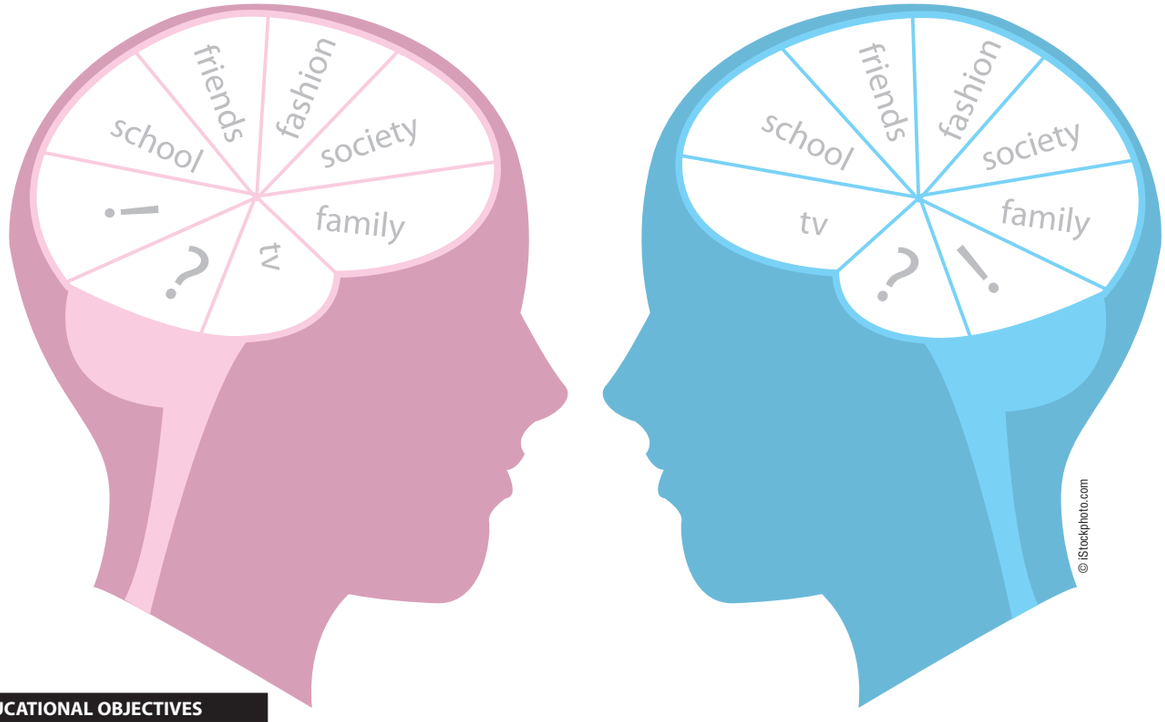
CME

From Developmental to Catastrophic: Contexts and Meanings of Childhood Stress



CME EDUCATIONAL OBJECTIVES

1. Describe at least four types of stress.
2. Explain two common ways children are buffered from external stressors.
3. List at least one example of the systems theory application to stress.

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Stress is increasingly present in all of our lives, yet as this term is used with greater frequency, its meaning has become less clear. What is stress? Often the term is used to refer to an external pressure exerted on systems of human homeostasis.[1] But it also can refer to the immediate result — a physiological reaction mediated by the hypothalamic-pituitary-adrenal (HPA) axis (neurohormonal mediators, such as corticotropin releasing factor, glucocorticoid release, and autonomic nervous system (ANS) response altering neurotransmitter levels), accompanied by adjustments in cardiovascular, immune system, and brain function, along with predictable behavioral manifestations — a "state of stress."[2]

Humans share stress-responsive brain structures like the amygdala with other primates. But because of the evolution of brain structures such as the hippocampus and prefrontal cortex, humans possess the unique ability to retrigger stress reactions in the absence of renewed external stress.[1,2] All we need to do to unleash a physiological stress response is to think about a particular stress. "Stress" has

Joshua D. Sparrow, MD

also come to refer not only to external pressures and immediate reactions to them, but to a prolonged internal state that may have long-term deleterious effects on health and mental health.

SPECTRUM OF STRESS

Stress reactions represent an evolutionary advantage in the face of danger when they prompt effective adaptations to changing environmental conditions. Such reactions are often critical to survival and are not necessarily detrimental. This is usually the case for mild everyday stress, except when it piles onto an already stressed individual. More demanding stresses can prod an individual to develop new strengths, although perhaps at a cost. Stress reactions can be harmful when they are of extraordinary proportions, cumulative, or unremitting.

