

## Articles

### Short-term and long-term processes linking job stressors to father-child interaction

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#### Abstract

*This study explores short-term and long-term processes through which daily job stressors may affect a father's relationship with his school-aged child. Fifteen male air traffic controllers (ATCs) described job stressors and parent-child interaction on three consecutive days. Objective measures of daily workload were also obtained. After a demanding day at work, fathers tended to be more behaviorally and emotionally withdrawn during interactions with their children at home. The emotional withdrawal finding was confirmed with both subjective and objective measures of high workload. There was also evidence of a direct spillover of negative feelings associated with distressing social experiences at work to expressions of anger and greater use of discipline during interactions with a child later in the day. The long-term impact of a chronically stressful work environment was also examined in a separate set of between-subjects analyses. A generally negative social climate at work was associated with a father's tendency to describe his interactions with a child as having a less positive and a more negative emotional tone. Coworkers' independent ratings of the social climate at work confirmed the finding of a long-term negative spillover effect.*

**Keywords:** Family interaction, fathers, job stress, parent-child interaction, parental employment.

Over 70% of all two-parent families in the United States are two-earner families and in more than half of all single-parent homes, the single parent is a wage earner (Bureau of Census, 1991a, 1991b). The realization that the majority of U.S. children are growing up in households in which all parents present in the home participate in the paid labor force has raised important questions in our society about the influence that parents' experiences at work have on children and

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families. Social scientists have approached the issues surrounding this phenomenon in many different ways (for reviews, see Crouter & McHale, 1992; Hoffman, 1986; Menaghan & Parcel, 1990). For example, some have considered how occupational conditions, such as job autonomy and skill utilization, might help to socialize child-rearing values and practices (Kohn, 1963; Piotrkowski & Katz, 1982). This paper focuses on the impact of psychosocial stressors in the work environment. Data from a small sample of air traffic controllers (ATCs) were used to explore the association between two job stressors, task overload and negative social interactions, and two dimensions of parent-child interaction, its emotional tone and the level of parental involvement.

There appears to be a global relation between chronic exposure to job stressors and generally less satisfying family relations, such as the employed person's decreased interpersonal availability to and involvement with family members, and increased signs of anger and aggression in the family (Barling & Rosenbaum, 1986; Burke, 1982; Jackson & Maslach, 1982; Piotrkowski & Cris-Christoph, 1982). In at least two studies an unpleasant social climate at work was associated with a poor emotional climate at home, including less family cohesion and more family conflict (Daniels & Moos, 1988; Repetti, 1987a). A number of investigators have suggested that findings like these may reflect a general spillover of psychological state or mood from work to home (e.g. Crouter, Perry-Jenkins, Huston, & Crawford, 1989; Piotrkowski, 1979; Repetti, 1987a).

There are three areas in which greater specificity is now needed in the work-family literature. First, most investigators have studied the effects that job conditions have on the marital relationship or on the family as a whole. There is a need for studies that focus specifically on the parent-child dyad. Second, studies that include assessments of multiple aspects of worklife can assess whether different types of job stressors have different effects on parent-child interaction.

Third, a differentiation of the within-subject and between-subject processes that underlie work-family linkages would clarify findings in the existing empirical literature. Most of the studies in this area have used cross-sectional between-subjects designs that examine covariation between stable work variables, such as job satisfaction or job strains, and stable outcomes, such as patterns of family conflict and caregiving. A limitation of this approach is the possibility that the observed stable patterns might reflect underlying individual differences, as much as they reflect the effects of an environmental job stressor on the family. Consider, for example, parents who have become depressed for reasons that are not directly connected to their job or their family life. These parents may both perceive and help to create a more stressful job situation. For example, they may receive less satisfaction from their jobs or lose the support of coworkers and supervisors (Repetti, 1993a). In addition, they may behave in a more aversive and withdrawn manner with their children (Downey & Coyne, 1990). In this situation a correlation between stressful occupational circumstances and problematic parent-child relations would not be explained by one condition causing the other but by the common influence of the parent's depression.

