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ABSTRACT

This paper reviews recent empirical and conceptual studies pertaining to stress in childhood and offers an integrative, cognitive-developmental theory for understanding childhood stress and coping. The theory builds upon Hunt's (1979) view of the epigenesis of intrinsic motivation and Block's (1982) formulation of assimilation and accommodation processes in personality dynamics. Key theoretical assumptions in the literature on adult stress, adaptation, and coping are first pointed out. Nine key questions are formulated to assess the usefulness of the adult stress-coping paradigm for understanding stress in children and adolescents. With respect to the theoretical assumptions of the adult stress-coping paradigm, the first two questions address the "stressor/appraisal/distress" sequence and the primacy of external stressors in producing distress reactions. The third question focuses on the diseases-of-adaptation syndrome. Questions four through seven address the importance of organismic tendencies in moderating the relationship between stress and distress, as well as the development of these coping resources. The eighth question inquires into the effectiveness of stress-coping interventions for treating children's behavior disorders. Finally, the ninth question sets the stage for the presentation of an integrative formulation for understanding childhood stress and coping. (RH)

Childhood Stress and Coping:

A Review and Cognitive-Developmental Theory

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Abstract

This paper examines the utility of the stress-coping paradigm for understanding the manifestation and timing of behavioral disorders of childhood and adolescence. The child's "biopsychosocial competencies," or coping resources, are emphasized as moderating the relationship between external stressors and distress reactions. The stress-coping skills of children and adolescents are viewed from a cognitive-developmental perspective, emphasizing intrinsic motivation and the "problem of the match."

Childhood Stress and Coping: A Review and Cognitive-Developmental Theory

The relationship between the occurrence of stressful life events and subsequent physical and psychological symptoms has been the subject of much theoretical speculation and research in recent years (e.g., Dohrenwend and Dohrenwend, 1974; Sarason, Johnson, and Siegel, 1978). Most of the studies have been concerned with stressors encountered in adulthood. The impact of stressful changes upon the development of children and adolescents has received less attention (Rutter, 1981). Childhood is certainly not a time of life which is exclusively blissful and carefree. Indeed, Elkind (1981) has characterized the youth of today as a "hurried generation," pressured to grow up too fast intellectually, physically, sexually, and socially by parents espousing societal values that place undue emphasis on early achievement, with less support from traditional social units such as the family. This paper reviews recent empirical and conceptual studies pertaining to childhood and stress and offers an integrative, cognitive-developmental theory for understanding childhood stress and coping, building upon Hunt's (1979) view of the epigenesis of intrinsic motivation and Block's (1982) recent reformulation of assimilation-accommodation processes in personality dynamics.

Key theoretical assumptions in adult stress, adaptation, and coping:

In order to ascertain the impact of external and internal changes ("stresses") upon the course of normal development in youth, it is first necessary to state in operational terms the important theoretical assumptions of the stress-coping paradigm as derived from adult studies. Four assumptions are offered as a working framework: (1) the "Stressor - Appraisal - Distress" sequence;

(2) the "Diseases of Adaptation" - Tissue Damage assumption; (3) the importance of organismic "competencies," or coping resources, in moderating the relationship between stressors and distress; and (4) the applicability of specific procedures for enhancing self-regulation or self-control of the stress-appraisal-distress sequence.

The "Stressor - Appraisal - Distress" Sequence:

The original paradigmatic studies by Holmes and Rahe (Holmes and Rahe, 1967; Holmes and Masuda, 1974) and Selye (1956) emphasized the primacy of external stressor(s) which would elicit a uniform, generalized pattern of physiological, behavioral, and emotional responses (i.e., "distress") following a predictable sequence (i.e., Selye's "General Adaptation Syndrome"). It was somewhat later that the importance of cognitive appraisal was recognized as a mediator of the relationship between stressors and distress (Lazarus, 1966; Lazarus and Launier, 1980). Nevertheless, the presumption of an increased risk for physical or psychological symptoms following exposure to negative life changes as a uniform response of most people (regardless of the appraisal process) remains a strong inference of the stress-coping paradigm. This situationalism, stemming from behavioristic origins, is still pronounced and a distinguishing feature of this paradigm in contradistinction to personalistic, dispositional theories of adjustment. A corollary assumption is that stressful life changes may be causally related to both short-term disruption in behavior or autonomic balance and also to more long-lasting diseases of distress (Rutter, 1981).

The "Diseases of Adaptation" - Tissue Damage assumption:

Selye's (1956) GAS model popularized the "diseases of adaptation" notion, i.e., that certain tissue damage (which appears transiently during the acute alarm reaction) occurs during the exhaustion or breakdown stage. The diseases of distress (now expanded to include the chief causes of death----cardiovascular disorders, even cancer) may involve psychosocial stressor interactions with physiological vulnerabilities (cf., Sternbach, 1966). Persons with these disorders present different psychological symptoms from those characteristic of neurotic conditions: there is less overt anxiety, with either pronounced preoccupation with physical complaints (hypochondriacal sensitizing) or denial and repression of concerns about physical symptoms (repressor type). Relative emotional constriction and inability to find appropriate words to describe feeling states ("alexithymia") are characteristics frequently reported (Sifneos, Apfel-Savitz, and Frankel, 1977). The hallmark of such psychophysiological disorders, however, has traditionally been that demonstrable physical changes (typically in the smooth muscles) or actual tissue damage is the primary locus for stress-related breakdown. The assumption of a direct influence of psychosocial stressors upon physical condition constitutes the second strong inference of the stress-coping paradigm.

