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## Emotionality and self-regulation, threat appraisal, and coping in children of divorce

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### Abstract

A model of the effects of children's temperament (negative and positive emotionality, impulsivity and attention focusing) on post-divorce threat appraisals, coping (active and avoidant), and psychological symptoms (depression and conduct problems) was investigated. The study utilized a sample of 223 mothers and children (ages 9 to 12 years) who had experienced divorce within the last two years. Evidence was found of direct effects of child-report negative emotionality on children's threat perceptions and of child-report positive emotionality and impulsivity on children's coping. Indirect effects of negative emotionality on active and avoidant coping through threat appraisal were found. Direct effects of the temperament variables on symptoms were also found. Cross group analyses indicated that the models were robust to age differences, but gender differences were found in the relation between negative emotionality and depression. The results of this study indicate that temperament and threat appraisals are important predictors of children's post-divorce symptoms, and that temperament is a predictor of children's appraisal and coping process.

There is a growing recognition of the important contribution of child variables to children's adaptation to major life stress. Both stable child characteristics, such as temperament, and stress responses, such as appraisal and coping efforts, are believed to affect adaptive outcomes (Felner, 1984; Reiss & Price, 1996). Investigation of individual differences in responses to a major life stressor may elucidate adaptive processes (e.g., Cicchetti, 1996), and the generalizability of such processes to other stressors can be explored. Such research can improve our understanding

of the role of individual differences in adaptive processes and facilitate identification of children at risk for developing adjustment problems (e.g., Reiss & Price).

This study investigated a theoretical model of the direct and indirect effects of temperament on the threat appraisals, coping and psychological symptoms of 9 to 12 year old children of divorce. This study is part of a series of studies investigating the influence of temperament on children's post-divorce adjustment. Our previous study using the same sample addressed the conceptual and empirical overlap in temperament and symptom measures, and it was shown that after eliminating such overlap, temperament was consistently and meaningfully related to children's post-divorce symptoms (Lengua, West, & Sandler, 1998). The present study investigates the interrelations of temperament, appraisal and coping in predicting children's post-divorce adjustment, which may increase our understanding of mechanisms by which individual differences affect response to stress (Hewitt &

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Flett, 1995). Before discussing the model tested in this study, we will discuss prior research on the role of temperament, perceived threat and coping in children's adaptation to divorce.

### Children of Divorce

Approximately one million children experience their parents' divorce each year (National Center for Health Statistics, 1992). Divorce is viewed not as a single stressful event in children's lives, but rather as a marker for the occurrence of a series of stressors including decreased contact with both parents, conflict between their parents, decreases in family income and resources, and other stressful events (e.g., Felner, Farber, & Primavera, 1980; Sandler, Wolchik, & Braver, 1988). Relative to children in intact families, children of divorced families are at risk for developing a wide range of adjustment problems (e.g., Amato & Keith, 1991; Guidubaldi, Cleminshaw, Perry, Nastasi, & Lightel, 1986). However, it is also clear that not all children who experience their parents' divorce develop adjustment problems (Felner et al.; Sandler et al.), and recent research has focused on identifying the factors which differentiate children who adjust well from those who develop adjustment problems (Grych & Fincham, 1993). Studying children of divorce focuses on a population of children who have experienced a specific major life stressor that can be a marker for a number of other stressors. Children's adaptation to divorce stressors may be influenced by three child variables, temperament, threat appraisal and coping, which are investigated in the present study.

### Temperament

Rothbart (1981, 1989) conceptualizes temperament as relatively stable, physiologically based individual differences in reactivity and self-regulation. Reactivity consists of both physiological arousal and emotionality. Rothbart proposes two independent reactive systems that result in the arousal of positive and negative affect. Evidence of distinct dimensions of positive and negative emotionality

has been found in infants (Rothbart, 1981), adolescents (Capaldi & Rothbart, 1992) and adults (e.g., Derryberry & Rothbart, 1988; Watson & Tellegen, 1985). Self-regulation involves processes that can modulate reactivity, either facilitating or inhibiting the affective response. It includes attention, impulsivity, approach, withdrawal, inhibitory control and self soothing (Goldsmith et al., 1987; Rothbart, 1989). An important aspect of self-regulatory mechanisms has been referred to as effortful control, which involves the effortful regulation of attention and the inhibition of behavioral responses (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994; Rothbart & Ahadi, 1994). Effortful control has been shown to be a predictor of the development of conscience, compliance (Kochanska, 1991) and social behaviors (Rothbart, Ahadi, & Hershey, 1994).

Individual differences in emotionality and self-regulation may be important predictors of children's post-divorce psychological adjustment. Children who respond negatively or intensely to environmental strains and/or who are unable to regulate or modulate their emotional or behavioral response may be highly vulnerable to the effects of stress (Bradley, 1990). Conversely, children high in positive emotionality may be able to maintain positive affect in the face of negative life events (e.g., Wertlieb, Weigel, & Feldstein, 1989), and children high in self-regulation may be better able to modulate their emotional and behavioral responses, resulting in better adjustment to stress. In the present study, the relations of emotionality and self-regulation to children's post-divorce symptomatology are investigated. Similar temperament dimensions have been found in previous studies to be related to children's internalizing and externalizing problems (see Rothbart & Bates, *in press*).

Although a theoretical model of emotionality and self-regulation previously has not been investigated in children of divorce, other models of temperament have been studied. Kurdek (1988) found that the temperament dimensions of emotional intensity and attention span at Time 1 were correlated with children's internalizing and externalizing problems, respectively, 1 year later. Hetherington

(1989) found that ratings of difficult temperament made by nurses during well-baby visits in the first 2 years of life significantly predicted children's post-divorce behavior problems.

### **Threat Appraisals and the Psychological Symptoms of Children of Divorce**

Appraisals refer to the individuals' evaluation of the implications of an event for their well-being (Lazarus, 1991). An event may be evaluated as threatening one's well-being by threatening one's self-esteem, values or goals, or the well-being of loved ones (Lazarus; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Theoretically, it has been proposed that the effects of negative events, such as interparental conflict, on children's psychological adjustment are mediated by children's threat appraisals. Krantz, Clark, Pruyn, and Usher (1985) found that the maladaptive appraisals of children of divorce (i.e., negative evaluations of self, family, or situation) were significantly related to adjustment problems. Kurdek and Berg (1987) found that children's fear of abandonment by the parents was related to higher levels of anxiety, and concern about peer ridicule was related to lower self-concept in children of divorce. Sheets, Sandler, and West (1996) found that threat appraisals of children of divorce were related to their psychological symptoms in cross-sectional and short-term longitudinal models.

### **Coping and the Psychological Symptoms of Children of Divorce**

Coping has been defined as the "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). Several studies have found that coping is related to psychological symptoms in children of divorce. One study investigated coping styles and adjustment in young adolescent children of divorce and found that avoidant coping was highly, significantly associated higher symptomatology for

girls but not boys (Armistead et al., 1990). Kurdek and Sinclair (1988) found that social support was negatively associated with school problems and externalizing coping was positively associated with school problems in adolescents. In another study that used a large, community-based sample of children of divorce, Sandler, Tein, and West (1994) found in cross-sectional analyses that the dimension of avoidant coping was significantly related to higher symptoms, whereas active coping was found to have an inverse longitudinal relation to children's depression.

### **Theoretical Model of Temperament, Threat Appraisal, and Coping**

There is evidence that temperament, appraisal and coping are each related to symptoms in children of divorce, however, it is likely that these variables are not independent. Temperament may influence appraisal and coping, and the effect of temperament on symptoms may be partially mediated by appraisal and coping. This study tested a model in which (a) temperament has direct effects on appraisal, coping and symptoms, and an indirect effect on symptoms through its effect on coping and appraisal, (b) appraisal has a direct effect on coping and symptoms and an indirect effect on symptoms through coping, and (c) coping has a direct effect on symptoms. The rationale for this model is presented below.

