  - Contextual rather than just environmental
    - Temporal: pacing, scaffolding
    - Challenge level (cog level)
  - Perfect for OT interventions!!!!

6 Approaches for EF School Years: EBP (Diamond & Lee, 2011)

- Martial arts/Mindfulness
- Aerobic exercise
- Montessori approach
- School based programs
- Computerized trainings
- Hybrid of computer and non-computer games


Elementary Occupations

- Games: card games, board games (speed and strategy), physical games that require attention, song and clapping games, quiet activities
- Chores, sports, social, school tasks, riding bikes with friends, emergence of organization and independence
- How do they differ between 5-7 and 7-12 year olds?
EF: Middle and High School

- MS: changing classes, organizing backpack and locker, studying for tests, long-term projects, social problem solving, competitive sports, time management
- HS: Employment, driving, sports, planning for college, budgeting, dating, independence with organization/planning/goal setting/time management

Young Adults

- EF matures at 27 years
- EF difficulties=college can be very difficult
- Independent living, peer pressures, not really an adult/not a child...
- STRESS!
- Understanding of consequences
“Smart But Scattered” (Dawson & Guare, 2009)

- Those who do not meet “potential”
  - WHY?
    - Intelligent, but lack EF
    - Assumption EF correlates with intelligence

- SBS Model
  - 1. Most have EF strengths and EF weaknesses
  - 2. ID EF weaknesses to address weaknesses


What is the problem with how EF is being “taught” in schools?

- Typically “teach” teacher’ s method/not individualized/learning style
- Directs rather than scaffolded/just right challenge
- Don’t understand/appreciate how sensory processing influences EF (self-regulation)
- Misperception of visual learners being “disorganized”
- Teaching level doesn’t match skill building level of EF / punitive reinforcers
- Doesn’t involve the “maintenance” aspects of organization
- Lack of emphasis on self-talk
- Lack of tying to motivator: Using skills with initial high-interest tasks rather than just embedding in school assignments
- Do not tie rewarding incentive to behaviors to increase performance patterns
Red Flags for EF Problems

- Reading problems (decoding, comprehension)
- Writing problems (automaticity, organization, poor graphomotor control, multiple tasks-hold, retrieve, generate, execute)
- Obesity (Barkin, S. L. 2013)
- Self-regulation difficulties (Bernier, A., Carlson, S. M., & Whipple, 2010)
- Socialization (Eisenberg et al. 2010)
- Externalizing behaviors
  - Aggression, impulsivity, hyperactive (Schoemaker, K., Mulder, H., Deković, M., & Matthys, W. 2013)
  - Aggression (Raaijmakers et al. 2008)

OT: How to Promote EF For All

- Identify & Utilize Learning Style (Gaskins & Pressley, 2007)
  - Affects memory
  - Individualizes for initial learning
  - Explicitly engages metacognition
- Identify Sensory Processing Style
  - Threshold for Environmental Input (H or L)
  - Self-Regulation Behavior (active or passive)
- Identify Development and Skill Level EF
  - Just-right challenge
  - Use of self talk, metacognition
- Identify Interests (O-based)
  - Motivation
  - Goals
Learning Preference: It Matters

- VARK
  - Visual, aural, read/write, kinesthetic, multimodal
- Observation of having to put something together (set up a game, put together a toy)
- Consider age and development
- MOST PEOPLE ARE VISUAL
- MOST PEOPLE ARE NOT AUDITORY*
- Observe their work space...

Sensory Processing Style: It Matters

- Dunn’s model (1997)
- 4 styles (neurological threshold, self-regulation pattern)
- How does this influence EF behaviors?
- How does this influence performance patterns?

Sensory Processing: Self-Regulation
POWER! Battery System

Low Battery Power
Dying Battery

Charged Battery
Ready to Learn

Battery Surge!!
High Battery

Quint, Nicole. (2010). POWER! Battery System. Course participants are permitted to make copies for personal use.