Mediated by physiologic HPA axis and ANS responses, prolonged reactions can increase risks to physical health (eg, hypertension, altered immune responses such as "pro-inflammatory" states, metabolic changes associated with obesity, diabetes, and arteriosclerosis) and to mental health (eg, post-traumatic stress disorder,[3] depression, anxiety, as well as motor hyperactivity, impaired attention, concentration, and other learning and behavioral challenges).[1,2] Recent studies have shown that specific 5-HTT (5-hydroxytryptamine serotonin transporter) gene alleles code for increased vulnerability to depression secondary to childhood stress and suggest that early environmental influences such as stress can alter phenotype later in life. Studies also suggest that environmental factors can protect against expression of genetic risk.[4]

Acute stress

Short-lived stress of everyday proportions – an unpredicted change in a day's schedule, a final exam, or an argument, for example – will result in transient HPA axis and ANS responses. These serve to mobilize appropriate adaptations, and they return to baseline before causing any long-term physical or mental health problems. Rapid recovery from the effects of brief, everyday stresses can promote new coping skills, broader awareness of opportunities and demands, and a sense of competency.

Chronic stress

Sustained stresses – bullying, parental discord, academic failure, for example – can expose a child to long-term effects of HPA axis and ANS stress responses on metabolism, cardiovascular and immune system functioning, and even brain development.[1,2,3,5] External sources of stress may be amplified by the child's anticipation of further or recurrent stressful stimuli, interfering with healthy development of self-esteem and the emotional availability for peers and caregivers.

The chronic stress of over-scheduling

The distinction between acute and chronic stress, between the opportunity for intermittent recovery, and return to baseline of HPA axis and ANS activity versus persistent physiological alterations may be useful in assessing the risks of over-scheduling children.[6] Although condemnation of busy children's schedules is tempting, clinicians should consider each child's need for activity and rest, challenge and nurturance, based on the child's temperament and behavioral response to the current regimen. Does the child brighten as she speaks enthusiastically about soccer and Advanced Placement Math, or does she glaze over, withdraw, and look away? Does she seem to have her own motivation and rewards – a driving hunger for stimulation and activity, or is she coping with external pressure at the expense of a more quiet temperament's need for 'down time' or 'refueling'? When over-scheduling is out-of-sync with a child's needs and strengths, signs of chronic stress, such as persistent irritability, emotional overreactions to minor demands, lack of pleasure in usually enjoyable activities, and withdrawal are likely to emerge.

Extraordinary stress and trauma

Short-lived stressors can result in long-term effects when they are of extraordinary proportions, bearing little resemblance to the child's everyday reality. Neuropsychological responses, such as hyperarousal (on edge, ready to overreact) and hypervigilance (on guard, scanning the environment for danger at all times), may persist long after a traumatic episode. Evocative reminders can retrigger traumatic memories and "re-experiencing" and may lead to withdrawal from routine activities. "Psychic numbing" can also emerge. This is a reactive underresponsiveness that prevents emotional shifts congruent with new events, a costly protective shield that interferes with full engagement in life as it unfolds.[7-9]

Geographic proximity of the child to an event, displacement, loss of or separation from family members, disruption of regular routines, immediate physical consequences of the event, and prolonged reminders of the event due to altered physical surroundings and conditions of life are among the more obvious factors increasing a child's risk of a serious stress reaction. History of previous severe acute or chronic stresses, pre-existing mental illness, or disrupted relationships with primary caregivers are also risk factors[7-10] for serious stress reactions.

Several months after the attacks of September 11, 2001, one parent reported that her child, a student at a middle school near the World Trade Center, seemed to have recovered from the initial shock and manifested no signs of long-term effects. In passing, however, she noted that the child's grades had remained stable in all but his French class. As she recounted his story, this mother began to realize that her child's

French class met on Tuesdays at 9 a.m. in a classroom overlooking Ground Zero, from which he had witnessed first hand the horrors of the attack. Her understandable wish that her child might have emerged entirely unscathed may have prevented her from recognizing that every time her son entered that classroom he was "retriggered" into a transient dissociative state interfering with attention, memory, and learning.

Chronic stress of poverty and war – everyday 'extraordinary' stress

A child chronically exposed to extraordinary levels of stress, for example chronic abuse, poverty, or a war zone, may not suffer from post traumatic stress disorder, but from chronic traumatic stress disorder.[7,9] No therapeutic intervention can be effective until physical safety has been restored.[11]

Cumulative stress

A child may endure one acute stress after another or multiple stresses simultaneously. The former may be more likely to lead to sustained physiological responses similar to those of chronic stress, while the latter may lead to those of an acute extraordinary stress, eg, a post-traumatic stress reaction. Many conditions predisposing to chronic stress (eg, poverty, prolonged, or life-threatening pediatric illness, a parent with mental illness, or substance abuse) heighten vulnerability to superimposed acute stress. Chronic and cumulative stress interfere with self-regulatory functions (eg, affect modulation, impulse control) and are likely to lead to more severe reactions to acute stresses such as a move or hospitalization. Acute stress reactions that appear out of proportion to the stressor should prompt clinical inquiry about covert sources of underlying chronic stress.[7,8,9]

HOW CHILDREN RESPOND TO STRESS

Initial biological stress reactions are quickly followed by the search for protection from familiar, reliable caretaking adults. Longstanding secure attachment to trustworthy parents is a potent protective factor throughout childhood.[7,9-11] Parents also influence their children's stress reactions with their own responses to their children's panicked state.