#### *Temperament and the perception of threat*

Children who are high in negative emotionality may experience greater negative arousal in the presence of stressful events and may seek negative cognitions to understand their negative arousal (Davies & Cummings, 1995; Gilligan & Bower, 1984; Winton, 1990). There is increasing recognition that individual differences are related to the perception of events as stressful (e.g., Costa, Somerfield, & McCrae, 1995). For example, in adult samples there is evidence that negative affectivity is related to negative appraisals of stressors. Negative affect has been found to induce self-focused attention (Wood, Saltzberg, & Goldsamt, 1990), which in turn, relates to in-

creased negative expectancies for the future (Pyszczynski, Holt, & Greenberg, 1987) and increased intensity of emotional experience (Scheier & Carver, 1977). Watson and Clark (1984) review evidence with adults that negative affectivity relates to more focus upon negative aspects of the self, other people, and the world and increased threat perceptions. In children, the induction of negative emotions was shown to predict greater distress, negative appraisals and expectations in reaction to interadult conflict (Davies & Cummings, 1995). Thus, negative emotionality is expected to relate to higher threat appraisals for stressful events.

Similar to prior studies, the appraisal of threat is proposed to lead to greater use of all types of coping. Children who perceive negative events as highly threatening may experience greater distress in response to events and, thus, have a greater need to cope. Also, it is expected that perceived threat is positively related to symptomatology, consistent with evidence from previous studies (e.g., Sheets et al., 1996).

#### *Temperament and coping*

Children's coping may also be directly influenced by their emotionality and self-regulation. Children who are high in negative emotionality may use fewer active coping strategies, such as problem-focused coping and cognitive reframing, and more avoidant coping strategies. A child high in negative emotionality may experience high levels of arousal in response to a stressor. That child may use avoidant strategies to obtain immediate relief from negative arousal rather than active strategies which require an individual to tolerate negative affect while considering alternative problem-solving options or ways to think about a stressor. Consistent with this hypothesis, Eisenberg et al. (1993) found that negative affectivity and emotional intensity were negatively correlated with constructive coping strategies in children. Studies with adult samples also find that negative affect predicts greater use of avoidant coping (e.g.,

Bolger, 1990; Carver & Scheier, 1994; Smith, Pope, Rhodewalt, & Poulton, 1989).

Positive emotionality is hypothesized to be associated with more active coping and with less avoidant coping. Children high in positive emotionality may be more inclined to recognize potential positive outcomes of events. This may increase the likelihood of the child making the appraisal that he or she is able to cope with the stressor, which might lead to greater use of direct or active coping strategies. There is evidence that the trait of positive affectivity in adults is associated with greater flexibility in thinking, more problem solving, and simplified, efficient strategies in decision making (Isen & Diamond, 1989). Also, in a sample of adolescents, the temperament dimension of positive mood was related to higher levels of behavioral coping, which included active, problem focused strategies (Wills, DuHamel, & Vaccaro, 1995).

Self-regulation, particularly the attentional control and inhibition mechanisms included within the concept of effortful control, is also expected to influence coping. Children who are higher in effortful control are hypothesized to use more active coping. They may have greater capacity to focus their attention on their coping efforts and plan better ways to cope with them than children low in effortful control. Attentional control may be important for the selection of relevant information for action in a stressful situation, which would impact the selection of a coping strategy (Matthews & Wells, 1995). Behavioral control would be important for the planning and effective implementation of coping strategies, which require inhibition of immediate responding. Children who have poor attentional focus or are impulsive would have difficulty utilizing problem solving, cognitive decision making or positive cognitive reframing which are strategies that require one to attend to relevant information, inhibit automatic responses, plan and make decisions about optimal coping options. Children low in effortful control may be more inclined to utilize avoidant coping strategies that provide immediate relief from negative arousal. There is some support for these hypotheses. For example, attentional

self-regulation has been suggested to impact children's ability to inhibit inappropriate behaviors (Rothbart & Ahadi, 1994), and has been found to be positively correlated with constructive coping (Eisenberg et al., 1993). Also, there is evidence that impulsive children demonstrate faulty social problem solving (e.g., Shure & Spivack, 1981). In addition, the ability to delay (low impulsivity) was found to be correlated longitudinally with children's ability to deal well with frustration and stress (Mischel, Shoda, & Peake, 1988).

## **This Study**

### *Hypotheses*

Using a large sample of 9- to 12-year-old children of divorce, this study tested the hypotheses that (a) negative emotionality would predict greater use of threat appraisals and avoidant coping, less use of active coping, and higher levels of adjustment problems; (b) positive emotionality would predict greater use of active coping, less use of avoidant coping, and lower adjustment problems; (c) impulsivity would predict less use of active coping, greater use of avoidant coping, and higher levels of adjustment problems; and (d) attention focusing would predict greater use of active coping, less use of avoidant coping, and lower adjustment problems. Temperament was expected to have both direct effects on symptoms and indirect effects through appraisal and coping.

### *Age and gender effects*

Developmental level (or age) has been shown to influence the use of coping strategies (Band & Weisz, 1990; Brown, O'Keeffe, Sanders, & Baker, 1986). As children grow older their use of emotion-focused coping, such as cognitive reframing, increases. Emotion-focused strategies may require more developed cognitive capacities, such as metacognitive functioning. Therefore, the hypothesized relations are tested for their consistency across age group. In addition, gender differences in temperament variables, including

negative emotionality, have been found (e.g., Kohnstamm, 1989). Thus, gender differences in the proposed models are tested, as well.

## **Method**

### *Participants*

*Recruitment and eligibility.* The participants in this study were 223 mothers and their children, ages 9 to 12 years, who took part in a larger experimental trial of a preventive intervention for children of divorce. Eighty-three percent of the families included in this study were recruited from court records of petitions for divorce. Twelve percent of the families responded to newspaper ads, 2% responded to television or radio ads, and 3% were obtained through referrals. Families who were recruited from court records were randomly selected from a list of all divorce decrees issued in Maricopa County, Arizona within a 2-year period from the start date of the intervention for each cohort. Families were screened to satisfy inclusion criteria that parents had been divorced for two years or less, mothers were not remarried and did not have a live-in partner, mothers had at least half time residential custody of the children, and at least one child in the home was between the ages of 9 and 12 years. In families where there was more than one child between the ages of 9 and 12 years, one child was randomly selected for participation to ensure independence of responses.

The sample in the larger study consisted of 296 mothers and children who agreed to participate in the intervention and met eligibility criteria. Of these 296 families, a total of 73 subjects were excluded from analyses in the present study. Subjects were excluded because they withdrew from the main intervention study prior to the orientation meeting described below ( $n = 26$ ) or because they had significant missing data on one or more scales ( $n = 19$ ). An additional 28 families were screened out of the main study prior to the orientation meeting (see below) because the children demonstrated significant adjustment problems (i.e., the target child obtained a score on the Children's Depression Inventory

within the clinical range, that is a score of  $\geq 18$ , or scored in the 97th percentile on the CBCL externalizing scale) and were therefore not considered appropriate for a preventive intervention. These families were referred for treatment elsewhere. As a result, complete data were not available for the child-report variables in these families. However, complete data were available for mother-report variables in these families, and a second set of mother-report analyses were conducted on this more complete sample ( $n = 283$ ).

A comparison of the sample included in this study with those subjects who were excluded (due to withdrawal, ineligibility or missing data) indicated that they differed significantly ( $p < .05$ ) on only 4 of the 18 variables used in this study. Differences were found on average upsettingness of the events that occurred to children (mean normative threat for participants included = 9.43 and excluded = 8.74,  $F(1) = 4.40$ ,  $p < .05$ ), mother report of negative emotionality ( $M$  included = 14.43,  $M$  excluded = 13.28,  $F(1) = 5.08$ ,  $p < .05$ ), children's perception of the threat of the stressful events they experienced ( $M$  included =  $-0.28$ ,  $M$  excluded = 0.49,  $F(1) = 7.10$ ,  $p < .01$ ), and child-report depression ( $M$  included = 5.70,  $M$  excluded = 8.50,  $F(1) = 17.39$ ,  $p < .001$ ).

