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## Anger Transmission from Mother to Child: A Comparison of Mothers in Chronic Pain and Well Mothers

*This study tested whether on days when mothers feel angrier than usual they transmit their anger to their child through harsh parenting, and it examined whether the anger-transmission process is dampened in families in which there is an obvious noninterpersonal explanation for maternal anger. Daily diary data were obtained from the mother and an adolescent child in 42 control families and in 40 families in which the mother experienced heightened anger because of a chronic-pain condition, Reflex Sympathetic Dystrophy Syndrome (RSDS). The anger-transmission model was supported in control mothers but not in RSDS mothers. Although RSDS mothers felt angrier than control mothers on the typical day, the negativity of their parenting was less contingent on their anger, and their children were marginally less reactive than control children to similar harsh parenting.*

There is accumulating evidence of heightened distress and interpersonal difficulties in children of parents experiencing acute and chronic stressors, such as divorce, unemployment, clinical depression, and poverty (Conger, Patterson, & Ge, 1995; Dix, 1991). To account for these findings, Downey and Coyne (1990) proposed that, by inducing distress, these parental stressors exhaust parents' capacity for tolerating aversive child behavior and for engaging in the sustained, effortful interaction that characterizes effective parenting. (See also, Forgatch, Patterson, & Skinner, 1988; McLoyd, 1990.) Specifically, distress is thought to disrupt parenting by increasing parental negativity (e.g., punitiveness, hostility) and by diminishing parental positivity (e.g., emotional support, responsiveness, affection, and involvement). These alternative ways of avoiding more complex, energy-absorbing forms of social interaction are thought to induce child distress by making the parent appear unavailable, rejecting, and coercive. (See also, Kochanska, Kuczynski, Radke-Yarrow, & Welsh, 1987; Patterson, 1982; Wahler & Dumas, 1989.)

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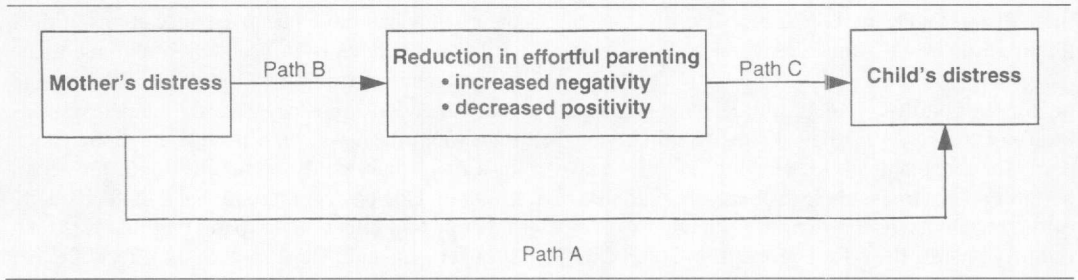
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### MODEL OF DISTRESS TRANSMISSION

Figure 1 summarizes this basic model of distress transmission. We acknowledge that the transmis-

FIGURE 1. MODEL OF DISTRESS TRANSMISSION



sion process is undoubtedly bidirectional. Children's distress influences parents, and parents' distress influences children. (For reviews, see Dix, 1991; Repetti & Wood, 1997a.) However, in this article we focus on transmission from parent to child. Consistent with the model in Figure 1, researchers have shown that parents' distress helps explain the association between chronic and acute parental stressors and disruptions in parenting (Conger et al., 1995; Elder, Caspi, & Downey, 1986; McLoyd & Wilson, 1990). Parenting quality, in turn, helps account for the link between parental distress and child difficulties. Although tests of the model generally have yielded evidence consistent with the model, a number of important questions remain. This study addresses three of these questions.

#### *Does the Model Operate Within Families as Well as Between Families?*

Prior studies of the model of distress transmission typically have treated parental distress as a stable, individual difference variable (e.g., Conger et al., 1995). Considerably less attention has been paid to determining whether the emotions of parents and their children covary over time within families and whether, if such an association exists, it is mediated by concomitant fluctuations in parenting quality. (For exceptions, see Repetti & Wood, 1997b; Snyder, 1991.) Our study uses daily diary data from mothers and their adolescent children to examine the links among maternal distress, parenting, and child distress in typical families and in chronically stressed families in which the mother experiences heightened distress because of chronic pain. (See Larson & Almeida, 1999, for a discussion of the advantages of the diary approach.)

#### *Does the Source or Context of Distress Matter?*

Both typical families and families in which the mother has chronic pain are included to allow a

test of whether the operation of the model depends on the context or the source of the distress. The context or source of distress may possibly lead to either the accentuation or the dampening of the transmission process outlined in Figure 1. We have termed these moderations of the basic model of distress transmission the accentuated distress-transmission model and the distress-containment model.

*Accentuated distress-transmission model.* Under severe chronic stress, such as that experienced by families in which the mother has chronic pain, the relation between the mother's distress and the child's distress may be stronger than in more typical families. Perhaps living continuously with pain or with other stressors taxes mothers' abilities to inhibit translating their distress into hostile interactions or complete withdrawal, which are distressing to children. Living with a parent who is chronically distressed because of illness also may sensitize children to be hyperreactive to daily changes in the ill parent's behavior.

