

## ATTACHMENT AND REGULATION

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### Regulation

Most healthy newborns have the capacity to regulate complex physiological processes (e.g., breathing, cardiopulmonary function, thermoregulation, swallowing, digestion). This capacity to self-regulate allows the maintenance of physiological homeostasis and survival. As infants mature, their self-regulatory capacities also mature and encompass increasingly complex domains such as emotion regulation, self-soothing, sensorimotor integration, motor planning, regulation of sleep-wake cycles and hunger-satiety cycles (Cicchetti & Tucker, 1994; Thompson & Calkins, 1996). Infants must learn to regulate physiological processes competently before they can engage effectively in complex social, behavioural, and emotional interactions with the environment (Porges, 1996).

Various internal (within the infant) and external (in the environment) factors influence infants' regulatory capacity (Thompson & Calkins, 1996). Internal factors that may negatively affect regulatory capacity include prenatal drug and cocaine exposure, prematurity, brain injury, birth complications and heredity (Alessandri et al., 1993; Jacobson et al., 1993; Mayes, et al., 1996; Porges, 1996). External factors that may impair or improve infants' regulatory capacity include the quality of the caregiver's response to the infant's signals (Mayes et al., 1996). For instance, an unpredictably responsive caregiver who fails to feed an infant who shows signs of hunger may interfere with the infant's ability to establish regular hunger-satiety cycles, to feel hunger and/or to communicate feelings of hunger. Similarly, a caregiver who responds to an infant in a frightening or atypical manner (e.g., by failing to comfort a distressed infant or touching/kissing an infant in a sexualized manner) or who dissociates in the infant's presence (e.g., staring into space while being unresponsive to surroundings) may interfere with the infant's capacity to regulate social and emotional interactions with others. Thus, infants' regulatory characteristics and the caregiving environment are closely intertwined.

Although they are influenced by the environment, regulatory disorders are believed to be due to dysfunction in the autonomic nervous system (Greenspan & Wieder, 1993; DeGangi, DiPietro, et al., 1991). Specifically, infants with regulatory disorders have higher baseline vagal tone and inconsistent vagal reactivity which disturb responses to sensory and cognitive tasks (DeGangi, DiPietro, et al., 1991). Although the prevalence of regulatory difficulties/disorders is unknown, it may be on the increase, partly because of advances in medical technology that allow many

seriously ill and premature infants to survive. The "diagnosis" of regulatory disorder should not be made in infants younger than 6 months because of the high frequency of transient difficulties with self-regulation (e.g., sleep problem) that resolve spontaneously by 5 to 6 months of age (DeGangi, DiPietro, et al., 1991).

Regulatory difficulties/disorders include innate constitutional elements and problems in sensory, sensori-motor, or processing capacities that affect daily adaptation and relationships (DeGangi, 1991; DeGangi, DiPietro, et al., 1991; Greenspan & Wieder, 1993). Symptoms of regulatory disorders include a "difficult" temperament (irritability, moodiness, difficulty self-consoling, and lack of cuddliness.) Infants with regulatory disorders may also have difficulty regulating physiological processes so that many have sleep problems (regulation of sleep-wake cycles, difficulty falling asleep, frequent night awakenings), feeding problems (regulation of hunger-satiety cycles, refusal to eat a variety of food textures), and elimination problems (constipation, diarrhea). Many have a history of colic. They may present with impaired attentional capacity, impulsivity, negativism, difficulty in making transitions, and impaired reactivity to sensory stimulation (e.g., auditory, visual, tactile, gustatory, vestibular, olfactory, temperature). Many have impaired sensorimotor processing abilities, motor tone and motor planning, delays in fine motor skills, and impaired capacity to discriminate or integrate auditory-verbal or visual-spatial stimuli. Thus, infants with regulatory disorders may be particularly challenging for caregivers.

Infants with regulatory disorders who are left untreated are at risk for later developmental, sensorimotor, and/or emotional and behavioural problems including problems in the areas of cognitive abilities, attention span, activity level, emotional maturity, motor maturity, tactile sensitivity (DeGangi, Porges et al., 1993; Eisenberg et al., 1996).

When internal components of regulation are dysfunctional, external regulation is often imposed upon the infant, until such time as the infant learns to self-regulate. For example, when a premature infant cannot maintain an appropriate body temperature, warmth is provided by means external to the infant such as the heating units or wool bonnets often used in special care units. Similarly, when an infant cannot soothe herself to sleep at bedtime and during the night, structured bedtime routines and behavioural programs can be used (DeGangi, Craft et al.,

1991). When regulatory disorders involve complex domains of regulation, management essentially focuses on improving the child's coping strategies, e.g., by teaching self-soothing strategies if the child has difficulties with self-consoling, by targeting a particular sensory processing deficit, and by helping parents cope with their child and re-structure the environment to "impose" external regulation (DeGangi, Craft, & Castellan, 1991; DeGangi, Wietisbach, & Scheiner, 1993).