*Sample characteristics.* The average age of the children was 10.33 years ( $SD = 1.10$ ). Fifty-percent of the children were female. The average time since the divorce was 1.06 years ( $SD = 0.54$ ). The average time since physical separation for the families was 2.25 years ( $SD = 1.34$ ) with a range of 1 month to 12 years. The majority of the sample was Caucasian (88.8%). The remainder of the sample was composed of 7.6% Hispanic families, 1% African American families, 1% Asian or Pacific Islander families, and 1.6% families of other racial or ethnic background. The mother was the primary residential parent in all of the families. In 62% of the families the mother had sole legal custody of the child, whereas 36% of the families had joint legal custody arrangements (i.e., both parents retain legal authority to make decisions concerning the child), and 2% of the families had split legal

custody arrangements (i.e., siblings live with different parents). The average age of the mothers was 37.42 years ( $SD = 4.81$ ). Mothers had an average annual income of \$26,996.

### Procedure

This study utilized data from the first wave of interviews (pre-test). All measures were collected prior to families being assigned to intervention conditions. Families were initially interviewed in their homes, with mothers and children being interviewed by separate trained, professional interviewers. After confidentiality was explained to mothers and children, mothers signed informed consent forms, and children signed assent forms, indicating their agreement to participate in the study. Computer Assisted Personal Interviews (CAPI) were conducted using laptop computers. Approximately 2 weeks after the family's home interview, families were interviewed a second time at the research center. All measures, except the temperament measures, were administered using CAPI during the home interviews. Mothers' ratings of their children's temperament were administered in a paper and pencil questionnaire format, which the mothers were given during the home interview and asked to return by mail or at the time of a second pre-test interview. Children reported on their own temperament during the second interview. Families received \$45 compensation for participating in the first wave interview and \$10 for returning the paper and pencil portion of the battery.

### Measures

Temperament and symptom measures may overlap in their content (e.g., Sanson, Prior, & Kyrios, 1990). In the present study, steps were taken to minimize this potential overlap. Expert ratings were obtained to evaluate conceptual overlap among the temperament and symptom measures, and confirmatory factor analyses (CFAs) were used to evaluate empirical overlap. The full details of these procedures and the specific items in the temperament and symptom measures that were eliminated are discussed in detail elsewhere

**Table 1.** Means, standard deviations, skewness, kurtosis, and internal consistency for measures

Variable	Mean	SD	Skewness	Kurtosis	$\alpha$
Child's age	10.33	1.10	0.27	-1.24	NA
Normative upsettingness	9.43	2.65	-1.98	3.44	NA
Mother-report					
Negative emotionality	14.29	3.88	0.03	-0.30	.69
Positive emotionality	30.67	4.74	-1.37	2.00	.90
Impulsivity	22.27	5.30	-0.05	-0.13	.76
Attention focusing	34.76	7.38	-0.22	-0.69	.83
Child-report					
Negative emotionality	16.11	5.17	0.28	-0.64	.70
Positive emotionality	31.14	4.17	-1.29	1.72	.79
Impulsivity	18.60	5.56	0.10	-0.48	.72
Attention focusing	28.68	5.05	-0.04	0.02	.60
Perceived threat	-0.28	2.34	1.31	2.07	.83
Active coping	71.68	12.43	-0.03	-0.17	.88
Avoidant coping	30.90	5.34	-0.20	-0.28	.65
Mother-report					
Depression	23.92	4.60	1.26	1.53	.81
Conduct problems	27.76	5.15	0.93	0.60	.87
Child-report					
Depression	5.70	4.58	0.73	-0.04	.83
Conduct problems	31.99	5.75	1.56	4.59	.86

(Lengua, West, & Sandler, 1998). As a result, the temperament and symptom measures used in this study were considered relatively free of "contamination." CFAs were used to test the construct validity of the temperament measures. All temperament dimensions demonstrated good fit to the data and moderate to good reliability after the contaminated items were removed. Table 1 presents the mean, standard deviation, skewness, kurtosis, and coefficient  $\alpha$  for each measure.

*Temperament emotionality and regulation.* Both mothers' and children's reports were obtained on parallel forms of the temperament measures. The Emotionality dimension of the EAS (Emotionality, Activity and Sociability; Buss & Plomin, 1984) was used to measure negative emotionality. The scale assesses the frequency of negative emotions (e.g., anger or fear), the intensity of the response, and the threshold of the response (e.g., "I frequently get distressed" and "I get troubled by everyday events"). An average internal consistency reliability of the three EAS dimensions of .83 and a one-week test-retest correlation of .72 for emotionality have been reported (Buss &

Plomin). Four mother-report items and two child-report items were eliminated as a result of being identified as overlapping with symptom measures. The internal consistency reliability for this scale in the current study, as measured by Cronbach's  $\alpha$ , was .69 and .70 for mother- and child-report, respectively.

Positive emotionality was assessed by the positive mood dimension of the Dimensions of Temperament Survey-Revised (DOTS-R; Windle & Lerner, 1986) which has both parent report and child self-report forms. The positive mood dimension consists of seven items that assess the frequency of smiling and laughter, and general cheerful or happy mood (e.g., "My child laughs and smiles at a lot of things" and "My child's mood is generally cheerful"). A Cronbach's  $\alpha$  of .80 has been reported for a sample of elementary school age children (Windle & Lerner). In this study, Cronbach's  $\alpha$  was .90 and .79 for mother and child report, respectively.

Self-regulation was measured using two primary dimensions representing effortful control, attentional focusing and impulsivity (reversed). The attentional focusing and impulsivity subscales from the Child Behavior

Questionnaire (Goldsmith & Rothbart, 1991; Rothbart, Ahadi, & Hershey, 1994) were used. Attentional focusing is an 11-item scale that assesses the tendency to maintain attentional focus upon task-related channels (e.g., "When picking up toys or other jobs, usually keeps at the task until it's done" and "Has a hard time concentrating on an activity when there are distracting noises"). Coefficient  $\alpha$  of .74 has been reported in a sample of school age children (Goldsmith & Rothbart). Impulsivity is a 13-item scale measuring the speed of response initiation (e.g., "Usually rushes into an activity without thinking about it" and "Sometimes interrupts others when they are speaking"). An internal consistency reliability of .78 has been reported (Goldsmith & Rothbart). These scales were in parent report format and were reworded for children's self-report for this study. For mother report, one attention focusing and six impulsivity items were eliminated as a result of overlap with symptom measures. For child report, three attention-focusing and seven impulsivity items were eliminated as a result of overlap. The internal consistency reliability for the attention-focusing measure was .83 and .60 for mother and child report, respectively. The internal consistency reliability for the impulsivity measure was .76 and .72 for mother and child report, respectively.

Confirmatory factor analyses were used to determine whether attentional focusing and impulsivity (reversed) should be combined into a single dimension of effortful control. Two models were tested within each reporter, one in which a single latent factor loading on the items from the two dimensions was specified, and one in which two correlated latent factors were specified. The one and two factor models demonstrated equivalent fit to the data, that is, neither model demonstrated a better fit than the other, and both models demonstrated moderate fit to the data. In the two-factor model, attention focusing and impulsivity were strongly related, and there were several correlated errors across factors, indicating overlap in the dimensions. However, in the one-factor model, the factor loadings were low to moderate, indicating that the items were not good indicators of a unitary construct. Since neither a one-factor or two-factor

model of effortful control presented a better fit to the data, attention focusing and impulsivity were retained as separate factors in order to explore differences in their relations to appraisal, coping and symptoms.

*Normative upsettingness.* This measure was the mean of the normative upsettingness ratings of three events from the Negative Life Events Schedule endorsed by the child as occurring in the past three months. The Negative Life Events Schedule was derived from two questionnaires, the Divorce Events Schedule for Children (DESC; Sandler, Wolchik, & Braver, 1988) and the General Life Events Schedule in Children (GLESC; Sandler, Ramirez, & Reynolds, 1986). For each of the events on the Negative Life Events Schedule, a normative upsettingness rating was calculated as the mean upsettingness score obtained from a separate sample of children of divorce ( $N = 250$ ; Sandler, 1992). In the present study, the three events with the highest normative upsettingness ratings endorsed by the child were selected. The normative upsettingness score in the current study was a mean of the normative upsettingness values of these three events.

