American Sociological Review
76(6) 809–833

DOI: 10.1177/0003122411425170
http://asr.sagepub.com

Revisiting the Gender Gap in Time-Use Patterns: Multitasking and Well-Being among Mothers and Fathers in Dual-Earner Families

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Abstract

This study suggests that multitasking constitutes an important source of gender inequality, which can help explain previous findings that mothers feel more burdened and stressed than do fathers even when they have relatively similar workloads. Using data from the 500 Family Study, including surveys and the Experience Sampling Method, the study examines activities parents simultaneously engage in and how they feel when multitasking. We find that mothers spend 10 more hours a week multitasking compared to fathers and that these additional hours are mainly related to time spent on housework and childcare. For mothers, multitasking activities at home and in public are associated with an increase in negative emotions, stress, psychological distress, and work-family conflict. By contrast, fathers' multitasking at home involves less housework and childcare and is not a negative experience. We also find several similarities by gender. Mothers' and fathers' multitasking in the company of a spouse or children are positive experiences, whereas multitasking at work, although associated with an increased sense of productivity, is perceived as a negative experience.

Keywords

multitasking, well-being, work-family conflict, dual-earner families, Experience Sampling Method

Current research indicates that gender differences in total workload (i.e., the amount of time spent on paid and unpaid work) are rather small (Bianchi, Robinson, and Milkie 2006; Bittman and Wajcman 2000). According to recent estimates, employed fathers and mothers in dual-earner families spend, on average, approximately 64 hours per week on paid and unpaid work combined (Bianchi et al. 2006). Despite similarities in total workloads by gender, the division of labor between men and women among dual-earner families remains inequitable. Although women's work hours in the labor market have greatly increased since the 1960s, mostly due to their substantial entry into the labor force, cross-sectional analyses indicate that women spend fewer hours in market work compared to men and still bear pri-

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mary responsibility for family care and housework (Bianchi et al. 2000; Craig and Bittman 2008; Presser 1994; Zick and Bryant 1996). Moreover, mothers tend to be more involved than fathers in routine, labor-intensive and rigidly scheduled chores such as cooking and cleaning (Hochschild 1989; Milkie and Peltola 1999; Twigges, McQuillan, and Ferree 1999) and spend more time doing mental labor, including planning, scheduling, coordinating, and managing events and activities for their families (Arendell 2001; Daly 2002; DeVault 1999; Hochschild 1989). Reviewing these trends, we can see why some scholars argue that mothers are substantially more likely than fathers to feel overburdened with work and family responsibilities and have too little time to attend to both (Coltrane 2000; Hochschild 1989). Could women's heightened sense of burden and stress also be related to gender differences in multitasking?

Multitasking, the simultaneous performance of several tasks or the rapid alternation between them (Spink, Cole, and Waller 2008), allows individuals to squeeze in more tasks and get more things done within a limited amount of time. As Bianchi and colleagues (2006:98) note, "parents can try to gain time in their 24-hour days by multitasking—doing more activities at once to fit everything into their lives." For example, parents can prepare dinner while helping children do their homework or fold the laundry while talking on the phone. By allowing parents to simultaneously attend to multiple obligations, multitasking can create a sense of greater time, that is, it can deepen the intensity of time as well as maximize efficiency (Bianchi et al. 2006; Sayer 2007a, 2007b).

The media portrays multitasking as a time-management strategy used primarily by working mothers in their struggle to meet the multiple demands of work and home. If indeed mothers multitask more frequently than do fathers, then multitasking is likely an important source of gender inequality. Research shows that in dual-earner families, mothers combine housework (Lee and Waite 2005; Sayer 2007a, 2007b; Sayer et al. 2009) and childcare (Bianchi et al. 2006; Craig 2006, 2007; Craig, Mullan, and Blaxland 2010; Ironmonger 2004; Sayer 2007a, 2007b; Zick and Bryant 1996) with other activities more frequently than do fathers, and that these trends contribute to the exacerbation of the unequal division of labor between mothers and fathers. Although insightful, these studies focus on the specific domain of unpaid domestic labor and overlook the different contexts in which parents are likely to multitask. This study aims to fill in this void by revealing the role that multitasking plays in mothers' and fathers' everyday lives and its implications for their well-being when at work, at home, and in public, while taking into account who they are with.

To examine the simultaneous performance of tasks in their everyday context, we analyze data from the 500 Family Study, focusing on information obtained from surveys and the Experience Sampling Method, a form of time diary that captures primary and secondary activities and emotional states of dual-earner families. Specifically, we examine (1) how frequently working mothers and fathers multitask, in which contexts they multitask, and the types of activities that are typically combined when multitasking; (2) whether multitasking in different contexts is associated with variation in parents' sense of well-being; and (3) to what extent patterns and emotional correlates of multitasking differ by gender. By providing more refined measures of time-use and estimating the emotional correlates of multitasking, this study expands on previous research to explain, in part, the paradox between quantitative assessments that suggest similar workloads by gender and qualitative findings that highlight working mothers' greater sense of burden and emotional stress.