Work-family researchers are beginning to conduct longitudinal and diary-report studies that permit an analysis of within-subject variance (Bolger *et al.*, 1989; Crouter *et al.*, 1989; Galambos & Maggs, 1990; Repetti, 1989). By controlling for individual subject characteristics, these studies can overcome the third-variable problem found in studies based on cross-sectional, between-subjects designs. In

addition to this methodological advantage, the recent diary-report studies, which focus on the immediate effects that conditions at work have on behavior in the family, provide a direct examination of the short-term processes that are assumed to support long-term linkages between work and family variables.

### The Present Study

The study reported here addresses these issues in a sample of ATCs. The choice of ATCs was based on several considerations. First, the effects of parental job conditions should be most salient in highly stressful occupations, such as air traffic control (Rose, Jenkins, & Hurst, 1978). Second, an ATC's workload can vary quite a bit from day to day. Third, because federal regulations limit an ATC's hours at work, increased load does not necessarily mean more time spent at the airport. Thus, unlike occupations in which workload is confounded with time, any observed change in parent-child interaction cannot be explained by a reduction in the time that the ATC had available to spend with his children.

The short-term effects of workload and negative social interaction at work were studied through an analysis of within-subject variability in daily data. First, it was hypothesized that *increased workload would be associated with a parent's behavioral and emotional withdrawal later that day*. Findings in the work-family literature suggest that parental withdrawal or decreased responsiveness are correlates of job stress. For example, Greenberger and O'Neil (1991) found that fathers who experienced more time pressure at work also reported spending less time alone with their children on weekdays. In other studies, mothers who reported less positive moods at work were described as less interpersonally available by their daughters, and fathers who were relatively less satisfied with their careers displayed less warmth, attention and responsiveness during interactions with their children (Grossman, Pollack & Golding, 1988; Piotrkowski & Katz, 1983).

The parental withdrawal findings are consistent with Wahler and Dumas' (1989) suggestion that stressful situations existing outside of the home can lead to parental attentional deficits. They are also consistent with the description of social withdrawal as a short-term coping response to stress. Repetti (1992) has proposed that social withdrawal and other behaviors that often entail social withdrawal (e.g. distraction, rest, relaxation) may help to restore a positive affective state and facilitate recovery from increased levels of physiological arousal.

Findings from several studies have also supported Hoffman's (1986) suggestion that work-related feelings of frustration and anger may be expressed as power assertion and more punitive behavior with children. For example, in Greenberger and O'Neil's (1991) study, fathers employed in jobs perceived as less challenging were more likely to describe a harsh orientation toward control with their sons. Grossman and colleagues (1988) similarly found that, in addition to being more emotionally withdrawn, fathers who were less satisfied with their careers were also less tolerant of their 5 year-olds' distress. These findings, based on between-subjects correlational designs, suggested that a pattern of *negative mood spillover* from work to home might also be observed on a short-term, daily basis. It was therefore hypothesized that *distressing social experiences at work would be followed by a more negative emotional tone in parent-child interactions after work that day*.

The more stable relation between the overall social environment at work and the father-child dyad's typical style of interaction was examined in a

between-subjects analysis to test the third hypothesis, that an *unsupportive or conflictive social climate at work would be associated with a more aversive father-child relationship*. As suggested above, an individual's characteristics, such as his level of depression, may act as third variables that influence both parenting behavior and certain job experiences, such as the quality of the individual's personal relationships at work. To address this issue, the general social climate of an ATC's work team was assessed rather than the quality of the individual ATC's own particular set of personal relationships at work. The social climate scale measured an individual's perception of the common social environment that is shared by all members of his work team, rather than his own unique individual social environment at work (Repetti, 1987b).

Individual respondent bias has been a particularly conspicuous example of the third variable problem in this area of research. Because most of the findings have been based on correlations between variables rated by the same individual, an obvious limitation in the literature has been the possibility that estimates of work-family linkages have been inflated by respondent biases. Therefore, rather than rely solely on self-report measures of job conditions, coworkers' ratings of the social climate at work and objective measures of daily workload were also used in the present study. By using aggregate coworker perceptions, the consensual measure of the social environment at work was free of individual respondent bias. Similarly, records of daily air traffic volume and visibility conditions at the airport provided independent measures of workload.