*Distress-containment model.* Even when parents are highly distressed, however, the source of the distress may determine how much it influences parenting and child distress. Experimental social-psychological research has shown that people use their experimentally induced current mood state as a basis for evaluating other people's behavior unless they are explicitly reminded of the source of their mood (Cervone, 1994; Schwartz & Clore, 1983, 1988). When reminded, they correct for the externally induced mood and make their evaluation of the person's behavior. These experimental findings suggest that when parents have a compelling noninterpersonal explanation for their distress, such as physical pain, they may adjust for the contribution of pain to their distress when they evaluate the negativity of the child's behavior, and thus they may be less likely to engage in harsh parenting. For mothers with chronic pain,

knowing the connection between their pain and their distress may make them aware that, when they feel distressed, they are vulnerable to over-perceiving and overreacting to negative child behavior. In contrast, typical mothers may be less aware of the effect of their distress on their standards for acceptable child behavior, and they may be more likely to use their distress as a barometer of the negativity of their child's behavior. Consequently, when they feel more distressed than usual, typical mothers may be more likely than mothers with chronic pain to withdraw positivity or to engage in harsh, coercive parenting.

Similarly, equivalent levels of harsh or distant parenting may evoke less anger in children when they can attribute parents' harshness or disinterest to something (i.e., uncontrollable pain) other than parental malevolence. This proposition has a basis in social-psychological studies showing that people tend to attribute other people's negative behavior (e.g., a parent ordering the child to clean up his or her room) to dispositional negativity on the part of the other person (e.g., the parent is a jerk) in the absence of a more obvious situational explanation (e.g., the parent is in pain; Nisbett & Ross, 1980).

#### *Which Parental Emotion Has the Most Disruptive Impact on Children?*

Despite mounting evidence that parents' emotions mediate the impact of parental stressors on parenting and children, relatively little is known about the distinctive influence of specific emotions, such as anger, anxiety, and depression (Dix, 1991). Prior research typically has used either a global measure of distress or has focused on a single aspect of distress, usually depression (Downey & Coyne, 1990). However, the aspect of distress with the most disruptive impact on parenting may be anger, rather than depression or anxiety. To explain why children of clinically and subclinically depressed parents show externalizing difficulties as well as internalizing difficulties, Downey and Coyne posited that the anger and irritability that often accompany parental depression explain why depressed parents tend to engage in the harsh, coercive parenting that contributes to externalizing difficulties.

In support of this position, researchers have shown that induced and naturally occurring anger promotes harsh, unsupportive parenting (Dix, Reinhold, & Zambarano, 1990; Downey, Osatinski, & Pettit, 1993; Elder et al., 1986; Patterson, 1982). In a particularly illuminating study, Dix et al.

found that when mothers were induced to feel angry, they had more negative expectations of their children's behaviors in problem situations, made more negative attributions for child behavior, and recommended more negative parental responses than when they were in a neutral emotional state. In a daily diary study of families with preschool children, Downey et al. found that a mother's daily anger had an effect on her parenting that was both stronger than and independent of the effect of either daily depressed mood or anxiety, neither of which had a significant independent effect on parenting.

Thus, prior research provides some evidence that maternal anger is particularly likely to prompt negative, unsupportive interactions between mother and child, interactions that, in turn, induce anger in the child. We test whether there is stronger evidence of transmission of emotion in the case of daily anger than in the case of daily depressed mood or anxiety. If so, we will test whether this is because of the disruptive impact of anger on parenting. If the hypothesized process of anger transmission operates at a daily level, we will test whether it does so irrespective of the mother's concomitant levels of depressed mood and anxiety.

#### *Current Study*

We tested the three alternative models of distress transmission with daily diary data from mothers and their adolescent children in control families and in families in which the mother had RSDS, a rare, unpredictable complication of soft-tissue trauma characterized by persistent burning pain, lowered pain threshold, and pain induced by non-noxious stimuli (e.g., minor friction; Chard, 1991). This disorder is particularly well suited for testing alternative models of the anger-transmission hypothesis using daily diaries. Because people with RSDS tend to experience clinically significant levels of pain-related distress (Feldman, Downey, & Schaffer-Neitz, 1998), daily fluctuations in distress occur around a higher mean level of distress than is typical. Thus, the disorder allows us to examine whether the process of distress transmission is accentuated in families in which the mother has chronically high levels of distress. Furthermore, pain provides a compelling noninterpersonal explanation for RSDS patients' daily distress and for any harsh and unsupportive parenting in which they might engage. Because the condition is not life threatening, any negative effects on family members do not reflect realistic fears about the prognosis, as might be the case for people with

cancer (Compas et al., 1994; Compas, Worsham, Ey, & Howell, 1996). Finally, although pain experienced by people with RSDS is more severe, on average, than other forms of chronic pain (De-Good, Cundiff, Adams, & Shetty, 1993; Melzack & Katz, 1992), there are large day-to-day fluctuations in pain and mood (Feldman et al., 1998). Throughout this article, we refer to families in which the mother has RSDS as RSDS families.