### **Attachment and Regulation**

Bowlby (1969/82, 1980) proposed that attachment is an organized system, the purpose of which is to make individuals feel safe and secure. The quality of the attachment relationship between an infant and her caregiver is determined by the quality of the caregiver's response to the infant at times when the infant's attachment system is activated, i.e., when the infant is emotionally upset/distressed, physically hurt, or ill. Thus, infants with regulatory difficulties/disorders (who are, by definition, frequently distressed and have difficulty settling) may have their attachment system activated more frequently than other infants do. Findings from attachment research over the past two decades have shown that there are three major ways in which caregivers respond to their infants' distress. In turn, these types of caregiver response are associated with socio-emotional outcome.

One group of caregivers responds to infants' distress in "loving" ways, i.e., they are consistently available, sensitively responsive to infants' cues and signals, and affectively receptive and accepting. Infants who experience caregivers in this way learn that they are worthy of love and affection, that relationships can be valued, and that their needs and subjective experience will be respected and valued. These infants become secure that their caregiver will be there when needed, most of the time (nobody can be responsive and available all of the time). The experience of having a loving and sensitive caregiver in the first year of life is a protective factor against the development of a variety of emotional and behavioural problems. Caregivers who are sensitive to the infant's cues could be more successful in adjusting their responses to meet the exceptional needs of an infant with a regulatory disorder and to respond to the infant's distress with empathic support rather than perceiving it as an attack on their abilities as a parent. Thus, it is possible that infants with regulatory difficulties/disorders who have "loving" caregivers have the best possible socio-emotional outcome.

Another group of caregivers responds to infants' distress by "rejecting" the distressed infant. These caregivers are generally unavailable psychologically and respond insensitively when their infants are distressed (e.g., by ridiculing bids for comforting, focusing the infant's attention away from the caregiver as a source of comfort and support, or ignoring the infant's distress altogether). Infants with regulatory difficulties are particularly difficult to soothe, and may themselves appear to "reject" caregivers' efforts to intervene on their behalf. Thus they may contribute to a caregiver feeling ineffective, discouraged and frustrated. This may elicit further caregiver rejection or withdrawal. Infants whose caregivers consistently respond in rejecting ways to their distress learn to become avoidant of the caregiver at times of stress and to "fend for themselves". They learn that

they are not worthy of love and affection, that their subjective experience will not be respected or valued, and that their emotional needs might not be met. Thus, an infant who has both regulatory difficulties and a primary caregiver who is "rejecting" may be at high risk for being unable to overcome the regulatory problems and for developing behavioural and emotional problems.

Another group of caregivers responds to infant distress in unpredictable ways. Their inconsistent responses and availability to the distressed infant may be associated with unrealistic expectations of the infant and difficulty reading cues and signals in their infants. Caregivers with this style of response to infant distress may be overtly or covertly critical of the infant, or expect the infant to please them and even to meet the parents' own psychological needs (role reversal). Infants whose caregivers respond in inconsistent ways to their distress learn to become ambivalent/resistant toward the caregiver at times of stress, e.g. separation experiences. In addition, infants with regulatory difficulties may be unpredictable in their biological functions and their cues may be unclear to an extent that makes it difficult for caregivers to anticipate and read. Again, the infant's own ambiguous or inconsistent responses may contribute to caregiver frustration and feelings of inadequacy. Thus, an infant who has both regulatory difficulties and a primary caregiver who is "inconsistent" may be at high risk for being unable to overcome the regulatory difficulties and for developing behavioural and emotional problems.

Recently, a new pattern of caregiver responses to infants has been described where the caregiver acts in frightening, frightened, dissociated or otherwise atypical ways towards the infant. This style of caregiver response relates to behavioural disorganization/disorientation in infants. This pattern, like the other two patterns of insecure attachment (i.e., avoidant and ambivalent/resistant), has been associated with increased risk for emotional and behavioural problems, in addition to psychopathology. In fact, disorganized attachment in infants is now believed to be the strongest known predictor of psychopathology. Thus, an infant who has both regulatory difficulties/disorders and a primary caregiver who acts in "frightening, frightened, dissociated or otherwise atypical" ways may be the highest risk for being unable to overcome the regulatory difficulties and for developing psychopathology.

