Sensory Processing Difficulties and Autism Spectrum Disorders in Toddlers

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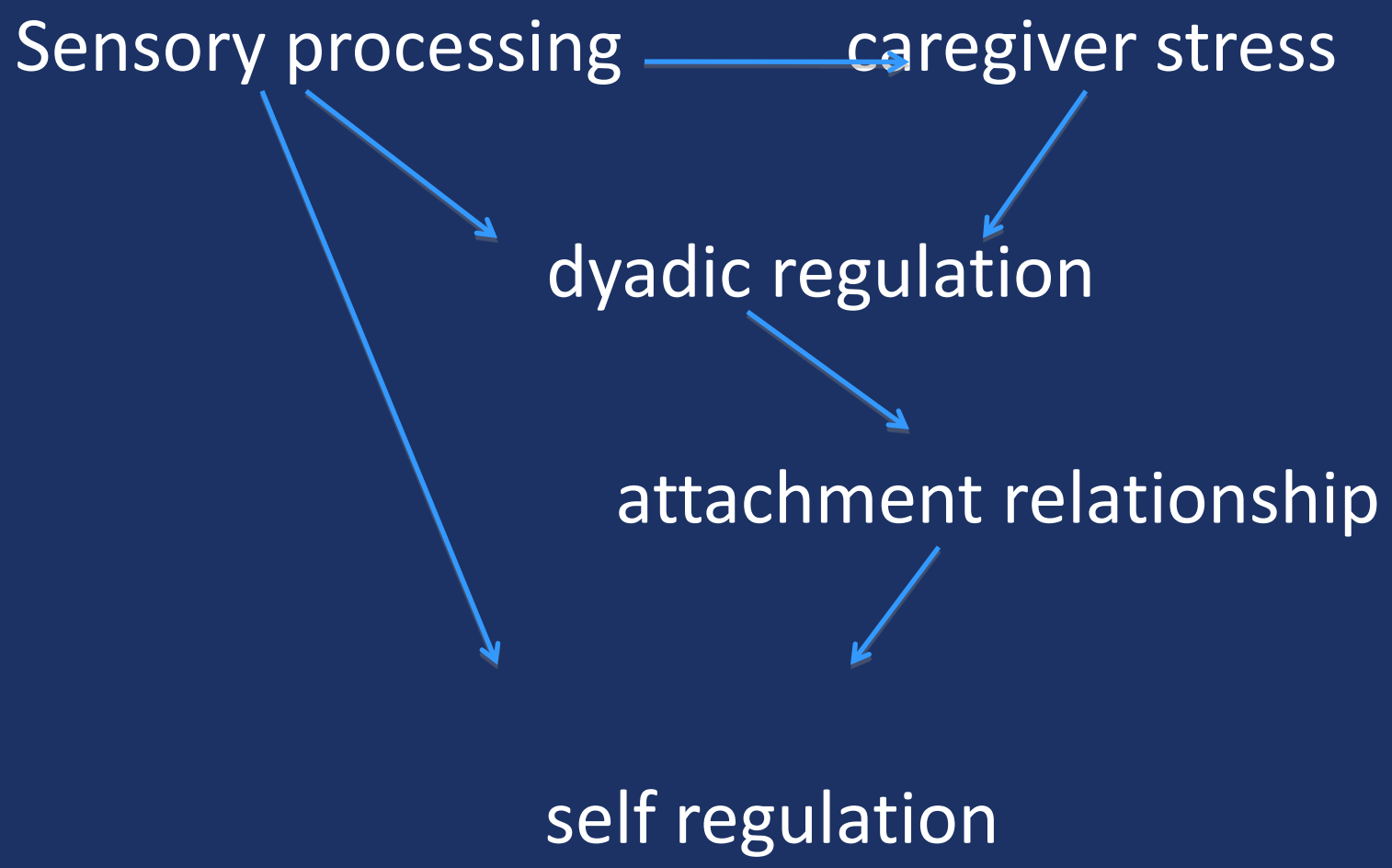
Sensory Processing

- Sensitivity and reaction to sensory input
  - tactile, vestibular, kinesthetic, auditory, visual
- Biologic/temperamental disposition
- Interacts with care-giving milieu
  - Can tax care-giver skills
  - Creates stressful and negative interactive pattern
    - Learned helplessness
    - Failure to learn self regulation in relationship context


Sensory processing
caregiver stress
dyadic regulation
attachment relationship
self regulation