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Parental emotional availability

The most potent buffer for young children is the quality of their relationships with parents and other important adult caregivers. To fall in love with a young child, to be sensitive and responsive to her cues, to know when to engage and to disengage, to lead and to follow her lead, and to challenge and to comfort all demand emotional availability. Overwhelming stress or crisis for parents makes these far more difficult tasks. Yet many parents in such circumstances still manage to free up enough emotional energy to supply the early ingredients of resiliency to their young children. Some parents' resiliency may be traced to the "angels from their nurseries," the early positive experiences in their own lives, especially strong attachments in their earliest relationships.[10] The powerful protective urges that their children stimulate in them may also help parents reestablish their emotional availability to their children.

Meaning-making

Overwhelming stress leads children to struggle to understand: Who or what is responsible? What can be done to make things better? What is the likelihood of recurrences, and how can these be prevented? They may ask, for example, "Why did I have to get leukemia?" "Why did my mother go off to war?" "Did I make my parents get divorced?" "If I am very, very good will there be no more hurricanes?" A common explanation is for a child to blame herself. Psychological effects of stress on children are partly determined by their answers to questions like these. They may interpret their world as hopelessly dangerous, or as a balance between life's perils and life's sustaining opportunities. Stances for facing the future may take the form of passive resignation, hunger for revenge, or resilient readiness to face adversity and stake a claim for survival and fulfillment.[7,9] The meaning-making process is influenced by children's developmental stage, by the effects of individual temperaments (traits) and by the acute emotional environment (state) in which they are figuring out their world. Caregiving adults can contribute to children's meaning-making and support the development of positive adaptations even when stress is overwhelming or when safety remains beyond reach. Resilient adaptations to stress in children are supported by ongoing proximity to parents who can model self-calming abilities in the face of stress and offer interpretations

that preserve hope. Studies comparing children who remained with their parents during the World War II bombing of London to those who were sent away to safer territory showed that the group who maintained proximity to their parents demonstrated fewer long-term psychopathological sequelae.[1,7,9]

STRESS AND DEVELOPMENT

Prenatal stress — effects on development

The influence of parents on children's vulnerability to stress begins far earlier than is commonly recognized. Stress-related maternal states such as depression, anxiety, and self-reported anger are associated with neurophysiologic changes that may affect the fetus.[12,17] Alterations in maternal cortisol and neurotransmitter (eg, norepinephrine and serotonin) levels have been correlated with corresponding cord blood levels and neonatal behavioral changes.[12-15,17,18] Uterine artery constriction may be another mode of transmission of stress reactions from expectant mother to the fetus.[12,15,19,20] Maternal stress and elevated maternal cortisol levels during pregnancy are correlated with developmental risk from toddlerhood through adolescence, affecting language acquisition, attentional function, and behavioral controls.[17,20-33]

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SYSTEMS THEORY APPROACHES TO STRESS

Child, parents, and the mental health provider can be seen as constituent members of a system. Systems theory, in which inter-relationships and multidirectional interactions within a system are the focus of inquiry rather than its constituent parts in isolation, is a useful perspective for understanding the effects of stress within a single child, family, and communities. Each member of a system is not only affected by external forces on the system, but each member also exerts influences on the others.[35,38]

Biologic systems

Similarly, in the neurobiological/psychological context, this approach also illuminates the multidirectional interactions of neurohormonal and neurotransmitter mediators of stress reactions with adaptations in attentional and perceptual functions such as hyperarousal and hypervigilance, or shifts in amygdala 'alarm' signals, hippocampal contextualizing, and prefrontal cortex analysis and response planning to external stress.[1,2]

Family systems

In family contexts, systems theory draws attention to multiple factors influencing a child's experience and reactions to stress. The child influences, and is influenced by, her family system. Her response will both stimulate a response in her parents and will be modulated by her parents' response.[35,38] A child's response to traumatic stress can be mitigated by the parents' ability to cope with it and to offer interpretations of the trauma that reaffirm sources of strength and restore hope.[7,9] Ironically, the self-comforting capacity of parents to cope with stress may be thrown off track by a sensitive, easily frightened, and difficult-to-soothe child, further influencing the inter-relational process.

Stress without supports

Stresses on parents interfering with their ability to buffer stress for their children appear to be mounting as more parents are working and raising children alone, often without the support of extended family, and in dispersed communities.[39]

Community and cultural systems

Community members and institutions also interact to modulate reactions to stress from within and external to the community "system."[9] For example, the stress of Hurricane Katrina on New Orleans was modulated by alienated relations of ethnic groups. The hurricane and flooding alone did not suffice to explain the range of stress reactions, and psychological recovery for the community will require not only the reestablishment of safety (strengthening the levees, emergency plans, etc.) but also the healing of a historically factionalized community.

CONCLUSION

It is critical for mental health and primary care providers to be aware of the multidirectional forces within the child, family, and community systems as they assess both the risk for long-term psychopathological sequelae to stress, and the sources of strength to prevent such outcomes, and to heal.[39] As members of the community system, mental health and primary care providers may play a larger role than they recognize in symbolizing hope, as reliable and trustworthy helpers whose beliefs and values remain unsullied by stressful events. As the late Fred Rogers exhorted young children in the aftermath of 9-11, "Look to the helpers."

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