The Mediating Influence of Organismic "Competencies":

According to this assumption the impact of negative life changes upon the individual is mediated by that individual's biopsychosocial competencies which provide "coping resources" for transacting with the environment (Sawin, Hawkins, Walker, and Penticuff, 1980; Bugen

and Hawkins, 1981). The assumption of a "person by situation" interaction or ongoing transactional process in this coping model is essential. Without this assumption this view on organismic competencies adds nothing to traditional personalistic, dispositional formulations of individual differences in hypothetical constructs such as "ego-strength."

Self-Regulation Training of the Stress - Appraisal - Distress Sequence:

Biofeedback and cognitive behavior therapy techniques represent treatment interventions which are theoretically compatible with the preceding theses of the stress-coping paradigm. These techniques share the additional assumption that adaptive behavior and/or personal well-being can be fostered by assisting the individual to break the connection between stress and distress through self-utilization of biopsychosocial competencies. These interventions, in contrast to traditional psychotherapy, are direct, symptom-focused procedures implemented with or without "insight," emphasizing the acquisition or utilization of active, problem-solving skills and attitudes.

Childhood and Stress: Some Key Questions

Given the theoretical assumptions of the stress-coping paradigm as derived from adult studies, some key questions will facilitate the assessment of the utility of this paradigm with children and adolescents:

(1) What are the kinds of experiences that children find distressing?

(2) Do these stressors differ from the stressful life changes determined for adults?

(3) Does the occurrence of life stressors lead to physical or psychological symptoms of distress in children and adolescents?

(4) What is the evidence that the relationship between external stressors and distress is mediated by a child's "coping resources?"

(5) Are there developmental changes in the stress-coping processes of children which parallel the shifts in the content of external stressors?

(6) To what extent are these changes in the stress-coping processes related to stages of cognitive-affective development?

(7) How are children's distress reactions or stress-coping responses influenced by the transactional process with their parents, siblings, peers, etc.?

(8) How useful are biofeedback and/or cognitive behavior therapies for breaking the connection between stress and distress in children and adolescents?

(9) Can we predict continuities in successful coping for individual children that may be related to specifiable developmental fostering experiences?

With respect to the previously stated theoretical assumptions of the stress-coping paradigm, the first two questions address the "Stressor-Appraisal-Distress" sequence and the inference about the primacy of the external stressors in producing distress reactions. The third question refers to the diseases of adaptation syndrome assumption. Questions four through seven address the importance of organismic tendencies in moderating the relationship between stress and distress, as well as the development of these coping

resources. The eighth question asks about the effectiveness of the stress-coping interventions with behavior disorders of children. Finally, the ninth question sets the stage for the presentation of an integrative formulation for understanding childhood stress and coping, based in part on Hunt's (1979) theory of the epigenesis of intrinsic motivation.

Life events considered stressful to children and adolescents

In many of the studies using adult subjects, stressful life changes, whether pleasant or unpleasant, have been hypothesized to evoke distress symptoms in proportion to the subjectively estimated magnitude of required adaptation (Dohrenwend & Dohrenwend, 1974). In the original procedure (Holmes & Rahe, 1967) "points" were assigned in proportion to the subjectively perceived magnitude of adjustment to the change event, whether it be positive or negative. The total number of points accumulated in a 1-2 year period has been found to predict the occurrence of physical and/or psychological symptoms (Holmes & Masuda, 1974). In an alternate procedure, pleasant events are distinguished from unpleasant events that have occurred, and the subject is asked to rate the "impact" of the event, thus allowing for individually determined subjective weights (Sarason, Johnson, and Siegel, 1978). Table I shows some stressful life events listed on the Holmes-Rahe measure (listed in decreasing order of readjustment stressfulness). As a general rule, unpleasant events appear to be more stressful than pleasant events.

Surveys of stressful life experiences for children and adolescents have been developed following a similar line of reasoning.

These instruments include Coddington's (1972) 37-item modification of the Holmes-Rahe Social Readjustment Rating Scale, Johnson and McCutcheon's (1980) Life Events Checklist, an adaptation of Sarason Johnson, and Siegel's (1978) Life Experiences Survey, Chandler's (1981) Source of Stress Inventory, and Yamamoto's (1979) Stressful Experiences Rating Scale. The measures by Coddington and Chandler utilized the ratings of childhood stressors provided by mental health professionals and teachers, while Yamamoto's scale used children's own impressions.

Examination of Table I reveals a considerable overlap in the kinds of experiences that are regarded as stressful for adults and children (as rated by adults). Inspection of Table 2, however, shows that adult and child raters may, for example, disagree on the experiences that are stressful for elementary school aged children. Children rated parental fights and academic retainment as more stressful than did professionals. Children also experienced certain events as upsetting which were not listed by the adult professionals (e.g., wetting in class, suspected of lying). The frequency with which the children in Yamamoto's sample reported experiencing these change events did not account for the rated upsettingness.

Does the occurence of stressful life events lead to physical or psychological symptoms of distress in children and adolescents? Parental ratings of children's behavior problems show statistically significant, but low correlations with parental reports of recent stressful experiences affecting the children (Note 1), (e.g., Gersten, Langner, Eisenberg, & Ozek, 1974; Johnson & McCutcheon,

1980; Sandler & Block, 1979). In a more systematic, controlled study Kashani, Hodges, Simonds, and Hildebrand (1981) compared life events in three groups of 7-12 year old children: hospitalized psychiatric, hospitalized pediatric, and non-patient non-hospitalized children. Parents of the children in the psychiatric group reported significantly more life events befalling their children. This study still relies upon parental retrospective accounts. To date, there are few systematic <u>prospective</u> studies showing that frequency of upsetting experiences reported by a child predicts subsequent physical/psychological adjustment status. Meyer and Haggerty's (1962) early finding that family diary records of "upsetting events" reliably predicted in the offspring occurrences of upper respiratory infections (objectively measured by throat cultures of streptococci) needs to be supplemented by more controlled studies.