POWER! BATTERY SYSTEM

LOW POWER
Charge up:
• Chair push-ups (fast)
• Pretzel push
• Eat a chewy or crunchy snack
• Get up and sharpen pencil/pencil case/room, etc.
• Sky reach/stretch
• Drink some water
• Sit on the ball
• Heavy work

CHARGED BATTERY
You:
• Feel in control
• Make good choices
• Pay attention
• Looking at what you are doing
• Mindful
• Calm body
• Calm, focused brain
• Meeting goals

POWER SURGE
Calm down:
• Chair push-ups (slow)
• Pretzel push
• Deep breaths
• Close eyes
• Say “be here now.”
• Chair melt
• Heavy work
• Sit on the bean bag

Quint, Nicole. POWER! Battery System. Course participants are permitted to make copies for personal use.
LOW POWER (dying battery/low arousal)

Charge up by:

- Chair push ups (fast)
- Pretzel push
- Eat a chewy or crunchy snack
- Get up and sharpen pencil/use restroom, etc.
- Sky reach/stretch (put arms overhead and stretch)
- Drink some water
- “Raise the roof”
- “Flip the floor”

Quint, Nicole (2010). POWER! Battery System.

CHARGED BATTERY

You are:

- Demonstrating **SLANT**
- Ready to learn
- Sitting tall
- Feet are on floor
- Focused
- Goal-directed
- Self-regulated
- Bridging past to present

Quint, Nicole (2010). POWER! Battery System.
POWER SURGE (high arousal, disorganized state)

Calm down:
- Chair push ups (slow)
- Pretzel push
- Deep breaths
- Close eyes
- Say “be here now”/self talk
- Chair melt

Quint, Nicole (2010). POWER! Battery System.

E-Motions

- Is the activity causing Anxiety? Avoidance?
- Batteries can help...

Feelings Check!

Anxiety has shut me down I’m avoiding
I’m not feeling anxious: I’m ready to work and I feel good
Anxiety is overwhelming and I’m feeling triggered out

Quint, Nicole (2010). POWER! Battery System
Battery Daily Chart

POWER! Battery Daily Chart

Name: ________________________

_____________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________

Mindfulness
Breathing
Counting
Self-talk (important and essential)
Take a break
You have to practice and find what works
Let’s try it...

POWER! Over Emotions

continued
Self-Regulation with POWER! Batteries

1) Introduction of POWER! Batteries
2) In situ examples of battery levels in context
3) In situ identification of battery levels in context
4) Practice strategies in context
   - Try various strategies
   - Identify effective vs non-effective
   - Vary contexts
   - Solidify choices
5) Manage levels with cueing
6) Self-regulation

Evaluation: Assessment Options

- Self-Regulation Tools
  - http://steinhardt.nyu.edu/ihdsc/csrp/psra
- Sensory Profile, AASP
- Inhibition: Go-No-Go Tasks, Stroop Color-Word Test
- Vision, Postural Control, Attention (TEA-CH)
- EF: BRIEF, D-REF, Brown Scales, Set Shifting: Trail Making, Stroop, Ca Sorting
- Observations: preferred and non-preferred tasks
- SLEEP performance
- DOTCA-Ch for learning potential
More Assessments

- Canadian Occupational Performance Measure (COPM)*
  - Parents
  - Teachers
  - Older children
- Perceived Efficacy & Goal Setting System (PEGS)
- Short Child Occupational Profile (SCOPE)
- Goal Attainment Scaling (GAS)*
- School Function Assessment (SFA)


POWER! Based on EBP

- GOAL-PLAN-DO-CHECK (Meichenbaum, 1977)
- Mediated learning experience (Feuerstein, 1971)
  - Children need interpretation by adult to improve cognitive abilities (mediator)
  - Adults need to organize environmental stimuli to support learning
    - Process questioning
    - Bridging
    - Comparison/desciring
    - Modeling
    - Challenging
    - Elaborated feedback

EBP Continued

- Mindfulness (sitting mediation, sensory, attention, awareness of others in environment, body scan)
- Yoga*
- Include physical options (aerobic, 20-40 min)
- Montessori (hands-on, child-to child teaching, client-centered)
- PATHS (SEL, self-control, self-talk)
- Tools of the Mind (Social pretend play, Vygotsky)
- Games (computer and non-computer)
  - Papa’s Pizzeria
  - Board Games, social games, etc


P=PLAN

- Planning involves:
  - initiation
  - Sequencing
  - Goal setting
  - Time management
  - Prioritizing
  - Break down large projects
  - Most importantly, a “TO DO” LIST!!!
**Plan: Initiation**

- 1. Use your visual support
  - Planner, visual, agenda
- 2. “TO DO LIST, TO DO LIST, TO DO LIST”
- 3. **Prioritize**

Younger children: making choices, following directions to start something/routine (transition)

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**Plan: Goal Setting**

**YOUNGER KIDS**

- Set Goal
- Engage them in mindfulness activity to build skill-relate to goal
- EI: utilize motor activity
- Motivate through choice/play

