

Review Article

Coping and Attention: Implications for Child Health and Pediatric Conditions

BRUCE E. COMPAS, Ph.D.
MARGARET C. BOYER, A.B.

Department of Psychology, University of Vermont, Burlington, Vermont

ABSTRACT. Child health and illness are best conceptualized in terms of the interaction of biological, psychological, and social processes. Among the central factors in biopsychosocial models of health and illness are processes of coping and attention in response to stress. As a guide to research on biopsychosocial processes in child health and illness, a dual-process model of responses to stress is described, distinguishing between stress responses that are involuntary/automatic and those responses that are voluntary/controlled. Research on coping with stress is briefly reviewed, along with research on attentional processes in response to stress. The relationships between coping and attention are highlighted, along with the implications of this research for understanding children's health and illness. Throughout the article, examples are drawn from research on pediatric recurrent abdominal pain to illustrate important aspects of coping and attention. *J Dev Behav Pediatr* 22:323-333, 2001. Index terms: *coping, attention, self-regulation.*

It is increasingly recognized that children's health and illness are not solely a function of biological factors, but are instead the result of complex interactions among biological, psychological, and social processes. Many pediatric problems including diabetes mellitus, juvenile rheumatoid arthritis, asthma, respiratory illnesses, headache pain, recurrent abdominal pain, and accidental injuries are linked to disruption or dysfunction in these fundamental processes and not to biological disturbances alone. As a result, approaches to the etiology, nature, course, and treatment of a variety of pediatric conditions are best considered within a broad biopsychosocial framework.¹⁻⁴

A central component in biopsychosocial models of child health and illness is the role of stressful events and circumstances and their effects on the physical, emotional, behavioral, and psychological equilibrium of children under stress. Concomitantly, two psychological processes are central in responding to stress and re-establishing psychological and biological homeostasis: the processes of coping and attention. In our preliminary biopsychosocial model of children's health, attention and coping assume central roles in the relationship between stressful events and emotional and physical outcomes (Fig. 1).

Individual differences in coping with stress reflect the ways that children attempt to regulate their thoughts, behavior, emotions, and autonomic arousal, and may play

an important role in determining who gets sick and who remains well in the face of significant stress and adversity. Attentional processes influence how individuals orient to and appraise potentially stressful aspects of the environment and internal sensations that convey the threat of disease, and attention further influences the ways that children respond to and cope with stress. The goals of this paper are to provide an overview of current conceptualizations and research on coping and attention in response to stress during childhood and adolescence and to highlight the implications of this research for child health and illness. We draw on examples from research with recurrent and chronic pediatric pain to elucidate the importance of these processes. We have selected pediatric recurrent abdominal pain (RAP) as a focal example because processes of coping and attention may be particularly important in the course and remission of RAP.

STRESS, BIOPSYCHOSOCIAL PROCESSES, AND ILLNESS

Biological, psychological, and social processes are prominent in several integrative models of child health and illness. In particular, pediatric recurrent abdominal pain (RAP) is an area in which the interplay of these processes has been especially well described.²⁻⁵ Biological processes that are implicated in RAP involve changes in the central and enteric nervous systems, including alterations in intestinal wall sensory receptors, modulation of sensory transmissions in the peripheral or central nervous system, cortical perceptions, and pain memories that contribute to

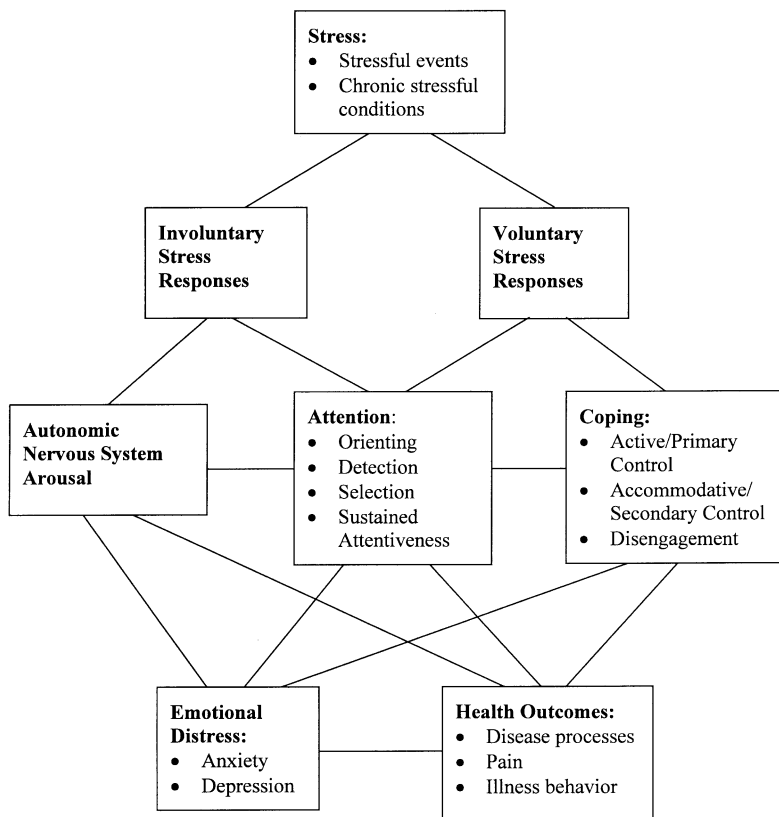


FIGURE 1. Biopsychosocial model of child health and illness.

visceral hyperalgesia.³ Psychological processes include temperament, attention to pain-related stimuli, emotional responses to pain, memories of pain, and efforts to cope with and manage pain.^{4,6} Social processes include family history of pain, parental responses to a child’s pain, and stressful events in the social environment.⁵

Stressful events and conditions are related to increased risk for illness and, in turn, illness and disease can be significant sources of stress for children and their families. Stress can be defined by the occurrence of acute events or the presence of chronic features of the physical and social environment that challenge, threaten, or exceed the developmental capacities of the individual (Kathryn E. Grant et al, unpublished data, 2001). Acute stressors during childhood and adolescence include major life events such as the unexpected death of a parent, an automobile accident, natural disaster, or an incident of traumatic abuse. Chronic stress includes recurrent and persistent conditions in the social and physical environment, such as exposure to recurrent conflict in the home, economic hardship, and the mundane hassles that typify daily life during childhood and adolescence (e.g., being teased by peers, school exams, homework).