## Method

### Sample

All of the air traffic controllers (ATCs) working at a major international airport in the United States ( $n = 87$ ) were invited to participate in a study of work, health, and family life. Of the 67 ATCs (77%) who volunteered, about half ( $n = 33$ ) were parents. Twenty-seven of the parent participants (82%) remained in the study long enough to contribute daily reports. This study focuses on a subset of those parents, 15 fathers with a target child between 4 and 10 years old. These fathers contributed a total of 41 days of data. Ten families were excluded from the analyses presented here because there was no child between the ages of 4 and 10 in the home. In addition, the two female ATCs in the sample were dropped.

### Procedures

Air traffic controllers completed daily reports rating conditions at work and parent-child interaction on three consecutive days. Data collection spanned a 6-month period. For each participant, the investigator selected three consecutive days of 'regular' work hours (i.e. beginning no earlier than 7:00 a.m. and ending no later than 7:00 p.m.). Participants were instructed to complete a daily report survey each night before going to bed and to seal it immediately in an envelope provided. Completed reports were returned by mail.

One to three months before the daily-report data were collected, all air traffic controllers, who were present at team meetings during which the study was initially described, were asked to complete a brief survey describing the general

social climate of their work teams. These surveys were completed by a total of 70 ATCs (parents and non-parents) on 15 different teams.

### Daily Measures of Job Stressors

Two types of daily job stressors were assessed: work overload and negative or conflictive social relations with coworkers and supervisors.

**Workload.** There were two factor-based measures of perceived workload. *Difficult Conditions* ( $\alpha = .74$ ) is a three-item scale that assesses the ATC's perception of weather and traffic conditions at the airport during his/her shift that day (e.g. We had the kind of weather conditions I would like to have every day at work). *Busy Day* ( $\alpha = .81$ ) is a five-item subjective rating of the amount and pace of workload that day (e.g. It was a very busy shift). Both measures were scored so that high scores indicated greater workload. In an analysis of pooled data from all 52 participating ATCs (fathers and non-fathers), the two perceived workload measures assessed on the same day were significantly correlated with each other ( $r(149) = .32, p < .0001$ ).

Two objective measures of daily workload assessed daily weather and traffic conditions at the airport. Less visibility around the airport and greater air traffic volume increase an ATC's workload. *Low Visibility*, the average visibility during the ATC's shift, was based on hourly weather observations made at the airport by the National Climatic Data Center. The score was the average visibility multiplied by  $-1$ , so that high scores would indicate lower visibility or greater workload. *High Traffic Volume* was the total number of aircraft of all types handled at the airport on each day. It included takeoffs, landings, overflights, and so forth, and was based on Federal Aviation Administration daily summary records. Based on an analysis of pooled data from all 52 ATCs, the same-day subjective and objective measures of daily workload were moderately correlated ( $r$ 's  $(146-149) = .20-.35, p < .05$ ). (See Repetti (1989) for more information about the measures of daily workload.)

**Negative Social Interaction at Work** ( $\alpha = .94$ ) is a 32-item mood adjective checklist in which respondents used 16 adjectives to separately rate how they felt during daily interactions with coworkers and with supervisors that day. Nine adjectives described positive social experiences (e.g. feeling respected, appreciated, cared about) and seven adjectives described unpleasant social experiences (e.g. feeling tense, annoyed, resentful). High scores indicated that more negative and less positive feelings were experienced during interactions at work that day. This daily report scale is adapted from a measure developed in another study (Repetti, 1987b). In this sample, scores averaged over the three days correlated significantly with standard measures of social support at work and satisfaction with social relations at work. (See Repetti (1993b) for details.)

**Common Social Environment at Work.** In addition to the short-term effects of daily job stress, I also examined the long-term effects of one type of stressor in a between-subjects analysis. Because all participants worked at the same airport, between-subjects variation in typical or average workload was not expected. However, most ATCs work on teams that rotate through their shifts together and

function as stable work groups. Because work groups develop their own social climates (Repetti, 1987b), variation was expected among the social climates of different ATC teams.