Variation in Sensory Response

- Hypo-sensitive
- Hyper-sensitive
- Sensation seeking

Hypo-sensitive to sensory input

- Under-reactive to stimuli; may be nonresponsive to social overtures
- limited exploration, restricted play, lethargy, poor motor planning, clumsiness
- apathy, withdrawal, easy fatigue, inattentiveness
- Caregiver experience

Hyper-sensitive to sensory input

- over-reactivity & fear
- difficulties with motor planning, postural control, decreased exploration, limited sensory motor play
- fear, clingyness, restricted exploration
- fears, worries, shyness, distractibility
- impulsivity, irritability, limited self- soothing

Hyper-sensitive to sensory input

- avoids new experiences, aggressive when provoked, negativistic, controlling, preference for routine, compulsive, slow to adapt
- Caregiver experience

Sensory-Seeking / Impulsive

- craving for high intensity stimulation
- active, impulsive, accident-prone
- reckless, disorganized, seek stimulation (dp), seek contact with people & objects
- excitable, intrusive, aggressive
- Caregiver experience

Regulation Disorder of Sensory Processing

- difficulties regulating emotions, behaviors and motor abilities in response to sensory stimulation that can lead to impairment in development and functioning
- across settings
- across relationships

Regulation Disorders of Sensory Processing

- constitutionally based responses to sensory stimuli
- Caregiver relationships may ameliorate or intensify Regulation Disorders

Overlapping Conditions

- Hyposensitive :
  - PDD, Developmental Delay
  - Depression, Social Anxiety
- Hyper-sensitive:
  - Anxiety
  - Oppositional Defiant Behavior
- Sensory Seeking:
  - ADHD, aggression

Possible Sequelea

- Hypo-sensitive: social anxiety
- Hyper-sensitive: anxiety disorder, oppositional defiant disorder
- Sensory Seeking: ADHD

Autism Diagnosis – for now…

- Pervasive Developmental Disorders
  - Autism
  - PDD-NOS
  - Asperger's Disorder
- Autism Spectrum Disorder
- 1 in 100 children

Why the dramatic increase in incidence?

- Changes in Diagnostic categories
  - Lower functioning children
  - Higher functioning children
- Increased awareness
- Potential environmental factors
  - Likely not vaccines

Diagnostic Criteria

- Qualitative impairment in social interaction
- Qualitative impairments in communication
- Restricted, repetitive and stereotyped patterns of behavior, interests and activities

Restricted Interests

- Encompassing preoccupation with restricted interest
- Inflexible adherence to nonfunctional routines
- Persistent preoccupation with parts of objects
- Stereotyped and repetitive motor movements
  - Often not seen until 3-4
  - Not specific to autism

Impairments in Communication

- Delayed development of spoken language
- Impaired ability to initiate and sustain conversation
- Stereotyped or repetitive use of language
- Lack of varied, spontaneous pretend play or social imitative play

Impairments in Social Interaction

- Impairment in use of nonverbal behaviors to regulate social interaction
- Failure to develop peer relationships appropriate to developmental level
- **Lack of spontaneous seeking to share enjoyment**
- **Lack of social or emotional reciprocity**

A Model of Social Development

- Facial processing – infancy
  - attention to facial expression
    - Interest in maternal imitation of infant behavior
  - imitation of facial expression
  - empathy
- affect sharing - 6 months
  - salience of affective expression
  - affect regulation

Social Development con't

- Joint attention 6-9 months
  - response to joint attention
  - initiation of joint attention
- inter-subjectivity - 9 months
- intentional communication - 9 months
  - pointing
- social referencing - 12 months
- language - 12 months

So what is autism?

- Initial neurological insult
  - deficit in facial processing?
- derails development of early social /emotional exchanges
  - environmental “deprivation”
  - Caregiver dis-engagement?
- prevents development of neuronal pathways
  - secondary neurological disturbance
- creates aberrant social & cognitive trajectories

Risk Processes

(Dawson, 2008)

- Risk factors
- Risk processes (6-12 months)
  - Prevent exposure to social/linguistic input
  - w/o social engagement
    - Brain regions which support social perception fail to integrate with areas that mediate reward
    - Child fails to develop social motivation
- Deficits in social/cognitive processes (12-18 months)

Clinical Implications

- Look to early social development
  - early detection
  - model for disorder
  - meaningful assessment
- intervention must address underlying deficits
  - affect sharing
  - joint attention