Another line of evidence comes from reviews by Rutter (1979; 1981). Rutter reviewed studies linking psychological disturbance with parental separation, one of the most commonly named stressful upsets experienced by children. His conclusion was that separation was <u>not</u> the crucial factor in acute distress syndromes sometimes shown after hospitalization of a child, in intellectual retardation, or in conduct disorders. Purcell (1975) has also convincingly demonstrated that family separation is not a necessary and sufficient cause of asthma attacks, although strong emotions (anger, crying, etc.) are immediate triggers of wheezing. Rutter (1981) contends that there are different kinds of stressors, those such as the birth of a

sibling (Dunn, Kendrick, and MacNamee, 1981) or single hospital admissions (Quinton and Rutter, 1976), which are associated with only transient distress reactions, and more serious stressors, which may sensitize the child for longer periods of time. One example of the second type of stressor is parental disharmony (arguments, fights), which Rutter (1979) contends is a more important contributing factor to psychological disturbances of children, particularly conduct disorders in boys. Parenthetically, in Yamamoto's study parental fights were rated by children as the fifth most upsetting event they experienced. Moreover, Kashani et al. found that hospitalized psychiatric children were distinctive in that they typically encountered much higher rates of parental arguments and divorce.

To summarize this section, although there appears to be considerable overlap in the kinds of life events both adults and children experience as stressful, adult observers' ratings of stressful life changes for children are somewhat discrepant from those of the children themselves, and the relationship between life stress and physical/psychological distress symptoms remains uncertain (Note 2). Why is the relationship between childhood life stresses and distress disorders weak? One possible reason is suggested by Abidin's (1979) operational definition of the major source domain of stress as incorporated in his new instrument, the Parenting Stress Index. The PSI is designed to identify mother-child systems under stress. "Stress" may reside in the "mother's characteristics," and "situational demographic characteristics," in addition to the

"child's characteristics." More explicitly, Chandler (1981) contends that childhood stress arises from failure of the caretaking environment to meet the child's needs, in addition to the environmental stressor(s) present. Alternately, as Rutter (1981) states (p. 333):

> "At least so far as hospital admission, birth of a sib and parental divorce are concerned, it seems that much of the stressful quality of the event lies in its affects on patterns of family interaction and relationships" (i.e., disappointment, loss, discord).

The impact of life stress upon children and adolescents thus is moderated or "buffered" by the presence of support from parents or other persons in the social surround. The importance of moderation of life stress by social supports and other coping resources of the child will now be discussed.

Coping resources as moderators of the relationship between stressors and distress:

Earlier in this paper the thesis was proposed that the impact of negative life changes upon the individual is moderated or mediated by the individual's biopsychosocial competencies which provide "coping resources" for environmental transactions. What is the evidence that the relationship between external stressors and distress is mediated by the child's coping resources?

One prominent example of such a moderator variable from the adult stress-coping literature is the Type A behavior pattern (Friedman & Rosenman, 1974). According to this research the Type A pattern, which is characterized by extremes of

hard-driving competitiveness, impatience with delay, easily aroused hositility, and aggressiveness, is an established risk factor for coronary artery and heart disease. Matthews and her colleagues (Matthews, 1979; Matthews & Angulo, 1980; Matthews & Volkin, 1981) have studied the developmental origins of the Type A pattern in children and adolescents using a 17-item instrument (i.e., the MYTH) which classifies children according to the extent they exhibit Type A-like behavior in the classroom. The classification of adolescents as "Type A's" or "Type B's" is accomplished by an adaptation of the semi-structured interview used with adults (Siegel, Matthews, and Leitch, 1981). Preliminary findings suggest that Type A children, like adults, are prone to respond to stress situations involving competitive achievement (e.g., holding a heavy weight in one's hand as long as possible, a toy car race) or where patient effort (e.g., star-tracing) or the opportunity for aggressive responding (e.g., playing with a Bobo doll) is encountered, with the same characteristic behaviors as do Type A adults: they exhibit strenuous efforts to maintain the perception of control in a skill situation, frustration and impatience in a tedious task situation, and increased aggression. Boys tended to exhibit more Type A behavioral tendencies than girls. Wolf, Sklor, Wenzl, Hunter, and Berenson (1982) have recently reported the vaildation of an additional 24-item Likert type rating scale for the Type A behavior in children in grades 5 through 8. This scale is completed by the children themselves rather than by adults. Consistent with the MYTH findings children,

especially boys, classified as Type A by the A-B Rating Scale, exhibited more intense, competitive achievement striving in comparison to the Type B children. White children scored higher than black children on the Type A behavior pattern measure.

