

Job Stress and Family Social Behavior: The Moderating Role of Neuroticism

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We investigated the role of neuroticism in the associations between job stress and working adults' social behavior during the first hour after work with their spouse and school-age children. Thirty dual-earner families were videotaped in their homes on two weekday afternoons and evenings. An observational coding system was developed to assess behavioral involvement and negative emotion expression. Participants also completed self-report measures of job stressors and trait neuroticism. There were few overall associations between job stress and social behavior during the first hour adults were at home with their spouse and school-age children. However, significant moderator effects indicated that linkages between work experiences and family behavior varied for men who reported different levels of trait neuroticism, which captures a dispositional tendency toward emotional instability. Among men who reported high neuroticism, job stress was linked to more active and more negative social behavior. Conversely, for men reporting low neuroticism, job stress was related to less talking and less negative emotion. These patterns were not found for the women in the study. The findings suggest that when work is stressful, men who are higher on neuroticism (i.e., less emotionally stable) may show a negative spillover effect, whereas men who are lower on neuroticism (i.e., more emotionally stable) may withdraw from social interactions.

Keywords: work-family processes, job stress, social behavior, neuroticism, naturalistic observation

The work-family interface and the transmission of stress between these two contexts is a rich area for investigations of family health and functioning. Research that focuses on how specific aspects of the employment experience are linked with workers' health and family dynamics illustrates the complex ways in which events outside the home can significantly shape what goes on in the family (Perry-Jenkins, Repetti, & Crouter, 2000; Repetti, Wang, &

Saxbe, 2009). Moreover, there is robust evidence indicating that the quality of family relationships and interactions is tied to individual health and well-being (e.g., Kiecolt-Glaser & Newton, 2001; Pendry & Adam, 2007). The work-family field has called for more research aimed at understanding the psychological and behavioral processes linking work and family using approaches that allow for fine-grained assessments of work-family relationships (Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005). Researchers have advocated investigation of individual difference moderators in work-family processes (Casper, Eby, Bordeaux, Lockwood, & Lambert, 2007; Eby et al., 2005), rejecting a one-size-fits-all approach (Repetti & Saxbe, 2009). Specifically, neuroticism (i.e., emotional instability) has emerged as one important individual difference that has been found to play a key role in work-family processes (e.g., negative spillover; Grzywacz & Marks, 2000). Furthermore, the methodologies have grown progressively more sophisticated; while cross-sectional self-report studies have been valuable in laying the foundation in this area, researchers have increasingly recognized the benefits of multisource and multimethod data, as well as qualitative approaches (Casper et al., 2007). However, the field has yet to capitalize on naturalistic observation techniques which can provide a more

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objective and ecologically valid view of how the workplace influences social behavior as it unfolds in everyday life. The current study is the first to employ naturalistic observations in the home to examine linkages between employed parents' job stress and social behavior with spouse and child, specifically investigating the moderating role of neuroticism in these associations.

Chronic Job Stress and The Family

Research suggests that chronic job stress can influence the social life of a family through its impact on an employed member's psychological health and energy reserves, resulting in at least two possible consequences for that member's social behavior—a withdrawal from social interaction and/or an increase in negative emotion expression. When workers regularly feel taxed and depleted by their jobs, they may be less likely to participate actively in family life. For example, in two studies researchers found that parents knew less about their children's daily activities and experiences when fathers were employed in more demanding jobs (Bumpus, Crouter, & McHale, 1999), and when fathers (but not mothers) described greater interference from work in their family lives (Bumpus, Crouter, & McHale, 2006). Another study found a positive association between work pressure and difficulties performing family roles, such as spending time with spouse (Hughes, Galinsky, & Morris, 1992). These studies suggest that one result of having a high stress job is that workers may not have the resources and energy to stay as involved with their family as those with low stress jobs. Similarly, daily report studies have shown that a more stressful day at work is often followed by decreases in emotional expression and behavioral involvement with family members (e.g., Repetti, 1989; Story & Repetti, 2006).

Social withdrawal and reductions in family involvement may be destructive for family cohesiveness and functioning when these coping techniques are used in the long-term. Indeed, one longitudinal study on dual-earner couples with multiple caregiving roles found that social withdrawal had negative effects on well-being (i.e., depression, affect balance, work-family conflict) over the period of 1 year (Neal & Hammer, 2009). However, *short-term* withdrawal from social interaction has been differently conceptualized as an attempt to recuperate from job stress by providing the individual with a period of isolated relaxation and recovery from elevated levels of arousal that is beneficial for health and well-being (Repetti, 1992). Furthermore, withdrawal may shield the individual from potentially stimulating social interactions that in turn benefit the family

system; for example, Larson and Gillman (1999) found evidence that solitary time buffers the transmission of negative emotions from working mothers to their children. Similarly, recent daily diary data have found that job stress is associated with greater marital distance, which may be indicative of relationship-protective coping (Lavee & Ben-Ari, 2007). Studies also implicate energy depletion as one mechanism by which daily job experiences spillover into the family (e.g., Dumas, Margolin, & John, 2008). Thus, there is evidence to suggest that short-term social withdrawal may be an adaptive response to job stress that benefits the employed individual's own health and well-being, as well as protects social interactions with family members.

While job stress may be linked to a withdrawal from family members, there is also evidence that it can carry over into the home and add to conflict and tension in family relationships. Crouter and colleagues (1999) found that work pressure and work overload predicted more parent-adolescent conflict. Other studies have found similar results: fathers who perceived greater workload also reported more parent-adolescent conflict (Galambos, Sears, Almeida, & Kolaric, 1995), and fathers who reported long hours and greater role overload had less positive relationships with both their adolescent children and their wives (Crouter, Bumpus, Head, & McHale, 2001). A longitudinal study of parents and their infants found that when mothers reported a more negative work climate, both mothers' and fathers' interactions with their infants were more negative three months later (Costigan, Cox, & Cauce, 2003). Studies in the daily report tradition have also uncovered same-day linkages between tensions at work and tensions with spouse (Bolger, DeLongis, Kessler, & Wethington, 1989), illustrating a negative mood spillover effect whereby negative emotions experienced at work (e.g., anger, irritability) are expressed at home with spouse (Story & Repetti, 2006) and children (Repetti, 1994). Thus, employed individuals may not always buffer family members from the residue of negative work experiences, and in fact, job stress can also increase the expression of negative emotion at home.

