A Biobehavioral Approach to Functional Assessment

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A Biobehavioral Model of Challenging Behavior

- My personal tribute to Ted Carr
  - One of the first proponents for looking at how biology and environment interact

Biological Setting Events for Self-Injury

Edward G. Lier and Christopher E. Scibba
Biol Psychopharmacol 1990; 6:471-489
What is a Biobehavioral Approach?

- Popular catch phrase in science and medicine
- Refers to an array of biological, psychobehavioral, environmental factors that affect disease states (e.g., headaches, irritable bowel syndrome, obesity, cancer-related fatigue)
- If you think about it, everything is "biobehavioral"

Biobehavioral Model of Stress

- External demands and pressures (we know who you are...)
- Internal demands and pressures (psychological strain, high expectations/perceptions)
- Results in an activation of stress response => release of cortisol, adrenaline

How does this fit with Functional Assessment Approach?

- Takes functional assessment one step further - to look beyond the environmental factors
- Looked at how biology can interact with environment at all points along the setting event – consequence continuum
Setting Events

- Role of biological setting events
- Affect the efficacy of reinforcers for both all kinds of behavior (both problematic and adaptive)

Biological Setting Events for problem behavior

Primary forms of setting events:
- Illness/pain
- Genetic
- Medical condition (medication)
- Psychiatric condition

Biological Setting Events

- Pain due to:
  - Otitis Media
  - Headaches
  - Gastroesophageal Reflux Disease or other GI problems
  - Menstrual Pain
- Illness (chronic conditions or acute illness)
Health Issues and Problem Behavior

Critical part of every FBA to rule out unidentified or undiagnosed health issues:
- A routine physical examination
- Health screen
- Medication assessment

By doing this assessment, you decrease the need for more intensive intervention approaches when problem behaviors are related to pain or discomfort due to an acute or chronic medical condition.

Menstrual Pain

- Carr and his colleagues (1996) investigated the daily frequency of aggression of several women at the same time each morning.
- They found that for one person, painful menstruation was a setting event that increased the probability of demand statements resulting in problem behavior.
Functional Assessment and Genetics

- Behavioral phenotype are characteristics commonly associated with a syndrome or condition that can help in diagnosis or in development of intervention plan.
- Can inform diagnosis and intervention (both medical and behavioral).
Behavioral Phenotypes

Behavioral phenotype associated with a genetic disorder are similar to physical phenotype – there is a high likelihood that it will be expressed, but not true in 100% of individuals.

Behavioral Phenotypes

Can impact behavior plan on many levels:
- Certain reinforcers are more or less effective
- More predisposed to certain behaviors and response patterns
- Also impacts types of interventions chosen

Prader-Willi Syndrome

Physical phenotype:
- Low muscle tone (floppy baby)
- Short stature
- Small hands and feet
- Fair complexion*
- Slow metabolism
- High pain tolerance
Prader-Willi Syndrome

Behavioral phenotype:
- Hyperphagia
- Temper tantrums
- Obsessive compulsive behavior
- Skin picking
- Rigidity/stubbornness

Functional Assessment with People with Prader-Willi Syndrome

- Evaluate the role of food as a motivator for problem behavior
- Look at other family dynamics as motivator
- Skin picking => sensory reinforcement but evidence that there may be other motivators as well (e.g., to escape demands)

Fragile X syndrome

Features usually include:
- Intellectual disability
- Attention deficit and hyperactivity
- Anxiety and unstable mood
- Autism-like behaviors
- Long face, large ears, flat feet
- Hyperextensive joints, especially fingers
- Seizures (epilepsy) affect about 25% of people with fragile X
Functional Assessment with people with Fragile x syndrome

- Evaluate setting events associated with:
  - increased anxiety
  - high levels of hyperactivity
  - inattention
- Role of social escape/avoidance behaviors
  - Hall, Debernardis, & Reiss (2006) – escape from social interaction versus demands

Williams Syndrome

Physical Phenotype:
- Characteristic facial appearance
- Heart and blood vessel problems
- Musculoskeletal problems