Stress is implicated in childhood illness in two ways. First, acute and chronic stress can contribute to the onset and course of childhood illness. For example, in a classic study, Meyer and Haggerty⁷ reported that streptococcal infections were triggered by stressful events in families. Similarly, Boyce and colleagues have shown in two studies

that stressful life events increase the risk of onset of childhood respiratory tract illness.^{8,9} Among kindergarten children who were exposed to the Loma Prieta earthquake in the San Francisco bay area, responses to standard immunologic tests (helper-suppressor cell ratios and poke-weed mitogen response) distinguished children who experienced an increase in respiratory illnesses from those with a decrease in respiratory illnesses after the earthquake.⁹ With regard to pediatric pain, Walker et al,¹⁰ using daily telephone interviews, found a significant relationship between minor, daily stressful events and somatic symptoms. This relationship was stronger for children with RAP than for a sample of well children and was highest for recurrent pain patients who were also highest in persistently negative emotions.

Stress occupies a second role in pediatric illness, because the characteristics of an illness can represent significant sources of stress to children and their families. For example, among children suffering from chronic pain, the experience of pain itself constitutes a significant stressor. Pain is a signal of threat to the health and well-being of the child, and it is a noxious internal state that may challenge or exceed the child’s adaptive capacities. Additionally, pain is associated with significant emotional distress (typically anxiety) and general disequilibrium in physiological systems. Therefore, it is important to consider how children attend to and cope with pain and other symptoms of illness, because their attention and coping responses may influence

the course, severity, and chronicity of their condition. For example, the ways that children cope with episodes of RAP is related to their emotional distress, levels of somatic symptoms, and pain episodes (e.g., Alexandra H. Thomsen et al, unpublished data, 2001).¹¹

Research on coping and attention in childhood health and illness has been concerned with three broad questions. Although a detailed consideration of these questions is beyond the scope of this review, we use them to frame our discussion of research in this area. First, what are the central features of the ways that children and adolescents cope with stress? Second, how do children and adolescents attend to and process information related to stressful events? And third, what is the relation between coping and attention in response to stress? These questions all pertain to the role of stress response processes in the onset, course, and adaptation to illness, pain, and other pediatric problems. To address these questions, we will first provide a brief summary of our dual-process model of stress response processes. We then consider coping and attention in more detail, as well as the relationship and interplay between these two processes. Finally, we outline the implications of attention and coping for research and treatment of childhood illness. Our perspective on coping, attention, and illness is reflected in a heuristic model of the relationships among these factors that is presented in Figure 1. Acute and chronic stress trigger automatic and voluntary stress response processes. Autonomic nervous system (ANS) reactivity is an example of purely automatic stress responses, and coping responses reflect voluntary, controlled responses. Attentional processes, however, include both automatic and controlled responses to stress. ANS reactivity, attention, and coping all influence emotional and health outcomes associated with stress.

STRESS RESPONSE PROCESSES

We view childhood health and illness in the context of a dual-process model of responses to stress.^{12–14} The dual processes are reflected in a system of involuntary, automatic response processes and a second system of voluntary, controlled responses (Fig. 1). Both involuntary and voluntary responses to stress can be further distinguished as engaging with, versus disengaging from, the source of stress and one's emotional responses to the stressor.

Involuntary and Voluntary Responses to Stress

When an individual is confronted with either acute or chronic stress, two separate but related systems are activated.^{12–14} One set of responses is characterized by physiological, affective, cognitive, and behavioral responses that are automatic, spontaneous, unintentional, not under voluntary control, and able to occur either within or outside of conscious awareness. A second set of responses are volitional, intentional, within conscious awareness, goal-oriented, and experienced as under the individual's control. We hypothesize that individual differences in these two systems are critical in determining how children respond to stress, and in moderating the role of stress in the etiology and course of childhood illness.

The distinction between voluntary/controlled and involuntary/automatic processes is not limited to conceptualizations of stress responses and is widely recognized in behavioral science, cognitive science, and neuroscience. These dual processes are reflected in research on associative conditioning and learning,^{15,16} memory,¹⁷ cognitive processes in emotions and emotional disorders,^{18,19} temperament and intentional behavior,^{20,21} social cognition,^{22,23} and self-regulation.²⁴ For example, responses to threatening cues in the environment, which are experienced as stressful and therefore may initiate coping behavior, are attended to on both an automatic, uncontrolled level as well as a controlled, strategic level (see Mathews and MacLeod,¹⁸ for a review of research with adults). Individuals who are high in symptoms of anxiety and depression are biased to attend to negative information in the environment at both the controlled and automatic level.¹⁸ Research has recently begun to examine attentional biases in children and has identified similar relationships between attentional processes and anxiety.^{25,26}

Involuntary responses to stress are hypothesized to be controlled by more primitive aspects of the brain and central nervous system, including the amygdala and other components of the limbic system.^{27–29} These include the sympathetic and parasympathetic arms of the autonomic nervous system that control stress reactivity and recovery. Sympathetic nervous system function is reflected in measures of stress reactivity such as skin conductance and heart rate. Parasympathetic function is represented by processes of recovery from stress, including the role of the vagus nerve in regulating respiratory sinus arrhythmia or vagal tone.^{30–32} Although sympathetic nervous system processes can be brought under conscious control to some degree (e.g., through biofeedback), they are triggered by automatic or involuntary responses to threat or challenge.

In contrast, it is hypothesized that voluntary stress response processes are governed by higher order executive processes of the prefrontal cerebral cortex. These executive functions play a central role in response control or inhibition and other aspects of self-regulation.^{33–35} Voluntary stress responses that are governed by executive functions include some of the more complex aspects of coping such as generating plans or solutions to a problem, cognitively reframing a stressful situation, distracting oneself with pleasant thoughts, and acceptance of a stressful situation. The role of cognitive abilities in the successful employment of higher level coping strategies is illustrated in a recent study by Tapert, Brown, Myers, and Granholm³⁶ who found that neurocognitive abilities (as reflected in a measure of general intelligence) interacted with coping skills in predicting relapse to alcohol and drug use.

Voluntary and involuntary responses may emerge differently over the course of development, with involuntary response systems present early in development,^{21,37,38} followed by the emergence of volitional response systems in early childhood. For example, fear motivation (which can be aroused in response to a stressful event) may provide important, but relatively involuntary, controls over appetitive (approach) motivation.²⁰ Initially, regulation of fear may be primarily automatic and reactive; however, additional

cortical development increases the child's capacity for voluntary or effortful forms of control.²⁰ Increased development of the prefrontal cortex allows the child to anticipate future states of the self and the world, to evaluate the consequences of potential actions, and thus to access information necessary for strategic voluntary control. Rothbart and colleagues have argued that as the child develops, initially reactive forms of regulation are supplemented by an increasing capacity for voluntary or effortful forms of control.^{39,40}

Volitional and involuntary processes are subjectively and qualitatively different. Individuals can distinguish between those aspects of their thoughts and behavior that they experience as under their personal control versus those that are beyond their control.⁴¹ For example, the release of emotions can occur through an involuntary ventilation of emotions (e.g., crying) or through a controlled process such as writing about one's feelings, and the effects of these processes on emotions and physiology may be quite different.⁴² Volitional and involuntary processes may also differ in the ways they respond to interventions. Psychological interventions are often designed to teach individuals skills in managing those aspects of cognition and behavior that are under personal control, but for the most part they can only indirectly increase or decrease responses that are experienced as uncontrollable.