Emotional Stability and Its Moderating Effect on Work-Family Associations

The patterns revealed in previous research may seem incongruent; how can job stress be linked to both a withdrawal from social interaction as well as increased negative engagement in social interaction? Perhaps different people have a tendency to display the different responses. In particular, individuals who

are generally more emotionally stable, may be better equipped to minimize any negative influences of job stress on their social behavior at home. Conversely, individuals who are less emotionally stable, and subsequently are more prone to negative affect and dissatisfaction with relationships, may not have the resources or abilities that can help shield their families from the negative carry-over of job stress.

Trait neuroticism is a well-studied global personality dimension that, according to John and Srivastava (1999), assesses adjustment or emotional stability versus maladjustment or neuroticism. Neuroticism describes a tendency to experience negative affect with decreased ability to cope with stress effectively or to regulate emotional states (Watson, 2000). Studies have found that individuals high on neuroticism generally experience greater exposure and reactivity to stressful events (e.g., Bolger & Schilling, 1991; Bolger & Zuckerman, 1995) and are more likely to employ less adaptive coping strategies (e.g., self-blame, wishful thinking; Gunthert, Cohen, & Armeli, 1999). Neuroticism has been found to be negatively linked with life satisfaction (DeNeve & Cooper, 1998) and marital satisfaction (Karney & Bradbury, 1997), and individuals high on neuroticism are more likely to use poor parenting practices (Belsky & Barends, 2002). Collectively, these findings suggest that individuals high on neuroticism—who experience more objective stress, are more reactive to stressful situations, have more negative moods, and are less satisfied in their lives and relationships—are less equipped with the personal qualities that could help shield the family from the negative impact of job stress.

There has been much recent attention on neuroticism as a particularly salient individual difference variable in work-family conflict studies, a branch of the research that focuses on interrole conflict (i.e., where efforts to fulfill roles in one domain interfere with efforts to fulfill roles in the other domain; Greenhaus & Beutell, 1985). These studies have found that neuroticism is not only reliably linked with work-to-family conflict as well as family to-work conflict, but is also negatively associated with work-family facilitation (i.e., where roles in one domain are enhanced or made easier by roles in another domain; see Eby, Maher, & Butts, 2010, for a review). For example, Grzywacz and Marks (2000) found that a higher level of neuroticism was associated with more negative spillover between work and family for both women and men, and less positive spillover between work and family for women. However, these studies exclusively employ self-reports to

study interrole conflict (e.g., Blanch & Aluja, 2009; Rantanen, Kinnunen, Feldt, & Pulkkinen, 2008). They do not address *how* the conflict or interference from work—moderated by neuroticism—manifests itself in the family; in other words, how do the joint effects of work and neuroticism actually play out in family relationships and what do they look like?

Repetti and Wood (1997) addressed this question by incorporating videotaped observations of mother-child reunions at the end of the workday on five consecutive days. They found that self-reported job stress had its strongest daily impact on the parenting behavior (e.g., more withdrawal from child, more aversive interactions with child) of mothers who generally experienced a more anxious and depressed mood, and especially those who endorsed more Type A behaviors. However, no other studies to our knowledge have made similar use of observational techniques to investigate the role of individual difference factors on the links between work and family, and specifically with regard to responses to job stress (i.e., social withdrawal, negative mood spillover). One particular strength of the Repetti and Wood (1997) study is that they examined parent-child relationships, an area of investigation for which scholars have lamented the lack of data (Casper et al., 2007). Still, no subsequent research has examined both parent-child as well as marital behaviors simultaneously using observational methods to understand individual differences in work-family associations.

The Current Study

The vast majority of research in the work-family area has relied on self-report questionnaire and interview methods to understand the sequelae of job experiences on family relationships and social behavior. The rich ethnographic traditions of anthropology have long since used naturalistic observation; however, scientific studies in psychology utilizing observation of families in their everyday environments are much less common. Furthermore, most of the existing naturalistic studies have been limited to a routine family event (e.g., mealtime; Hayden et al., 1998) and the early pioneering work in this area faced significant technological and methodological challenges (e.g., Patterson, 1977). Rarely do scientific studies of work-family issues, in particular, include methods that are not influenced by reporter memory recall or social desirability biases, and that can permit third-party analysis of family interactions. Observations in real-life contexts have the potential to provide valuable objective and ecologically valid in-

sights into family interactions as they naturally occur outside the laboratory.

The current study addresses these methodological challenges and extends the work–family research literature by observing the employed individual’s social behavior at home with both spouse and school-aged child, and connecting those naturalistic observations with self-reports of job stress and neuroticism. The tradeoff of using such intensive data collection methods is that the number of families studied is relatively small ($N = 30$); however, this novel methodological approach provides a rich and close-up view of family behavior as it naturally unfolds that is, to our knowledge, the first of its kind in the field.

Observational, job stress, and neuroticism data were collected from a sample of dual-earner families. The individual was the unit of analysis for all analyses. Our hypotheses and research questions are below:

Hypothesis 1 (H1): We hypothesized that workers reporting more job stress would display more negative emotion and more social withdrawal during interactions with spouse and child after work.

Hypothesis 2 (H2): We expected that the negative effects of job stress would be stronger among individuals who score high on neuroticism (i.e., those who are less emotionally stable). However, because social withdrawal may also serve a short-term adaptive recuperative function, it is possible that more emotionally stable individuals (i.e., those who score low on neuroticism) may be more likely to use social withdrawal as a response to job stress.

Research Question 3 (RQ3): We were also interested in exploring how the associations between job stress, family social behavior, and neuroticism may vary for men and women. While we did not have specific hypotheses regarding how these associations may differ, we did expect to find different patterns for men and women.

