

# Behavior Problems of Children With Autism, Parental Self-Efficacy, and Mental Health

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## Abstract

Self-efficacy has been identified in the general parenting literature as an important variable affecting parent outcomes. In the present study, 26 mothers and 20 fathers of children with autism reported on their self-efficacy, anxiety, and depression. Teachers rated the behavior problems of the children. Regression analyses showed that self-efficacy mediated the effect of child behavior problems on mothers' anxiety and depression, but there was no evidence that it functioned as a mediator for fathers. However, there was evidence that self-efficacy moderated the effect of child behavior problems on fathers' anxiety. No evidence for the moderating effect of self-efficacy was apparent for mothers. Methodological issues and the theoretical and practical implications of these results are discussed.

One of the most significant stressors for family caregivers and support staff is the extent of behavior problems exhibited by children and adults with developmental disabilities (e.g., Bebko, Konstantareas, & Springer, 1987; Bersani & Heifetz, 1985; Buckhalt, Marchetti, & Bearden, 1990; Chung, Corbett, & Cumella, 1995; Corrigan, 1993; Hatton, Brown, Caine, & Emerson, 1995; Jenkins, Rose, & Lovell, 1997; Koegel et al., 1992; Konstantareas & Homatidis, 1989; Quine & Pahl, 1985; Weiss, 1991). Although many studies of parental stress have incorporated a broad range of measures, including child characteristics and parental resources variables, researchers have typically addressed the main effects of predictor variables on parental psychological well-being. However, relevant psychological theory suggests that the interrelationships between variables are likely to be crucial in understanding the impact of caring for a child with significant disabilities on parent outcomes (e.g., Lazarus & Folkman, 1984; McCubbin & Patterson, 1983).

Self-efficacy may be a particularly significant factor in understanding the effects of dimensions of childhood disability on parents. Bandura's (1977, 1986, 1989) theoretical writings identify

*self-efficacy* in terms of perceptions of one's skills in a given domain. A crucial point is that self-efficacy is likely to vary for different behaviors in different contexts. That is, self-efficacy is something that is domain-specific. In the present study we focused on a particular dimension of childhood disability (behavior problems) and effects on parents. Thus, the most appropriate level at which to measure self-efficacy, and the level where one is likely to observe effects, is focused on the domain of child behavior problems.

Over more than 2 decades, there has been a large volume of general research identifying self-efficacy as a crucial variable in predicting behavior and in understanding psychological well-being. In terms of mental health, more positive self-efficacy is associated with psychological well-being or less psychological distress. In the parenting domain, self-efficacy has also been identified as a key construct in terms of its relationship to various outcomes, including parenting behaviors and parenting stress (see Coleman & Karraker, 1998, for a recent review).

A further model that identifies self-efficacy as an important factor in adaptation to stress is Taylor's (1983) cognition adaptation theory. This the-

ory has also been influential in research addressing adaptation in families of children with disabilities (e.g., Turnbull & Turnbull, 1993). Taylor's theory suggests that people develop coping strategies that serve to enhance feelings of efficacy and self-concept when faced with traumatic events. These coping strategies are typically in the form of cognitive illusions (i.e., a positive "spin" on the situation that facilitates coping). Thus, if the coping strategies adopted have a positive impact on self-efficacy, the likelihood of positive/adaptive outcomes is increased.

Within the research literature on families of children with developmental disabilities, parental self-efficacy has been explored in two ways to date: (a) as a predictor of parental outcomes and (b) as an outcome variable itself. In research addressing the former, several studies have established that self-efficacy or closely related constructs are predictive of parental stress (e.g., Frey, Greenberg, & Fewell, 1989; Friedrich, Wilturner, & Cohen, 1985; Krauss, 1993). In research addressing the latter, investigators have found child variables, including child behavior problems and caregiving demands, to be predictive of self-efficacy (e.g., Heller, 1993). However, most researchers addressing self-efficacy as an outcome variable have operationalized it in terms of feelings of parental competence.

A number of researchers have either focused on parenting competence in families of children with disabilities as the primary dependent variable or have included measures of psychological distress alongside a measure of competence. Comparison designs have indicated that mothers of children with developmental delays report greater competence in parenting than do mothers of children with no delays, especially during the infant stage (Gowen, Johnson-Martin, Goldman, & Appelbaum, 1989; Haldy & Hanzlik, 1990). Non-parental caregivers have also been investigated. For example, Stoneman and Crapps (1988) studied 104 women providing care for people with mental retardation in their homes. The three predictors of these women's perceived competence in the caregiving role were the presence of a person with mental retardation in the caregiver's own family, positive attitudes of neighbors, and social support.