Behavioral Phenotype:
- Irritable
- Hyperacusis (sensitive hearing)
- Overly friendly, excessively social personality
- Intellectual disability
- Inattentive

Functional Assessment with people with Williams Syndrome

- Look at role of attention and social interactions
- Presence of certain people
- Escape from noisy environments/loud noises
FBA and Williams Syndrome -
O’Reilly, Lacey, & Lancioni, JABA, 2000

- Evaluated the effects of background noise on problem behavior in child with Williams syndrome.
- Hyperacusis (sound sensitivity) characteristic of the syndrome.
- Background noise was associated with increases in problem behavior (aggression) and pain behavior (clasp ing ears and crying).

O’Reilly, Lacey, & Lancioni, JABA, 2000

- Intervention:
  - child was fitted with earplugs => substantial reductions in both problem and pain behavior in noisy environments.

Competing Behavior Diagram
Genetic Syndromes Associated with SIB

Smith-Magenis Syndrome
- 50-70% of individuals engage in body self-hugging, putting objects in body orifices

Genetic Syndromes Associated with SIB – Rett Syndrome

Neurodegenerative syndrome in females
- Early normal growth followed by
  - a loss of purposeful use of the hands,
  - distinctive hand movements (hand wringing),
  - slowed brain and head growth,
  - gait abnormalities,
  - seizures,
  - Intellectual disability
Lesch-Nyhan Syndrome

- 100% of individuals engage in SIB
- Topography: lip and finger biting
- Treatment involves constant mechanical and physical restraints or blocking of SIB
- Neurological symptoms including
  - facial grimacing,
  - involuntary writhing, and repetitive movements

Is autism a genetic syndrome?

- Definitely has a genetic component
- But there is a lot of variability in behavioral phenotype
- Multiple phenotypes?
  - Individuals with severe autism (males vs females)
  - PDD-NOS
  - Asperger syndrome

Functional Assessment with Individuals with Autism

Must take into account autism-specific issues

- Sensory issues
- Communication issues
- Interruption of perseverative activities
- Access to perseverative activities/toys
Autism-specific Function of Disruptive Behavior

- Conducted a study with children with autism coming into diagnostic clinic
- Completed Functional Assessment Interview with caregivers of the children.
- Two categories of “functions” or possible reinforcers for problem behavior that parents were asked about:
  - “standard” reinforcers and
  - reinforcers more likely related to autism.

Reese et al., 2003

Comparison of “typical” versus autism-related functions

Typical Reinforcers:
- Gain attention
- Gain access to toys, activities
- Escape demands

Autism-Related:
- Gain access to perseverative activities or toys
- Escape demands when engaged in perseverative activities
- Escape sensory stimulation

![Graph showing comparison between control group and autism group](image-url)
Gender Differences in Autism: Problem Behavior

- Males with autism are:
  - more likely to engage in stereotypic play;
  - more likely to have problem behavior when stereotypy interrupted, and
  - less likely to find attention from caregivers reinforcing.
- Females are more likely to find attention reinforcing
- Extended study to compare males and females

Males versus Females with Autism

Completed Functional Assessment Interview Form with families in clinic:
- 17 males; 6 females
- 3 to 6 year olds
- Males age (m = 40 months)
- Females age (m = 48 months)
Problems with Intervention Based on Behavioral Phenotypes

- Significant overlap in behavioral characteristics both across and within syndrome groups
- Low incidence of some syndromes makes it difficult to study systematically
- Not all people with a specific syndrome are the same (behavioral phenotype varies)
How the Environment can Override Biology

Growing evidence that environmental factors and history of reinforcement may actually “override” behavioral phenotype

- Skin picking in a child with PWS reduced using reinforcement program for keeping bandage on
- Oliver et al., 2002 - Demonstrated that 3 children with Angelman syndrome were more likely to laugh and smile in social situations but not across all situations

Mental Health Issues

People with ID are subject to the same mental health problems as others and may be more susceptible to:

- depressive disorder
- anxiety disorders
- eating disorders
- schizophrenia and other psychosis
- conduct disorders

Presence of Psychiatric Diagnosis (Dual Diagnosis)

Several problems with diagnosing psychiatric conditions in individuals w/DD due to:

- language impairments (difficulty of self-report),
- cognitive impairments,
- required use of caregivers for all/most information,
- diagnostic overshadowing
Tools for Assessment

To help assess impairment associated with or diagnosis of psychiatric disorder. Look for recent changes in:
- Eating patterns
- Sleep patterns
- Tics, abnormal movements
- Mood
- Behavior problems
- General health evaluation (to rule out illness)

Relationship b/w Behavior and Psychiatric Diagnosis

- Primary relation – problem behavior directly related to diagnosis (hand washing and OCD)
- Secondary relation – problem behavior indirectly related (panic attack => agg)
- Consequential relation – problem behavior initially a symptom that gets reinforced and becomes “learned” over time (faking seizures to get attention)

Behavioral Interventions

How does having a mental health disorder affect the behavioral intervention you choose?
- Type of reinforcement used
- Level of motivation
- Target behaviors selected (e.g., defiant disorder versus noncompliance)
- Choice of replacement behaviors
Example – Delusional statements
- Individual with ID and co-morbid diagnosis of schizophrenia related to TBI
- Often made unrealistic statements
  - “Brittney Spears called and said she wants to take me out to dinner”
- Found that statements were often followed by attention by staff
- Intervention: Attention to statements that made sense; extinction of delusional statements

Two sides to the coin
- Medical conditions can be affected by environment
- Behavior with clear reinforcement function can be affected by biological factors

What about the Use of Medication?
Who are the most at risk for overmedicating?

In a study that assessed the prevalence of psychostimulant prescriptions for children with ADHD, researchers found that 90% of children left doctor’s office with a prescription.

Children and Adults with Intellectual Disabilities

- 14% – 30% are taking medication to control challenging behavior
- 27% taking multiple medications
- Up to 36% of people with ID in residential settings are prescribed meds in absence of psychiatric diagnosis

The Use of Psychotropic Medication with individuals with ID
Do people with ID respond to medications in the same way as others?

- Some evidence that
  - More sensitive to behavioral effects
  - More sensitive to side effects
- But when deciding how to prescribe, have to use:
  - guidelines developed for people without ID (i.e., off label)
  - or clinical judgment

The Role of Medication

- Presence of medication can also serve as setting event
- Can affect efficacy of reinforcers
  - e.g., Risperdal increases appetite => does it make food a more potent reinforcer?
  - e.g., Ritalin decreases appetite

Guidelines for Evaluating Medication Effects

Collect data from a variety of sources
- Biological information
- Behavioral rating scales
- Direct observation data
  - Problem behavior
  - Adaptive behavior
  - Side effects
Guidelines for Evaluating Medication Effects

- Try to keep data collector blind
- Ask that one intervention be implemented at a time
  - behavioral
  - medication
  (if you can’t, at least document changes)

Biobehavioral Implications for Functional Assessment Process

- Get a complete medical evaluation of possible biological factors
- Collect data on presence/absence of these factors and frequency of problem behavior
- Use this information to inform FA process
- Intervention – based on alleviated SE or modifying the environment when SE present

Developing Behavioral Interventions

During FBA process, identify the biobehavioral setting events and develop interventions based on modifying these variables:
- Interventions that modify/improve diet, sleep, mood
- Interventions that change when setting event is present
- Medications – measure both behavioral effects and side effects
Guidelines to consider

Without taking these issues into consideration, interventions are not likely to be successful

Resources

- More information:
  - KIPBS.org: Module on Emotional & Behavioral Health
  - webMD for info on medications
  - Websites for individual genetic syndromes:
    - http://www.pwsausa.org/
    - http://www.williams-syndrome.org/
- Jennifer_zarcone@urmc.rochester.edu