Method

Participants

The current study was conducted by the Center on Everyday Lives of Families (CELFL), an interdis-

iplinary research group located at the University of California, Los Angeles, and funded by the Alfred P. Sloan Foundation. The study was approved by the university institutional review board, and all participants provided written informed consent prior to their participation. Participants included 32 dual-earner middle-class families residing in the greater Los Angeles area who were recruited through newspaper advertisements, bulletins distributed in public elementary schools, and word of mouth. Study inclusion was based on the following criteria: (a) each family included two cohabiting adults; (b) both spouses worked full-time (at least 30 hours per week); (c) each family included at least one school-age child between 7 and 12 years old; (d) each family owned a home with a mortgage. The inclusion of families that had a child between 7 and 12 years of age rendered a sample of families at similar stages of development, whereas having a mortgage served as a marker of middle-class socioeconomic status. These criteria provided points of standardization across our families drawn from the community for this investigation of dual-earner middle-class couples with school-age children. All families were compensated \$1,000 for their participation.

The data used in the current study were collected from the 30 families headed by heterosexual couples. The median age for both men and women was 41 years, with a range of 32–58 years for men and 28–50 years for women, and the couples had been married for a range of 3–18 years (median = 13). Nine of the families had three children, and 21 of the families had two children, with the children ranging from 1 to 17 years of age. The median family income was \$100,000 (range \$51,000 to \$196,000), and most (65%) of the adults had completed college. The majority of participants worked 40–49 hours per week (63% of men, 50% of women), whereas a smaller subset reported working over 50 hours per week (30% of men, 13% of women). On average, women worked significantly fewer hours per day ($M = 8.84$, $SD = 1.39$) on the days of observation than did men ($M = 9.79$, $SD = 1.53$; $t(53) = 2.42$, $p \leq .05$). The adults were employed in a variety of occupations that included, for example: restaurant manager, lawyer, firefighter, and architect. The families participating in the study came from diverse ethnic and cultural backgrounds, including European American, African American, Latino, East Asian, South Asian, and multicultural backgrounds; 33% of the families had at least one member who identified them-

selves as having an ethnic background other than European American.

Procedure

The larger CELF study captured a week in the lives of these dual-earner middle-class families employing multiple methods that included semistructured interviews, daily reports, questionnaires, salivary cortisol sampling, and ethnographic video-recordings (for details, see Ochs, Graesch, Mittmann, Bradbury, & Repetti, 2006). This study utilizes data from the ethnographic video, daily reports, and questionnaires. Family members were intensively videotaped on four days, two weekdays (i.e., workdays) and two weekend days. Two professional quality cameras with wide angle lenses were assigned to each family and operated by researchers who received theoretical and practical training on participant observation techniques and use of the digital equipment. Each camera targeted one of the working adults and followed them as they went about their everyday routines. Filming began each day in the early morning (when the first adult to wake opened the front door) and ended when the children went to bed, and wireless microphones were used to capture all dialogue. Data collection resulted in over 1,600 hours of ethnographic footage that provide a unique opportunity to study family interactions via naturalistic observation. For the purposes of this study, we focus on video-recordings taken after work on two weekdays, starting from the time that a participant returned home from work until they went to bed. In addition, each working adult completed paper daily reports that included measures of job stressors at two time-points on each weekday. Participants also completed a questionnaire measure of trait neuroticism prior to the study week.

Measures

Job Stress

Measures of workload and negative social interactions at work were obtained twice (at work before lunch, and in the afternoon before leaving work) on each of the two weekdays during which video-recordings were analyzed.

Each working participant completed the 5-item Busy Day Scale that inquires about the amount and pace of workload (Repetti, 1989; Repetti & Wood, 1997). Items such as "There were more demands on my time than usual" and "I felt like I barely had a

chance to breathe" are rated on a 1 (*completely inaccurate*) to 4 (*completely accurate*) scale. A previous study reported significant correlations between the Busy Day Scale and objective measures of daily workload (Repetti, 1989). In the current study, Cronbach's alpha ranged between .71 and .75 for women, and .64 and .76 for men.

Participants also completed the 14-item Negative Social Interactions at Work Scale, which assesses negative feelings experienced during social interactions at work, and has been found to correlate with other measures of satisfaction with work relationships (Repetti, 1993). Participants rated seven feelings (e.g., pressured, annoyed) on a 4-point scale ranging from 1 (*rarely*) to 4 (*almost always*). Cronbach's alpha for the current study ranged between .75 and .90 for wives, and between .76 and .84 for husbands.

Because work overload and negative work interactions were highly correlated, $r(54) = .41, p \leq .001$, and in order to reduce the number of variables in the study given the small sample size, a composite Job Stress variable was created by taking the mean of participants' scores on both measures across all four time-points. This composite variable represents the underlying construct of job stress experienced that week. Mean job stress scores were computed ($M = 1.62, SD = .39$), with no significant difference between women ($M = 1.68, SD = .45$) and men ($M = 1.54, SD = .30$). Day 1 and Day 2 job stress were highly correlated, $r(50) = .50, p \leq .001$.

Trait Neuroticism

Participants completed the 12-item neuroticism scale from the NEO Personality Inventory Revised (NEO-PI-R; Costa & McCrae, 1992) in a visit prior to the study week. Neuroticism is used in this study as an indicator of poor emotional stability. Participants responded to items such as "Sometimes I feel completely worthless" and "I often feel tense or jittery" on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. The NEO-PI-R has been extensively used and validated, and has been found to have a coefficient alpha of .91 in prior research (Piedmont, 1999). Cronbach's alpha in the current sample for the NEO was .82. In this study, women ($M = 24.27, SD = 4.98$) scored significantly higher than men ($M = 15.47, SD = 7.81; t(58) = 5.20, p \leq .05$) on neuroticism.

Naturalistic Social Behavior in the Home

We examined video-recordings of participants on two weekday afternoons and evenings to assess working adults' social behavior in the family after work. On both days, filming started when the working adult returned home from work and ended when the children went to bed. We employed a "thin-slicing" approach to organize our continuous streams of video into 10-min intervals, and designated the first 30-s slice of video at the start of each 10-min interval for coding. Adopting a "thin-slicing" method to assess behavior has been successfully used in prior work showing that brief samples of behavior can be reliable indicators of individual differences (Ambady, Bernieri, & Richeson, 2000), particularly in the area of emotion expression (i.e., smiles, touches; Harker & Keltner, 2001; Hertenstein, Keltner, App, Bulleit, & Jaskolka, 2006; Oveis, Gruber, Keltner, Stamper, & Boyce, 2009). The use of thin slices of video conferred practical benefits for conserving researcher resources (i.e., saving time and effort), and allowed us to estimate the social behavior in the family of each working adult after they returned home from work.