To demonstrate support for the unmoderated distress-transmission model depicted in Figure 1 we must show: (a) a positive link between the mother's distress and the child's distress, total Path A; (b) a positive link between the mother's distress and her unsupportive and negative parenting, Path B; (c) a positive link between the mother's negative, unsupportive parenting and the child's distress, when controlling for the mother's distress, Path C; and (d) a substantially reduced link between the mother's and the child's distress when statistically controlling for negative, unsupportive parenting, unmediated Path A. Finding a stronger association between the relevant variables depicted by Paths A, B, and C in RSDS families than in control families would support the accentuated distress-transmission model. If the association between the relevant variables were significantly weaker in RSDS families than in control families, then the distress-containment model would be supported. Based on prior research, we expect that anger is the component of distress that will show the strongest evidence of transmission from mother to child.

## METHOD

### Sample

Data were from mothers and their adolescent children in a community sample of 82 two-parent families that included a child who was 10–18 years old. In 40 of these families, the mother had RSDS. The remaining 42 families made up the control group. In households with more than one child between 10 and 18 years, the mother was asked to select one child as the focal child of the study.

Control families were recruited through advertisements placed in a newspaper serving suburban, semi-rural, and rural areas, paralleling the residential distribution of the RSDS families. Families in which one parent had RSDS were recruited nationwide through advertisements posted in the RSDS Association newsletter and through announcements made at meetings of RSDS support groups. The

study is limited to families in which the mother had RSDS. One family in which both parents had RSDS was included. On average, mothers had been diagnosed 3 years before participating in the study ( $SD = 2.1$  years). Many RSDS mothers experienced substantial disability: 39% reported loss of the use of at least one arm, and 40% reported either being unable to walk or needing crutches.

RSDS families and control families did not differ significantly in the age, grade, or sex of the participating children. The mean age of adolescents in the study was 14 years ( $SD = 1.9$ ), and the median grade was eighth grade. Forty-six percent were girls, and 54% were boys. The number of children in the families ranged from 1 to 6, with a mean of 2.4 ( $SD = 1.1$ ). The mean number of children was significantly lower in RSDS families than in control families (RSDS families:  $M = 2.2$ ,  $SD = .33$ ; control families:  $M = 2.67$ ,  $SD = .13$ ;  $t(79) = 2.09$ ,  $p < .05$ ).

Participating families were Caucasian, with two exceptions (one Native American, one Hispanic). Both non-Caucasian families were in the RSDS group. The median family income was in the \$35,000–\$45,000 range and did not differ significantly between RSDS families and control families. Ninety percent of fathers were currently employed, and the rate of paternal employment did not differ significantly between RSDS families and control families. Sixty-eight percent of control mothers were employed outside the home, but only 20% of women with RSDS were employed,  $\chi^2(1, n = 82) = 19$ ,  $p < .001$ . The relatively low employment rate of RSDS mothers is not surprising, given the level of physical impairment experienced by them.

Both RSDS mothers and control mothers had completed an average of 14 years of education ( $SD = .42$ ). Fathers in RSDS families had completed significantly fewer years of education than control fathers (RSDS families:  $M = 11$ ,  $SD = 1.7$ ; control families:  $M = 15$ ,  $SD = 2.3$ ;  $t(76) = 2.75$ ,  $p < .01$ ). Parents in RSDS families were significantly younger than the control parents—mothers in RSDS families:  $M = 37$  years,  $SD = 4.1$ ; mothers in control families:  $M = 41$  years,  $SD = 3.9$ ,  $t(79) = 3.9$ ,  $p < .001$ ; fathers in RSDS families:  $M = 30$  years,  $SD = 6$ ; fathers in control families:  $M = 41$  years,  $SD = 6.1$ ;  $t(75) = 3.19$ ,  $p < .01$ .

### Procedure

We asked the mother and the participating child to separately complete a brief structured question-

naire (diary) before retiring each night on 28 consecutive days. Where relevant in the questionnaire, the mother's responses were focused on the child in the study. If a participant forgot to complete a particular day's diary, we asked them to complete it as soon as possible and to note the date and time when the diary was completed. A packet of seven questionnaires was mailed to participants at the beginning of each week, and participants returned the packets by mail at the end of the week. Each family member returned the completed week's worth of diaries in a separate sealed envelope. The first packet also contained a background questionnaire. After completing the study, families received \$35. RSDS families were given the option of having the money donated to the RSDS Association.

### Measures

*Background questionnaire.* The mother completed the background questionnaire at the beginning of the diary study. It included questions on the family's composition, the family's income, and parents' education levels and occupations. Questionnaires completed by mothers with RSDS included items about the onset and severity of their disability.

*Diary questionnaire.* The daily diary questionnaire included items about distress and mother-child interaction. The distress items were adapted from the Affect Balance Scale (Derogatis, 1975) and assessed anger, anxiety, and depressed mood. Participants rated the intensity of each of these feelings during the past 24 hours using a 3-point scale, ranging from *no* to *very much*. The four items assessing anger were angry, irritable, enraged, frustrated (mother's  $\alpha = .80$ , children's  $\alpha = .75$ ). The eight items assessing depressed mood were guilty, hopeless, sad, depressed, worthless, unhappy, blue, miserable (mother's  $\alpha = .89$ , children's  $\alpha = .86$ ). The five items assessing anxiety were nervous, afraid, agitated, tense, anxious (mother's  $\alpha = .81$ , children's  $\alpha = .70$ ).