Now that we have that settled…

- Problems with DSM IV
  - Differentiation among ASDs is not reliable
  - Current knowledge supports a spectrum of disorder
  - Deficits in social behavior & communication are inseparable
  - Language delays are neither universal nor unique to ASDs

DSM - V

- Deficits in social communication & social interaction (3)
  - Deficits in social emotional reciprocity
  - Deficits in non-verbal behaviors used for social interaction
  - Deficits in developing & maintaining relationships appropriate to developmental level

DSM V con't

- Restricted, repetitive patterns of behavior, interests or activities (2)
  - Stereotyped speech, movement or use of objects
  - Excessive adherence to routines, resistance to change
  - Highly restricted interests
  - Hypo or hyper reactivity to sensory input, or extreme interest in sensory experience
- Three severity levels based on need for support

Early Detection and Screening

- AAP recommends
  - Screen every child at well baby visits
    - once at 18 months
    - once at 24 months
  - Implement intensive services
    - with positive screen
    - w/o diagnosis

The M-CHAT

- Procedure: Ages 16-30 months
  - Parent fills out checklist - 23 items
  - Clinicians score
    - failure on any 2 critical items
    - failure on any 3 items
  - Scripted phone follow-up for failed screens
  - Children who fail referred for evaluation

M-CHAT

- Critical Items
  - pointing to indicate interest
  - responding to name
  - shows interest in other children
  - bringing objects to show
  - follows a point
  - Imitation
- Poor Discriminators
  - eye contact
  - repetitive behaviors and stereotypies
  - sensory concerns

Primary Observations

- Attention to faces (?)
- Sharing affect
- Joint attention
- Pointing to show
- Showing
- Intentional communication

Clinical Evaluation

- Detailed developmental and family history
- Developmental Assessment
  - Bayley, Mullen
- Assessment of Adaptive Function
  - Vineland II
- Autism Specific Observational Instrument
  - Autism Diagnostic Observation Schedule (ADOS)
- Childhood Autism Rating Scale II (CARS)

Post Initial Evaluation

- Further Evaluation
  - Hearing test
  - Medical evaluation
  - Assessment of sensory processing
  - Assessment of care-giving relationship
- Referral to Birth to Three Specialty Programs

Intervention

- Lovaas (1987): 47% of children “recovered”
  - Questions and concerns
- Smith, Groen & Wynn (2000):
  - Methodologic improvements
  - Replicated positive effects of tx
  - 2/15 children attained best outcome (1/15)
  - Children with PDD NOS made most gains

Intervention

- Sallows & Graupner (2005)
  - ABA w/PRT
  - Compared clinic treated to parent directed
    - No differences between groups
  - Replicated IQ gains for both groups
    - Bimodal distribution: 11/23 sig gains
    - 13/23 no gains
- Eikeseth, Smith, Jahr, Eldevik (2002)
  - Gains associated with ABA, not eclectic tx
  - Gains apparent with less intensive intervention (12 hours)

Intervention

- Dawson, Rogers et al, (2010)
  - Randomized controlled trial of Early Start Denver Model
    - Comprehensive developmental/behavioral model
    - 18-30 month olds
    - Clinicians: 20 hrs. weekly; parents : 5 hrs. weekly
    - ESDM vs community tx; 2 years
    - ESDM Grp: Gains of 17.5 points, normative growth in ADLs, change in dx to PDD

Intervention: What have we learned?

- Spontaneous functional communication is a core goal
- Naturalistic teaching approaches, relationship based, functional skills
  - If massed trials are used, should not occur alone
- Successful programs:
  - Well defined plans to teach functional skills, administered at high frequency, throughout the day
  - Ongoing monitoring of progress and adjustment of strategies
  - Maintenance and generalization in functional daily routines across settings

Intervention: What have we learned?

- Positive behavioral supports to address negative behaviors
  - Functional behavioral analysis
- Parents/family must be involved
- Generalization is crucial
- Peer interaction critical as child grows

What have we earned more generally?

- No method works for everyone
- Every strategy must be relationship based
- There is more overlap between methods than we once thought
- ABA is more than discrete trials
- All of us are quasi-behaviorists
- Parents and families need help and support

Optimal Outcome

- 5-20% of children
- Child variables are important predictors
- How might we explain OO?
  - Normalizing attention
  - Increase reinforcement value of social stimulation
  - Redirect interactive patterns
  - Provide an “enriched environment”
  - Practice, practice, practice