*Perceived threat.* Perceived threat was measured using an aggregate of children's threat ratings for the same three most upsetting events children endorsed as having occurred in the past three months. Threat appraisals for the event with the highest normative upsettingness rating were assessed using the 24-item "What I Felt Scale" (Sheets et al., 1996). The scale assesses six dimensions of negative thoughts about the event: negative self evaluation, negative evaluation by others, rejection, criticism of others, harm to others, loss of desired objects or activities. Children rated how much they thought each of these 24 thoughts when the specific event occurred. A brief form of the "What I Felt Scale" in which one item was used to assess each of the six threat dimension was administered for the remaining two stressful events. Threat ratings for these two event were computed as a mean score of the six threat items. The threat score for each event was standardized (i.e., converted into  $z$



scores) in order to be weighted equally. The measure of perceived threat was the mean of the standardized threat scores for the three events. Data were considered missing if a child endorsed fewer than two events. The internal consistency reliability for the measure of perceived threat was .83.

*Coping style.* Coping styles were assessed using an adaptation of the Children's Coping Strategies Checklist (CCSC; Ayers, Sandler, West, & Roosa, 1996). In the present study, the dimensions of positive cognitive restructuring and cognitive avoidance were augmented with additional items intended to measure more specific aspects of each coping strategy. Children rated how often they used each coping behavior when they had a problem in the past three months using a 4-point Likert scale (1 = *never*, 2 = *sometimes*, 3 = *often*, and 4 = *most of the time*). Previous studies have shown that the coping dimensions factored into four factors: Active strategies (cognitive decision making, direct problem solving, positive cognitive restructuring, seeking understanding), Avoidant strategies (cognitive avoidance, avoidant actions), Distraction strategies (distracting actions, physical release of emotions), and Support Seeking strategies (problem-focused support, emotion-focused support; Ayers et al., 1996; Sandler et al., 1994). The dimensions of active and avoidant coping were used in the present study because of their theoretical importance in relation to temperament. The internal consistency reliabilities for active and avoidant coping were .88 and .65, respectively. In a sample of children of divorce, avoidant coping was related significantly to children's symptomatology in cross-sectional analyses, and active coping longitudinally predicted children's symptoms (Sandler et al.).

*Children's report of symptoms.* Symptomatology was assessed using two scales measuring depression and conduct problems. The 27-item Child Depression Inventory (Kovacs, 1981) was used to measure depression. The internal consistency reliabilities of the scale have ranged from .71 (Kovacs) to .94 (Saylor, Finch, Spirito, & Bennet, 1984), and a one-

month test-retest reliability of .72 has been reported (Kovacs). Scores on the CDI have been shown to discriminate clinically depressed and nondepressed psychiatric patients (Saylor et al.). One item was eliminated as a result of being identified as overlapping the temperament measures. In the present study, the internal consistency reliability for this scale was .83.

Conduct problems were measured using a mean weighted sum of the 28 items from the Youth Self-Report (YSR; Achenbach & Edelbrock, 1983) comprising the delinquent behavior and aggressive behavior subscales. This scale was designed to assess the extent to which a child engages in antisocial tendencies and behavior problems. The scale has been found to discriminate clinic referred and nonreferred adolescents, and 1-week test-retest reliabilities of .72 and .79 for the delinquent and aggressive behavior subscales, respectively, are reported (Achenbach & Edelbrock). Four items were eliminated as a result of overlap with temperament measures. The internal consistency reliability of the scale in the current study was .86.

*Parent-report of children's symptoms.* Parents' reports of children's maladjustment were assessed using items from the Child Behavior Check List (CBCL; Achenbach & Edelbrock, 1983) which assessed depression and anti-social tendencies or conduct problems. The CBCL measure provides a standardized assessment of behavior problems in children between the ages of 4 to 16 years. Measures of children's depression (19 items) and conduct problems (23 items) were constructed with no overlapping items using items rated by experts in clinical psychology as assessing each construct (Gersten, Beals, West, & Sandler, 1987). Depression and conduct problems scores were sum scores of the relevant items. In a sample of children of divorce similar to the current sample, internal consistency reliabilities were .82 for the depression scale and .88 for the conduct problems scale (Sandler, 1992). One depression item and three conduct problem items were eliminated as a result of overlap with temperament measures. In the current study, the internal consistency reliabil-

ities were .81 and .87 for the depression and conduct problems scales, respectively.

## Results

### *Checks on assumptions of multiple regression*

*Regression diagnostics* were conducted prior to the test of the hypotheses. First, the presence of outliers was assessed using guidelines provided by Bollen and Jackman (1990). The path analyses were conducted dropping three outliers from the sample, and the pattern and magnitude of results remained largely the same whether the data were analyzed including or not including these cases. Therefore, the three outliers were retained in all subsequent analyses. Next, *multicollinearity* among the predictors in the model was assessed using the variance inflation factor (VIF) statistic. In the present sample, the VIFs ranged from 1.02 to 1.80, all within acceptable ranges. The *distributional characteristics* of the measured variables were then examined. Maximum likelihood estimation, which was used for the path analyses conducted in the present study, assumes multivariate normality in the distribution of the variables included in the models. Non-normally distributed data can result in underestimates of fit of a model to the data (West, Finch, & Curran, 1995). In the present study, absolute values of skewness ranged from 0.03 to 1.98. Absolute values of kurtosis ranged from 0.02 to 3.44. Mardia's coefficient of multivariate kurtosis for the mother-report and child-report path models were 17.89 and 25.00, respectively. Overall, these values do not represent major deviations from normal distributions.

### *Tests of the research questions*

The mean, standard deviation, skewness, kurtosis and internal consistency reliability for the study variables are presented in Table 1. The intercorrelations among the variables are presented in Table 2. The amount of time since parental divorce or separation are important variables to consider in divorce research, as children's appraisals, coping efforts

or adjustment may vary in relation to the time that has passed since parental separation or divorce. Time since parental divorce was not significantly correlated with any of the variables included in this study. Time since parental separation was correlated with only one variable, mother report of children's attention focusing ( $r = -.13$ ,  $p = .05$ ). Because time since separation and divorce were not related to any of the mediator or outcome variables, they were not included as covariates in subsequent analyses.

Path analyses in EQS were used to test the hypothesized relations among temperament, threat, coping and symptomatology. Chi-square test statistics and fit indices were computed to assess the adequacy of the fit of the models to the observed data and competing models were compared for their ability to account for a given data set, thus allowing for the disconfirmation of alternative models.

The hypothesized relations among temperament, threat, coping and symptomatology were tested in three competing theoretical models in order to test whether threat and coping variables partially mediated the effects of temperament on symptoms: (a) *Null Model*—There is no relation among the variables being investigated (i.e., variances of the measured variables are estimated, but all covariances are constrained to be zero). This model provides a basis of comparison for estimating the goodness of fit of the hypothesized models. (b) *Direct Effects Model*—The temperament variables have direct effects on symptomatology in the hypothesized directions, but they do not have effects on threat or coping. Threat has both direct effects and indirect effects through coping on symptomatology. The direct effects of threat, coping and temperament on symptoms are independent. (c) *Direct Plus Indirect Effects Model*—The temperament variables have both direct effects and indirect effects, through threat and coping, on symptomatology in the directions hypothesized.