We assessed mother-child interaction by having mothers indicate the extent to which they had engaged in various indicators of positive and negative parenting each day on a 3-point scale, ranging from *no* to *a lot*. The items used to index parenting were drawn from existing measures of positive and negative parenting and were tested in a prior daily diary study (Downey et al., 1993). Factor analyses of data from our sample showed that the positive and negative items loaded on two distinct factors. The four negative parenting items were: "I

pushed, shoved, or hit my child," "I tried to make my child feel guilty," "I yelled or screamed at my child," "I told my child that I was disappointed in him/her" ( $\alpha = .62$ ). The five positive parenting items were: "I showed my child how happy she/he makes me," "I considered my child's needs when making my plans," "I negotiated or reasoned with my child," "I made time to listen to my child," and "I helped my child with things that were important to him/her" ( $\alpha = .76$ ). Measures for negative and positive parenting were obtained by averaging the ratings of the respective items.

### Compliance and Attrition

Ninety percent of mothers and 85% of children completed at least 3 weeks of the diaries. Mothers completed an average of 26 diary days. Children completed an average of 25 days. Most diary entries were completed on the appropriate day (mothers: 97%; children: 99%). Most of the remaining diaries were completed 1 day late (mother: 2%; child: 1%). RSDS family members and control family members did not differ significantly in the number of diaries completed or in the number of days when the diary was completed late. We used analyses of variance (ANOVAs) and chi-square tests to determine if there were systematic differences in completion rates on demographic variables (gender, religion, parents' education, employment status, age of child, and family income) and, for RSDS families, on medical variables (length of illness, RSDS stage, and level of physical disability). We found no systematic differences. Moreover, the demographic variables did not interact with RSDS versus control status to predict completion rates for either mothers or children.

### Analyses

This study yielded a data set with two levels of analysis. The within-family level reflects daily variation over time within a family or within a focal family member (e.g., daily variation in child anger). The between-family level reflects differences between families or focal members of families (e.g., differences in mean anger between RSDS mothers and control mothers). The within-family level of analysis can be used, for example, to estimate how strongly the mother's anger and the child's anger are linked within a family, as well as the average level of anger for members of a family. The between-family level of analysis can be used to examine whether the processes in families that

include an RSDS mother (RSDS families) differ from the processes in control families (e.g., whether RSDS mothers and control mothers differ in average daily levels of anger, whether RSDS families differ from control families in how strongly the anger of mother and child is linked).

We conducted analyses using a multilevel or hierarchical linear model approach, which permits the simultaneous analysis of within-family and between-family variation (Bolger & Zuckerman, 1995; Bryk & Raudenbush, 1992; Kenny, Kashy, & Bolger, 1998). In contrast, conventional linear models either aggregate across within-family data, resulting in information loss, or conflate within-family and between-family variation, resulting in incorrect tests of significance. (See Kenny et al., 1998.) We wanted to examine two types of differences between RSDS families and control families. First, we looked at mean differences in daily levels of distress and parenting quality. We asked, "What is the main effect of RSDS on the dependent variables of interest?" Then we looked at differences in the relationship among variables measured at the daily level. We asked, "Does the relationship between mother's and child's distress differ in RSDS and control families? That is, is there an interaction effect?"

*Mean differences.* A multilevel analysis approach to assessing whether focal members of RSDS families differed from focal members of control families in anger, for example, on the average day during the diary period requires that we estimate a within-family and a between-family equation. The within-family equation specifies that a family member's (e.g., the child's) anger on a given day,  $C\text{Ang}_i$ , is a function of their mean level across all days,  $a_0$ , plus a residual component specific to each day,  $q_i$ :

$$C\text{Ang}_i = a_0 + q_i \quad (1)$$

The between-family equation specifies that members of RSDS families (e.g., children) differ in their mean level of anger across all days from members of control families:

$$a_{0i} = b_0 + b_1\text{RSDS}_i + e_i \quad (2)$$

Assuming that  $\text{RSDS}_i$  is coded 1 for children of RSDS mothers and 0 for control children, then  $b_0$  is the mean anger of the control children, and  $b_1$  is how many units higher in anger the RSDS children

are over the control children. We assume that  $e_i$  is a residual component of the dependent variable specific to each family and that  $e_i$  is a normally distributed random variable with a mean of 0 and a constant variance.

*Differences in relationships among variables.* A multilevel approach to assessing the relation among variables measured at the daily level (e.g., the mother anger-child anger relation) and to establishing whether the relation differed for RSDS families and control families also involves specifying two equations. The within-family equation specifies that the value of the dependent variable (e.g., child's anger) for a given family on a given day,  $C\text{Ang}_i$ , is predicted by the level of the independent variable (e.g., mother's anger) on the same day,  $M\text{Ang}_i$ , and by a residual component of the dependent variable,  $r_i$ , which is specific to each day and is assumed to have a mean of 0 and a constant variance across families and days. The equation is:

$$C\text{Ang}_i = a_0 + a_1M\text{Ang}_i + r_i \quad (3)$$

Estimates of  $a_0$  and  $a_1$  are obtained for all families in the sample. The estimation of  $a_0$  is given in Equations 1 and 2. The estimation of  $a_1$  follows.