An ATC's social climate at work was measured by a 22-item survey completed by ATCs months before the daily-report data were collected. *Team Social Climate* was adapted from a scale developed in a study of bank workers (Repetti, 1987b) ( $\alpha = .88$  in this sample,  $\alpha = .93$  in the sample of 440 bank workers) (e.g. There's not much group spirit, There are often conflicts among people who work here). High scores indicated that the ATC perceived the general social climate of the team to be nonsupportive, unpleasant or conflictive.

In addition to the ATC's own description of the social climate, a separate score, *Consensual Team Climate*, was computed for each ATC who was a regular member of a team. It is the average of his team members' ratings on the same 22-item scale and is included here as an independent measure of his social climate at work. Because two of the ATCs who were fathers were not regular members of a team, this variable was computed for 13 ATCs who represented 9 different teams. On average, five team members rated the social climate of each of these work groups. Four teams had two members who were fathers participating in the study. However, no two *Consensual Team Climate* scores are exactly the same because each ATC had a unique set of coworkers on the team.<sup>2</sup>

#### Measures of Parent-Child Interaction

Because there are no existing psychometrically sound measures of daily parent-child interaction, measures were developed for this study. The daily report surveys completed by parents included (a) 15 items to assess the emotional tone and quality of interactions with a target child after work and, (b) 17 items to assess the individual's parenting behavior and state of mind during those interactions. The two item pools were factor analyzed separately using data from the complete sample of 27 parents. Following a principal-axis factor analysis with varimax rotation, factor-based scales were created from factors with eigenvalues greater than 1. An item was retained as a measure of a factor if its correlation with that factor was greater than or equal to .40 and its correlation with the other factors was less than .40.

The analysis of the first item pool resulted in two factor-based scales. ATCs rated each item on a 4-point scale indicating how accurately the statement described the emotional tone of interactions with the target child that evening. Scores were computed by averaging responses to the items on each scale. *Positive Feelings* ( $\alpha = .85$ ) is a nine-item scale (e.g. Between us there was a feeling of love. We showed affection toward each other). *Negative Feelings* ( $\alpha = .83$ ) is a five-item scale (e.g. Between us there was a feeling of . . . anger . . . disappointment).

The analysis of the second item pool resulted in three factor-based scales. Two of the scales assessed daily parenting behavior. (The third factor-based scale assessed the parent's state-of-mind, not parent-child interaction, and therefore was not used in the analyses presented here.) Each item was rated on a true/false scale, and scores were computed by summing the number of 'true' responses. The scale labelled *High Involvement Behaviors* ( $\alpha = .61$ ) contains two types of statements. Two items describe a parent who was involved with the child in a

positive and helpful way (e.g. I helped my child with homework), and two items describe a parent who was 'too permissive' and 'too protective' that evening. *Discipline Behaviors* ( $\alpha = .78$ ) consists of 4 items describing the use of discipline tactics, such as reminding, yelling, and punishing (e.g. I had to discipline the child).<sup>3</sup>

Emotional withdrawal on a given day was indicated by a decrease in the subject's ratings on an emotional tone scale (*Positive Feelings*, *Negative Feelings*), compared to his baseline or average rating on the scale. Thus, a decrease in the father's ratings of his experience or expression of emotion with the child, whether the feelings were positive or negative, was interpreted as emotional withdrawal. Behavioral withdrawal on a given day was indicated by a decrease in the subject's ratings on a parenting behavior scale (*High Involvement Behaviors*, *Discipline Behaviors*), compared to his baseline or average rating on the scale. The *Negative Feelings* and *Discipline Behaviors* scales were also used to assess aversive parent-child interactions, in order to test the hypothesis about a same-day transfer or spillover of negative emotions from work to home.

For between-subjects analyses, a parent-child dyad's typical style of interaction was measured by averaging an ATC's ratings, provided over three consecutive days, on the parent-child interaction scales. The resulting scores were labelled *Average Positive Feelings*, *Average Negative Feelings*, *Average High Involvement Behaviors*, and *Average Discipline Behaviors*.