Models were tested separately for mother- and child-report of temperament. The  $\chi^2$  test and goodness of fit indices for the three models are presented in Table 3. In addition, because the models were nested,  $\chi^2$  difference

**Table 2.** Intercorrelation among variables included in current study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Child gender	—																
2. Child age	.11	—															
3. Normative upsettingness	.14*	.06	—														
4. Negative emotionality (mother)	.12	-.00	.08	—													
5. Positive emotionality (mother)	-.24**	-.01	-.02	-.42**	—												
6. Impulsivity (mother)	.15*	-.02	.16*	.51**	-.02	—											
7. Attention focusing (mother)	-.09	-.04	-.05	-.52**	.26**	-.62**	—										
8. Negative emotionality (child)	.08	.10	.11	.25**	-.11	.14*	-.07	—									
9. Positive emotionality (child)	-.21**	.01	-.13*	-.15*	.23**	-.12	.04	-.37**	—								
10. Impulsivity (child)	.16*	.21**	.14*	.12	-.11	.11	-.04	.36**	-.18**	—							
11. Attention focusing (child)	-.14*	-.14*	-.16*	-.18**	.11	-.18**	.17	-.47**	.36**	-.55**	—						
12. Perceived threat	.06	.01	.26**	.07	-.04	.10	-.05	.32**	-.23**	.22**	-.18**	—					
13. Active coping	-.01	-.08	-.02	-.03	.07	.02	-.10	-.05	.18**	-.13	.07	.11	—				
14. Avoidant coping	.14*	-.19**	.22**	.04	-.04	.01	-.03	.09	-.05	.00	-.07	.30**	.46**	—			
15. Depression (mother)	.12	-.01	.09	.51**	-.50**	.29**	-.38**	.22**	-.30**	.07	-.24**	.09	-.07	.06	—		
16. Conduct problems (mother)	.32**	-.03	.17**	.52**	-.30**	.52*	-.49**	.13	-.27**	.15*	-.22**	.07	.00	.08	.54**	—	
17. Depression (child)	.10	.04	.25**	.20**	-.18**	.16	-.08	.52**	-.50**	.37**	-.43**	.39**	-.07	.11	.33**	.25**	—
18. Conduct problems (child)	.17**	.10	.31**	.15*	-.11	.14*	-.09	.38**	-.40**	.46**	-.48**	.35**	-.04	.06	.18**	.27**	.58**

Note: Gender was coded 1 = female, 2 = male.

\* $p < .05$ . \*\* $p < .01$ .

**Table 3.** Model fit indices and nested  $\chi^2$  difference tests among hypothesized models

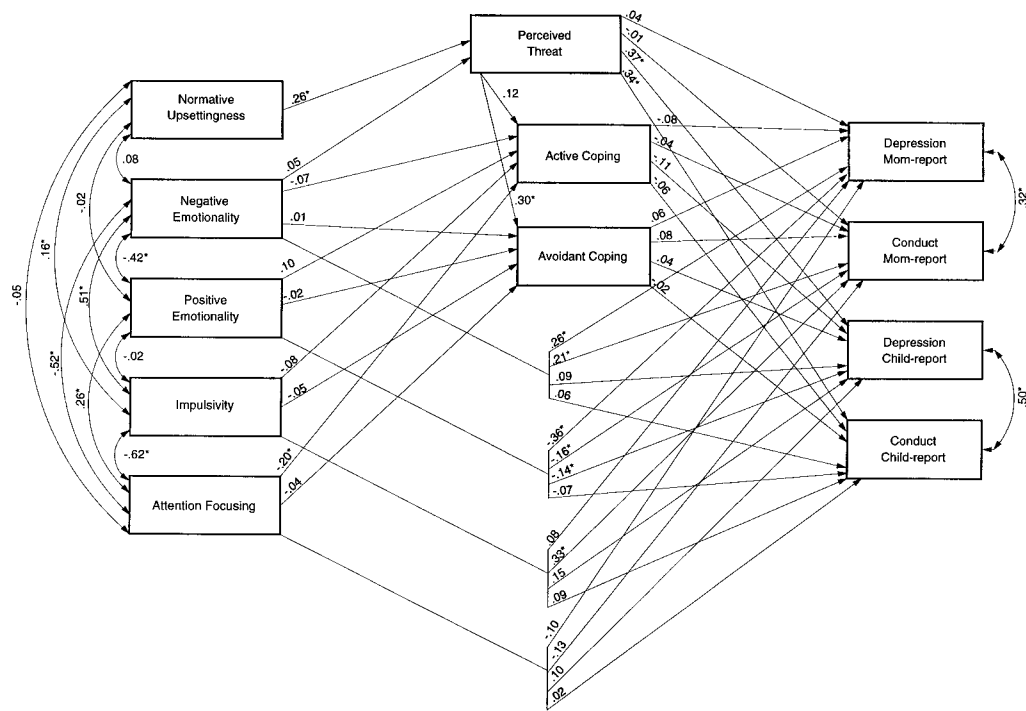
Model	Fit Indices	$\chi^2$ Differences
Mother-report model		
1. Null	$\chi^2(66, n = 223) = 811.71$	
2. Direct effects	$\chi^2(22, n = 223) = 58.25$ CFI = .95 TLI = .85	[1 vs. 2] $\chi^2(44) = 753.46, p < .01$
3. Direct plus indirect effects	$\chi^2(13, n = 223) = 49.20$ CFI = .95 TLI = .85	[1 vs. 3] $\chi^2(53) = 762.51, p < .01$ [2 vs. 3] $\chi^2(9) = 9.05, n.s.$
Child-report model		
1. Null	$\chi^2(66, n = 223) = 743.83$	
2. Direct effects	$\chi^2(22, n = 223) = 83.18$ CFI = .91 TLI = .73	[1 vs. 2] $\chi^2(44) = 660.65, p < .01$
3. Direct plus indirect effects	$\chi^2(13, n = 223) = 44.54$ CFI = .95 TLI = .76	[1 vs. 3] $\chi^2(53) = 699.29, p < .01$ [2 vs. 3] $\chi^2(9) = 38.64, p < .01$

tests were performed, providing a test of the improvement of fit of the model when additional parameters are freed to be estimated (Bentler & Bonett, 1980). Table 3 presents the  $\chi^2$  differences between the models.

Also, tests of the significance of indirect effects were conducted using the Sobel test. A total of 54 indirect effects from negative emotionality to the coping variables through perceived threat, from the temperament variables to symptomatology through perceived threat and coping, and from perceived threat to symptomatology through coping were possible. Only those indirect effects for which one or more component paths were significant were tested for their significance and are discussed below.

*Mother report of temperament.* The mother-report Direct Effects and Direct Plus Indirect Effects Models were first tested using the sample of 223 families for which there were complete data for both mothers and children. Both models demonstrated good fit to the data (see Table 3). The fit of the Direct Plus Indirect Effects Model was *not* significantly better than that of the Direct Effects Model, indicating that the estimation of additional paths (i.e., direct paths from temperament to perceived threat and coping) did not appreciably improve the fit of the model to the data.

Therefore, the Direct Effects Model was considered the more parsimonious, best fitting model. However, because both models demonstrated an adequate fit to the data and the relations among the temperament, perceived threat and coping variables were of central interest in this study, but not estimated in the Direct Effects Model, the Direct Plus Indirect Effects Model will be discussed. In the Direct Plus Indirect Effects Model (see Figure 1), the mother-report temperament variables did not significantly predict children's perception of threat or avoidant coping. Mother-report attention focusing was significantly negatively related to children's active coping; however, the relation was in the direction opposite the a priori prediction. The mother-report measure of negative emotionality was significantly positively related to mothers' reports of children's depression and conduct problems. Positive emotionality was significantly negatively related to mother-report depression and conduct problems and child-report depression. Impulsivity was significantly positively related to mother-report conduct problems. Perceived threat, active and avoidant coping were unrelated to mothers' reports of symptoms. Perceived threat was significantly positively related to avoidant coping and child-report depression and conduct problems. Fifteen of the possible 54 indirect effects had one or more



**Figure 1.** Mother-report Direct Plus Indirect Effects Model, including the temperament effects on threat and coping, estimated using *mother* report of temperament. (Note: Error correlation for active and avoidant coping was estimated in the model:  $r = .45$ ,  $p < .01$ .)