Thus, existing research on self-efficacy of caregivers of children with developmental disabilities has been limited to its main effect on other outcomes, such as stress, or as an outcome in its own

right. Given the theoretical reasons for expecting self-efficacy and other parental resources variables (cf. Beresford, 1994) to act in ways other than a simple main effect relationship, research is needed on the functions of self-efficacy. We have already indicated that self-efficacy is best studied within a defined domain in order to understand its potential effects. Children's behavior problems are clearly a significant stressor for parents. Thus, research in which the impact of children's behavior problems on parental outcomes is addressed may be a good vehicle for the exploration of the role of self-efficacy.

In addition to the fact that they are a significant factor predicting parental stress, there is a further reason for an interest in the role of psychological variables in understanding the response of caregivers to problem behaviors. Systems models of behavior problems in children and adults with developmental disabilities have emphasized the dynamic nature of the relationship between child and parent or support staff behavior (Hastings & Brown, 2000). In particular, researchers have suggested that parents and support staff act in ways that avoid the short-term negative impact of behavior problems on themselves but ensure their longer term maintenance (e.g., Oliver, 1995). In essence, parents and support staff find problem behaviors aversive, which affects their interactions with the people with developmental disabilities who are in their care. Thus, studying the role of self-efficacy as a variable that may affect the relationship between child behavior problems and parental mental health outcomes may have implications for work with parents but also for theory and practice relating to problem behavior.

The preceding discussion suggests that it is important to understand the psychological mechanisms underlying the impact of behavior problems on parents from the perspective of parents under stress and from an interest in the prevention or amelioration of problem behaviors themselves. Our main purpose in the present study was to explore the role of self-efficacy as an intervening variable affecting the relationship between child behavior problems and parental well-being. Existing research within the general parenting domain suggests that self-efficacy will act as a mediator of such a relationship (Coleman & Karraker, 1998). However, intervening variables may alternatively function as moderators (see Baron & Kenny, 1986). Therefore, the analyses presented

here explored both mediator and moderator models of the action of self-efficacy.

In the present research we also addressed a number of important methodological issues. First, much stress research suffers from a lack of independent measurement of stressor variables and parental outcomes. Typically, parents report on the behavior problems of their children and self-report on stress or another outcome. In the present study, we relied on self-reports of psychological distress but asked teachers rather than parents to rate the behavior problems of the children. Second, it is clear from existing research that mothers and fathers are affected differently by the experience of raising a child with developmental disabilities (e.g., Krauss, 1993; Roach, Orsmond, & Barratt, 1999). Therefore, we included measurement of both fathers and mothers in the present study. Finally, in the majority of existing research studies, investigators used a measure of general parenting stress as their outcome variable or one designed to be used with samples of families of children with disabilities. In the present research, we adopted a standard measure of depression and anxiety used more widely in mental health research.

## Method

### *Participants*

Participants were 26 mothers (including one foster mother) and 20 fathers of children with autism. Twenty of the mothers and 18 of the fathers were married or living with their partner, and the remainder were divorced or separated from their partners. The mothers' mean age was 41.04 years (standard deviation [*SD*] = 5.00), 15.3% had a university education, although their modal educational level was high school level certificates. The fathers' mean age was 43.50 years (*SD* = 5.06), 25% had a university education, and their modal level of education was high school.

All of the parents had offspring who attended a school for children with autism. Their children were 12.15 years of age on average (*SD* = 2.49); 17 were male and 9 were female. For the mothers, 12 children resided at home, one resided mainly with the mother but some of the time with the father, and the remainder lived most of the time in a residential setting (11 were weekly boarders at the school). For the fathers, 10 children resided at home, one resided mainly with the mother but some of the time with the father, and the remain-

der resided most of the time in a residential setting (6 were weekly boarders at the school). Fifteen of the mothers and 11 of the fathers reported that respite care services for their child with autism were available to them.