**OLDER KIDS**

- Set goal(s)
- Short goals to meet long term goals
- Use visual imagery within mindfulness (EBP)
- Goal Attainment Scaling (GAS) to monitor performance over time
Plan: Time Management

- Time Estimation

- 4th grade and older: In your planner, put an estimated time next to each homework assignment
  - When you are finished, put how long it actually took you to complete the assignment

Time Management Activities

- Time Detective
- Which takes longer?
- “Lost time” game
- Watch the clock game
- Timer activities
- How many times? Game
- Timed mindfulness

- Time awareness, estimation, acknowledgement, management
Plan: Prioritizing

- What is most important on my to do list?
- Identify what assignments are:
  - High priority
  - Medium priority
  - Low priority

Plan: What is my battery level?

- Are you low (dying), charged (ready to learn), or surging (out of control/anxious/hyper)
O=ORGANIZE

- Organization includes:
  - Choice of environment
  - Obtaining materials
  - Organization system
  - Choice of strategies
  - Where to seek information
  - Where to seek assistance (if needed)

Organize: Environment

- You can incorporate this into so many “fun” OT activities involving play
  - Swing-based activities
  - Obstacle courses
  - Sports activities
  - Craft activities
  - Imaginary play

Is this space working for the activity?
Organize: Materials

- Before you get started, get out everything you need...

Organization System: Are you a piler or a filer?

- "Filer"= use a binder
- "Piler"= use accordion folder system or multi-pocket folder
Organize Self

How do I get green?

Organize: Choosing Strategies

- What strategies best fit my learning style?
- What strategies are best for this situation?
- How can I make the activity more efficient?
### Organize: Where do I Seek Information?

- Library?
- Internet?
- Book?
- Other?

### W=WORK (Task Breakdown)

- Taking care of business!...
  - Use strategies
  - Manage time
  - Focus and concentrate
  - Problem solving
  - Pace yourself
  - Take a break
  - Clean up
WORK: Focus and concentrate

- Broken down into steps - more doable, less emotionally overwhelmed
- Sensory fidgets
- Self-monitoring
- Timers

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WORK: Metacognition

- Internal Voice/Self Talk (EBP)
- Reflecting on what you know and what to do next with it
- Mindful
- Activities:
  - Mindfulness
  - Color Chart (Paint swatches to indicate level)
  - Play by play (self talk)
  - Teach back method, playing teacher
  - CROSS OFF EACH STEP OF TASK!
WORK: Problem Solving

- Identifying problem
- Celebrate finding the problem
- Emotional regulation
- Accepting it’s a problem
- Collaborating with process
- Choosing choice of solutions
- What are consequences of choice?
- Trying solution!

Work: Graphic Organizers

- Checklists!!!!
- Mindmapping offers you problem solving, organization in a visual form (simplemind app or online at
  - [http://mymindmap.net/Mind_Map_Templates.html](http://mymindmap.net/Mind_Map_Templates.html)
- Or you can use other graphic organizers to fit your need(s)
Evaluate involves…
- Check your work
- What was successful?
- What do you struggle or need help with?
- Did you plan appropriately?
- Were you organized?
- How could you make changes for the better?
- Did it take more or less time than you planned?

EVALUATE: Check work
- “Did I answer everything?”
- Math-check answers
- Re-read essays, written work
  - Read out loud instead of in head
  - Have peer read it for you
EVALUATE: Good vs. Bad

- “What did I do well?”
- “What did I struggle with?”
- “Is my organization system working?”

EVALUATE: Reflect

- “How can I make this better?”
- “How can I be more efficient?”
- “If it’s not working...make a change!”
- “Why did I win/lose? How could I win next time?”
How can you reward yourself?

OR self-consequate?

Consider occupation-based rewards, self-praise, or celebratory/attention-based rewards

Reward procedures requiring specific high task performance = intrinsic motivation

Put an exclamation point on it!
  - It is not finished until...
  - First identify “finish(ed)”
  - Add to task breakdown list as final step

How do you know you are finished:
  - Studying
  - Rehearsing for a play
  - Practicing a sport
  - With a project
  - Getting your backpack organized
  - Cleaning your room
Example of using POWER!