#### Results

Two types of questions were addressed in the analyses presented here. First, in a series of within-subjects analyses, day-to-day changes in objective and perceived job stressors were related to daily fluctuations in the fathers' descriptions of parent-child interaction after work that day. Second, in a between-subjects analysis, the overall social climate of each participant's work team, as rated by the individual and by his coworkers, was correlated with the father's description of the parent-child dyad's typical style of interaction.

#### Daily Fluctuations in Job Stress and Parent-Child Interactions

The statistical significance of the relation between each job stressor variable and each parent-child outcome was assessed in a multiple regression analysis of the pooled cross-sectional and time-series data. The general approach is described by West and Hepworth (1991) as least squares with dummy variables. The statistical model was:

$$Y_{ij} = (b_0)SUBJ1 + \dots + b_{15}SUBJ15 + b_{16}DAY1 + b_{17}DAY2 + b_{18}X_{ij}$$

In this model,  $Y_{ij}$  is the parent-child outcome score for respondent  $j$  on day  $i$  and  $X_{ij}$  is the predictor variable, a measure of job stress for respondent  $j$  on day  $i$ . This model was tested with 20 different combinations of predictor and outcome measures, 5 measures of daily job stress and 4 measures of daily parent-child interaction.

Two types of control variables were inserted before examining the association between a measure of daily job stress and a measure of parent-child interaction. First, 15 dummy variables (SUBJ1-SUBJ15) were included in order to control all

between-subjects variance, both between-subjects effects and errors, in the scores of the 15 ATCs. One dummy variable was included for each subject, so that dummy variable SUBJ# equals 1 for respondent #, and 0 otherwise. (This necessitated exclusion of a constant 1 from the equation to prevent perfect multicollinearity.) Thus, each ATC's tendency over the three days to respond to the daily-report scales in a particular way (i.e. each ATC's baseline level or three-day average) was controlled before examining the association between job stress and parent-child interaction on the same day. Using this procedure, the parent-child outcome being predicted is that particular day's deviation from the subject's three-day average. Similarly, the daily job stress predictor variable is also that particular day's deviation from the subject's three-day average.

The second set of dummy variables, DAY1 and DAY2, were included in order to control for any trends across the three days (i.e. differences in the association between a particular predictor and outcome variable using data collected on the first, second, and third day of the study).<sup>4</sup> The dummy variable DAY1 equals 1 for observations made on the first daily-report day, and 0 otherwise; the dummy variable DAY2 equals 1 for observations made on the second daily-report day, and 0 otherwise.

The regression coefficients (betas) were estimated with both ordinary least squares and weighted least squares. The weighted least squares estimation employed subject-based weightings (i.e. the inverse of the standard deviation of the residuals for the individual). Thus, data from ATCs with greater variability in their three daily regression residuals were accorded less weight in the regression. Heteroskedastic residuals could bias the inferred significance levels of the ordinary least squares regression coefficients (although not the estimates themselves). Hence, only the weighted least squares regression results are presented in the paper. However, there were few differences between results using ordinary least squares and the results reported here.<sup>5</sup>

After controlling for all between-subjects variance (i.e. 15 SUBJ variables), and for the 'occasion' effect (i.e. DAY1 and DAY2) there were 24 degrees of freedom remaining (41 - 15 - 2 = 24) to test the relation between a measure of daily job stress and a measure of parent-child interaction. In sum, the regression model represents a pooled within-subjects design, exploring the determinants of day-to-day fluctuations in parent-child interaction.<sup>6</sup>

Table 1 presents the results of 20 regression analyses testing the relations between 5 measures of daily job stressors and 4 measures of parent-child interaction. Nine of the beta coefficients were statistically significant. The first hypothesis predicted that increased workload would be associated with behavioral and emotional withdrawal later that day. The first two columns of Table 1 contain the results of analyses testing the association between perceived daily workload and parent-child interaction. Half of the beta coefficients were statistically significant and all of those were negative. After workdays that they experienced as more demanding, the ATCs described their interactions with the target children as having a less negative emotional tone, and they reported fewer high involvement behaviors and fewer instances of the use of discipline. All four results indicate increased parental withdrawal on high perceived workload days.