### *Materials*

*Ratings of children's behavior problems.* The extent of problem behavior exhibited by each of the children was measured using the Teacher Report version of the Developmental Behavior Checklist (Einfeld & Tonge, 1995). This rating questionnaire contains 93 individual items that were derived from case files of children and adolescents with developmental disabilities. It is one of a very small number of behavior rating questionnaires developed upon and standardized for populations of children and adolescents with mental retardation, and it has excellent psychometric properties (Einfeld & Tonge, 1995; Hastings, Brown, Mount, & Cormack, 2001). The Developmental Behavior Checklist has been used in a broad range of research studies, including research in which relationships between children's behavior problems and parental stress are explored (e.g., Hoare, Harris, Jackson, & Kerley, 1998). The Developmental Behavior Checklist Total Behaviour Score was used as an index of the severity of behavior problems displayed by the children.

*Parent questionnaire.* Mothers and fathers were asked to complete a questionnaire composed of three main sections. The first section contained a number of demographic questions (see *Participants* section). The second section was a domain-specific measure of parents' self-efficacy (i.e., perception of efficacy in relation to their child's behavior problems). This scale contained five efficacy items: feelings of confidence, control and satisfaction in dealing with their child's problem behaviors, a perception that they have a positive impact on their child's problem behaviors, and a rating of how difficult they find it to deal with their child's problem behaviors. Each item is rated on a 7-point scale, and a total score is derived by summing the ratings on the five items. Although no other psychometric data are available on this scale, it was found to have an excellent level of internal consistency, Cronbach's alpha for mothers = .94; for fathers, .92.

The final section of the parent questionnaire contained the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). Although originally developed for residential populations, this

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measure has been used extensively in community research. It contains 14 four-point items, with 7 assessing depression (e.g., "I feel as if I am slowed down") and 7 assessing anxiety (e.g., "I get sudden feelings of panic"). Participants reaching a clinical cut-off on each scale can be classified as likely to have depression or anxiety. However, a dimensional approach was taken for the main analyses in the present study, with total scores on the two subscales being used. A reliability check within the present sample confirmed that both the Anxiety, Cronbach's alpha = .86 for fathers and .89 for mothers, and Depression, fathers' alpha = .74, mothers' = .86, subscales had high levels of internal consistency.

*Procedure*

Teaching staff were given a Developmental Behavior Checklist for each child in their classroom, and 38 questionnaires were returned. Parent questionnaires were mailed to each child's home address by the school and then returned in a prepaid envelope to the researchers. The response rates (50% for fathers and 65% for mothers) were within the typical range for survey research of this sort. No postal reminders were issued to parents because of two linked ethical issues: (a) the researchers did not have access to the parent database at the school for data-protection reasons, and (b) parents were assured that their response to the survey would not be made known to the school. No data were available on nonresponders, although the demographic data appear to be reasonably representative of the parents whose children attend the school.

**Results**

Through the main analyses we investigated evidence for the mediating or moderating effect

of self-efficacy on the relationship between children's problem behavior and parental depression and anxiety. Before these main analyses, we conducted descriptive and exploratory analyses. The descriptive analyses were focused on mean scores for mothers and fathers on the main variables of interest and the percentage of parents who scored in the borderline or clinical range on the Hospital Anxiety and Depression Scale (see Table 1). Associations between mothers' and fathers' scale scores and self-efficacy ratings, and the relative level of behavioral problems reported for their children with autism, were also explored. These analyses revealed small and nonsignificant associations between the ratings of married couples (Anxiety:  $r(18) = .21$ , Depression:  $r(18) = .36$ ; self-efficacy:  $r(18) = .25$ ). Furthermore, the Developmental Behavior Checklist total score for the present sample was similar to that in previous research conducted in the United Kingdom (Cormack, Brown, & Hastings, 2000) that was focused on children in schools for students with severe mental retardation ( $M_s = 55.58$ ,  $SD = 21.88$ , and 51.70, respectively).

Exploratory analyses addressed two issues: (a) the suitability of the data for parametric analysis and (b) any effects of demographic variables on depression and anxiety self-reports. The first of these issues was addressed through the use of one-sample Kolmogorov-Smirnov tests to compare the distributions of all of the continuous independent and dependent variables to a normal distribution. All of these test results were nonsignificant, indicating that the data did not differ significantly from a normal distribution.