- **Assignment:** Writing essay on chosen topic
  - **P:** Sequence order of events, set goal
    - Choose topic, choose outline format, break down project into steps
    - Goal: Complete paper by due date and turn in
    - To do list: steps for project with dates provided
  - **O:** Get materials, choose where to find info
    - Complete outline, have materials, to do list
    - Follow directions from assignment
    - Choose where to find info (ex. book vs. internet)
    - Identify learning energy and then get to charged level

- **W:** Follow outline to write essay
  - Use strategies to help you
  - Take breaks
  - Break down steps
  - Cross off as finish each

- **E:** Check your work in multiple ways
  - Have someone else read, read aloud
  - Make changes
  - Check to make sure you followed directions

- **R:** Pat yourself on the back, play video games

- **!: What is finished for this project?**
  - Did you save it with a name you can identify easily?
  - Did you turn it in on time as directed?
  - Have you received a grade for it?

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POW!

- **P:** Make silly putty
  - 1. glue
  - 2. water
  - 3. borax
  - 4. stir
  - 5. 6. towel

- **O:** 7. mix 1 & 3

- **W:** 2. mix 1 + mixture, color
  - 3. stir
  - 4. clean

- **!: When it picks up picture**
Example of POW!

- This is a way to grade down
- Can be used for initial process as way of scaffolding
- Integrate self-talk
- Plan
- Organize
- Work
- Finish

P: Build an obstacle course with 5 steps (can add additional goal).

O: pick and set up 5 steps of course, check battery and self-regulate

W: break down steps /sequence of course and trial, choose reps, set up parameters

Finish: Clean away items, goal met?

POW! Visual Supports
POW! IT

Example of POWER!

- **P:** Build an obstacle course with 5 steps
- **O:** pick and set up 5 steps of course, check battery and self-regulate
- **W:** break down steps /sequence of course and trial, choose reps, set up parameters
- **! Finish:** Clean away items, goal met?

- **P:** Add time goal for challenge
- **O:** Additional item (timer), establish reward
- **W:** Additional step (check time)
- **E:** Was goal met? Analyze
- **R:** Get reward if met
- **!:** Clean up.
Example of using POW!

- Organizing bills
  - **P:** create organization system for bills
  - **O:** What do you need? What kind of system?
  - Where to look at examples? Would it work for me and my habits/behaviors?
  - **W:** Break it down into steps:
    - **Piler:** use accordion folder with 13 sections
    - **Filer:** use filing system
    - Organize bills for each month
    - Put it somewhere where you will keep it up
  - **!: ??**

Add E and R:

- **E:** is this working for me? Am I paying everything on time? What changes do I need to make?
- **R:** Rewards for improved organization:
  - Feel in control, reduce stress
  - Save money and credit rating
  - This is ongoing....(!)
Example of POW!

- **P:** Put together a lamp from IKEA
- **O:** read instructions, get materials on list
  - Make sure your space is appropriate
- **W:** Put it together per the instructions
  - Task analysis (so important)
- **!:** Does it work? Where to put it?

Case Example

- Jake is in 2nd grade (8 years old), dx of SPD, ADHD
- Assessments: Sensory Profile, COPM, SFA, Observation
- Low Registration, kinesthetic learner, battery typically yellow or red, language weakness, enjoys: physical activities, martial arts, hide and seek, building
  - Inhibitory control and WM weaker than cognitive flexibility
  - No self talk
  - No visualization skills
### Jake’s POW!

1. **Focus on self-regulation, aerobic input, establishing self talk, visualization**
   - Walking/running on treadmill
   - Play by play with turn taking
   - Visualization tied to hitting targets

2. **Plan and goal-directed behavior**
   - Visualization to meet goals and chart success
   - Setting goals and charting success
   - Mediation from OT

3. **Environmental scanning and organization to support goals and play**
   - Assisting with set up/cleaning
   - Messy activities to promote behavior

### Jake, continued

4. **Breaking down tasks and tying to decrease frustration**
   - Obstacle course, drawn out
   - Building using visual supports and numbering steps
   - Teaching OT-mistakes (teach-back)

5. **Integration of POW! with chosen activities**
   - Hide and seek, obstacle course, bowling

6. **Mother educated on how to use for HP**
   - Using visual support for environmental area responsibilities with POW! for each section (hamper, mud room area, toy box)
   - POW! for homework tied to reward (this is a huge issue)
   - Mother has GAS she created that motivates her-charts progress
References (not on slides)


Resources

- [http://www.toolsofthemind.org/](http://www.toolsofthemind.org/)
- [http://astore.amazon.com/tooofthemino6-20](http://astore.amazon.com/tooofthemino6-20)