Type A adults tend to respond to competitive situations with increased systolic blood pressure and elevated levels of plasma catecholamines (Matthews, 1979). These physiological reactions are regarded as antecedent risks to cardiovascular heart disease. There is no conclusive evidence that Type A children or adolescents are beginning to develop physiological changes or "tissue damage" as a result of their behavioral pattern. In a preliminary report of the biracial Bogalusa Heart Study (Wolf et al., 1982), however, Type A children obtained significantly higher mean serum cholesterol and triglyceride levels than Type B children, while black Type A boys had higher systolic blood pressure. Along these same lines, Siegel and her colleagues (Siegel, 1981; Siegel, Matthews, and Leitch, 1981) have recently reported that adolescents self-reporting high levels of anger, a core characteristic of the Type A behavior pattern, showed higher cholesterol levels, had more reports of cardiovascular arousal (i.e., shortness of breath, heart racing, and light-headedness), smoked more, had less physical activity, and exhibited more Type A behavior, relative to adolescents in the low anger group. The high anger group also reported lower levels of self-esteem and more life dissatisfaction. These preliminary findings would seem to warrant further

close examination of the Type A behavioral pattern, and specifically the anger component, in longitudinal studies of cardiovascular risk and psychological adjustment (Note 3).

The potential relationship between adolescent anger and the antecedents of cardiovascular risk and phychosocial dissatisfaction may link to Rutter's (1979) comment that the quality of the home life is more closely associated with the adjustment status of the offspring than is the presence of an intact parental unit. Family violence clearly follows an intergenerational cycle (Rutter, 1979). But what specifically comprises the risk factors that contribute to disharmonious family relations? Rutter's (1979) summary of the factors contributing to vulnerability or invulnerability to life stressors is instructive. He divides these factors as follows: (1) multiplicity of stresses; (2) change in circumstances; (3) factors in the child; (4) factors in the family; (5) factors outside the home. These divisions correspond roughly to Bronfenbrenner's (1979) ecological framework for individual development, respectively: (a) the mesosystem - involving the interactional compounding of multiple stressors at various levels; (b) the macrosystem - the current beliefs, values, and attitudes surrounding contemporary family life; (c) the ontogenic system - the child's individual psychological competencies for dealing with a stress; (d) the microsystem - social support from the family, parent-child relations; and (e) the exosystem - external social supports available to the family. The important unifying principle is that the causes of distress in children are multiple and interacting.

Multiplicity of stresses: The presence of a stressor potentiates the damage caused by another. The biopsychosocial competencies of the child or parent have limited resiliency to multiple stresses, and one stressor (biological or social) may lead to another. Sameroff and Chandler (1975) stated this pessimistic tendency succinctly in their concept of caretaking casualties. Infants with biophysical problems (i.e., reproductive casualties) may be at increased risk for failure in parent-infant attachment formation, especially in the presence of adverse social circumstances.

Changes in circumstances: When stressors such as parental discord are removed, the risk for psychiatric impairment in the child is reduced (Rutter, 1979). It should be noted, however, that plasticity cuts both ways: a period of favorable curcumstances does not necessarily yield a child or adult who is invulnerable to the impact of a subsequent series of stressful life changes (Hunt, 1979, 1980).

Factors in the child: Rutter (1979) mentions several individual risk factors. First, male children (and adults) are more susceptible to distress reactions to psychosocial stressors such as parental discord. The reasons for this gender associated vulnerability difference are uncertain, although undoubtedly both genetic and social factors are involved. A very important moderating variable is the child's temperament: children with "difficult" temperaments (i.e., showing low regularity, low malleability, negative mood, and low fastidiousness; Rutter, 1979; Thomas & Chess, 1978) are more at risk for psychiatric disorder, and transactionally are more likely to be the target of parental discord and

criticism (Buss & Plomin, 1975). Rutter (1979) tends to endorse a diathesis-stress view of vulnerable children from troubled families: the stress of marital discord is much more likely to lead to psychological and physical distress in the child if the parent(s) have life-long personality disorders (e.g., antisocial behavior, alcoholism, criminality). The "diathesis" or predisposition involves genetic factors, since current research shows that antisocial behavior in the offspring (especially boys) is associated more closely with the criminal tendencies of the biological father than of the adoptive father (Hutchings & Mednick, 1974, as cited by Rutter, 1979). On a more optimistic note, Rutter (1979) suggests that children's coping skills may enable them some protection from family disharmony. It would seem crucially important that research studies be conducted to understand how "invulnerable" children escape the deleterious effects of living with a disturbed parent (cf. Murphy and Moriarty, 1976; Werner and Smith, 1982). The child's gender, age (i.e., between 6 months and 4 years most vulnerable), intelligence, and perceived social competence undoubtedly play a role (Emery, 1982; Harter, 1982; Kohlberg et al., 1972; Rutter, 1981; Thomas and Chess, 1978), as well as the presence of social support within and outside of the family. There may also be additional behavioral/cognitive skills (Zeitlin, 1980) that the child could learn to cope with stress, such as fantasy and empathy abilities (Bryant, 1982; Rosenfeld, Huesman, Eron, and Tourney-Purta, 1982). One model of coping developed for adults (Bugen & Hawkins, 1981) would predict that children's coping strategies would lie in the domains of "direct action"

(instrumental efforts to remove the stressor), "life review" (cognitive perspective taking and reframing), and "emotional maintenance" (use of short-term tension reduction efforts). Effective coping would probably be most closely associated with instrumental effectiveness, with developmental changes evident in the increasing use of cognitive strategies in addition to emotional maintenance strategies for palliative coping. Mondell and Tyler (1981) have recently reported data consistent with these predictions.