Our unique naturalistic video-recordings of daily home life were taken at a variety of angles and distances, and captured a wide range of activities and interactions with people. The unpredictable and unstructured nature of these interactions and activities precluded the use of established coding systems developed in controlled laboratory settings (e.g., Facial Action Coding System or Specific Affect Coding System; Coan & Gottman, 2007; Ekman & Friesen, 1978). Consequently, we designed a global coding system specifically for our naturalistic observations that drew on FACS and used Likert scales to capture variation in behavioral involvement and negative emotion expression; this modification has been successfully used in prior research to capture emotion expression in data where FACS is not feasible (e.g., Harker & Keltner, 2001). The coding system was first piloted and refined on video clips not used in the study, and a coding team (comprised of seven women and three men, including the first author) was intensively trained on 60 practice video clips drawn from two separate families. Coders reached an *ICC* of .80 or above during training in order to move forward with coding, and were blind to hypotheses and participants' self-report data. Data were coded independently by each coder, during training as well as during actual coding, and coders overlapped on 10% of the video clips. Coders met weekly with the sec-

ond and third authors to review codes, and interrater reliability was calculated regularly. All coding resolutions were based on discussion and consensus agreement of independent judgments.

Each family was filmed by two cameras, with each camera assigned to follow one of the working adults; we refer to the designated adult in each video clip as the "target". It was possible for a range of individuals (e.g., spouse, children, friends, grandparents) to appear on-screen and interact with the target. The current study only considered video clips that captured a target's interactions with two people: the spouse and the school-aged child (7 to 12 years old).

Prior research on micro role transitions (i.e., psychological movement between roles) from work to family has focused on specific windows of time, such as the commute home, as being critical periods in which the psychological transition from work to family occurs (e.g., Ashforth, Kreiner, & Fugate, 2000). Given this body of work, it appears that key psychosocial processes concerning how individuals respond to job stress once they enter the home environment may also be more likely to occur at the temporal shift between work and home. Therefore, we reasoned that the effects of job stress on family social behavior would be strongest and most readily detected in the first hour that participants arrive home and interact with family members; perhaps stress from the work day dissipates as time passes. Based on this reasoning, first hour time blocks were created for each working adult on each evening, with one first hour time block created for interactions with spouse and another for interactions with child. It should be noted that the first hour time blocks do not reflect exclusive interaction with just spouse or child, as other family members could appear on film during a marital or parent-child first hour time block given the naturalistic and uncontrolled nature of these data. The overlap between the clips used for marital and parent-child first hour together time blocks was 11% among wives and 26% among husbands, reflecting a general pattern of men returning home from work later, and thus being more likely to interact with spouse and child simultaneously. The time blocks began with the first 30 second clip and end with the last 30 second clip in which the target and family member (i.e., spouse or child) were both present within a continuous 60 minutes of video. For example, the marital first hour time block might start at 20:16:00 (hour:minute:second) and end at 21:15:59, and consist of all coded clips that included the spouse (the maximum was six 30 second clips). We applied a minimum criterion of at least two clips with the relevant

family member present within the 60 minute span in order for that block to constitute the marital or parent-child first hour time block. On the rare occasion that no two clips at any point that evening satisfied this criterion, then the one clip in the first hour time block was used. The number of clips comprising the first hour time block averaged 3.32 (range 1-6) for marital interactions and 3.25 (range 1-6) for parent-child interactions. Averages of coded behavior in the first hour time blocks from both days were used for analyses in this study.

Video codes were developed to assess each adult's behavioral involvement and negative emotion expression. Two codes were used to represent the amount of behavioral involvement (response intensity and talking) during each 30 second clip, and one code represented the degree of negative emotion display. These three codes allow us to assess whether social withdrawal (low levels of behavioral involvement) and negative mood spillover (high levels of negative emotion expression) occurred for these workers in their first hour home with family members. Because these three codes were scored separately for the marital first hour and the parent-child first hour video data, a total of six variables characterized the quality of the working adult's social behavior with family members upon returning home from work. These six indicators of social behavior provide a close-up insight into family interactions during the first hour in which working individuals were home with their spouse and children.

Response intensity. The target's intensity of response to a specific family member's verbal and nonverbal initiation of interaction during each 30 second clip was coded on a 0 (*not at all responsive*) to 3 (*high response intensity*) scale. For example, following a spouse asking, "How was your day?" the target could ignore the question (coded a 0 for *not at all responsive*), give a grunt (coded a 1 for *low response intensity*), or say "Good, how was your day?" (coded a 2 for *moderate response intensity*), while an effusive response that includes the details of the day would be coded a 3 (*high response intensity*). Since multiple initiations for interaction can take place within a clip, response intensity codes were given for overall response intensity toward the spouse and toward the child during that 30 second clip. When no initiation for interaction took place, there was no opportunity for a response and thus no code for response intensity was given. It is important to note that the response intensity scores do not code for the quality or valence of the response, but only the strength of the response; for example, a negative

response could conceivably be rated as moderate or high response intensity. Interrater reliability for targets' response intensity to spouses was $ICC = .81$ and to children was $ICC = .88$.

Talking. A global code for the target's overall amount of talking, regardless of who it was directed toward, was coded on a scale from 0 (*no talking at all*) to 3 (*talking almost the entire time*). For example, the target could be complaining about work continuously at the dinner table (coded a 3), or s/he could be completely silent during the clip (coded a 0). A score of 1 was assigned for *minimal talking* (e.g., if the target only says a few words), and a conversation in which the target asks a couple of questions while also responding to another's questions would receive a code of 2 for *moderate talking*. Of note, the amount of talking is distinct from response intensity in that all of the target's speech was coded, regardless of whether it was in response to another's initiation of interaction. Talking was coded separately for marital and parent-child clips, and interrater reliability for targets' overall amount of talking yielded an ICC of .99.