We hypothesize that voluntary and involuntary stress response processes interact in their effects on emotional, behavioral, and physical functioning. In some instances, voluntary coping efforts control and regulate involuntary stress responses. For example, coping that involves emotional regulation can be directed at dampening high emotional and physiological arousal in response to stress through mental and physical strategies to achieve relaxation. In other instances, voluntary coping attempts can have the unintended effect of paradoxically increasing those involuntary responses that they are intended to diminish. For example, efforts to suppress unwanted automatic thoughts may increase their frequency.⁴³ Similarly, involuntary responses may facilitate and inhibit different aspects of voluntary coping processes. Temperamental characteristics, such as adaptability, may facilitate the use of problem-solving skills and emotion-regulation strategies, whereas high levels of inhibition may constrain the use of active, approach-oriented coping.⁴⁴ For example, inhibited children may be less able to generate and enact coping strategies that involve engaging with and approaching threatening stimuli (e.g., seeking information, active problem solving). One important implication of this model is that both volitional coping and involuntary stress responses need to be measured to provide a comprehensive understanding of how children and adolescents respond to and manage stress.

Engagement and Disengagement Responses to Stress

Both of the dual processes of voluntary and involuntary responses can be further distinguished along a dimension of engagement versus disengagement; that is, individuals can both voluntarily and involuntarily engage with or disengage

from a stressor. The origins of the engagement-disengagement dimension can be found in the concept of the automatic fight (engagement) or flight (disengagement) response⁴⁵⁻⁴⁷ and in the contrast between approach and avoidance responses.⁴⁸ Coping responses have also been distinguished along the engagement-disengagement dimension.^{49,50} Engagement coping includes responses that are oriented toward either the source of stress or toward one's emotions or thoughts (e.g., problem solving, seeking social support, modulated expression of emotions). Disengagement coping refers to responses that are oriented away from the stressor or one's emotions/thoughts (e.g., cognitive avoidance, denial, social withdrawal). Although the dimension of engagement-disengagement coping is related to the dimension of approach and avoidance, the engagement-disengagement distinction is broader, because avoidance represents only one form of disengagement. Responses such as cognitive distraction also involve disengagement but are not purely avoidant, because they include redirecting attention toward an alternative target and reflect awareness and acknowledgment of the stressor.^{14,51}

We now consider two aspects of responses to stress: processes of coping and attention. Within our dual-process model of stress responses, coping involves only voluntary response processes, whereas attention to threatening and stressful information involves both involuntary and voluntary response systems. Both coping and attention can be further distinguished in terms of engagement with or disengagement from information related to stress.

COPING

We define coping as *conscious volitional efforts to regulate emotion, cognition, behavior, physiology, and the environment in response to stressful events or circumstances*.^{12-14,52} Optimal coping is planful, strategic, organized, goal directed, linguistically based, and context-specific. Coping is a subset of responses to stress, with coping referring to regulatory efforts that are volitionally and intentionally enacted specifically in response to stress.⁵⁰ Regulation involves a broad array of responses, including efforts to (a) initiate, (b) terminate or delay, (c) modify or change the form or content, (d) modulate the amount or intensity of a thought, emotion, behavior, or physiological reaction, and (e) redirect thought or behavior toward a new target. Coping is a subset of self-regulatory processes; therefore, it is important to recognize that self-regulation includes responses in nonstressful circumstances that are not characterized as coping.⁵³ These regulatory processes both draw on and are constrained by the biological, cognitive, social, and emotional development of the individual. An individual's developmental level contributes to the resources that are available for coping and limits the types of coping responses the individual can enact.

From infancy, individuals are capable of regulating aspects of their physiological arousal, behavior, and emotions.^{20,54,55} However, regulation is achieved initially through automatic, biologically based processes.³⁸ These regulatory capacities are augmented early in development by responses that are acquired through learning and experience

but are also automatic in that they are controlled by environmental cues that elicit and maintain behavior.²⁰ Therefore, some important aspects of self-regulation precede the development of the capacity for the conscious volitional efforts that comprise coping. Features of responses to stress in infancy that precede coping include individual differences in self-soothing behaviors.⁵⁴ For example, infants display an innate soothing response to sucrose that facilitates early self-regulation of emotion.³⁷ A small amount of sucrose administered to the tip of an infant's tongue will interrupt and reduce the infant's crying and distress significantly more than the administration of other tastes. Early self-regulatory responses may be oriented toward palliating negative emotions through primarily behavioral means, including seeking support and soothing from others, behavioral withdrawal from threat, and the use of tangible objects for soothing and security.⁵⁴ These behaviors develop prior to the skills needed for conscious volitional self-regulation, yet they are important aspects of the ways that infants regulate themselves in response to stress.

Coping is influenced by the emergence of cognitive and behavioral capacities for regulation of the self and the environment, including the emergence of intentionality, representational thinking, language, metacognition, and the capacity for delay. More complex methods of achieving the goals of emotional palliation and problem solving emerge in early to middle childhood with the development of more complex language capacities. These include cognitively reframing or rethinking a problem situation, cognitively representing absent caregivers, using self-talk to calm negative emotions, and generating alternative solutions to solve problems.^{56,57} Greater diversity and flexibility in the range of coping responses available to the individual are expected to develop during middle childhood and adolescence. In addition, with increasing cognitive skills in early adolescence, a greater ability to match coping efforts to the perceived and/or objective characteristics of stress is expected.

Categories or Subtypes of Coping

Although the broad dimensions of engagement and disengagement provide an overall framework for organizing coping responses, understanding the nature of coping depends in part on an analysis of the more specific subtypes of coping responses that comprise these broader dimensions, because specific subtypes of coping may differ in their effects. This task is difficult, however, because of the very large number of different subtypes of coping that have been examined in previous research.¹⁴ These include problem solving, information seeking, cognitive restructuring, seeking understanding, catastrophizing, emotional release or ventilation, physical activities, acceptance, distraction, distancing, avoidance, self-criticism, blaming others, wishful thinking, humor, suppression, social withdrawal, resigned acceptance, denial, alcohol or drug use, seeking social support, seeking informational support, and use of religion. Items on measures of coping have been grouped into these categories using statistical methods (factor analysis) and conceptual groupings of items, or a combination of these two methods. There has been little consistency

in the application of these various subtypes of coping across different measures and studies, however, leading to considerable difficulty developing a cohesive picture of the structure of coping in childhood and adolescence.