Factors in the family and factors outside the home: These two categories from Rutter's (1979) review are combined in this discussion, since social support in environmental transactions is the common theme in ameliorating or buffering the child from stresses. Recently, investigators of stress-coping processes in adults have emphasized the importance of this social support "buffering" function (cf., Wilcox, 1981). In a recent review of "life stress, self-preoccupation, and social supports" Sarason (1980) emphasized Bowlby's (1973) assertion that human beings of all ages are happiest when they are confident of receiving the social support of loved ones. Sarason adds that social attachment in early childhood promotes self-efficacy expectations and "...reduces the tendency of anxious self-preoccupation when confronted with a call to action" (p. 90). Sroufe and his colleagues in a series of longitudinal studies have shown that infants who were securely attached to their caregivers at age 12-18 months show more curiosity and problem solving skills at age 2 years, better peer-peer interations at age 3 years, and

more ego-resilience in teacher ratings taken during kindergarten (Matus, Arend, & Stroufe, 1978; Arend, Gove, & Stroufe, 1979). Vaughn, Egland, and Stroufe (1979), however, showed that quality of attachment was less stable in a lower class, disadvantaged sample of mother-infant dyads, with stressful life events associated with change in status of infants from the "secure" to "insecure" attachment categories. Consistent with this emphasis on social support, Rutter (1979) concluded that a warm, close relationship with one parent serves to protect the child from distress evoked in an otherwise unhappy family. Extrafamilial social support (e.g., neighborhood groups, good schools) may also have a protective function. A recent study by Kellam, Ensminger, and Turner (1977) suggests that the social adjustment status and psychological well-being of a sample of first through third grade children growing up in a low income environment was closely related to the presence of second adults in the home to assist the mother with childrearing, with mother/grandmother families showing nearly as good child adjustment and well-being as mother/father families, and better than mother/stepfather, and mother alone families, in that order.

The effectiveness of childhood and adolescent treatment procedures based upon the stress-coping paradigm:

Biofeedback and cognitive behavior therapy represent treatment approaches for enhancing self-regulation and self-control of the stress-appraisal-distress sequence (Blanchard & Epstein, 1978; Meichenbaum, 1977). How useful are these interventions for breaking the connection between stress and distress in children

and adolescents? One area of application of stress-coping training has been the modification of childhood hyperactivity and inattentiveness. Hyperactive children have been taught to use self-instructions to slow down their impulsive response tendencies and improve the accuracy of their answers (Meichenbaum, 1977). Biofeedback training has also been widely used in the treatment of hyperactivity (for a review, see Bhatara, Arnold, Lorance, and Gupta, 1979). EMG biofeedback for muscle relaxation has been clinically useful in improving teacher and parent ratings of children's hyperactive behavior. Bhatara et al., however, contend that the reduction in muscle potential activity with EMG biofeedback occurred chiefly for those hyperactive children who showed initially high levels of EMG activity, i.e., the so-called "anxious hyperactives." Subsequent studies (Hampstead, 1979; Hughes, Henry, & Hughes, 1980) using well-controlled multiple baseline designs have also showed the beneficial effects of EMG biofeedback on reducing activity level, improving time spent attending to academic tasks, and reducing the frequency of problem behaviors---in addition to reducing EMG levels. Finley, Etherton, Dickman, Kariman, & Simpson (1981) have recently described an automated reward system for the biofeedback training of cerebral palsied children. This procedure might produce quicker acquisition of EMG self-control and deeper levels of muscle relaxation in those hyperactive children displaying average initial EMG levels, who may be presumed to be underaroused "sensation seekers." More interestingly, Bird and his colleagues (Bird, Newton, Sheer, & Ford, 1978a,b; Ford,

Bird, Newton, & Sheer, 1980) have shown that it is possible to use biofeedback training to increase or suppress the production of high frequency (i.e., 40 Hz) EEG activity. The "fast wave" activity is characteristic of the cortical arousal shown by normal adults and normal children during problem solving. These investigators suggest that children with "minimal brain dysfunction" may not as readily produce 40 Hz. brain waves during problem solving; EEG biofeedback in this case would be used to speed up rather than relax certain hyperactive children displaying cortical underarousal. Consistent with this speculation is a recent clinical demonstration that contingent biofeedback reinforcement for suppression of alpha wave activity was related to facilitation of performance on an arithmetic task in five inattentive mentally retarded adults (Jackson & Eberly, 1982).

According to the assumption of the stress-coping paradigm the beneficial effects of biofeedback and related techniques are manifested through the enhancement of self-regulation and expectancies of self-efficacy and control (Hawkins, 1980). Omizo (1980) found that with adolescents, EMG biofeedback induced relaxation training was associated with increases in internal locus of control attributions and enhanced aspiration to succeed.

When therapists emphasize skills training and the competencies of troubled adolescents the likelihood of favorable adult outcome is increased over that attained when a focus

upon past conflicts and failures is used (Ricks, 1974, "super-shrink" study). This facilitative effect may be attributable to the supportive presence of a friendly adult who takes an active interest in the day to day concerns of the adolescent and offers tips for problem solving. The importance of social support for children experiencing transitions or life crises is emphasized also by Felner, Norton, Cowen, & Farber (1981) in their preventatively oriented crisis intervention program for primary school children who were experiencing such life change events as parental death, divorce or remarriage, major surgery, etc. Trained, nonprofessional child-aides used abreactive and problem solving techniques in a school setting twice weekly for about six weeks. Preliminary results suggest that the children showed improvements in school adjustment and anxiety reduction. There was no follow-up in this study; however, the findings suggest the value of further research on the impact of crisis intervention programs on the child's long range psychological adjustment.