Negative emotion display. The extent to which discrete negative emotion behaviors were displayed by the target in each clip was coded on a 1 (*none at all*) to 7 (*many*) Likert scale. Markers of negative emotion included displayed frowns, turning away, angry voices or flat affect, and negative touching, which have been found in prior research to be linked with negative emotion (Ekman, 1972; Hertenstein et al., 2006). The FACS certified third author trained coders to look for emotion displays that indicated anger and sadness such as (a) facial movements resulting in frowning with brows knitting together and lips tightened or pressed; (b) facial movements resulting in raising of the inner and outer eyebrows, with crinkling in space between eyebrows, and widened eyes, with body turning inward; (c) facial movements resulting in raising of the inner eyebrows, lips corners turned down, raised chin center that may look wrinkled; and (d) crying or angry voice tones, possibly with raised voice. Negative emotion display was coded separately for marital and parent-child clips, and interrater reliability for targets' overall negative emotion display produced an ICC of .90. As expected, mean levels of negative emotion display were positively associated with trait neuroticism, $r(60) = .32, p \leq .05$.

The correlations between social behavior variables on Day 1 and Day 2 were examined prior to aggregating social behavior across the two days. Day 1 and Day 2 social behavior were all positively associated: levels of response intensity to spouse, $r(41) = .30$,

$p \leq .10$, and child, $r(48) = .26$, $p \leq .10$ were marginally associated. Amount of talking, $r(56) = .51$, $p \leq .001$ and negative emotion display, $r(56) = .30$, $p \leq .05$ were significantly correlated. When these Day 1–Day 2 correlations were examined separately for men and women, all but one of the correlations were similar in magnitude to those of the overall sample; the one exception was a relatively low correlation for women's negative emotion display, $r(30) = .19$, *ns*. Thus, it appears that participants were consistent in their social behavior across the two days of the study, justifying the decision to aggregate data from Day 1 and Day 2. Furthermore, we also examined how much husbands and wives covaried in their behaviors averaged over the two days of the study to test the independence of behavior. All correlations for response intensity (to spouse, $r(26) = .20$, *NS*; to child, $r(29) = .04$, *NS*), talking ($r(30) = .04$, *NS*), and negative emotion display ($r(30) = .29$, *NS*) were nonsignificant.

Results

After presenting basic descriptive analyses, we focus on the main research questions. These analyses are based on self-reported trait neuroticism, and daily reports of job stress and observed first hour social interaction with spouse and child aggregated across two weeknights.

Behavioral Involvement and Negative Emotion Display During the First Hour

A series of paired *t* tests assessed sex differences in social behavior in the marital and parent–child first hour time blocks averaged across two evenings. The means for response intensity (that is, degree of response to another's initiation for interaction) suggest that both men and women displayed, on average, low to moderate levels of response intensity toward spouses, with men ($M = 1.94$, $SD = 0.43$) exhibiting greater response intensity to their wives than women ($M = 1.62$, $SD = 0.55$) did to their husbands, $t(23) = 2.53$, $p \leq .05$. Both men ($M = 1.67$, $SD = 0.36$) and women ($M = 1.67$, $SD = 0.34$) generally displayed low to moderate levels of talking in the marital first hour, with no significant sex differences in the amount of talking, $t(29) = -0.01$, *NS*. With regard to emotional expressivity, both men and women expressed little negative emotion during their first hour together, although women ($M = 1.30$, $SD = 0.40$)

displayed more negative emotion than did men ($M = 1.16$, $SD = 0.22$; $t(29) = -1.97$, $p \leq .05$).

For the parent–child first hour, there were no significant differences between women ($M = 1.67$, $SD = 0.54$) and men ($M = 1.65$, $SD = 0.67$; $t(27) = 0.09$, *NS*) in their low to moderate levels of response intensity to their children, or in their low to moderate amounts of talking ($M = 1.72$, $SD = 0.32$, and $M = 1.63$, $SD = 0.44$, respectively; $t(29) = 1.06$, *NS*). However, although women and men both generally displayed little negative emotion, women ($M = 1.40$, $SD = 0.35$) did show more negative emotion than did men ($M = 1.21$, $SD = 0.30$; $t(29) = 2.19$, $p \leq .05$).

Links Between Job Stress and Social Behavior in the Home

Associations between average levels of job stress and average social behavior in the first hour shared with spouses and children across the two days of the study were first tested through correlations reported in Table 1. Counter to H1, no significant correlations were found between job stress and family social behavior for men or women. Correlations also tested associations between trait neuroticism and average social behavior in the first hour with spouses and children, again revealing a pattern of nonsignificant associations.

The Moderating Role of Neuroticism

A series of multiple regression analyses tested H2 that the association between an individual's level of job stress and his or her first hour social behavior would vary with different levels of neuroticism. Three predictors were entered in each model: job stress, trait neuroticism, and their interaction. The outcome variable was one of the six social behavior variables (three for marital behavior, three for parent–child behavior). A total of six multiple regression models were tested (1 job stress predictor \times 1 neuroticism moderator \times 6 social behavior outcomes). The analyses were conducted separately for women and for men to test RQ3; sample sizes ranged from $N = 22$ –29. The range of sample sizes reflects some missing job stress data as well as missing response intensity ratings when targets did not receive an initiation for interaction (i.e., there was no initiation to which the target could respond).

Moderator analyses for women. No significant interactions were found between job stress and neu-

Table 1
Bivariate Correlations for Job Stress, Trait Neuroticism, and First Hour Social Behavior Variables Averaged Across Two Days

	1	2	3	4	5	6	7	8
1. Job Stress	—	-.09	.14	.05	.15	.12	-.14	-.18
2. Trait Neuroticism	.38*	—	.16	-.18	-.05	.01	.16	-.09
Marital First Hour Social Behavior								
3. Response Intensity to Spouse	.33	.25	—	-.25	.23	.02	-.31	.08
4. Talking	.23	-.24	.37[†]	—	.21	-.09	.21	.03
5. Negative Emotion Display	-.07	.07	.11	-.09	—	-.19	-.29	.26
Parent-Child First Hour Social Behavior								
6. Response Intensity to Child	-.16	-.12	-.32	-.13	-.08	—	.34[†]	.13
7. Talking	.10	-.20	.17	.66**	-.13	.06	—	.08
8. Negative Emotion Display	-.04	-.02	.09	.00	.83**	-.01	-.07	—

Note. $N = 26$ –30 women; $N = 23$ –30 men. Values above the main diagonal represent correlations for women, and values below the main diagonal represent correlations for men.