Three recent studies have used confirmatory factor analyses to test conceptual models of the structure of coping and have provided encouraging evidence for a common structure of coping responses. Confirmatory factor analysis tests the degree to which patterns that are observed in children's coping responses confirm or fit with proposed theoretical models of coping. Ayers, Sandler, West, and Roosa⁵⁸ conducted confirmatory factor analyses of 10 coping scales and found that they were subsumed under four hypothesized factors: *active coping* (cognitive decision making, direct problem solving, seeking understanding, positive cognitive restructuring), *social support* (emotion-focused support, problem-focused support), *distraction* (distracting action, physical release of energy), and *avoidance* (cognitive avoidance, avoidant action). Walker et al¹¹ found support for three hypothesized factors (with several scales that cross-loaded on more than one factor) in their development of a measure of coping with pediatric pain: *active coping* (e.g., problem solving, seeking social support), *passive coping* (e.g., self-isolation, behavioral disengagement), and *accommodative coping* (e.g., acceptance, distract/ignore, self-encouragement). Connor-Smith et al⁵⁹ conducted confirmatory factor analyses of adolescents' coping responses and found that they were distinguished by three factors: *primary control engagement coping* (problem solving, emotional expression, emotional modulation), *secondary control engagement coping* (cognitive restructuring, positive thinking, acceptance, distraction), and *disengagement coping* (wishful thinking, denial).

The common findings from the results of these studies are summarized in Table 1. The first dimension reflects active efforts to regulate one's emotions and to act on sources of stress in the environment. The second dimension

Table 1. Dimensions and Subtypes of Coping

Active or primary control coping
Problem solving
Emotional expression
Emotional modulation
Decision making
Problem-focused social support
Emotion-focused social support
Accommodative or secondary control coping
Distraction
Acceptance
Cognitive restructuring
Positive thinking
Self-encouragement
Minimization
Disengagement, avoidant, or passive coping
Denial
Cognitive avoidance
Behavioral avoidance
Wishful thinking
Self-isolation/withdrawal

From Ayers et al⁵⁸; Connor-Smith et al⁵⁹; Walker et al.¹¹

includes coping efforts that are aimed at adjusting to the stressor rather than acting directly on the source of stress. And the third dimension represents efforts to disengage and orient away from the source of stress and one's emotional reactions to it. The first two dimensions reflect forms of engagement coping (directly engaging with the stressor or one's emotional responses to the stressor), and the third dimension represents efforts to withdraw from the stressor and one's emotions.

The studies by Ayers et al,⁵⁸ Walker et al,¹¹ and Connor-Smith et al⁵⁹ suggest that the commonly used dichotomies of problem- and emotion-focused coping or between approach and avoidance coping do not adequately reflect the structure of coping in young people. Ayers et al⁵⁸ found that their active coping factor was comprised of both problem- and emotion-focused scales, and Connor-Smith et al⁵⁹ found that problem solving loaded together with two forms of emotion-focused coping (emotional expression and emotional modulation) on the primary control engagement coping factor. Furthermore, both of these studies found that distraction and avoidance coping loaded on separate factors, indicating that distraction is not simply a subtype of avoidance coping as it is represented in some models. The findings of these studies suggest that confirmatory factor analytic methods provide a promising avenue for testing theory-driven models of the dimensions and subtypes of coping in childhood and adolescence. Moreover, these three studies provide useful new measures for research on children's coping with stress as it relates to illness and other health problems.

ATTENTION

In addition to coping, attention serves as a critical component in the stress response process, and attentional processes are involved in children's health. Attention is deployed before the initiation of coping responses and permits individuals to orient toward and appraise potential stressors. In addition, once coping strategies have been engaged, attentional processes are continually engaged to assess the status of the stressor, monitor changing environmental or internal inputs, and facilitate certain coping strategies that involve shifting and focusing attention. Like coping, attention can be controlled and voluntary (one can deliberately "pay attention" to something), but unlike coping, attention also can be automatic and involuntary.

Attention functions both as a mental filter that selects among competing sources of information for processing and also as a finite resource or capacity that can be distributed differentially among tasks.^{60,61} Although each of these metaphors describing attentional processes has drawbacks, both acknowledge the existence of limitations to what we can attend to at one time. Given these attentional limitations, researchers have attempted to understand what, how, and when we attend to or ignore information in different situations. In the context of child health and illness, it is important to understand how attention affects and is affected by both external factors, such as parental functioning, school environment, or traumatic events, as

well as internal factors, such as chronic illness, emotions, or basic biological processes.

Attention has an automatic or nonconscious component that is used in the performance of routine tasks or the initial orientation and reaction to threat, as well as a deliberate or voluntary component¹⁴ that is engaged during new, dangerous, or cognitively demanding activities.⁶² Certain behaviors that may have once required high levels of voluntary, strategic attention, such as learning to walk or read, become automatized through learning and repeated practice until they generally require only automatic, involuntary attention. This increasing automatization is crucial for development, as it frees more attentional resources for the learning of new tasks.

In addition to highlighting the voluntary-involuntary, dual-process nature of attention, researchers have also described attentional processes in terms of differential function, temporal sequence, and cortical representation. For instance, there is increasing consensus within cognitive science that attention involves at least three processes, including (a) initial orienting following a change in the sensory field, (b) detection/selection of the event that was the source of the orienting, and (c) sustained attentiveness to the event.^{27,63} Developmental-biological models propose that the attentional system is distributed among several neural structures. This system consists of (a) a basic vigilance system that facilitates defensive behavior, located in the reticular activating system; (b) a posterior system that allows attention to be disengaged and shifted to different locations, distributed across the midbrain, thalamus, and parietal lobe; and (c) an executive anterior system located in the frontal cortex that facilitates conscious, effortful behavior.^{20,64} The attentional abilities linked to these separate components and functions change with development; for instance, controlled, sustained attention facilitated by the anterior system undergoes major development during the toddler years.²⁰

Attention and Stress Responses

Three properties of attention play central roles in responding to stress: attentional focus, attentional shift, and attentional bias. First, children differ in their capacity to focus attention on a target. Researchers studying attentional focus have examined how this attentional property contributes to a child's ability to self-regulate.⁴⁰ Children who can focus their attention more proficiently and easily are better able to regulate their emotions and arousal. Also, researchers have demonstrated a relation between attention and the alleviation of distressing emotional states.²⁷ For example, Walker has hypothesized that for children with recurrent abdominal pain (RAP), poor ability to regulate the focus of their attention may increase their focus on the sensations of pain, thereby increasing their anxiety and fear, which in turn magnifies the pain.⁵ Such links between attentional processes, such as attentional focus, and emotion have been shown in both children and adults.⁶⁵

Second, there are individual differences in the capacity to shift attention among different inputs.²⁰ From a resource-allocation model of attention,⁶⁰ it has been demonstrated that one component of adaptive self-regulation is the capacity to

allocate attentional resources differentially among competing sources of information. For example, infants who are able to shift their attention away from arousing stimuli are more soothable and less affected by the mother's or other caretakers' negative emotions.⁶⁶ Deficiencies in shifting and balancing attention have been linked to negative emotionality and lower competence among older children as well.^{67,68} As children increasingly develop control of attention, they are able to shift attention away from a negative or distressing stimulus (e.g., pain), which results in a decrease in negative emotionality.⁶⁹