The next two columns of Table 1 present the results of regressions using the objective measures of daily workload as predictor variables. The objective traffic volume measure was not associated with any of the daily ratings of parent-child

**Table 1. Results of Weighted Least Squares Regressions Predicting Daily Fluctuations in Parent-Child Interaction from Fathers' Daily Job Stress (A Within-Subjects Analysis)**

Daily Parent-Child Interaction	Perceived Workload Predictors		Objective Workload Predictors		
	Difficult Conditions	Busy Day	High Traffic Volume	Low Visibility	Negative Social Interaction at Work
	beta		beta		
Positive Feelings	-.05	.17	-.06	-.02*	.01
Negative Feelings	.05	-.45***	.08	-.01*	.01***
High Involvement Behaviors	-.83***	-.36**	-.03	-.01	-.04***
Discipline Behaviors	-.73**	-.23	.01	-.02	.05**

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .0001$

Note:  $N = 41$  days. Each job stress predictor was tested in a separate equation after controlling for the individual's three-day baseline (average) level of parental behavior and day on which the data were collected.

interaction. Low visibility at the airport, however, was significantly associated with two of the four parent-child variables. ATCs described their interactions with the target children as having a less negative and a less positive emotional tone on days in which their workload was heavier due to decreased visibility at the airport. This finding is consistent with the parental withdrawal results based on the measures of perceived workload.

The last column of Table 1 presents the tests of the association between the ATCs' reports of distressing social interactions at work and parent-child interactions later that day. The second hypothesis predicted that distressing social experiences at work would be followed by a more negative emotional tone in parent-child interactions after work that day. Three of the four betas were statistically significant. Unpleasant social interactions with coworkers and supervisors were followed by the ATCs' reports of a more negative emotional tone during parent-child interactions, greater use of discipline, and fewer high involvement behaviors. Thus, there was evidence of both a transfer of negative feelings and behavioral withdrawal on days in which social experiences at work were distressing.

To summarize, these fathers of 4-10 year olds tended to report less behavioral and emotional involvement of both a positive and a negative nature after days at work that were perceived as more demanding. The emotional withdrawal findings were replicated with an objective measure of daily workload, visibility conditions at the airport. The transfer of a negative mood state from work to home was indicated by the findings that daily ratings of distressing social interactions at the airport were linked to the ATCs' reports of greater use of discipline and a more negative emotional tone during interactions with their children after work.

#### *Typical Social Relations at Work and Parent-Child Relations*

Correlations between the two measures of the social climate at work and ATC ratings, averaged over three days, of parent-child interaction are presented in

**Table 2. Correlations Between the Social Climate At Work and Typical Parent-Child Interactions After Work (A Between-Subjects Analysis)**

Parent-Child Interaction	Team Social	Consensual Team
	Climate <sup>a</sup>	Climate <sup>b</sup>
Average Positive Feelings	-.88***	-.56*
Average Negative Feelings	.40	.78**
Average High Involvement Behaviors	.14	.24
Average Discipline Behaviors	.07	.38

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ <sup>a</sup> $N = 15$  fathers<sup>b</sup>Based on coworkers' averaged ratings of each team's social climate. Because two ATCs were not regular members of a team, this variable was computed for 13 ATCs who represented 9 different teams

Table 2. In the first row of results, both of the correlations involving the *Average Positive Feelings* scale were significant. ATCs on teams with a poor social climate reported, on average, a less positive emotional tone during parent-child interactions after work. Note that these significant correlations were based on data collected in different ways. *Average Positive Feelings* is an average score based on the ATCs' daily reports collected over three consecutive days; *Team Social Climate* was rated at the airport months before any other data were collected; *Consensual Team Climate* is the other team members' average rating on that scale.

In the second row of results, the other team members' average rating of the social climate was correlated in a positive direction with the ATC's average rating of daily expressions of negative emotions during interactions with his child after work. Thus, when coworkers described an unsupportive or conflictive social climate at work, the fathers reported a more negative emotional tone to the parent-child dyad's interactions after work.

In the last two rows of Table 2, there were no significant correlations between an ATC's social environment at work and the extent of his reported use of discipline and high involvement behaviors. In sum, the common social environment at work was not a significant predictor of the parenting behaviors assessed here, but a negative social climate was associated with a pattern of father-child interaction characterized by a less positive and a more negative emotional tone.