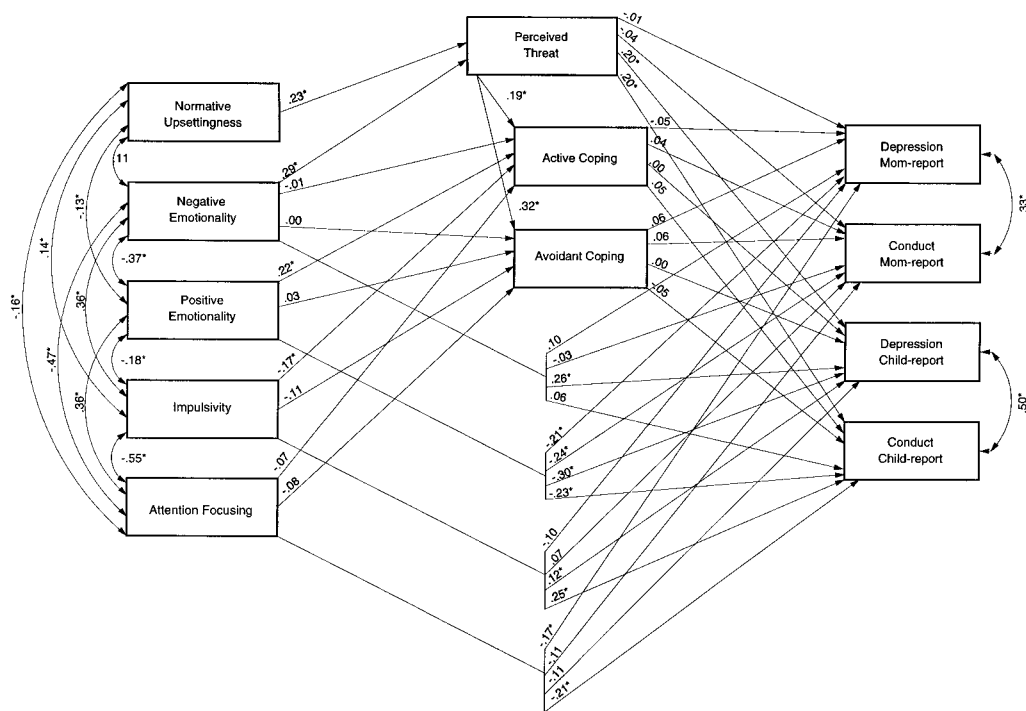
significant component paths and were tested for their significance. None of the indirect effects tested was significant.<sup>1</sup>

It is possible that the censoring of data for children with depression and conduct problem scores in the clinical range may have attenuated the magnitude of the path coefficients in the model. For mother report, data were available on a more complete subset of the larger sample in which children with depression and conduct problems scores in the clinical range were included ( $n = 283$ ). In order to assess the

effect of eliminating the children who scored in the clinical range on adjustment measures, the Direct Plus Indirect Effects Model was estimated using this more complete sample. Although there were small differences in the magnitudes of the paths among temperament, threat and coping, and in the paths from temperament to symptoms (magnitude of change  $\leq .05$ ), the pattern of significant associations remained identical with one exception being that the path from active coping to child-report depression became significant ( $\beta = -.18$ ,  $p < .05$ ).

1. Mother- and child-report Model 3 were compared to the identical models correcting for unreliability using the procedure recommended by Bollen (1989). In this approach, single-indicator factors are created for each variable, and the errors for each factor are set to the product of the unreliability  $\times$  the variance of the scale. Although there were changes in the magnitudes of many of the paths in both models corrected for unreliability, the changes were minor and the pattern of significant associations remained the same as in the uncorrected models.

*Child report of temperament.* The variables in the child-report models were the same as in the mother-report models except that the temperament variables were child self-report instead of mother report. Both mother- and child-report of symptoms were included in the models. The Direct Plus Indirect Effects Model fit the data significantly better than the



**Figure 2.** Child-report Direct Plus Indirect Effects Model, including the temperament effects on threat and coping, estimated using *child* report of temperament. (Note: Error correlation for active and avoidant coping was estimated in the model:  $r = .45$ ,  $p < .01$ .)

Direct Effects Model (see Table 3 and Figure 2). In the Direct Plus Indirect Effects Model, child-report negative emotionality significantly predicted perceived threat in the hypothesized direction. Negative emotionality was not directly related to coping. Negative emotionality was significantly positively related to child-report depression. Positive emotionality significantly predicted active coping in the positive direction, and was significantly negatively related to all mother- and child-report symptoms. Impulsivity was significantly, negatively related to active coping and was positively related to child-report conduct problems. Attention focusing was not significantly related to the coping variables. Attention focusing was significantly negatively related to child-report conduct problems and mother-report depression. Perceived threat significantly predicted active and avoidant coping and child-report of symptoms in the positive direction, as hypothesized. Note that these path coefficients differ from those in the parent report model due to the different tem-

perament measures (i.e., child vs. mother report). Coping was unrelated to the outcome measures.<sup>2</sup> In child-report Direct Plus Indirect Effects Model, 30 of the possible 54 indirect effects had one or more component paths that were significant, and of these, 4 indirect effects (13%) were significant. The indirect effects of negative emotionality on active and avoidant coping through perceived threat were significant (estimate of indirect effect = .06,  $z = 2.09$ ,  $p < .05$ ; and .09,  $z = 6.56$ ,  $p < .01$ , respectively). In addition, the indirect effects of negative emotionality on child-report depression and conduct problems through perceived threat were significant (estimate of in-

2. Although the coping variables were unrelated to symptoms in the present models, tests of path models not including the temperament and threat variables resulted in a significant positive association between avoidant coping and child-report depression ( $\beta = .18$ ,  $p < .01$ ), and a significant negative association between active coping and child-report depression ( $\beta = -.15$ ,  $p < .05$ ). Thus, controlling for perceived threat and temperament reduced the coping-symptom relations.

direct effect = .06,  $z = 2.63$ ,  $p < .01$ ; and .06,  $z = 2.39$ ,  $p < .05$ , respectively).

Post hoc analyses were conducted to further explore issues raised by several surprising aspects of the results. The lack of a relation between negative emotionality and either dimension of coping was surprising and inconsistent with prior findings in the literature (e.g., Eisenberg et al., 1993). A post hoc explanation was that the relation between these variables was completely accounted for by the indirect effect through perceived threat, and that in the absence of the perceived threat variable the relation between negative emotionality and coping would be observed. The model was rerun without the perceived threat variable, and consistent with prior research, there was a trend for a relation between negative emotionality and avoidant coping ( $\beta = .09$ ,  $p \leq .10$ ).

It was also plausible that the removal of items from the negative emotionality dimension changed the content of this construct, thus mitigating the relation with coping. This possibility was assessed by re-running the model using the original measure of negative emotionality, including the items that had previously been eliminated as a result of overlap with measures of symptoms. This model also showed an indirect effect of negative emotionality on avoidant coping through threat appraisals (estimate of indirect effect on active coping = .05,  $z = 1.82$ ,  $ns$ , and avoidant coping = .09,  $z = 6.34$ ,  $p < .01$ ) with no significant direct effects on coping.

In addition, the strong effects of positive emotionality on psychological symptoms led to the post-hoc expectation that positive emotionality might also be related to lower perceived threat. The modification indices indeed confirmed this speculation, indicating a significant negative relation between positive emotionality and perceived threat ( $\beta = -.19$ ,  $p < .05$ ).

#### *Cross-group analyses*

Both the mother- and child-report Direct Plus Indirect Effects Models were tested for their consistency across children's age group and gender. Sequential tests based on hierarchy of

importance and theoretical interest regarding the parameters have been recommended (Alwin & Jackson, 1981). Hypotheses of invariance across groups of the covariance structure, structural matrix, variance-covariance matrices of exogenous variables, endogenous variables and residuals were sequentially tested.

*Children's age.* The variance-covariance matrix for mother- and child-report models were tested for invariance across age groups using Box's  $M$  test. The 9- and 10-year-olds ( $n = 133$ ) were compared with the 11- and 12-year-olds ( $n = 90$ ), yielding no significant difference between the covariance matrices for the two groups for either the variables involved in the mother-report models (Box's  $M = 101.41$ ,  $F(91, 115491) = 1.04$ ,  $ns$ ) or the child-report models (Box's  $M = 111.80$ ,  $F(91, 115491) = 1.15$ ,  $ns$ ). Given that the omnibus tests failed to detect age-group differences, further tests for differences between the age groups were not conducted in the absence of specific a priori hypotheses.