Finally, attention is not randomly allocated, and biases in attention have important implications for physiological and emotional responses to stress. Recent research on these biases among children, mainly those with emotional and behavioral disorders, has found significant relationships between biases in attention and levels of anxiety.^{26,70} For example, it has been demonstrated that children with anxiety disorders, compared with their peers, exhibit consistent biases in attention toward anxiety-related, emotionally threatening stimuli.^{26,70} Although research on attentional biases among children is still at a preliminary stage, attentional bias research among adults has shown that these biases are disorder-specific (e.g., people with social phobia respond more quickly to social threat words such as "foolish" and "lonely" than to physical threat words such as "pain" and "nausea"),⁷¹ and that some biases in attention are unconscious and involuntary (i.e., outside of conscious awareness).⁷² In our lab we are currently investigating whether children with RAP demonstrate consistent attentional biases toward pain-related words (Margaret C. Boyer et al, unpublished data, 2001), and we have found that women with newly diagnosed breast cancer show automatic unconscious, as well as conscious, attentional biases for cancer-related words (e.g., "mastectomy," "surgery"; Judith G. Glinder and Bruce E. Compas, unpublished data, 2001).

RELATIONS BETWEEN COPING AND ATTENTION

We now consider how coping and attention are related in responding to stress. Within our dual-process model of stress responses, coping and attention may interact in several important ways. For example, attention initially sets the stage for coping by orienting an individual toward potential sources of stress. The individual then appraises the stressor, including its immediacy, threat, and potential controllability. At this point, the individual diverts some attentional resources away from the stressor and toward generating effective ways of coping with it. Once a coping strategy is chosen, some attentional resources are focused on enacting the coping strategy, as well as assessing changes in the stressor, the environment, and the individual's internal state.

In this sequence, several potential breakdowns in the interaction between attention and coping may result in ineffective responses to stress. We highlight two potential difficulties in an effort to show the interdependence between attention and coping, and we relate these examples to children's health and illness. First, poor ability to shift attention away from a stressor and toward other inputs, such

as the environment or helpful coping strategies, may result in poor outcomes. Second, difficulty maintaining attentional focus on the employment of attentionally demanding coping strategies may also pose problems for some children.

In terms of shifting attention, there are individual differences in children's abilities to shift and balance attention across competing sources of information.²⁰ When faced with stress, some children are unable to shift their attention away from engaging with a stressor and toward generating effective coping strategies for dealing with it. In particular, children who develop recurrent abdominal pain (RAP), compared with other children, are hypothesized to have difficulty shifting attention away from episodes of abdominal pain and experience difficulties shifting attention toward coping productively with the pain. This difficulty with attentional shift may arise from several factors, including aspects of a child's temperament and a child's learning through the observation of others (especially parents) who experience difficulties shifting attention during pain episodes. Because they are less able to shift attention away from the pain, children with chronic pain may experience pain episodes more intensely or longer than children who are able to shift attention effectively.

Evidence supporting the hypothesis that greater attention directed toward pain increases pain was found among children with RAP in a study by Walker et al¹¹ Specifically, in a study of pain-coping strategies among clinical and nonclinical samples, focusing attention on the pain (e.g., holding or rubbing the stomach) related to greater pain and somatization. Although attentional shift was not directly assessed in this study, children who did not or were not able to shift attention away from the pain seemed to have worse outcomes. Additional evidence supporting the relationship between poor attentional shifting and greater pain has been found among adults with chronic pain. In a laboratory study of adults with chronic pain, those who performed most poorly in laboratory tasks assessing their ability to switch attention intentionally and effortfully between environmental demands and pain also had the greatest level of pain.⁷³ It should be noted that the relationship between attention and pain is complicated, and researchers continue to examine several hypotheses, including whether impairments in attention lead to greater pain and/or whether greater pain leads to impaired attention.⁷⁴ We maintain that attentional problems such as difficulties in shifting attention will lead to greater pain among children with RAP, but we recognize that overwhelming pain can in fact consume all attentional resources.

A second area in which ineffective interactions between coping and attention might impede effective responses with stress is the attentional focus or attentional resource allocation required by different types of coping. Many coping strategies, such as problem solving, require substantial attentional focus and may be less effectively used, or even inaccessibility, when attention is distracted or unavailable.⁷⁵ Particularly in times of stress, some children may have difficulty engaging in coping strategies that require a high level of attentional focus. Instead, they may respond to stress in ways that further focus attention toward the source

of stress rather ineffectively (e.g., intrusive thoughts or emotional arousal), or they may simply shut down in response to the stressor (e.g., inaction or avoidance.)

Although the degree of attentional focus required by different types of coping responses is unclear and may vary with different children and situations, we hypothesize that automatic or involuntary stress responses, as well as those voluntary coping strategies characterized by disengaging with the stressor, require less effortful attention than voluntary coping strategies that involve engagement with the stressor or one's emotions. Indeed, we have found preliminary evidence that children with RAP who are able to use some kinds of attention-demanding coping strategies may have better outcomes than those who do not. Specifically, those children with RAP who respond to episodes of pain with fewer of the more attention-demanding voluntary engagement coping strategies (e.g., problem solving, cognitive restructuring, distraction) and with more disengagement coping and involuntary engagement responses appear to have the greatest pain and the poorest emotional adjustment (e.g., avoidance and physiological arousal; Alexandra H. Thomsen et al, unpublished data, 2001). Further research is needed to assess the effect of abdominal pain on attentional focus, in addition to the effect of attentional focus on abdominal pain.⁷⁴

Temperament may play a role in limiting the ability of children with RAP to focus their attention on effective coping strategies. In our lab we have found a relationship between greater temperamentally based attentional focus, effective coping, and better adjustment among children with RAP. Specifically, in a study of children with RAP, Alexandra H. Thomsen et al (unpublished data, 2001) found that greater attentional focus (assessed as a temperamental characteristic) related to increased use of secondary control engagement coping strategies such as acceptance, positive thinking, cognitive restructuring, and distraction and also to lower levels of anxiety/depression, pain, and overall somatization. Temperamentally based attentional focus is critical to emotion regulatory processes and is linked to critical developmental milestones early in life, such as physiological homeostasis and the development of peer relationships.⁷⁶

IMPLICATIONS FOR CHILD HEALTH AND ILLNESS

Research on processes of coping and attention has clear implications for understanding child health and illness within a biopsychosocial framework. First, coping processes are implicated in adjustment to acute stressful events, to chronic stressful conditions in the environment, and to illness and disease. Coping that involves engagement with the stressor or one's emotional reactions is generally associated with better functioning and fewer emotional, behavioral, and health problems.¹⁴ Furthermore, coping that involves accommodation to the stressor through acceptance, distraction, or cognitive restructuring is associated with better outcomes in response to stressors that are beyond personal control.⁷⁷ In contrast, coping that is characterized by efforts to disengage from or avoid

the stressor and unwanted emotions or thoughts is generally associated with poorer emotional, behavioral, and health outcomes.¹⁴

Second, individual differences in attentional focus, attentional shift, and attentional biases may contribute to individual differences in vulnerability to stress as a risk for illness. The ability to focus attention, for example, on a stressor to appraise its threat value, facilitates effective stress responding and leads to effective emotion and arousal regulation.⁴⁰ The ability to shift attention, particularly away from avoidable negative inputs, also contributes to the ability to regulate arousal, even among infants.⁶⁶ And, finally, attentional biases toward negative or threatening information may lead to a cognitive vulnerability to high levels of emotional distress and somatic symptoms.