## Discussion

### *Parental Withdrawal in Response to Work Overload*

This study provides evidence for the hypothesized short-term process of behavioral and emotional withdrawal in response to high workload. On days in which there was a perception of increased workload, ATCs reported engaging in fewer discipline behaviors and fewer high involvement behaviors, such as teaching and helping with homework, and they described a less negative emotional tone to interactions with the target child. Although any stable respondent biases were

controlled by the subject dummy variables in the analyses, a more state-like variable that fluctuates from day to day, such as the ATC's mood, could have inflated the correlations between the fathers' daily reports of workload and parent-child interaction.

It is therefore noteworthy that the emotional withdrawal finding was replicated with an objective measure of daily workload. ATCs described interactions with their children as having a less intense emotional tone (both less positive and less negative) on days in which visibility at the airport was poor. It is interesting that one of the objective measures of daily workload, visibility during the ATC's shift, predicted a same-day change in parent-child interaction, but the traffic volume variable did not. Because hourly traffic data were not available, this measure was based on a 24-hour period rather than an 8-hour shift and was therefore a less precise measure of the ATC's actual workload.

The results reported here parallel findings based on marital data from the same study. In those analyses, high levels of daily workload were associated with social withdrawal and less expression of anger during marital interactions (Repetti, 1989). Thus, in the short run, social withdrawal, not expressions of anger and intolerance, appears to be the predominant parental response to overloads at work. As I have suggested elsewhere, individual self-focused attention and social withdrawal may reflect a coping process aimed at helping an aroused individual return to a baseline emotional and physiological state; diminished emotional responsiveness may be a by-product of the process (Repetti, 1992).

It seems prudent not to assume that the work-family patterns found in this sample are exactly the same as those that would be observed in a sample of mothers. Because employed women are still responsible for the lion's share of household work and child care (Meehan & Parcel, 1990), it may be much more difficult for them to find a way to unwind and withdraw after work. For example, Greenberger and O'Neil (1991) found that fathers who feel more time pressure at work spend less time alone with their children on weekdays, but this was not the case for employed mothers in their study. Other evidence indicates that not only are fathers spending very little time alone with their school-age children after work, but the most common father-child activities (with the exception of assisting with homework) would be characterized as low involvement (e.g. transporting a child, watching television, eating a meal) and may therefore easily allow periods of social withdrawal (Crouter & Crowley, 1990).

### *Responses to Social Stress at Work: Negative Spillover and Parental Withdrawal*

The results also supported the second hypothesis. There was evidence of a daily spillover of negative feelings resulting from interactions at work to increased negative feelings expressed immediately after, during parent-child interactions. The spillover findings conflict with the Bolger *et al.* (1989) daily-report study in which arguments at work were not associated with a short-term increase in parent-child arguments. The different results may be explained by the different approaches to measurement. Detailed ratings of the emotional quality of social interactions at work and at home, such as those used in the present study, may be required to detect a spillover effect. In addition to the negative spillover findings, the data also suggested a social withdrawal response following distressing social interactions at work. The ATCs described fewer high involvement behaviors after work

days during which they were more disturbed by their interactions with coworkers and supervisors.

It is important to note that, because there were no objective measures of daily social stressors at work, common method variance could have exaggerated the correlation between the ATCs' reports of social interactions at work and at home on the same day. However, it is interesting that another study, which used independent observers' ratings of daily parent-child interaction over several weeks, obtained results that were very similar to those reported here. In an intensive study of five mother-child dyads, Gerald Patterson (1983) found that an increase in the number of daily hassles (or minor stressors) reported by mothers was associated with two different patterns of parent-child interaction on the same day. For two of the dyads, there was an increase in the probability that the mother would persist in an aversive exchange with her child and, for one dyad, an increase in daily stressors was associated with a decrease in the probability of continuance. Patterson speculated that the case of reduced irritability might have reflected the mother's general withdrawal from social interaction.