The between-family equation specifies that for each family, the effect ( $a_{1i}$ ) on the dependent variable of the independent variables is a function of whether family  $i$  is an RSDS family:

$$a_{1i} = c_0 + c_1\text{RSDS}_i + f_i \quad (4)$$

Assuming that  $\text{RSDS}_i$  is coded 0 for the control group and 1 for the RSDS group,  $c_0$  is the mean association between maternal anger and child anger in the control group, and  $c_1$  is the number of units higher that the association between maternal anger and child anger is in RSDS families than in control families. Thus the coefficient,  $c_1$ , can be thought of as mother's anger  $\times$  RSDS interaction effect and will be reported as such in the results section. We assume that  $f_i$  is a residual component of the dependent variable specific to each family and that  $f_i$  is a normally distributed random variable with a mean of 0 and a constant variance.

If we substitute  $b_0 + b_1\text{RSDS}_i + e_i$  for  $a_{0i}$  and  $c_0 + c_1\text{RSDS}_i + f_i$  for  $a_{1i}$  in Equation 3, we get the following equation:

$$C\text{Ang}_i = b_0 + b_1\text{RSDS}_i + (c_0 + f_i) \\ M\text{Ang}_i + c_1\text{RSDS}_i \times M\text{Ang}_i + r_i + e_i \quad (5)$$

This is the equation that we used to test the three alternative versions of the distress-transmission model. In the basic unmoderated distress-transmission model,  $\text{RSDS}_i$  is dropped from the equation on the assumption that the relationship between  $C\text{Ang}$  and  $M\text{Ang}$  is similar across families.

We implemented this analysis approach using a modification of PROC GLM in SAS that permits a weighted least squares approach to multilevel analysis. (See Kenny et al., 1998.)

## RESULTS

### *Mean Daily Levels of Anger, Anxiety, and Depressed Mood*

The results in Table 1, which are estimates from multilevel analyses, show that RSDS mothers reported significantly higher levels of daily anger, anxiety, and depressed mood than control mothers. In contrast, children of RSDS mothers did not differ significantly from control children on these three components of daily distress. These findings suggest that although mothers with chronic pain show heightened levels of distress, they do not appear to transmit their distress to their children.

### *Mean Daily Levels of Positive and Negative Parenting*

RSDS mothers did not differ significantly from control mothers in levels of negative parenting (RSDS mothers:  $M = 1.12$ ,  $SD = .23$ ; control mothers:  $M = 1.10$ ,  $SD = .23$ ;  $F(1,80) = .70$ , *ns*). RSDS mothers reported engaging in more positive parenting than did control mothers, but the difference was only marginally significant (RSDS mothers:  $M = 2.20$ ,  $SD = .45$ ; control mothers:  $M = 2.08$ ,  $SD = .45$ ;  $F(1,80) = 3.31$ ,  $p < .10$ ). This finding suggests that although RSDS mothers show heightened levels of daily distress relative to control mothers,

their distress does not appear to spill over into their parenting. We test this possibility explicitly.

### *Testing the Distress-Transmission Model*

We conducted a series of multilevel analyses to test whether the distress-transmission model operates in the combined sample of RSDS families and control families. In each analysis, we included the previous day's value for the dependent variable as a control variable to allow us to establish the effect of the independent variables on change in the dependent variable from the previous day. (See Larson & Almeida, 1999.)

Are the distress scores of mothers and children related at the daily level? The first step in the analyses involved answering this question. We conducted separate analyses for each of the three components of child distress (anger, anxiety, and depressed mood) as the dependent variable.

Maternal anger was a significant predictor of child anger ( $b = .05$ ,  $F(1,80) = 4.60$ ,  $p < .05$ ; see Table 2, Model A). Maternal depressed mood was a marginally significant predictor of child depressed mood ( $b = .05$ ,  $F(1,80) = 3.83$ ,  $p < .10$ ). Maternal anxiety was not a significant predictor of child anxiety ( $b = .02$ ,  $F(1,80) = .98$ , *ns*). To establish whether each component of maternal distress was uniquely associated with the corresponding component of distress in children, we reran the analyses and included all three components of maternal distress as predictor variables for each of the three components of child distress. Maternal anger continued to have a unique, positive association with child anger, controlling for maternal anxiety and depressed mood ( $b = .065$ ,  $F(1, 79) = 4.03$ ,  $p < .05$ ). Neither maternal anxiety nor depressed mood was uniquely associated with child anger. The marginally significant association between maternal depressed mood and child depressed mood became nonsignificant ( $b = .04$ ,  $F(1,80) = 1.81$ , *ns*). The nonsignificant association between maternal anxiety and child anxiety remained nonsignificant ( $b = .004$ ,  $F(1,79) = .02$ , *ns*). These findings provide ev-

TABLE 1. MEAN DAILY DISTRESS FOR MOTHERS AND CHILDREN BY FAMILY TYPE

Daily Distress	Mother					Child				
	RSDS		Control		F	RSDS		Control		F
	M	SD	M	SD		M	SD	M	SD	
Anger	1.70	(.52)	1.31	(.42)	43.19***	1.32	(.43)	1.31	(.41)	.02
Anxiety	1.74	(.53)	1.31	(.36)	46.65***	1.31	(.43)	1.25	(.39)	1.37
Depression	1.71	(.52)	1.21	(.28)	59.33***	1.17	(.33)	1.17	(.29)	.03

\*\*\* $p < .001$ .