[†] $p \leq .10$. * $p \leq .05$. ** $p \leq .01$.

roticism in the prediction of women's social behavior after work.

Moderator analyses for men. The results of the multiple regression analyses, presented in Table 2, show that in five of the six models, the interaction between job stress and neuroticism made either a significant (4 models) or a marginally significant (1 model) contribution to the prediction of men's social behavior with their families after work. For marital first hour social behavior, neuroticism moderated the associations between job stress and all three of the marital behavior codes: response intensity to wife ($\beta = .48, p \leq .05$), talking ($\beta = .55, p \leq .01$), and negative emotion display ($\beta = .47, p \leq .05$). Similarly, for parent-child first hour social behavior, neuroticism moderated the association between job stress and response intensity to child ($\beta = -.46, p \leq .05$), and approached significance in the association between job stress and negative emotion display ($\beta = .37, p \leq .10$). These significant and marginally significant interaction betas were generally consistent with respect to the direction of the effects; all of the betas associated with neuroticism were positive, with one exception being the beta for response intensity to child.¹

To illustrate the significant interactions for men, we divided the men at the median on neuroticism, creating two groups: high neuroticism ($m = 21.13, n = 15$) and low neuroticism ($m = 9.80, n = 15$). For each of the five significant or marginally significant interaction terms, bivariate correlations between the job stressor and the social behavior variable were computed for each group. Although the moderator effects are tested by the interactions shown in Table 2 and these correlations are presented for illustrative

purposes only, it is interesting to note the strength of these associations despite the small sample size in these subgroup analyses. The sample sizes reflect missing self-reported job stress scores and response intensity ratings (when there was no initiation for interaction to which the target could respond).

Findings show partial support for our moderation (H2) hypothesis and sex difference research question (RQ3). For the men who were higher on neuroticism, the positive correlations in Table 3 indicate that more job stress was associated with greater response intensity and more talking coupled with more negative emotion displays in first hour marital behavior. In the parent-child first hour, high neuroticism men showed more negative emotion displays but less response intensity to their children. Overall, these findings show a general pattern of more active, involved, and negative social behavior with family members among men who reported higher neuroticism and who reported more stressors at work. On the other hand, among the men who reported low neuroticism, those who described more job stress talked less and showed less negative emotion with their family mem-

¹ We re-ran the moderation analyses controlling for own work hours, spouse's work hours, and whether or not paid childcare was used. The findings remain largely the same, with four out of the five originally significant interactions for men remaining significant when controlling for own work hours (the interaction term for response intensity in the parent-child first hour loses significance), and all five of the five originally significant interactions for men remaining significant when controlling for spouse's work hours or whether or not paid childcare was used. As before, there were no significant interactions for wives.

Table 2
Multiple Regressions Predicting Men's First Hour Social Behavior From the Interaction of Job Stress and Trait Neuroticism

First Hour Social Behavior Outcome	Beta			Adj R^2	df	F
	Job stress predictor	Trait neuroticism moderator	Interaction term			
Marital Behavior						
Response Intensity to Wife Talking	.41[†]	.08	.48*	.24	(3, 19)	3.26*
Negative Emotion Display	.41*	-.30[†]	.55**	.40	(3, 23)	6.70**
Parent-Child Behavior						
Response Intensity to Child Talking	-.07	.13	.47*	.12	(3, 23)	2.15
Negative Emotion Display	-.16	-.13	-.46*	.13	(3, 22)	2.27
Talking	.23	-.27	.19	.01	(3, 23)	1.07
Negative Emotion Display	-.01	.03	.37[†]	.02	(3, 23)	1.18

Note. $N = 22-26$ men.

[†] $p \leq .10$. * $p \leq .05$. ** $p \leq .01$.

bers. Thus, for more emotionally stable men who are better able to deal with stress, greater job stress was associated with more socially withdrawn behavior in the first hour with both spouse and child. The one exception to these patterns is how neuroticism affected men's response intensity to their children. These correlations, and the negative beta for the interaction term shown in Table 2, indicated that among men who reported higher levels of job stress, those high on neuroticism responded with less intensity to their children, whereas those low on neuroticism responded with more intensity to their children.

Table 3
Bivariate Correlations Comparing Associations Between Job Stress and Men's First Hour Social Behavior in Groups With Low and High Trait Neuroticism

First Hour Social Behavior	Low trait neuroticism	High trait neuroticism
Marital Behavior		
Response Intensity to Wife Talking	.14	.37
Negative Emotion Display	-.35	.56*
Parent-Child Behavior		
Response Intensity to Child Talking	-.39	.39
Negative Emotion Display	.30	-.67**
Negative Emotion Display	-.35	.41

Note. $N = 23-27$ men. Only correlations corresponding to significant or marginally significant interaction terms from Table 2 are presented here.

* $p \leq .05$. ** $p \leq .01$.

Discussion

This study examined how self-reported job stressors are linked to observed social behavior in the family, and how these associations differ according to the employed individual's level of neuroticism, over two weeknights. We employed naturalistic observations of a small sample of dual-earner families with school-age children. Counter to our hypothesis, there was no evidence for an overall association between job stress and social behavior in the family. However, when neuroticism was tested as a moderator in the association between an individual's job stress and social behavior, significant and marginally significant interaction effects provide partial support for study predictions and suggest that men's responses at home to stressors at work may be shaped by their level of emotional stability and subsequent ability to cope with stress.