Third, an important pathway through which attention influences vulnerability to stress is the relationship between attention and coping. If a particular stressor is appraised to be overwhelming, potentially harmful, or immediately dangerous, all attentional resources may be drained from other areas, such as coping, and focused on the stressor. This is most apparent in cases of extreme, traumatic stress, such as abuse, natural disasters, or serious accidents, but it can also be the case in less severe situations, including episodes of pain or illness. Successfully coping with stress requires that a certain amount of attention be shifted and redirected toward selecting and engaging in coping strategies (such as the attention-demanding strategies of problem solving or cognitive restructuring), and children who are developmentally and situationally able to balance attention between assessing the stress and using adaptive coping strategies may see the best outcomes.

Finally, interventions that enhance both attentional and coping skills are expected to contribute to increased resilience to stress and decreased risk for illness. Interventions that enhance attentional control and the capacity to strategically shift attention are likely to be effective in managing pain and other pediatric conditions. For example, the use of distraction (purposefully shifting attention from pain to an alternative stimulus) has been shown to be effective in helping children manage and cope with acute procedure-related pain.⁷⁸⁻⁸¹ Specific distraction techniques during procedures, such as having parents talk with children about non-pain-related activities and encouraging children to use party blowers, appear to reduce pain and distress. In situations of chronic pain, attention-based coping strategies appear to be important, although evidence supporting the effective use of distraction is mixed.⁸² Instead, using cognitive restructuring to redefine the meaning of the pain and, in doing so, shifting attention away from the threatening properties of the pain, holds promise for coping with chronic pain.⁸³ Although treatment approaches for recurrent abdominal pain (RAP) are still in the "probably efficacious" stage,⁸⁴ one intervention using several cognitive-behavioral coping components, including cognitive self-control techniques such as distraction, led to greater improvements and less pain compared with a control group.⁸⁵⁻⁸⁶

Additionally, interventions that teach children to use complex forms of engagement coping and promote alternatives to the tendency to avoid or disengage from stress are

also likely to enhance children's functioning and decrease the risk for illness. Teaching children to use effective attention

and coping skills to deal with illness and stress will help enhance their emotional, mental, and physical well-being.

REFERENCES

- Boyce WT, Barr RG, Zeltzer LK: Temperament and the psychobiology of childhood stress. *Pediatrics* 90:483–486, 1992
- Drossman DA: Chronic functional abdominal pain. *Am J Gastroenterol* 91:2270–2281, 1996
- Hyams JS, Hyman PE: Recurrent abdominal pain and the biopsychosocial model of medical practice. *J Pediatr* 133:473–478, 1998
- Zeltzer L, Bursch B, Walco G: Pain responsiveness and chronic pain: A psychobiological perspective. *J Dev Behav Pediatr* 18:413–422, 1997
- Walker L: The evolution of research on recurrent abdominal pain: History, assumptions, and a conceptual model, in McGrath PJ, Finley GA (eds): *Chronic and Recurrent Pain in Children and Adolescents*. Seattle, WA, IASP Press, 1999
- Compas BE, Thomsen AH: Coping and responses to stress among children with recurrent abdominal pain. *J Dev Behav Pediatr* 20:323–324, 1999
- Meyer RJ, Haggerty RJ: Streptococcal infections in families: Factors altering individual susceptibility. *Pediatrics* 29:539–549, 1962
- Boyce WT, Jensen EW, Cassel JC, et al: Influence of life events and family routines on childhood respiratory tract illness. *Pediatrics* 60:609–615, 1977
- Boyce WT, Chesterman EA, Martin N, Folkman S, Cohen F, Wara D: Immunologic changes occurring at kindergarten entry predict respiratory illnesses after the Loma Prieta earthquake. *J Dev Behav Pediatr* 14:296–303, 1993
- Walker LS, Garber J, Smith C, Van Slyke DA, Claar RL: The relation of daily stressors to somatic and emotional symptoms in children with and without recurrent abdominal pain. *J Consult Clin Psychol* 69:85–91, 2001
- Walker LS, Smith CA, Garber J, Van Slyke DA: Development and validation of the Pain Response Inventory for Children. *Psychol Assess* 9:392–405, 1997
- Compas BE, Connor JK, Osowiecki D, Welch A: Effortful and involuntary responses to stress: Implications for coping with chronic stress, in Gottlieb BH (ed): *Coping with Chronic Stress*. New York, NY, Plenum Press, 1997, pp 229–256
- Compas BE, Connor JK, Thomsen AH, et al: Getting specific about coping: Effortful and involuntary responses to stress in development, in Lewis M, Ramsey D (eds): *Soothing and Stress*. New York, NY, Cambridge University Press, 1999, pp 229–256
- Compas BE, Connor-Smith JK, Saltzman H, et al: Coping during childhood and adolescence: Problems, progress, and potential. *Psychol Bull* 127:87–127, 2001
- Shiffrin RM: Attention, automatism, and consciousness, in Cohen JD, Schooler JW (eds): *Scientific Approaches to Consciousness*. Mahwah, NJ, Erlbaum, 1997, pp 49–64
- Shiffrin RM, Schneider W: Controlled and automatic human information processing: II. Perceptual learning, automatic attending, and a general theory. *Psychol Rev* 84:127–190, 1977
- Schacter DL: *Searching for Memory: The Brain, the Mind, and the Past*. New York, NY, BasicBooks, 1996
- Mathews A, MacLeod C: Cognitive approaches to emotion and emotional disorders. *Annu Rev Psychol* 45:25–50, 1994
- McNally RJ: Automaticity and the anxiety disorders. *Behav Res Ther* 33:747–754, 1995
- Derryberry D, Rothbart MK: Reactive and effortful processes in the organization of temperament. *Dev Psychopathol* 9:633–652, 1997
- Rothbart MK: Temperament: A developmental framework, in Strelau J, Angleitner A, (eds): *Explorations in Temperament: International Perspectives on Theory and Measurement*. New York, NY, Plenum Press, 1991, pp 61–74
- Bargh JA: The automaticity of everyday life, in Wyer RS (ed): *The Automaticity of Everyday Life: Advances in Social Cognition*, vol 10. Mahwah, NJ, Erlbaum, 1997, pp 1–61
- Mischel W: Was the cognitive revolution just a detour on the road to behaviorism? On the need to reconcile situational control and personal control, in Wyer RS (ed): *The Automaticity of Everyday Life: Advances in Social Cognition*, vol 10. Mahwah, NJ, Erlbaum, 1997, pp 181–186
- Metcalf J, Mischel W: A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychol Rev* 106:3–19, 1999
- Daleiden EL, Vasey MW: An information-processing perspective on childhood anxiety. *Clin Psychol Rev* 17:407–429, 1997
- Vasey MW, El-Hag N, Daleiden EL: Anxiety and the processing of emotionally threatening stimuli: Distinctive patterns of selective attention among high- and low-test-anxious children. *Child Dev* 67:1173–1185, 1996
- Balaban MT, Snidman N, Kagan J: Attention, emotion, and reactivity in infancy and early childhood, in Lang PJ, Simons RF, Balaban M (eds): *Attention and Orienting: Sensory and Motivational Processes*. Mahwah, NJ, Lawrence Erlbaum Associates, 1997, pp 369–391
- Kagan J, Snidman N, Arcus DM: Initial reactions to unfamiliarity. *Curr Dir Psychol Sci* 1:171–174, 1992
- Ledoux J: *The emotional brain*. New York, NY, Touchstone, 1996
- Berntson GG, Bigger T, Eckberg DL, et al: Heart rate variability: Origins, methods, and interpretive caveats. *Psychophysiology* 34: 623–648, 1997
- Grossman P: Respiratory and cardiac rhythms as windows to central and autonomic biobehavioral regulation: Selection of window frames, keeping the panes clean and viewing the neural topography. *Biol Psychol* 34:131–161, 1992
- Porges SW, Doussard-Roosevelt JA, Maiti AK: Vagal tone and the physiological regulation of emotion, in Fox NA (ed): *The development of Emotion Regulation: Biological and Behavioral Considerations*. *Monogr Soc Res Child Dev*, Serial No. 240, 59, 1994, pp 167–186
- Barkley RA: *ADHD and the nature of self-control*. New York, NY, Guilford Press, 1997
- Dempster FN: The rise and fall of the inhibitory mechanism: Toward a unified theory of cognitive development and aging. *Dev Rev* 12:45–75, 1992
- Fox NA: Dynamic cerebral processes underlying emotional regulation. *Monogr Soc Res Child Dev* 59:152–166, 1994
- Talpert SF, Brown SA, Myers MG, Granholm E: The role of neurocognitive abilities in coping with adolescent relapse to alcohol and drug use. *J Stud Alcohol* 60:500–508, 1997
- Barr RG, Young SN, Wright JH, Gravel R, Alkawas R: Differential calming responses to sucrose taste in crying infants with and without colic. *Pediatrics* 103:e68, 1999
- Blass EM, Ciaramitaro V: A new look at some old mechanisms in human newborns: Taste and tactile determinants of state, affect, and action. *Monogr Soc Res Child Dev* 59:v–81, 1994
- Rothbart MK, Bates JE: Temperament, in Damon W, Eisenberg N (eds): *Handbook of Child Psychology*, vol 3: Social, Emotional, and Personality Development. New York, NY, Wiley, in press