Developmental changes in the stress-coping processes of children and adolescents:

Are there developmental changes in the stress-coping resources of children and adolescents? If so, to what extent are these changes related to cognitive-affective developmental stages? Expectations for task performance obviously show age-gradation, with task difficulty increasing as the child grows older. The nature of children's fears also show age-related changes, suggestive of emerging cognitive-behavioral competencies. Table 3,

which is adapted from data summarized by Anthony (1970), Jersild and Holmes (1935), and Achenbach (1974), shows the content of children's fears at five chronological age ranges associated with Piaget's cognitive stages. In the first three years of life the chief fears of children center around aloneness and separation issues. In middle childhood fears become more concrete (e.g., animals, injury, and school failure). Finally, in adolescence worries are more abstract (e.g., being different from peers, humiliation, etc.) The relationship between fear content and cognitive-affective development is apparent. Also shown in Table 3 are hypothesized coping skills emergent at each age level.

There have been almost no systematic empirical investigations of developmental changes in the stress-coping processes of children and adolescents (i.e., Bronfenbrenner's "ontogenic" systems level). One notable exception, however, has been studies of the adjustment of children to parental divorce. In a recent review, Kurdek (1981) concluded that older children and adolescents show a higher level of divorce adjustment. Kurdek argues for a cognitive-developmental perspective on children's divorce adjustment, according to which the child's ability to use interpersonal reasoning (e.g., to understand the sequence of events leading to the parents' separation, infer the motives of the parents in the breakup, and assess accurately their own role in the divorce decision) and display an internal locus of control with regard to these life changes positively relates to the child's divorce adjustment. (Note 4).

Efforts toward an intergrative theory for understanding childhood stress-coping

Kurdek (1981) cautions us to view the child's adjustment to parental divorce within Bronfenbrenner's (1979) multivariate, ecological framework (as discussed earlier), which emphasizes reciprocal dialectic changes that occur between the child and the various levels of his/her social context. The problem is that the study of these interactions is exceedingly complex. Therefore, the following outline of an integrative framework for understanding stress-coping is child-centered, emphasizing the child's active efforts to construct a knowledge of his/her world, through which biopsychosocial competencies emerge which enable coping with increasingly complex and difficult tasks, accompanied by positive affect (joy, mastery). The adjustment to stressful life changes is seen as a special case of the child's assimilation - accommodation of new experiences. This perspective thus focuses upon the "appraisal process" as key to understanding the impact of stressors upon the child, just as is the trend in the adult studies. This formulation is based upon Hunt's (1979) theory of the epigenesis of intrinsic motivation, with an acknowledgement ot previous theoretical efforts by Greenspan & Lourie (1981), and by Block (1982).

A cognitive-developmental perspective on the manifestation and timing of behavior disorders of childhood and adolescence

This cognitive-developmental perspective is presented in the form of a series of propositions, some of which are supported by

empirical research and others are still quite speculative:

1. With respect to developmental milestones and tasks, an organism must make adaptive modifications in its structures or schemes in response to change/contrasts in its context. This is an active transactional process involving a reciprocal relation between socio-environmental changes ("stresses") and the increasing behavioral/cognitive competencies of the organism. Human organisms (especially young ones) have considerable "plasticity" to make such adaptive modifications (Hunt 1979, 1980).

2. The pathways of development may be better traced by noting cognitive and social competencies, for example, what Block (1982) has called "ego resilience" and "ego control." Predictions based upon behavioral "symptoms," or personality traits are less accurate (Kohlberg et al., 1972).

3. Distress "symptoms" are more likely to occur at periods of developmental transition or cognitive disequilibration (see Table 3). The organism at such times experiences problems in making the adaptive modifications required to meet developmental task requirements. In Mandler's (1980) terminology (p. 234):

> "anxiety (arises) out of the combination of the interruption of ongoing behavior and thought on the one hand and the unavailability of appropriate situation-relevant task or problem-solving actions on the other." (as cited in Block, 1982)

4. In other words, symptoms occur when a human organism's behavioral and cognitive competencies are insufficiently developed

to assimilate the new information and/or to accommodate to it. Hunt (1961) has called this process the "problem of the match." There exists an optimal discrepancy between novel information and existing structures at which point "mastery" (with its associated positive affect) can occur. If the discrepancy is too small there is boredom. If it is too large, there is negative affect, frustration, lack of persistence, and ultimately, behavioral symptoms of distress (e.g.Selye's (1956) "general adaptation syndrome"). Genetics (temperament, etc.) may influence this "match," as well as early experiences with aversive events (Hunt, 1979).

5. Where the discrepancy between new information to be processed and existing structures is too large, dedifferentiation may occur aiding equilibration efforts by simplifying structures (Block, 1982). Sometimes "one has to regress in order to progress." (Werner, 1957, p. 139). When dedifferentiation is ineffective, "the individual must live with anxiety during the time a creative accommodation is being worked through" (Block, 1982, p. 291). A central problem thus is optimizing for each individual child the intensity and/or duration of "destructure" or anxiety that can be endured while equibibrating structures are being evolved. If tolerance limits are exceeded, distress ensues along with reversion to regressive coping styles (such as frustrative perserveration or random impulsive responding) (Block, 1982).

6. This developmental perspective is not incompatible with other formulations, including social learning/reinforcement

theory. This above model pertains to the initial response acquisition process. Reinforcement processes may stabilize ("strengthen") a particular adaptive or maladaptive behavior or cognitive strategy after its initial occurrence.

7. The issue of developmental change vs. continuity is crucially important. The emphasis is placed upon what Kagan (1971) terms "heterotypic" continuity---developmental processes (e.g., attachment, separation-individuation) reflect changes, not continuities. That is, there is continuity in the style of meeting successive developmental tasks, not in the appearance of certain behaviors. For example, optimal attachment for the one-year old involves some separation protest and clinging. This style is related to more independent exploration and good peer relations in three year olds and teacher reports of "ego-resilience" in five year olds (Arend, Gove, & Sroufe, 1979).