Among men who self-reported high levels of neuroticism, more job stress was generally associated with greater behavioral involvement (i.e., more talking and higher response intensity to wife in first hour marital interaction), coupled with more negative emotion expression (i.e., more displays of negative emotion in marital and parent-child interactions) during their initial interactions with family members in the home. In the daily report literature, a comparable process has been termed "negative mood spillover," whereby the stresses of the workday are carried into the home in the form of angry and irritable behavior (e.g., Story & Repetti, 2006). Our findings suggest that among men who are higher on neuroti-

cism, negative mood spillover can become a common response if they also have stressful work experiences. Because individuals high on neuroticism tend to react more strongly to events (Bolger & Schilling, 1991; Bolger & Zuckerman, 1995) and experience more negative mood (John & Srivastava, 1999), these men may not have the emotional qualities and coping skills that can protect the family from the influence of workplace stressors. We note, however, that the family interactions observed in this study were typically quite benign, as indicated by the low mean scores for negative emotion display; thus, these findings should not be interpreted as evidence of maladaptive interactions. Instead, the arousal resulting from a stressful work day may result in social interactions at home that are generally more active and intense, and with an emotional tone that is a bit more negative.

The opposite pattern was observed for the men who reported low trait neuroticism—more stress at work was associated with less behavioral (i.e., less talking to wife) and emotional engagement (i.e., fewer displays of negative emotion in marital and parent–child interactions) with spouse and child. In the daily report literature, social withdrawal following a more stressful day at work has been conceptualized as an adaptive short-term coping response that can facilitate recovery from a stressful day (e.g., Repetti, 1989). As such, the period of isolated relaxation and recovery offered by withdrawal from social interaction presents a healthy response to job stress, both for individual health as well as for social interactions with others. In our study, the link between job stress and less engagement among the low neuroticism men supports this notion. On the other hand, although differences in the quality of social behavior observed in this study were subtle, the cumulative impact of a chronic pattern of social withdrawal could be significant. Given research indicating the negative effects of long-term social withdrawal on well-being (e.g., Neal & Hammer, 2009), chronic withdrawal from one's spouse may erode the quality of the marital relationship, detract from consistency in parenting, and contribute to an overall loss of family cohesion. However, because the present study considered only the first hour in which these working men were at home with their families, the observed social withdrawal response may be restricted to a narrow window of time. This view of social withdrawal as an immediate short-term coping response is more in line with the definition drawn from the daily report literature (e.g., Repetti, 1989).

Glimpsing Inside the Home: Two Case Examples

The negative mood spillover and social withdrawal responses may be hard to fully picture when starkly described by our quantitative analysis, which does not capture the rich and nuanced view of social behavior in the family provided by the naturalistic observation in this study. Here, we provide short case examples of what these responses qualitatively looked like for two different families in our sample in order to provide readers with a glimpse of the unique vantage point afforded by naturalistic observation. Names and details have been altered to protect the privacy of our participant families.

Ed Anderson fits the profile we found associated with negative mood spillover; he scored high on neuroticism and reported high job stress. He is married to Rhoda and together they have three young daughters between the ages of 5 and 11. On Day 1 of videotaping, Ed returned home and was immediately very engaged with his family members—greeting them hello, asking questions about their day, and helping get dinner ready. However, he appeared somewhat irritated during these interactions with Rhoda and his daughters, and often sighed, rubbed his head in annoyance, and used a mildly sarcastic tone. At the start of dinner, Ed learned from an apologetic Rhoda that the fish she had made would not be ready for another 20 minutes. Although Ed said “OK, I’ll eat it later,” he made several references to the dinner that showed a critical undertone. For example, when served a salad, Ed grunted “Yeah, yeah . . . *this* is sort of like Daddy style,” a backhanded compliment that implied that Rhoda typically served “non-Daddy style” food. Several minutes into the meal, Ed silently left the table and began loudly crunching on chips. Rhoda continued to be apologetic about the delay with the fish, but Ed told her “I’m not even really hungry” as he ate his chips. Although Ed continued to inquire when the fish would be ready, he ultimately rejected the fish when it came out of the oven. After dinner, Ed continued to show irritation (e.g., raised eyebrows, annoyed looks, sighs, sarcastic tone) while helping clear the table, running the bath water for his youngest daughter, and helping his oldest daughter with her homework. In this glimpse into the Anderson family, Ed appeared to be an extremely engaged and integrated member of the family; however, his involvement was often infused with irritation, sarcasm, and mild criticism. Negative mood spillover from work to home may have been one possible contributor to his social be-

havior. It is important to note that Ed Anderson generally appeared to be a very caring and helpful father and husband, and that our case example captures only a small window of time in the daily life of this working father.

The Reis family provides a different glimpse into work-family linkages. Jerry is one of the men who scored low on neuroticism but reported high job stress, a pattern that was associated with social withdrawal in our data. He is married to Pam, and has a son (age 7), a daughter (age 8), and a dog. After arriving home on Day 1 of videotaping, Jerry busied himself with checking the mail and handling paperwork, virtually ignoring the rest of his family as Pam attended to the children. He then wandered into the den/computer room where he played with a new phone he purchased for the house. Jerry's oldest daughter sat down next to him for several minutes and tried to engage him in her drawings for a school project, but he scarcely responded ("uh-huh" "yeah") or turned to look at her as he continued to toy with the phone with great interest. Jerry also turned on the TV during this time, and absent-mindedly split his attention between the phone and the world news as his daughter sat beside him and continued to draw. After he turned off the TV, Jerry became engrossed with a new remote control he purchased that allowed him to order the songs he wanted to play on the computer from the couch. He appeared to enjoy listening to music, and played it so loudly that it was difficult to hear his daughter's occasional remarks to which he continued to be minimally responsive. The daughter eventually left the room, and Jerry enjoyed several solitary minutes where he relaxed as he listened to music, pet the family dog, and then quietly read a book. During this entire time, Pam was in the kitchen preparing dinner and attending to other household matters. For the Reis family, Jerry disengaged himself from his family and seemed to take pleasure in having solitary time where he was able to relax undisturbed and enjoy calming activities. This behavior may have been influenced by a social withdrawal response, such that solitary time helped Jerry cope with a stressful day at work and buffered the effects of job stress on the family.