In summary, the assessment of infants with regulatory difficulties/disorders should also include an assessment of the quality of the relationship between infant and caregiver, especially the attachment relationship. In situations where the attachment relationship between the infant with regulatory difficulties and her caregiver is insecure, i.e., when the caregiver responds to the infant's distress in ways that are rejecting, inconsistent, or frightening/frightened/dissociated/atypical, then intervention focused on changing the quality of caregiver response to infant distress is suggested. Such an intervention aimed at training the caregiver to read the infant's cues and signals of distress accurately and respond sensitively has been documented as helpful in promoting secure attachment, which in turn, is associated with better socio-emotional outcome than insecure attachment (van den Boom, 1994, 1995).

## References

- Ainsworth MDS, Blehar M, Waters E & Wall M (1978). *Patterns of Attachment*. Hillsdale, NJ: Lawrence Erlbaum.
- Allessandri SM, Sullivan MW, Imaizumi S & Lewis M (1993). Learning and emotional responsivity in cocaine-exposed infants. *Developmental Psychology* **29**, 989-997.
- Bowlby J (1969/82). *Attachment and Loss. Vol. 1: Attachment*. New York: Basic Books.
- Bowlby J (1980). *Attachment and Loss. Vol. 3: Loss, sadness and depression*. New York: Basic Books.
- Cicchetti D & Tucker D (1994). Development and self-regulatory structures of the mind. *Development and Psychopathology* **6**, 533-549.
- DeGangi GA (1991). Assessment of sensory, emotional, and attentional problems in regulatory disordered infants: Part 1. *Infant & Young Children* **3**, 3:1-8.
- DeGangi GA, Craft P & Castellan J (1991). Treatment of sensory, emotional, and attentional problems in regulatory disordered infants: Part 2. *Infant & Young Children* **3**, 3:9-19.
- DeGangi GA, DiPietro JA, Greenspan SI & Porges SW (1991). Psychophysiological characteristics of the regulatory disordered infant. *Infant Behavior and Development* **14**, 37-50.
- DeGangi GA, Porges SW, Sickel RZ & Greenspan SI (1993). Four-year follow-up of a sample of regulatory disordered infants. *Infant Mental Health Journal* **14**, 330-343.
- DeGangi GA, Wietisbach MG & Scheiner N (1993). A comparison of structured sensorimotor therapy and child-centered activity in the treatment of preschool children with sensorimotor problems. *The American Journal of Occupational Therapy* **47**:9, 777-786.
- Eisenberg N, Fabes RA, Guthrie IK, Murphy BC, Maszk P, Holmgren R & Suh K (1996). The relations of regulation and emotionality to problem behavior in elementary school children. *Development and Psychopathology* **8**, 141-162.
- Fox NA, Schmidt LA, Calkins SD, Rubin KH & Coplan RJ (1996). The role of frontal activation in the regulation and dysregulation of social behavior during the preschool years. *Development and Psychopathology* **8**, 89-102.
- Greenspan SI & Wieder S (1993). Regulatory disorders. In CH Zeanah (Ed.), *Handbook of Infant Mental Health*, 280-290, New York: The Guilford Press.
- Jacobson S, Jacobson JL, Sokol RJ, Martier S & Ager JW (1993). Prenatal alcohol exposure and infant information processing. *Child Development* **64**, 1706-1721.
- Mayes LC, Bornstein MC, Chawarska K, Haynes OM & Granger RH (1996). Impaired regulation of arousal in 3-month-old infants exposed prenatally to cocaine and other drugs. *Development and Psychopathology* **8**, 29-42.
- Mayes LC, Bornstein MH, Chawarska K & Granger RH (1995). Information-processing and developmental assessments in 3-month-old infants exposed prenatally to cocaine. *Pediatrics* **95**, 539-545.
- Porges SW (1996). Physiological regulation in high-risk infants: A model for assessment and potential intervention. *Development and Psychopathology* **8**, 43-58.
- Thompson RA & Calkins SD (1996). The doubled-edged sword: Emotional regulation for children at risk. *Development and Psychopathology* **8**, 163-182.
- van den Boom D (1994). The influence of temperament and mothering on attachment and exploration: An experimental manipulation of sensitive responsiveness among lower-class mothers with irritable infants. *Child Development* **65**, 1457-1477.
- van den Boom D (1995). Do first-year intervention effects endure? Follow-up during toddlerhood of a sample of Dutch irritable infants. *Child Development* **65**, 1798-1816.