40. Rothbart MK, Posner MI, Boylan A: Regulatory mechanisms in infant development, in Enns JT (ed): *The Development of Attention: Research and Theory*. New York, NY, Elsevier Science, 1990, pp 47–66
41. Skinner EA: *Perceived Control, Motivation, and Coping*. Thousand Oaks, CA, Sage, 1995
42. Pennebaker J: *Opening Up: The Healing Power of Expressing Emotions* (rev ed). New York, NY, The Guilford Press, 1997
43. Wegner DM: Ironic processes of mental control. *Psychol Rev* 101:34–52, 1994
44. Compas BE: Coping with stress during childhood and adolescence. *Psychol Bull* 101:393–403, 1987
45. Cannon W: *The Wisdom of the Body*. New York, NY, Norton, 1933
46. Cannon W: The significance of emotional level. *Sci Mon* 38:101–110, 1934
47. Gray JA: The neuropsychology of temperament, in Strelau J, Angleitner A, (eds): *Explorations in Temperament: International Perspectives on Theory and Measurement*. New York, NY, Plenum, 1991, pp 105–128
48. Krohne HW: Individual differences in coping, in Zeidner M, Endler NS (eds): *Handbook of Coping: Theory, Research, and Application*. New York, NY, Wiley, 1996, pp 381–409
49. Ebata A, Moos R: Coping and adjustment in distressed and healthy adolescents. *J Appl Dev Psychol* 12:33–54, 1991
50. Tobin DL, Holroyd KA, Reynolds RV, Wigal JK: The hierarchical factor structure of the Coping Strategies Inventory. *Cognit Ther Res* 13:343–361, 1989
51. Ayers TS, Sandler IN, Twohey J: Conceptualization and measurement of coping in children and adolescents, in Ollendick TH, Prinz RJ (eds): *Advances in Clinical Child Psychology*, vol 20. New York, NY, Plenum Press, 1998, pp 243–301
52. Compas BE: An agenda for coping research and theory: Basic and applied developmental issues. *Int J Behav Dev* 22:231–237, 1998
53. Eisenberg N, Fabes RA, Guthrie I: Coping with stress: The roles of regulation and development, in Sandler IN, Wolchik SA (eds): *Handbook of Children's Coping with Common Stressors: Linking Theory, Research, and Intervention*. New York, NY, Plenum, 1997, pp 41–70
54. Gunnar M: Psychoendocrine studies of temperament and stress in early childhood: Expanding current models, in Bates JE, Wachs TD (eds): *Temperament: Individual Differences at the Interface of Biology and Behavior*. Washington, DC, American Psychological Association, 1994, pp 25–38
55. Rothbart MK (eds): *Temperament in Childhood*. Chichester, UK, Wiley & Sons, 1988, pp 59–73
56. Moss E, Gosselin C, Parent S, Rousseau D, Dumont M: Attachment and joint problem-solving experiences during the preschool period. *Soc Dev* 6:1–17, 1997
57. Normandeau S, Gobeil A: A developmental perspective on children's understanding of causal attributions in achievement-related situations. *Int J Behav Dev* 22:611–632
58. Ayers TS, Sandler IN, West SG, Roosa MW: A dispositional and situational assessment of children's coping: Testing alternative models of coping. *J Pers* 64:923–958, 1996
59. Connor-Smith JK, Compas BE, Wadsworth ME, et al: Responses to stress in adolescence: Measurement of coping and involuntary stress responses. *J Consult Clin Psychol* 68:976–992, 2000
60. Broadbent DE: *Perception and Communication*. London, UK, Pergamon Press, 1958
61. Kahneman D: *Attention and Effort*. New York, NY, Prentice-Hall, 1973
62. Norman DA, Shallice T: Attention to action: Willed and automatic control of behavior, in Davidson RJ, Schwartz GE, Shapiro D (eds): *Consciousness and Self-Regulation*, vol 4. New York, NY, Plenum, 1986, pp 1–18
63. Posner MI: Attention in cognitive neuroscience: An overview, in Gazzaniga MS (ed): *The Cognitive Neurosciences*. Cambridge, MA, MIT Press, 1995, pp 615–624
64. Posner MI, Rothbart MK: Attentional mechanisms and conscious experience, in Milner D, Rugg M (eds): *The Neuropsychobiology of Consciousness*. San Diego, CA, Academic Press, 1992, pp 91–111
65. Gotlib I, MacLeod C: Information processing in anxiety and depression: A cognitive-developmental perspective, in Burack JA, Enns JT (eds): *Attention, Development, and Psychopathology*. New York, NY, Guilford Press, 1997, pp 350–378
66. Rothbart MK, Ziaie H, O'Boyle C: Self-regulation and emotion in infancy, in Eisenberg N, Fabes RA (eds): *Emotion and Self-Regulation in Early Development: New Directions in Child Development*. San Francisco, CA, Jossey-Bass, 1992, pp 7–24
67. Eisenberg N, Fabes RA, Bernzweig J, et al: The relations of emotionality and regulation to preschoolers' social skills and socio-metric status. *Child Dev* 64:1418–1438, 1993
68. Eisenberg N, Guthrie IK, Fabes RA, et al: The relations of regulation and emotionality to resiliency and competent social functioning in elementary school children. *Child Dev* 68:295–311, 1997
69. Ruddy MG: Attention shifting and temperament at 5 months. *Infant Behav Dev* 16:255–259, 1993
70. Vasey MW, Daleiden EL, Williams LL, Brown LM: Biased attention in childhood anxiety disorders: A preliminary study. *J Abnorm Child Psychol* 23:267–279, 1995
71. Asmundson GJ, Stein MB: Selective processing of social threat in patients with generalized social phobia: Evaluation using a dot-probe paradigm. *J Anxiety Disord* 8:107–117, 1994
72. Mogg K, Bradley BP, Williams R, Mathews A: Subliminal processing of emotional information in anxiety and depression. *J Abnorm Psychol* 102:304–311, 1993
73. Eccleston C: Chronic pain and distraction: An experimental investigation into the role of sustained and shifting attention in the processing of chronic persistent pain. *Behav Res Therapy* 33:391–405, 1995
74. Eccleston C, Crombez G: Pain demands attention. *Psychol Bull* 125:356–366, 1999
75. Mathews G, Wells A: Attentional processes, dysfunctional coping, and clinical intervention, in Zeidner M, Endler NS (eds): *Handbook of Coping: Theory, Research, and Applications*. New York, NY, Wiley, 1996, pp 573–601
76. Wilson BJ, Gottman JM: Attention—the shuttle between emotion and cognition: Risk, resiliency, and physiological bases, in Hetherington EM, Blechman EA, et al (eds): *Stress, Coping, and Resiliency in Children and Families*. Family Research Consortium: *Advances in Family Research*. Mahwah, NJ, Erlbaum, 1996, pp 189–228
77. Weisz JR, McCabe MA, Dennig MD: Primary and secondary control among children undergoing medical procedures: Adjustment as a function of coping style. *J Consult Clin Psychol* 62:324–332, 1994
78. Kendall PC, Flannery-Schroeder E, Panichelli-Mindel SM, Southam-Gerow M, Henin A, Warman M: Therapy for youths with anxiety disorders: A second randomized trial. *J Consult Clin Psychol* 65:366–380, 1997
79. Blount RL, Powers SW, Cotter MW, Swan S, Free K: Making the system work: Training pediatric oncology patients to cope with their parents to coach them during BMA/LP procedures. *Behav Mod* 18:6–31, 1994
80. Kazak AE, Penati B, Boyer BA, et al: A randomized controlled prospective outcome study of a psychological and pharmacological intervention protocol for procedural distress in pediatric leukemia. *J Pediatr Psychol* 21:615–631, 1996
81. Gonzalez JC, Routh DK, Armstrong FD: Effects of maternal distraction versus reassurance on children's reactions to injections. *J Pediatr Psychol* 18:593–604, 1993