Sex Differences

In sum, the results of this study suggest different patterns of work-family associations among men depending on levels of neuroticism, providing further evidence that emotional stability is an important individual difference factor that shapes work-family linkages. The moderator effects were fairly consistent, with four out of six interaction terms

reaching a level of statistical significance and one out of the six interaction terms reaching a marginal level of significance. No consistent patterns of work-family associations were found for the women in this study. Almeida and colleagues (1999) have suggested that men may be more susceptible to stressors that impact their families, due to the less scripted nature of their role in the home. Women, on the other hand, are typically the primary providers of domestic labor and childcare (Bianchi, Milkie, Sayer, & Robinson, 2000), a pattern that has been replicated in the current study's sample of families (Ochs, Shohet, Campos, & Beck, 2010), and so it is possible that the differing roles of men and women within the household may contribute to differences in work-family processes.

There are other potential explanations for the lack of effects found for women in our sample. Our limited sample size may have precluded the detection of work-family associations small in magnitude for women. Additionally, it is possible that the effects of job stress for women on their social behavior in the family may be more delayed than men's, and are better observed at a different time point in the evening. Perhaps job stress has a more pronounced effect on women's social behavior with their husbands after most of the household duties have concluded and the children have gone to bed, given that women typically bear the brunt of domestic labor and childcare and are commonly characterized as facing the "six o'clock crash" (Larson & Richards, 1994) and the "second shift" (Hochschild, 2003). The women in this study typically returned home before their husbands; when the men arrived home, both spouse and children were usually already there (see Campos, Graesch, Repetti, Bradbury, & Ochs, 2009). Thus, the men and women faced different social contexts during their first hour home after work, which may have contributed to different behavior patterns observed in relation to job stress. Because videotaping in this study ended once the children went to bed, we were not able to examine how job stress was related to social behavior at later points in the evening, after the end of the "second shift." Examining the effects of job stress on different windows of time in the family's day is an important goal for future research.

Influence of Neuroticism on Work-Family Linkages

This study addressed the impact of neuroticism on work-family associations. For example, the men with

higher neuroticism scores displayed a negative engagement response (characterized by greater behavioral involvement with wives that is negative in nature) that may reflect difficulty keeping their responses to a stressful job “contained.” Perhaps these men did not have the coping abilities to effectively regulate negative emotion in a way that protects the family from job stress spillover. Studies have identified maladaptive coping strategies used by individuals high on neuroticism, including hostile reactions and catharsis (Gunthert et al., 1999) and confrontive coping (Bolger & Zuckerman, 1995), all behaviors that would contribute to the negative social interaction scores observed in this study. Our results suggest that men who are high on neuroticism may not only feel more pressured and rushed at work, but may then respond to job stressors with maladaptive coping strategies that create negative family interactions. Thus, neuroticism may intensify negative spillover from work.

We have construed these moderation results as evidence for neuroticism shaping the effect that job stressors have on the family. However, it is also possible that job stress moderates the connection between neuroticism and social behavior in the family. From this perspective, job stress is a situational variable that can aggravate the impact that neuroticism has on observed social behavior. In addition, while our focus on behavior during the first hour at home after work may seem to imply that we are studying the effect that work has on the family, the design we used cannot test a causal process.

Our findings underscore the links between job stress and family social behavior as an important dimension of worker health and well-being. While research has traditionally approached work-family processes as individual level-phenomena (Casper et al., 2007), studies such as this emphasize the effects that job stress can have on the family and underscore the need for workplaces to attend to job stress and its effects on employees, their health, and the well-being of their families. Employers can adopt primary interventions that change the physical and psychosocial work environment in order to decrease job stress, including strategies such as altering work pacing, building social support, and job redesign. Additionally, organizations may do well to adopt secondary interventions that help workers respond to stress constructively; examples of these methods include offering anger management and coping classes (La Montagne, Keegel, Louie, Ostry, & Landsbergis, 2007). Our study builds on these traditional interventions in occupa-

tional settings by also suggesting that employers can educate workers and encourage adaptive behaviors particularly during the transition period from work to home, as one way of supporting worker health, well-being, and family relationships.

Advantages and Limitations of the Current Study

The present study addressed several limitations in the extant literature. First, we intensively observed social behavior inside the home as families went about their lives, avoiding shortcomings associated with relying exclusively on self-reports of social behavior. Second the measures of job stress were collected twice per day on two days when workers described their experiences during the last few hours, minimizing recall error and guarding against retrospective biases. In addition, our examination of neuroticism as a moderator of the link between job stress and social behavior furthers scientific knowledge of how work-family associations may differ for certain people, and clarifies seemingly incongruent results that have thus far characterized the literature.

The benefits of the intensive data collection were off-set by a sample size that ruled out the detection of small effects. For example, we were only able to reject the null hypothesis when correlations reached a magnitude near .40, which is typically regarded as a moderate effect size; thus, it appears that we only had the power to detect moderate to large effects. The lack of findings for women may be in part a function of our limited statistical power. Similarly, with a larger sample size, we may have found more statistically significant interaction effects for men. Another limitation was the fact that we only had video-recordings from two weekdays, which were then averaged, thus off-setting some of the benefits of having two days of data. As a result, there were restrictions on the variability of job stress and social behavior, and our data were not well-suited for multilevel modeling approaches. Additionally, this study employs a between-subjects design to study processes for married working adults that could be further clarified using a dyadic analysis; however, our small sample size precluded a dyadic analysis. Furthermore, although thin-slicing is a valid approach to sampling behavior, it is possible that our method may have missed relevant behavior and events. Last, we do not know how well these findings would generalize to different households, such as those outside the

middle class, at different stages of the life cycle, or headed by same-sex couples or single-parents. Stronger or clearer patterns of results may be found for families and workers in different circumstances or facing different objective stressors, such as poverty or multiple caregiver roles.

Our recommendations for future research include using naturalistic observation as a way to study the effects of job stress on families, with a focus on moderator variables and the fine-grained work-family patterns that may exist for different groups of people. More repeated measures over multiple days would permit within-subjects analyses, and a larger sample of families would also make a dyadic analysis statistically viable. Nonetheless, we believe that these data present an intriguing look into the effects of job stress on social behavior in the family in a way not possible before. In particular, our findings highlight an important moderator process involving neuroticism that appeared best captured using observational as well as self-report methods. We hope that this study brings to light the special utility of naturalistic observational data for helping researchers better understand what actually occurs within the four walls of that place we all call "home."

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