We explored associations between demographic factors and anxiety and depression scores using *t* tests (for dichotomous demographic variables, such as child gender, availability of respite care services, and whether the child lived mainly

Table 1. Mean Scores on the Hospital Anxiety and Depression Scale (HADS) and Self-Efficacy Measures

Measure	Mothers		Fathers	
	Mean	5D	Mean	5D
Self-efficacy	23.45	8.58	22.40	6.46
HADS Anxiety	7.92	4.44	5.80	4.16
Clinical or borderline range (%)	—	54	—	25
HADS Depression	5.23	4.06	4.60	3.12
Clinical or borderline range (%)	—	38	—	15

**Table 2.** Results of Regression Analysis of Mothers' Depression

Model/Predictor	B	Model R	F	R <sup>2</sup> change	F
1 DBC <sup>a</sup> total score	.47*	.47	5.57*		
2 DBC total score	-.02	.78	14.66***	.39	18.78***
Self-efficacy	-.79***				
3 DBC total score	-.05	.79	9.62***	.01	.43
Self-efficacy	-.76***				
DBC x Self-efficacy	-.11				

<sup>a</sup>Developmental Behavior Checklist.

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

with the parent) and Pearson's correlations (for continuous demographic variables, such as parental age). These analyses revealed only two significant relationships, between fathers' age and their Hospital Anxiety and Depression Scale scores. Older fathers reported less anxiety,  $r(20) = -.54$ ,  $p < .05$ , and less depression symptoms,  $r(20) = -.53$ ,  $p > .05$ . Thus, age was retained as a variable for the analyses of fathers' data described later.

The main statistical analyses were focused on hierarchical regression procedures. First, the child's total Developmental Behavior Checklist score was entered into the regression as a predictor. In order to explore evidence for mediation, we entered self-efficacy scores as the second step in the analysis. If self-efficacy mediated the effect of behavior problems on anxiety or depression, we would expect to see checklist scores initially making a significant independent contribution to the prediction of the dependent variable. However, once self-efficacy scores were entered, we would expect to see a reduction in the contribution made by Checklist scores and for this contribution to no longer be significant (cf. Baron & Kenny, 1986).

In the third step of the regression, an interaction term for the Developmental Behavior

Checklist and self-efficacy scores was entered. This term was the product of the z-transformed scores on the Developmental Behavior Checklist and the self-efficacy measure as recommended by Baron and Kenny (1986). Evidence for the moderating effect of self-efficacy could be established at this third step if the interaction term explained a significant proportion of the variance over and above that accounted for by the main effects of its two contributing variables (Baron & Kenny, 1986). Four regression analyses were conducted in this manner (two for fathers and two for mothers). The analyses for fathers included an additional first step where their age was entered as a predictor variable because it had a significant univariate association with Hospital Anxiety and Depression Scale scores. Thus, the contribution of other variables was evaluated independent of age effects. The results of the regression analyses are summarized in Tables 2 to 5.

All of the steps of the regression models summarized in Tables 2 to 5 led to significant prediction of parents' Hospital Anxiety and Depression Scale scores. In terms of evidence for the role of self-efficacy as a mediator variable carrying the effect of their child's behavior problems on parents' mental health, there is appropriate evidence in Ta-

**Table 3.** Results of Regression Analysis of Mothers' Anxiety

Model/Predictor	3	Model R	F	R <sup>2</sup> change	F
1 DBC <sup>a</sup> total score	.54**	.54	8.38**		
2 DBC total score	.18	.72	10.13***	.22	8.67**
Self-efficacy	-.59**				
3 DBC total score	.21	.73	6.68**	.01	.41
Self-efficacy	-.62**				
DBC x Self-efficacy	.12				

<sup>a</sup>Developmental Behavior Checklist.

\*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 4.** Results of Regression Analysis of Fathers' Depression

Model/Predictor	<i>p</i>	Model <i>R</i>	<i>F</i>	<i>R</i> <sup>2</sup> change	<i>F</i>
1 Father age	-.53*	.53	6.91*		
2 Father age	-.49*	.55	3.76*	.03	.71
DBC <sup>a</sup> total score	.17				
3 Father age	-.50*	.73	6.04**	.23	7.66*
DBC total score	.17				
Self-efficacy	-.47*				
4 Father age	-.53*	.73	4.39*	.01	.27
DBC total score	.13				
Self-efficacy	-.49*				
DBC x Self-efficacy	-.10				

<sup>a</sup>Developmental Behavior Checklist.