8. The occurrence of behavioral "symptoms" should also be viewed in a broader ecological transactional context as well. For example, the success or difficulty a child may have in meeting a developmental task requirement may be related to the degree of success other family members are having in resolving their own developmental tasks (e.g., adolescent ego-identity formation related to parents' resolution of ego-integrity issues (Levi, Stierlin, & Savard, 1972). Cultural processes ("rites of passage," etc.) are co-determined by biological-cognitive maturational changes in the organism (e.g., puberty) and changes in social roles (e.g., first day of school).

9. The distinction between so-called "transient" and "persistent" maladaptive behaviors requires elaboration in this developmental perspective. The transactional process between organism and socio-environmental context is related to the "diathesis-stress" model for liability to forms of psychopathology (Meehl, 1962; Hawkins, 1980). According to this latter model, a biologic/genetic predisposition is a necessary, but not sufficient, condition for the manifestation of psychopathology. A "stressful" environment provides the additional requirement (threshold effect). Now for the most part developmental psychopathologists have found the "diathesis" to be indicated by rather severe limitations in sensory-perceptual, cognitive, and/or social competencies (e.g., attention dysfunction and low social competence leading to adolescent behavior problems and adult antisocial personality or schizophrenia, in males). The optimistic, philosophical view of an active, growing, resilient human organism, in whom stress symptoms are transitional and transitory phenomena may hold true for most, but certainly not all, behavior problems of childhood and adolescence. There appears to be a limit to "plasticity" in organisms whose biopsychosocial competencies are severely limited or absent (e.g., early infantile autism, organic mental retardation, severe hyperactivity and unsocialized aggressiveness). In such cases, the damaged organism is less responsive to development fostering experiences from the environment. Indeed, the deficiencies may actually bring about a reciprocal deterioration in the quality of the social environmental stimulation (e.g., the coercion

process leading to mutual aggressive responding, Patterson, Reid, Jones, and Conger, 1975). This latter assumption is consistent with the observation that severe childhood psychopathology often involves a compounding of organicity (i.e., limited biopsychosocial competencies) with impoverished socio-environmental stimulation (Sameroff & Chandler, 1975). In the absence of organic damage, however, optimal environments will revive the "plasticity" of the organism to make the required adaptive modifications to its context. Thus, there is probably no "critical period" for an undamaged human organism that has been exposed to impoverished environmental conditions: environmental deprivation may be "reversible" later on (Hunt, 1980).

Thus behavior problems become persistent under the following conditions: (1) Limited plasticity: Severe deficiencies in the behavioral/cognitive competencies of the organism, related to genetic and/or congenital problems; (2) Limited environmental opportunities: When the social environment lacks development fostering characteristics (i.e., maturation is arrested, but plasticity is present), such that environmental enrichment permits "catching up;" and (3) Transitional symptoms stabilized by social learning contingencies: For transitional symptoms that become established, the effect is generally due to consistent social reinforcement for the maladaptive behavior ("secondary gain"); for older children and adolescents, negative labeling may contribute to the stabilization along with psssible negative self attributions. Note that in this third case we are describing a normally developing organism that

encounters life stresses; basic competencies are largely established. However, developmental arrests or regressions may still occur under chronic stress conditions.

Conclusions

This paper has examined through a selective review of the clinical and research literature the utility of the stress-coping paradigm for understanding the manifestation and timing of childhood and adolescent disorders. Some general conclusions follow:

(1) There is suggestive evidence that stressful life changes, particularly family discord and parental fighting, are associated with increased incidence of physical/psychological disturbance in children and adolescents. There are no systematic, controlled studies, however, to indicate that external stressors increase the likelihood of subsequent disorders.

(2) There is some evidence that the impact of stressful life changes is moderated by the child's biopsychosocial competencies, including social support from adults. Delineating the exact nature of these coping resources used by children of different ages is a prime area for future research.

(3) Biofeedback and cognitive behavior therapy have been found to be effective for certain stress-related developmental disorders, particularly hyperactivity and inattentiveness.

(4) Application of the stress-coping paradigm to children and adolescents should be viewed within the context of a cognitive-developmental perspective emphasizing intrinsic motivation and "the problem of the match."

Reference Notes

1. The magnitude of these correlations is .10 to .30, accounting for one to nine per cent of the total variation. A major problem is retrospective rater bias from the parents.

2. To be sure, multiple stressors, unlike single acute episodes do increase the risk for longer term damage to the child (Rutter, 1979).

3. Longitudinal studies of cardiovascular heart disease proneness, stress, and personality characteristics should of course include familial risk factors. For example, Manuch et al. (1981) have found that male undergraduates reporting a parental history of hypertension showed significantly larger increases in systolic blood pressure during performance of a concept formation task than did subjects reporting no parental hypertension. These familial trends in behaviorally induced cardiovascular reactivity may constitute a genetic predisposition which may interact with Type A behavior characteristics to yield individual vulnerability.

4. The relationship between stress-coping processes and developmental transitions experienced by adults has only recently been speculated upon (cf., Brammer and Abrego, 1981; Schlossberg, 1981).

5. Parental attitudes about infant development may provide a prototype or template for parent-infant transactions. Ricks (1982, unpublished data), for example, has found that mothers' self-esteem and recollections of their childhood experience from their own parents were significantly more "negative" in anxiously

attached mother-infant dyads. Sameroff's (1980) categories of parental conceptions of infant development (i.e., symbiotic, categorical, compensating, and perspectivistic) may also mediate the acceptance of infants with "difficult" temperments.