*Children's gender.* Comparing girls ( $n = 111$ ) with boys ( $n = 112$ ), the Box's  $M$  test was significant for the covariance matrices based on the mother-report model (Box's  $M = 129.29$ ,  $F(91, 153047) = 1.33$ ,  $p \leq .05$ ) and the child-report model (Box's  $M = 148.81$ ,  $F(91, 153047) = 1.54$ ,  $p \leq .001$ ). Given that the omnibus tests detected differences in the variance-covariance matrices of observed variables, the mother-report and child-report models were probed further following the procedures recommended by Alwin and Jackson (1981).

In the mother-report model, differences across gender were accounted for by differences in the variance-covariance matrix of exogenous variables (Phi matrix). The variances for normative threat and positive emotionality differed across gender, such that the variance of normative threat was greater for girls, and the variance of positive emotionality was greater for boys. In the child-report model, the sequential tests indicated that source of differences across gender was in the matrix of path coefficients (Beta matrix).

Modification indices suggested that the path coefficient from negative emotionality to child-report depression differed across gender. The standardized path coefficient from negative emotionality to child-report depression was .39 for boys, whereas it was .17 for girls.

## Discussion

This study investigated alternative models of the direct and indirect effects of temperament, threat appraisals and coping on the psychological symptoms of children of divorce. In addition, reporter differences in the assessment of temperament were addressed by testing identical models using both mother and children's report of children's temperament and symptoms. Evidence was found of direct effects of child-report negative emotionality on children's threat perceptions and child-report positive emotionality and impulsivity on active coping. While negative emotionality was not related directly to coping, significant indirect effects of negative emotionality on active and avoidant coping through perceived threat were found in the child-report model.

Significant direct effects of the temperament variables on symptoms were also found, particularly for the dimension of positive emotionality. Positive emotionality was related to lower levels of depression and conduct problems, and these relations were consistently found across parent and child ratings of positive emotionality and symptoms. Impulsivity was related to higher levels of conduct problems, and negative emotionality was related to higher levels of depression and conduct problems. However, these relations were found only within reporter.

### *Effects of temperament and threat on coping*

As predicted, children who were higher in negative emotionality were more likely to perceive events as threatening than children lower in negative emotionality. The effect of negative emotionality on perceived threat cannot be accounted for by children with higher negative emotionality experiencing more stressful events, since this effect was indepen-

dent of the effect of normative ratings of event upsettingness (a measure of the negative quality of the event that is independent of the perceptions of the individual child). If we assume that stressful events include a wide array of informational cues, negative emotionality may organize and direct children's response to these complicated situations (Davies & Cummings, 1995) and influence cognitive representations (e.g., Derryberry & Reed, 1996). Children who are high in negative emotionality may experience greater negative arousal in response to stressors and may attend more to negative cues in evaluating stressful events (Rothbart & Ahadi, 1994). Interestingly, positive emotionality was significantly related to lower threat appraisals, independent of the effects of negative emotionality. Although this relation was not predicted a priori, it may suggest that children high in positive emotionality are more sensitive to positive and rewarding cues in the environment (Rothbart & Ahadi), and thus be more likely to see stressful events in a more positive way, such as being a challenge that they can handle (Lazarus & Folkman, 1984). By attending to the more positive cues, children high in positive emotionality may be less likely to focus on threatening cues in stressful situations.

Although negative emotionality was not directly related to coping, it had significant indirect effects to higher active and avoidant coping through perceived threat. Perceived threat was found to be associated positively with both active and avoidant coping, possibly because children who perceive higher levels of threat have a greater need to cope. The lack of significant direct relations between negative emotionality and coping was somewhat surprising considering previous studies with adults (e.g., McCrae & Costa, 1986; Terry, 1994) and children (Eisenberg et al., 1993) have found direct associations between negative emotionality and coping. However, the results of this study indicate that the effect of negative emotionality on coping may be an indirect one, through increased threat appraisal. Previous studies have not investigated threat appraisal as a mediator of the effects of negative emotionality on coping. Similar to



previous studies, post-hoc analyses of the current data indicated that there was a trend for a relation between negative emotionality and avoidant coping when perceived threat was not included in the model.

Another possible explanation for the lack of direct association between negative emotionality and coping may be the nature of the measure of negative emotionality used. It is possible that different dimensions of negative emotionality, such as anger/frustration and fear/inhibition, relate differently to coping variables. Fearfulness may increase the likelihood of avoidant coping, whereas anger may be unrelated to avoidance. The elimination of items from the negative emotionality measure due to overlap with symptoms may have weighted one dimension more than the other (cf. Lengua et al., 1998), possibly reducing the association between negative emotionality and avoidant coping. However, in post hoc analyses, the pattern of results remained consistent when the model was tested using the original measure of negative emotionality, that is, including all of the original items. In the future, specificity in the relations among fear and anger dimensions of negative emotionality and coping should be investigated.

Positive emotionality was significantly related to more active coping, as hypothesized. This finding was consistent with evidence that the trait of positive affectivity in adults and adolescents is associated with greater flexibility in thinking and greater use of problem solving (Isen & Diamond, 1989; Wills et al., 1995). Active coping includes both problem solving and positive, more optimistic cognitions about the stressful event. Children higher in positive emotionality may maintain a relatively more positive emotional state in response to a stressor facilitating the planning of problem solving strategies. It may also be that higher positive emotionality makes children more attentive to the more positive, optimistic cues in the stressful situation. They may be more likely to perceive stressors as temporary or as having the potential for positive outcomes in the future.

Also as predicted, children's report of impulsivity was negatively related to active coping. This was consistent with evidence that

impulsive children demonstrate faulty social problem solving (e.g., Shure & Spivack, 1981). Children high in impulsivity may be unable to delay reactions to stressors. They may have difficulty thinking through a problem, identifying potential problem-solving options, and choosing the best one. The lack of effective coping may be one of the mechanisms that leads to adjustment problems in impulsive children (e.g., Block, Block, & Keyes, 1988; Zahn-Waxler et al., 1994).

Although the measures of impulsivity and attention focusing were strongly correlated in this sample, and they are both part of the broader set of self-regulatory processes involved in effortful control (Ahadi & Rothbart, 1994), the pattern of relations of attention focusing to other variables was different than that of impulsivity. The predicted relations between attention focusing and coping were not found. While mother report of attention focusing was negatively related to active coping, this relation was in the direction opposite than predicted. However, the zero-order correlation between mother-report attention focusing and active coping was not significant, and the negative path coefficient observed in the model may reflect a suppression effect of impulsivity on the relation between mother-report attention focusing and active coping. It is likely that multiple self-regulation processes are involved in children's response to stress. Children must inhibit their initial impulsive responses, focus on the stressor enough to plan their response, but shift focus away from the stressor so as to relieve their distress (e.g., Fabes et al., 1993). Future research should investigate how these regulatory processes jointly contribute to adaptive coping.

The finding that attentional focusing was not related to active coping seems inconsistent with prior studies that found relations between attentional control processes and either adaptive coping (Eisenberg et al., 1993) or distress (Derryberry & Rothbart, 1988; Fabes et al., 1993). However, the measure of attention focusing used in the present study was narrower than the measures of attentional control used on prior studies. For example, Eisenberg et al. (1993) used a measure that com-

bined attention focusing and shifting, and the latter may be responsible for their observed relations with coping. It may also be that attentional processes interact with other dimensions of temperament or cognitive expectancies to affect coping with stress. For example, while attention focusing may enable a child to maintain his or her attention on the coping task, whether the child does so may depend on his or her expectancy that he or she can be effective in dealing with the situation (Sandler, Tein, & Mehta, 1997). Furthermore, attentional processes may interact with negative or positive emotionality in affecting whether children focus on the positive or negative aspects of the stressful situation (e.g., Derryberry & Reed, 1994).

*Effects of temperament, threat and coping on symptomatology*

*Temperament and symptoms.* As predicted, negative emotionality and impulsivity were related to higher levels of symptoms, whereas, positive emotionality and attention focusing were related to lower levels of symptoms. The effects of each temperament variable estimated in our models were unique effects, independent of the other temperament variables. Thus, the temperament variables have independent and potentially additive effects on children's risk or resilience in response to divorce or other stressors, reinforcing the need to consider the effects of multiple temperament characteristics in predicting adjustment problems (Rothbart & Bates, in press).