\**p* < .05. \*\**p* > .01.

bles 2 and 3. The independent significant prediction of anxiety and depression scores by the child's total Developmental Behavior Checklist score became nonsignificant when mothers' self-efficacy ratings were added to the regression equation. Furthermore, mothers' self-efficacy ratings made a significant independent contribution to the prediction of Hospital Anxiety and Depression Scale scores within these regression models. There was no evidence for the mediational role of self-efficacy in the analyses of fathers' anxiety and depression (Tables 4 and 5).

Within the analyses of mothers' anxiety and depression, there was no evidence for the role of self-efficacy as a moderator variable. The interaction term between Developmental Behavior Checklist scores and self-efficacy ratings did not make a significant contribution to the prediction

of Hospital Anxiety and Depression Scale scores after accounting for the main effects of these variables. However, although there was similarly no evidence for a moderating role of self-efficacy in the analysis of fathers' depression, there was evidence that self-efficacy moderated the effect of child behavior problems on fathers' anxiety. Specifically, the interaction term in Table 5 was significant at Step 4 of the hierarchical regression and accounted for a significant change in *R*<sup>2</sup>.

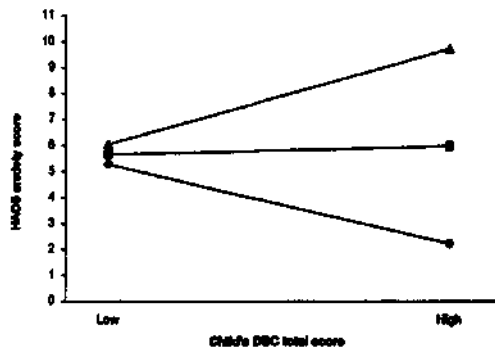
In order to explore the nature of this interaction effect, we derived a data plot based on the guidelines developed by Aiken and West (1991). Figure 1 shows predicted values (i.e., derived from the regression equation) for fathers' anxiety scores at low (one *SD* below the mean) and high (one *SD* above the mean) values of their child's total Developmental Behavior Checklist score for each

**Table 5.** Results of Regression Analysis of Fathers' Anxiety

Model/Predictor	<i>B</i>	Model <i>R</i>	<i>F</i>	<i>R</i> <sup>2</sup> change	<i>F</i>
1 Father age	-.54*	.54	7.39*		
2 Father age	-.50*	.57	4.14*	.04	.92
DBC <sup>a</sup> total score	.20				
3 Father age	-.51*	.73	5.92**	.20	6.70*
DBC total score	.19				
Self-efficacy	-.45*				
4 Father age	-.62***	.82	7.92***	.15	7.13*
DBC total score	.04				
Self-efficacy	-.49**				
DBC x Self-efficacy	-.43*				

<sup>a</sup>Developmental Behavior Checklist.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.



**Figure 1.** Interpretation of the interaction effect between child's behavior problems and fathers' self-efficacy on fathers' anxiety. The circle indicates high self-efficacy; the square, mid self-efficacy; and the triangle, low self-efficacy. HADS = Hospital Anxiety and Depression Scale, DBC = Developmental Behavior Checklist.

of three levels of self-efficacy scores (one *SD* below the mean, at the mean value, and one *SD* above the mean). Figure 1 shows that at low levels of child behavior problems, there was little effect of varying levels of self-efficacy. Conversely, at higher levels of child behavior problems, those fathers with lower feelings of self-efficacy reported more anxiety.

## Discussion

The data from the present study show high levels of potential mental health problems in parents of children with autism, especially mothers. Also at the descriptive level, there were only weak and nonsignificant associations between parents of the same child, suggesting that mothers and fathers may be affected differently by their child, as has been indicated in previous research. Hierarchical regression analyses helped to elucidate one mechanism by which parents may be affected differently by their child's behavior problems. These analyses identified self-efficacy as a mediator of the relationship between child behavior problems and mothers' anxiety and depression, but not fathers' anxiety and depression. Conversely, self-efficacy moderated the effect of child behavior problems on fathers' anxiety. Fathers with high self-efficacy were less anxious than were those with low self-efficacy when their child had a high level of behavior problems. When their child had low levels of behavior problems, father's self-efficacy had no effect on their anxiety. There

was no evidence for the moderating effect of self-efficacy in the analyses of mothers' anxiety or depression.