TABLE 2. TESTING THE MODEL OF DISTRESS TRANSMISSION (BASED ON MULTILEVEL ANALYSES)

Model	Dependent Variable	Intercept	Child's Anger Yesterday	Mother's Anger	Negative Parenting	Positive Parenting
A	Child's anger	1.07	.11***	.05*	—	—
B	Negative parenting	0.84	.03	.16***	—	—
C	Positive parenting	2.32	-.01	-.12***	—	—
D	Child's anger	0.02	.09***	.03	.20***	—
E	Child's anger	.99	.11***	.05 <sup>†</sup>	—	.001

<sup>†</sup> $p < .10$ . \* $p < .05$ . \*\*\* $p < .001$ .

idence that the transmission of anger from mother to child is robust and distinctive.

Does parenting quality mediate the impact of maternal distress on children? The next step in testing the distress-transmission model involved answering this question. Because only maternal anger had a unique effect on child anger, we tested the mediational model for anger only. First, we tested whether mother's anger predicted increased negativity and diminished positivity in her parenting. As expected, mothers reported parenting less positively and more negatively on days when they felt angrier than on days when they felt less angry. The results are given in Table 2 (Models B and C).

Next, we examined whether parenting mediated the effect of the mother's anger on the child's anger. When negative parenting was added to Model A, Table 2, the effect of mother's anger on child's anger declined from a significant effect of .05 to a nonsignificant effect of .03, and the effect of negative parenting on child's anger was significant (Model D, Table 2). Although mothers reported a reduced level of positive parenting on days when they felt angrier, positive parenting did not help mediate the association between mother's anger on child's anger because it did not predict child's anger (Model E, Table 2).

We also conducted analyses to establish whether the relations between mother's and child's anger, between mother's anger and parenting, and between parenting and child's anger varied as a function of the mother's mean level of anger across the diary period. In each case, the interaction term for mother's mean level of anger (which was treated as a between-family variable) and the relevant within-family variable was nonsignificant.

In sum, these results suggest that, for the sample as a whole, the distress-transmission model outlined in Figure 1 operated for anger but not for anxiety or depressed mood and that negative, but not positive, parenting helped to mediate the impact of a mother's anger on her child's anger.

#### *Does the Model Operate Differently in Families of RSDS Mothers and in Control Families?*

Preliminary analyses indicated that neither maternal anxiety nor depressed mood predicted the corresponding emotion in children in the RSDS families or the control families. Thus, the remaining analyses are focused on establishing whether the process of anger transmission operates differently in RSDS and control families.

One possibility is that the process of anger transmission is accentuated in families that include a mother with RSDS (accentuated anger-transmission model). That is, RSDS mothers' anger may have a stronger impact than control mothers' anger on their child's anger. Alternatively, the process of anger transmission may be dampened (anger-containment model). That is, RSDS mothers' anger may have a weaker impact than control mothers' anger on their child's anger.

To test these possibilities, we assessed whether the link between mother's and child's anger differed between the two family types by introducing into Model A, Table 2, a term for the interaction between mother's anger and RSDS family status versus control family status, and a term for the main effect of RSDS. The analyses revealed a positive main effect for mother's anger and a significant negative mother's anger  $\times$  RSDS interaction term. (See Model A, Table 3.) The negative interaction term indicates that the impact of mother's anger on child's anger was reduced in families that included an RSDS mother. This supports the anger-containment model.

The reduced impact of maternal anger on child's anger in RSDS families might reflect a reduced impact of RSDS mother's anger on negative parenting or a reduced responsivity on the part of the child to the RSDS mother's negative parenting or both. We tested the first of these possibilities by introducing into Model B, Table 2, a RSDS status term and a term for the interaction between mother's anger and RSDS family status. The interaction term was significantly negative (Model B,



TABLE 3. TESTING WHETHER THE DISTRESS-TRANSMISSION MODEL OPERATES DIFFERENTLY IN RSDS AND CONTROL FAMILIES (BASED ON MULTILEVEL ANALYSES)

Model	Dependent Variable	Intercept	Child's Anger Yesterday	Mother's Anger	RSDS Family	Mother's Anger × RSDS Family
A	Child's anger	1.00	.10***	.12***	.15 <sup>†</sup>	-.12*
B	Negative parenting	.79	.02	.22***	.10*	-.11**

<sup>†</sup> $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 3), indicating that RSDS mothers were less likely than control mothers to engage in negative parenting when they felt angry.