Positive emotionality was significantly related both to lower depression and conduct problems, and the relations of positive emotionality to symptoms were significant across reporter. It is notable that the effects of positive emotionality on symptoms were independent of the effects of negative emotionality, threat appraisal and coping. Children high in positive emotionality may focus more on positive, rewarding aspects of the environment, have more positive social relationships, and may elicit positive feedback in social interactions (e.g., Clark, Watson, & Mineka, 1994; Rothbart & Ahadi, 1994). Conversely, low positive emotionality, which may be charac-

terized by the absence of pleasurable engagement (Tellegen, 1985) may lead to unrewarding experiences and may be related to the apathy and anhedonia components of depression or other adjustment problems.

Few researchers have investigated the relation between positive emotionality and symptoms. One reason is that early models of temperament viewed emotionality as a single, bipolar dimension with negative and positive emotionality on opposite poles (e.g., Thomas & Chess, 1977). There is evidence in the adult and child literature that negative and positive emotionality are separate, correlated dimensions (e.g., Rothbart & Ahadi, 1994; Watson & Tellegen, 1985). However, in exploratory factor analyses positive emotionality frequently combines with other temperament dimensions such as energy, activity level and sociability (e.g., Rothbart & Ahadi). Thus, it is possible that the relations of positive emotionality and symptoms reflect the effects of a broader temperament construct, such as surgency (e.g., Ahadi & Rothbart) or the behavioral activation system (e.g., Gray, 1982) which involves approach and responsiveness to rewards.

*Threat, coping, and symptoms.* As found in previous research, the appraisal of threat was related significantly to children's report of depression and conduct problems (Krantz et al., 1985; Kurdek & Berg, 1987; Sheets et al., 1996). In this study, the objective level of the upsettingness of the events was controlled, so that threat perceptions reflected the individual's interpretations of the events as threatening. Children who interpret harm or loss from stressors are likely to experience greater distress, demoralization, or a sense of lack of control of their environment than other children. The effect of threat appraisals on symptoms was in addition to the direct effect of negative emotionality, indicating that both the tendency to be negatively affectively aroused and the presence of negative cognitions contribute to children's post-divorce symptoms.

Unlike previous studies (Armistead et al., 1990; Sandler et al., 1994), this study found no significant relation between coping and symptomatology. This apparent failure to rep-

licate previous findings was, in part, a result of eliminating subjects from the present study based on exceeding the clinical cut-off on child-reported depression or mother-reported conduct problems. The nonrandom exclusion of observations (i.e., as a result of high scores on the child-report depression measure and mother-report CBCL) appears to have resulted in a truncated distribution for some of the variables, making detection of effects less likely (cf. Cohen & Cohen, 1983, p. 70) and possibly biasing the observed associations (Berk, 1983). When the mother-report model was tested using the more complete sample (high depression and conduct problem children included), active coping had a significant, negative relation to child-report depression. The non-significant association between coping and symptoms was also the result of including temperament and perceived threat in the models. When the effects of coping were tested not controlling for these variables, both active and avoidant coping significantly predicted child-report depression, even in the reduced sample that eliminated children high in depression and conduct problems.<sup>2</sup> These findings reinforce the need to study coping in the context of multivariate models in which complex patterns of relations among coping, appraisal, and other individual differences can be investigated.

#### *Group differences*

Cross-group comparisons of the models were made to investigate the extent to which the theoretical model was robust to age and gender differences. No significant differences were found across age group, possibly because the sample consisted of a fairly restricted age range (9- to 12-year-olds). Overall differences across gender were found, with a stronger path from child-report negative emotionality to child-report depression for boys than for girls. Few previous studies have investigated gender differences in the association of negative emotionality with psychological symptoms, and those studies did not investigate internalizing and externalizing problems separately (e.g., Brody, Stoneman, & Burke, 1988; Earls & Jung, 1987).

Negative emotionality may be a greater risk for depression for boys than for girls because boys may receive less acceptance of their emotions from adults or peers, or they may have fewer appropriate outlets for their negative emotions. These findings add to previous evidence of different developmental pathways to depression for boys and girls (Block, Gjerde, & Block, 1991; Patterson & Capaldi, 1990).

#### *Cross-reporter issues*

In this study, the relations of temperament with the threat, coping and symptomatology variables differed as a function of whether mothers or children reported on temperament. Except for positive emotionality, mother-report temperament was unrelated to any of the child-report variables, but was significantly related to mother-report of symptoms, suggesting that significant associations may have been due to shared method variance. However, child report of both positive emotionality and attention focusing were related significantly to mother-report, as well as child-report symptoms, suggesting that method variance alone does not account for the association between these temperament dimensions and symptoms. In addition, there was some consistency across reporter in the pattern of relations between temperament and symptoms with negative emotionality predicting depression and impulsivity predicting conduct problems within both mother- and child-report models.

Few previous studies have obtained both parent and child reports of temperament. Evidence suggests that there is low to moderate agreement between parents' and children's reports of temperament (e.g., Capaldi & Rothbart, 1992). Similarly, the strong within-reporter correlations between measures of depression and conduct problems are evidence of the important influence of shared method variance in the measurement of children's symptoms (e.g., Achenbach, McConaughy, & Howell, 1987). Although there was modest agreement between these reporters in the present study, they can each provide informative perspectives on children's behav-

iors (e.g., Achenbach et al., 1987; Compas, Howell, & Phares, 1989). Children may be better able to report on their internal emotional experiences or moods, whereas mothers may be better reporters of their children's behavioral expressions of emotions or impulsive behaviors. Since the current study is based on the data from two reporters, it should be interpreted as reflecting their perceptions of children's temperament, coping and symptoms across reporter. Relations between different reporters' perceptions of temperament and symptoms, particularly significant cross-reporter associations using child-report temperament measures of positive emotionality and attention focusing, provides the strongest evidence of relations between constructs that is independent of common method variance. Also, consistency in the pattern of relations between temperament and symptoms suggest that self-report of temperament by children in this age range can be useful, and both parents' and children's reports of temperament variables should be obtained. In the future, multi-method measurement of temperament and symptoms may help elucidate reporter issues and improve the chances of detecting associations among temperament, appraisal, coping, and symptoms across reporter. Observation or laboratory measures of temperament dimensions are needed to enhance understanding about the role of temperament in children's appraisal and coping processes (e.g., Eisenberg et al., 1993) and in predicting symptoms.

### Limitations

Some limitations of the current study must be acknowledged. One limitation was that the sample was not representative of the population of children of divorce. Whereas the sample in the larger study was generally representative of recently divorced families in the Phoenix, Arizona metropolitan area, the range

of child-report depression for the subset of subjects used in this study was truncated. This appears to have lowered the observed associations between coping and depression. A second limitation is that the study employed a cross-sectional design. Although path analyses can test alternative models of the relations between variables, only prospective longitudinal designs satisfy the criteria of time precedence necessary for making causal inferences.

### Implications

Investigations of alternative models of the relations among temperament, appraisal, coping and adjustment are needed to demonstrate how individual differences may predispose some individuals to negative outcomes resulting from stressors such as parental divorce (e.g., Hewitt & Flett, 1995). This study provides evidence that temperament relates to coping and threat appraisal for divorce stressors and has independent direct effects on children's symptoms. These findings can be used to identify children who are at greatest risk for developing adjustment problems following divorce. Future studies should investigate the role of temperament, appraisal, and coping in predicting children's adaptation to other major life stressors or risk factors in order to assess the generalizability of these adaptive processes to other stressors. If findings are replicated across multiple stressors they may represent general principles of adaptation to stress. Alternatively, if models of adaptation are different for different stressors, research will be needed to understand what aspects of stressful situations affect adaptive processes. In sum, the results of this study suggest that temperament may play an important role in children's response to divorce, and knowledge of temperament could improve our understanding of children's adaptive processes.

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