82. Fernandez E, Turk DC: The utility of cognitive coping strategies for altering pain perception: A meta-analysis. *Pain* 38:123–135, 1989
83. Eccleston C: Chronic pain and distraction: An experimental investigation into the role of sustained and shifting attention in the processing of chronic persistent pain. *Behav Res Ther* 33:391–405, 1995
84. Janicke DM, Finney JW: Empirically supported treatments in pediatric psychology: Recurrent abdominal pain. *J Pediatr Psychol* 24:115–127, 1999
85. Sanders MR, Rebetz M, Morrison M, et al: Cognitive-behavioral treatment of recurrent nonspecific abdominal pain in children: An analysis of generalization, maintenance, and side effects. *J Consult Clin Psychol* 57:294–300, 1989
86. Sanders MR, Shepherd RW, Cleghorn G, Woolford H: The treatment of recurrent abdominal pain in children. A controlled comparison of cognitive-behavioral family intervention and standard pediatric care. *J Consult Clin Psychol* 62:306–314, 1994

Literary Quotes

Doctor Johnson on Corporal Punishment

Samuel Johnson (1709–1784) is generally regarded as the outstanding English literary figure of the second half of the eighteenth century. In addition to his poetry and essays he is best known for compiling the monumental Dictionary of the English Language. James Boswell's (1740–1795) The Life of Samuel Johnson (1791) describes his brilliance and eccentricities.

Since European literature had not yet arrived at a point of describing the experience of childhood with interest or compassion, we should not expect to find in these authors' writings much understanding of the problems of childhood or of competent advice about child rearing. Consider Johnson's views on discipline, as reported by Boswell:

Johnson, upon all occasions, expressed his approbation of enforcing instruction by means of the rod. "I would rather (said he) have the rod to be the general terrour to all, to make them learn, than tell a child, if you do thus, or thus, you will be more esteemed than your brothers or sisters. The rod produces an effect which terminates in itself. A child is afraid of being whipped, and gets his task, and there's an end on't; whereas, by exciting emulation and comparisons of superiority, you lay the foundation of lasting mischief; you make brothers and sisters hate each other."

Literary genius is no guarantee of accurate insights into children and their needs, especially before about 1800. However, since then, literature has become a rich resource.

Boswell J: *The Life of Samuel Johnson*. New York, NY, Viking Penguin, 1986, pp 40–41

Noted by William B. Carey, M.D.