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Table 1. Comparison of rank orders of the "Top 12" stressful life experience "readjustment ratings" for adults and children.

Adults (cf. Holmes & Masuda, 1974)	Children (cf. Sandler & Block, 1979)[a]
1. Death of spouse	1. Death of parent
2. Divorce	2. Divorce of parents
3. Marital separation from spouse	3. Marital separation of parents
4. Detention in jail or institution	4. Child acquired a visible deformity
5. Death of a close family member (other than spouse)	5. Death of a brother or sister
6. Major personal injury or illness	6. Marriage of parent to step-parent
7. Marriage	7. Serious illness or accident requiring hospitalization of the child
8. Being fired from work	8. Serious illness or accident requiring hospitalization of parent
9. Retirement from work	9. Death of child's close friend
10. Marital reconciliation with spouse	10. Discovery by child of being an adopted child
11. Major change in health or behavior of family member	11. Increase in arguments between parents
12. Pregnancy	12. Birth of a brother or sister

Notes: a Stressful life events for children of elementary school age, as rated by mental health professionals and teachers.

Table 2. Comparison of rank orders of the relative stressfulness of negative life change events experienced by elementary school aged children, as judged by mental health professionals and teachers (Chandler, 1981) vs. children's ratings (Yamamoto, 1979).

Adults' Ratings	Children's Ratings
1. Physical child abuse[a]	1. Losing parent
2. Death of a parent	2. Going blind
3. Divorce of parents	3. Academic retainment
4. Death of a brother or sister	4. Wetting in class
5. Acquiring a visible deformity	5. Parental fights
6. Marital separation of parents	6. Caught in theft
7. Foster home placement	7. Suspected of lying
8. Serious illness requiring hospitalization of child	8. A poor report card
9. Death of close friend	9. Sent to principal
10. Jail sentence of a parent	10. Having an operation
11. Severe illness requiring hospitalization of a parent	11. Getting lost
12. Having a visible congenital deformity	12. Ridiculed in class
13. Increase in number of arguments between parents	13. Move to new school
14. Being involved with drugs and alcohol	14. Scarey dream
15. Marriage of parent to step-parent	15. Not making 100%
16. Increase in number of arguments with parents	16. Picked last on team
17. Frequent absence of one or both parents	17. Losing in game
18. Change in child's acceptance by peers	18. Going to dentist
19. Family moves, relocations	19. Giving class report
20. Academic failure	20. New baby sibling
21. Changed schools	
22. Learning problems in school	
23. Illness requiring hospitalization of brother or sister	
24. Beginning school	
25. Death of a grandparent	
26. Speech problems	
27. Hearing problems	
28. Child needed special education services	
29. Suspension from school	
30. Mother beginning to work	
31. Loss of job by parent	
32. Poor grades in school	
33. Birth of brother or sister	
34. Increased arguments with brothers and sisters	
35. Brother or sister leaving home	
36. Addition of a third party to family (e.g., grandmother)	
37. Vision problem requiring eyeglasses	

Notes: a Item #1 was preselected to be ranked number one in stressfulness, serving as a "standard" by which to proportionately rate the other events in the Chandler (1981) scale.

Table 3. Content of childrer's fears at different chronological age ranges, Piagetian cognitive stages, and emergent coping resources (adapted from Achenbach, 1974).

Ages	Cognitive stage	Fears (from Jersild[a])	Emergent coping resources[b]
0-1½ yrs.	Sensorimotor	Fears of dark, strangers, aloneness, sudden noise, loss of support	"Easy" temperament (Thomas & Chess, 1978); capacity for for self-regulation, tolerance for stimulation, tension reduction (crying, fussing, turning away from overstimulating objs.), pleasurable sensory gratificatior (thumb-sucking, turning toward pleasurable objs.) (Murphy & Moriarty, 1976); secure attachmer responsiveness to caregiver, object permanence (Sroufe, 1978; Greenspan & Lourie, 1981); task orientation, persistence, and attention span (Matheny, 198
1½-3 yrs.	Symbolic	Separation, desertion, sudden movements	Initiative, trust, compassion, curiosity (Hunt, 1979); language, "healthy narcissism," (Murphy & Moriarty, 1976); curiosity and exploration in novel problem solving situation (Matas et al., 1978); cooperative play, flexible autonomy, temporary regression, aggression, motoric activity
3-5 yrs.	Intuitive, Representational	Animals, imaginary creatures, injury	Reflectiveness (Kagan et al., 196 range of fine motor skills; fantasy expression (ability to distinguish real from imagined) (Gould, 1972); self-satisfaction, ego-resilience, ego-control (Aren et al., 1979); verbal self-instruction (Meichenbaum, 1977)
6-11 yrs.	Concrete operational	School failure, ridicule, loss of possessions, disfigurement, disease, death	Logical thinking with concrete objects, classification/categoriz tion; conformity, industriousness (work/achievement), practicality, orderliness, friendship, social perspective taking, rule-governed play; use of denial, rationaliza- tion; "cognitive conceit" (Elkind, 1976)
12-17 yrs.	Formal operational	Being different: physically, socially, intellectually; sexual fears, loss of face	Mental hypothesis testing; self-monitoring, self-consciousness ("imaginary audience," projection (Elkind, 1976); peer reference ("clique," "gang") formation; verbal aggressiveness, sulking, substance abuse

Notes: a Jersild & Holmes, 1935
b biopsychosocial competencies