We conducted a similar analysis with positive parenting as the dependent variable. In this case, the interaction term was not significant ( $b = .06$ ,  $F(1,79) = 1.2$ , *ns*). Next, we examined whether the anger levels of children of RSDS mothers were less responsive than those of control children to the mother's negative parenting. We tested this possibility by estimating a model in which child's anger was the dependent variable, and negative parenting, RSDS status, and a term for the interaction between negative parenting and RSDS status were the independent variables. A marginally significant negative interaction term indicated that child's anger was less strongly associated with negative parenting in RSDS families than in control families ( $b = -.17$ ,  $F(1,66) = 3.3$ ,  $p < .08$ ). When a similar analysis was conducted for positive parenting, the interaction term was nonsignificant ( $b = .01$ ,  $F(1,80) = .01$ , *ns*).

In sum, these findings indicate that the anger-transmission model depicted in Figure 1 is dampened in RSDS families. To more clearly show the differences between RSDS families and control families in anger transmission via negative parenting, we recomputed the relevant models in Table 2 separately for both groups (i.e., Models A, B, D). The results of this analysis are reported in Table 4 and depicted graphically in Figure 2, where the coefficients for control families are above the line, and the coefficients for RSDS families are below the line. The results show that the anger-transmission model operates for control families but not for

RSDS families. For control families, the coefficient for the total association between maternal anger and child's anger is .11, whereas it is  $-.001$  for the RSDS families (Table 4, Model A). For control families, the part of the total anger-transmission effect that is mediated by negative parenting is .05, maternal anger  $\rightarrow$  negative parenting coefficient (.22, Model B)  $\times$  negative parenting  $\rightarrow$  child anger coefficient (.24, Model D), and the part that is unmediated is .06 (Model D). For RSDS families, the part of the total anger-transmission effect that is mediated by negative parenting is .015, maternal anger  $\rightarrow$  negative parenting coefficient (.11, Model B)  $\times$  negative parenting  $\rightarrow$  child anger coefficient (.14, Model D), and the part that is unmediated is  $-.014$  (Model D). Although the links between maternal anger and negative parenting (Model B) and between negative parenting and child's anger (Model D) are significant for RSDS families, they are about half the magnitude that they are for control families.

When we controlled for mothers' daily anxiety or depressed mood, the findings reported in Table 4 were not altered. Moreover, controlling for between-family variables on which RSDS families and control families differed significantly (parental age, father's education, and the number of children in the family) did not account for why the process of anger transmission differed in RSDS families and control families.

## DISCUSSION

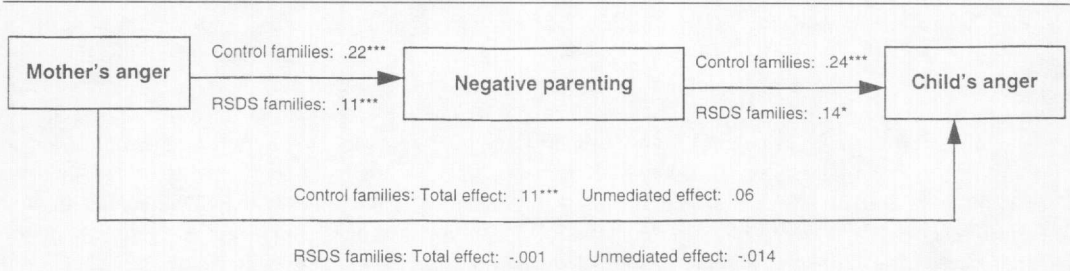
The model of distress transmission depicted in Figure 1 has received considerable support in between-

TABLE 4. TESTING THE MODEL OF DISTRESS TRANSMISSION SEPARATELY FOR RSDS FAMILIES AND CONTROL FAMILIES (BASED ON MULTILEVEL ANALYSES)

Model	Dependent Variable	Family Type	Intercept	Child's Anger Yesterday	Mother's Anger	Negative Parenting
A	Child's anger	RSDS	1.18	.08*	$-.001$	—
		Control	0.98	.13***	.11***	—
B	Negative parenting	RSDS	0.90	.03	.11***	—
		Control	.80	.03	.22***	—
D	Child's anger	RSDS	.90	.06	$-.014$	.14*
		Control	.80	.12***	.06	.24***

\* $p < .05$ . \*\*\* $p < .001$ .

FIGURE 2. PROCESS OF ANGER TRANSMISSION IN RSDS FAMILIES AND IN CONTROL FAMILIES



\* $p < .05$ . \*\*\* $p < .001$ .

subjects designs in which parental distress is treated as a stable, individual difference. Our results show support for the model with data from a within-subjects design in which the focus is on establishing whether the distress levels of mothers and their adolescent children covary across days. However, our findings also suggest a number of refinements that need to be made to the general model of distress transmission.

First, we found evidence of a unique correspondence between mother's anger and child's anger at the daily level. This correspondence was mediated partially by harsh mother-child interactions but not by a reduction in positive mother-child interactions. We did not find a unique correspondence between mother and child in daily depressed mood or anxiety.