Like the Patterson study, some of the ATCs in this study may have only withdrawn in response to social stressors and other ATCs may have showed a pure negative spillover response. With such a small sample of fathers and only three days of data from each, it was impossible to explore this possibility. Alternatively, reduced contact and involvement with a child, when compounded by decreases in responsiveness and perhaps less tolerance for non-compliant child behavior, could escalate into irritable or punishing parental behavior. Future research might distinguish between parents who simply withdraw and those who become more irritable in the face of stress, and it might uncover a chain of events in which parental withdrawal in response to stress escalates into aversive interactions.

#### *Long-Term Spillover from a Negative Social Climate at Work*

Stable patterns of work-family linkages supported the negative spillover model. Fathers who worked in the same occupation but were assigned to teams with an unsupportive or conflictive social climate, characterized the emotional tone of their relationship with a target child as more negative and less positive. Over three days, they reported more anger, hostility, and tension, and less closeness and warmth during interactions with a school-age child after work. Most importantly, these associations were confirmed using coworkers' ratings of the social climate at work and are therefore not subject to the most significant problem in most cross-sectional studies of work-family spillover: individual respondent biases inflating the correlations.

#### **Conclusion**

Taken together, the results reported here suggest that different types of job stressors may have different kinds of effects on the parent-child relationship. Social withdrawal may be an effective way for a father to cope, in the short-term, with overloads at work. The data suggest, however, that a negative mood spillover may sometimes be both a short-term and a long-term consequence of poor social relations at work. The results point to the importance of differentiating between

different types of job stressors and examining both short-term and long-term work-family associations.

The number of significant findings in this study is notable considering the small sample size and resulting low power in the analyses. Given the care that was taken to ensure that the significant effects were not due to omitted variables or biases in statistical inferences, the magnitude of the relation between the variables generating the significant coefficients must be quite large indeed. Despite the apparent robustness of the findings, the work-family linkages observed in this study are based on a small, restricted sample and their generalizability must be tested in future research. In particular, the sample size did not permit separate analyses of father-daughter and father-son interactions, which Greenberger and O'Neil's (1991) work suggests may be differentially affected by fathers' job situations. By focusing on ATCs, the sampling procedure controlled for a number of demographic variables. Almost all of the fathers in this sample were White and had some college-level education. Average family income was over \$60,000 in 1986. It is important to determine the extent to which the findings reported here generalize to other groups of parents, in particular to fathers and mothers who are not in the middle class and to those employed in different types of stressful occupations.

#### **Notes**

1. Items on the parent-child interaction scales were written with school-age children in mind. This appeared to be an ideal age group in which to observe the predicted effects of job stress. On the one hand, the needs and dependencies of younger children may not permit most parents to withdraw on a high stress day. In addition, because school-age children increasingly question their parents' authority, there is a greater opportunity to observe aversive parent-child interactions and the use of discipline. Older children, on the other hand, are better at recognizing their parents' mood states and might use their greater independence to avoid interacting with a stressed parent, which would contribute to a decreased amount of contact between parent and child on high stress days.
2. Because a restriction of range in one variable limits its correlation with another variable, the sampling of some ATCs from the same team reduced the chance of obtaining a significant result (relative to 13 ATCs from 13 different teams). Thus, these data provide a conservative test of the hypothesis.
3. The four parent-child interaction scales used here were generally uncorrelated with one another, which is not surprising because each set of factors was submitted to an orthogonal rotation before the scales were created. The one exception was a significant positive correlation between ratings on the *Negative Feelings* and *Discipline Behaviors* scales assessed on the same day ( $r(41) = .52, p < .001$ , based on a pooling of 41 days of data from 15 fathers).
4. I am grateful to an anonymous reviewer for this suggestion.
5. Serial correlation, or a correlation between residuals for adjacent days, is another problem that could bias the significance levels derived from the test statistics. Tests were performed to determine if the day  $t$  and day  $t + 1$  residuals were correlated and whether they were more correlated than the day  $t$  and day  $t + 2$  residuals. Not only did these tests indicate no difference between the two types of correlations, but the magnitude of the correlation coefficients themselves indicated no serial correlation at all.
6. An alternative to this type of pooled analysis, in which separate regressions are performed for each subject and the fifteen coefficient estimates are averaged, lacks power relative to the approach used here and results in biased inferences for the sample sizes available in this dataset.

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