These findings complement those of research studies in other fields, especially on parenting, in that self-efficacy was identified as an important variable in understanding the relationship between child behavior problems and parents' mental health outcomes. Analyses of mothers' data supported the general prediction that self-efficacy would function as a mediator variable in this context. However, analyses of fathers' data indicated that self-efficacy was not a mediating variable for them. Rather, there was evidence that self-efficacy acted as a moderator variable for fathers. In essence, self-efficacy acted as a protective factor (Rutter, 1985) for fathers, countering the risk to anxiety associated with high levels of child behavior problems. This difference in the mechanism of action of self-efficacy between mothers and fathers of children with autism requires replication. However, the observed distinction emphasizes the importance of studying mothers and fathers separately, even where overall levels of mental health and self-efficacy were relatively similar.

There are a number of methodological issues that need to be emphasized before we discuss the theoretical and practical significance of the present findings. First, the samples of mothers and fathers were small. This needs to be balanced against the fact that the effects observed in the analyses were found to be statistically significant. With a larger sample, the effect of child behavior problems on fathers' mental health probably was substantial enough to emerge as statistically significant. Even within the small sample here, there were strong relationships between the child's behavior problems and mothers' anxiety and depression (see Tables 2 and 3). However, our focus in the present study was on process, and the results of the analyses in Tables 4 and 5 show no change in the prediction of mental health by child behavior problems when self-efficacy is added at Step 3. Thus, there is not even a hint that self-efficacy might act as a mediator variable for fathers. Also worthy of note is that it is very difficult to identify interaction effects in regression in applied studies (McClelland & Judd, 1993). However, the interaction term for fathers' anxiety was found to be significant even in this small sample.

The second methodological issue is that the present sample was unlikely to have been representative on a number of levels. First, the response

rates were only of a medium level, so the sample may not have been representative of parents at the school. Second, the sample was not likely to have been representative of families of children with autism generally because these families were relatively highly educated. Third, the sample did not contain parents of children with other developmental disabilities. Finally, many of the children boarded at the school during the week and were only home on weekends and during school holiday periods. These points, and those raised earlier, should be considered as we explore the implications of the findings. Most important is that the results need to be replicated with larger and more representative samples.

The issue of the residential status of a number of the children (at least as weekly boarders at the school) is one that could have been predicted to be important in the context of the present study. There were no differences on Hospital Anxiety and Depression Scale scores between mothers and fathers whose children lived with them and those whose children boarded at the school. However, it was possible that parents whose children resided at the school would be less affected by their child's behavior problems than were other parents. Although not our main focus, and thus not reported in the *Results* section, we repeated the hierarchical regression analyses but explored residential status as a moderator variable in place of self-efficacy. There was no evidence that residential status moderated the impact of child behavior problems on parents in the manner suggested. Thus, it seems unlikely that the results relating to self-efficacy can be explained by the child's residential status.

Two further methodological issues are worthy of note. The first is that the regression models for mothers were able to explain more of the variance in anxiety (52%) and depression (62%) than were the regression models for fathers' anxiety (39%, excluding fathers' age) and depression (27%, excluding fathers' age). This serves again to support the argument that children with disabilities and associated parental psychological factors, such as self-efficacy, are likely to affect fathers and mothers differently.

The final methodological issue relates to the problem of source variance and potential measurement overlap. Although we avoided the source variance problem of parents reporting on their child and on themselves, respondents did report on both their self-efficacy and their mental

health symptoms. Clearly, self-concept is a key dimension of mental health problems, especially anxiety and depression. By way of counterargument, the items for these variables in the present study are dissimilar and address a different level of measurement (the domain of dealing with the child's behavior problems vs. general day-to-day mental health symptoms). Further research is needed in order to address these problems in two ways: (a) independent assessment of parental mental health problems and (b) longitudinal data to allow testing of the implied causal role of self-efficacy as either a mediator or moderator. Causality cannot be inferred from the present study, although these are the first data to suggest that there may be a key role for self-efficacy relating to behavior problems as an intervening variable affecting the relationship between child behavior problems and parental outcomes.