Second, the overall support for the model in the case of anger masked important differences in the transmission process between typical families and families in which the mother experienced chronically heightened distress because of RSDS. The model of anger transmission operated in typical families, but it did not operate in RSDS families. This supports the hypothesized model of distress containment for these families. The within-day correspondence between mother's anger and child's anger was significantly reduced in RSDS families, relative to typical families, because RSDS mother's anger was less likely to spill over into negative parenting and because the children of RSDS mothers were marginally less reactive to their mother's anger. The reduced transmission of anger from mother to child helps explain why children with RSDS mothers did not differ from their counterparts in control families in daily levels of anger, despite having mothers who reported significantly higher levels of daily anger than the control mothers reported.

In sum, the results of our research on the process of distress transmission underscore the value of distinguishing among different types of emotion and of addressing the possibility that the

model may operate differently, depending on the source of parental distress.

#### *Why Is the Transmission Process Dampened in Families in Which the Mother Has RSDS?*

One potential explanation is that the mothers and their children may simply have adapted to chronically high levels of maternal anger. We found no support for this explanation because the process of anger transmission was not dependent on the mother's mean level of anger across the diary period. An alternative explanation is based on the assumption that the effect of people's anger on their behavior toward others depends on the attributions they make for their anger (Cervone, 1994; Schachter & Singer, 1962; Schwartz & Clore, 1988). Because pain provides a ready explanation for RSDS mothers' anger, these mothers may be less likely than control mothers to attribute their anger to the actions of their children. In addition to having a heightened awareness of the role of pain in their anger, they also may be more practiced at inhibiting the translation of angry thoughts and feelings into harsh, coercive parenting. Thus, their threshold for reacting harshly to their child when they feel angry may be higher than that of control women. Testing these explanations requires assessing mothers' attributions for their feelings each day and their efforts to regulate the impact of their mood on their behavior. Such information would help to establish whether control mothers transmit anger to their children to a greater extent than RSDS mothers because the control mothers are more likely than RSDS mothers to attribute their anger to their child's behavior and to let the child know that they are angry at him or her.

Similar explanations may account for why children of RSDS mothers are marginally significantly less responsive to their mother's negative parenting. These children may be more likely to explain their mother's negativity as resulting from her

pain than from her negative personality. This explanation is illustrated by the response given by the child of a RSDS mother. Asked how she would interpret a hypothetical parental behavior that embarrassed her in front of a friend (i.e., if the parent angrily ordered the child to tidy up her room in front of a friend), the child stated, "If my father did it, it would be because he's being a jerk; if my mother did it, it would be because she is in pain because of her illness." The more benevolent explanation given to the behavior of the parent with RSDS is likely to modulate the child's affective and behavioral response.

It is also possible that family-level characteristics—beliefs, routines—may help to structure daily life in ways that facilitate anger containment in RSDS mothers. Qualitative reports from study participants suggest that the families of women with RSDS often believe that they should make every effort to minimize family stress and conflict, which they believe exacerbate pain symptomatology. Thus, members of these families may work to minimize stress and conflict by establishing family routines and using proactive coping strategies. In addition, RSDS mothers' awareness of the limits on their energy and activity may prompt them to direct their scarce resources toward their most important goals, such as parenting effectively.

#### *Caveats and Conclusions*

Several caveats need to be considered when evaluating our results. First, the hypothesized unidirectional model linking maternal anger with child anger via parenting clearly does not capture the bidirectional nature of anger transmission in parent-child dyads (Dix, 1991). Moreover, because we examined same-day associations between parent and child distress, it was not possible to determine unambiguously the direction of causality in the associations that we documented. One way around this would be to examine whether mother's current anger predicted change from one day to the next in parenting or child anger. Analyses revealed no cross-day effects either from mother to child or from child to mother, however. Thus, the effect of mothers' anger on children or vice versa was restricted to the same day. This finding suggests that the 24-hour period covered by daily diaries may not be optimal for detecting changes in child's anger that are caused by mother's anger and associated negative parenting, a prerequisite to demonstrating causality. Detecting such effects may require reports made many times during the day.

Second, we rely on mothers' reports of their own parenting behavior. However, a similar pattern of results emerged when we substituted the child's report of the occurrence of mother-child conflict for the mother's report of negative parenting. Specifically, the association between maternal anger and children's reports of conflict with their mothers was dampened in families with RSDS mothers. In future studies, it will be important to complement self-reports of parenting with reports by other family members or with direct observations. (See for example, Repetti & Wood, 1997b.)

Third, it should not be concluded from our findings that the mother's pain condition has no detrimental effect on family life. A different picture emerged from RSDS family members' qualitative accounts of how the illness had changed their family. They spoke of dashed dreams for the future, of financial worries, of the feeling that family life had become centered around the illness. Nonetheless, the toll of the illness does not emerge in the daily distress levels of children. Yet, qualitative data revealed that, when asked to focus more directly on how the illness has changed their lives, children readily identified its disruptive impact.

Finally, our criteria for the sample may have inadvertently selected RSDS families with a relatively more adaptive approach to coping with the mother's health crisis, and thus our sample may be unrepresentative of RSDS families, in general.

Caveats notwithstanding, this study illustrates that it is sometimes possible to function adequately in important social roles, despite being distressed. Understanding the circumstances under which anger, depressed mood, or anxiety do and do not translate into impaired interpersonal functioning is clearly a topic for further research.

#### NOTE

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