The finding that self-efficacy may potentially act as a mediator variable for mothers and possibly as a moderator variable for fathers has theoretical and practical implications. At the theoretical level, a distinction has been drawn between protective factors and compensatory factors (Luthar & Zigler, 1991; Rutter, 1985). Compensatory factors have a positive effect on outcomes such as mental health across all levels of risk. However, the action of protective factors is dependent on the context of risk. At low levels of risk, they have no effect because there is nothing to protect against. However, under conditions of high risk, they reduce negative outcomes. Thus, self-efficacy can be viewed as a compensatory factor for mothers of children with autism in terms of the impact of their child's behavior problems on their anxiety and depression. Furthermore, self-efficacy can be viewed as a protective factor for fathers of children with autism because it acts only under conditions of high risk (when the level of behavior problems is high).

The distinction between the mediating and moderating role of self-efficacy also has practical implications. Interventions that act to increase feelings of self-efficacy in parents of children with autism would, on the basis of findings from the present study, have positive effects on both fathers' and mothers' mental health. For mothers, improving self-efficacy should have a direct impact on improvements in mental health. For fathers, improving self-efficacy will reduce the impact of child behavior problems on anxiety for those fathers dealing with the most difficult chil-

dren. However, mothers' self-efficacy is also related strongly to the level of their child's behavior problems. Therefore, it is less certain that targeting self-efficacy will have a predictable effect on mental health outcomes. Conversely, fathers' self-efficacy was not related to their child's behavior problems. Thus, self-efficacy interventions ought to have a more predictable effect. Of course, there are likely to be variables other than the child's behavior problems that affect parents' feelings of efficacy in dealing with difficult behavior. Therefore, the picture painted here may not be as straightforward as implied. However, the main point is that basic research addressing psychological mechanisms is likely to have significant implications for intervention with parents of children who have developmental disabilities.

Also needed are studies in which researchers explore the interaction between key psychological variables affecting parental outcomes. In particular, the relationships among coping, social support, and self-efficacy appear worthy of study. This observation is derived from a number of sources. First, Taylor's (1983) cognitive adaptation theory suggests that the coping strategies adopted in the face of traumatic events will have an effect on self-efficacy. Second, although not focused on parents, recent research in the developmental disabilities field supports this prediction. Specifically, the adoption of adaptive as well as disengagement coping strategies predicted burnout in support staff working with adults who have mental retardation and engage in problem behaviors (Mitchell & Hastings, 2001). Third, existing research on competence of parents of children with developmental disabilities suggests a relationship between social support and self-efficacy. Several researchers have found that social support predicts parents' feelings of competence (e.g., Gowen et al., 1989; Haldy & Hanzlik, 1990; Stoneman & Crapps, 1988).

In the discussion so far we have assumed that the effects observed are related closely to parent gender in some way. However, it is important to ask why self-efficacy might function differently for mothers and fathers of children with autism. In particular, it is likely that the extent of involvement with the child is a crucial variable. In a recent study of mothers and fathers of preschool children with Down syndrome, Roach et al. (1999) showed that the extent of involvement in child care was predictive of fathers' but not mothers' stress. We might speculate that fathers in the

present study were not involved in the care of their child with autism to any great extent when the child had lower levels of behavior problems. However, when the child had high levels of behavior problems, it was more important and necessary for the father to become involved. This difference could explain the effects observed here.

The point that psychological factors may act differently for mothers and fathers is not reduced by the possibility that the effects identified in the present research may be related closely to involvement in child care. However, it is important not to be seduced by gender differences that may be related to a third variable. In the present context, more research is needed, but the data could potentially be more properly interpreted as suggesting that self-efficacy may mediate the impact of child behavior problems on mental health for those parents involved closely in the care of their child. However, self-efficacy may act as a moderator for those typically less involved in child care.

Finally, the results of the present study may also have implications for theory and practice in relation to problem behaviors of children with developmental disabilities. If we accept the hypothesis that parental mental health is likely to be an important determinant of the way in which parents deal with behavior problems and interact generally with their children, then a focus on self-efficacy may have an indirect impact on the amelioration of problem behaviors. Of course, interventions designed to improve self-efficacy may also have a direct impact on parents' behavior (e.g., via skills-training interventions). These relationships could be explored in future research. These potential implications suggest that a theoretical model of the impact of behavior problems on parents should also refer to the effects of parent behavior on children's behavior problems. A model of this kind would assist researchers and clinicians considerably.

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