MOTHERS' AND FATHERS' WORKLOADS IN DUAL-EARNER FAMILIES

Demands of work and home in contemporary U.S. society have created heavy workloads for many parents (Christensen and Schneider

2010). Although this may be a problem for most working parents, those employed in professional and managerial jobs face particular challenges because they have experienced a substantial increase in their work time over the past three decades. As Jacobs and Gerson (2004) find, even though the average work week has changed little over time, educated and highly-skilled workers' work hours have risen significantly. According to recent estimates, the percentage of professional women working at least 50 hours a week has more than doubled, from 6.1 percent in the 1970s to 14.4 percent in the late 2000s. The increase among men, from 34 to 37.8 percent during this time period, has been more modest (Williams and Boushey 2010). Moreover, as more women have joined the labor force since the 1970s, the number of dual-earner families has substantially increased, resulting in a growth in couples' joint work hours (Gornick and Meyers 2003; Jacobs and Gerson 2004). Workloads, however, are determined not only by how much time parents spend on market work but also by when and where they do it. Presser (2003) finds that in almost 30 percent of all dual-earner couples with children, at least one spouse works a nonstandard daytime schedule, and in almost half of these couples at least one spouse works during the weekend.

Many U.S. firms faced with economic pressures and heightened global competition have dramatically restructured their workforces (Christensen and Schneider 2010). Employers expect high commitment to work, reward long work hours, and heavily rely on electronic communication technologies, which have contributed to the blurring of boundaries between work and home (Blair-Loy 2003; Jacobs and Gerson 2004; Maume and Purcell 2007). Working parents feeling this pressure often arrive at work early or stay late and tend to work at home on weekends, at nights, and in the early morning hours (Darrah, Freeman, and English-Lueck 2007; Schneider and Waite 2005). Galinsky and colleagues (2005:22) argue in their report on the National Study of the Changing Workforce that these changes in the economy and the labor force are the main reasons why multitasking has become so pervasive: "put simply, in many organizations, there is simply more work to do, often with fewer people to do it." Nearly half of the respondents in their study report multitasking "often" or "very often" during a typical workweek.

Increased demands at home may also have created the need for parents to multitask. Family responsibilities, including housework and caring for children and aged parents, correspond to almost one additional full-time job per family (Moen and Yu 2000). Analyses based on the 2000 National Survey of Parents show that married couples spend nearly 130 hours a week on market and nonmarket work combined, an approximately 10-hour increase since the mid-1960s (Bianchi et al. 2006). Additionally, some scholars argue that parenting has become more demanding as parents, especially mothers, seeking to promote their children's development, engage in highly active and intensive childrearing practices that are time and energy consuming (Arendell 2001; Hays 1996; Lareau 2003; Nelson 2010). Considering their heavy workloads, studies of working families show that work-life imbalance leads to decreased psychological well-being stemming from increased stress at home and at work.

PARENTS' WORKLOADS AND WELL-BEING

Prior research shows that working parents' heavy workloads create severe time squeezes that have negative repercussions for their well-being. Mattingly and Sayer (2006) find that time pressures increase with the number of work hours (see also Roxburgh 2002) and that men and women report higher time pressures in families where both parents work full-time compared to families where wives work part-time or are not employed (see also Bianchi and Wight 2010). Working parents also frequently report work-family conflict, particularly when they work long hours (Frone, Yardley, and Markel 1997; Jacobs and

Gerson 2004; Moen and Yu 2000; Schieman, Milkie, and Glavin 2009; Voydanoff 2004; Wharton and Blair-Loy 2006). Using data from two national surveys, Nomaguchi (2009) shows that work-family conflict significantly increased over the past three decades, due, in part, to parents' heightened experience of time pressures.

Roxburgh (2004) also finds an association between time pressures and the amount of time spent on housework among full-time working mothers. She shows that time pressures constitute an important mediating factor that accounts for the differential depressing effects of housework by gender. Results pertaining to the presence of children in the home are mixed. Whereas Roxburgh (2004) reports a negative effect between childcare responsibilities and time pressures among men and women alike, Mattingly and Sayer (2006) find an association between the two but only among women. Similarly, studies provide mixed conclusions about the association between childcare responsibilities and work-family conflict (for a review, see Schieman et al. 2009).

Work-family conflict is traditionally framed as a challenge only to women. Normative expectations, it is argued, require employed mothers to give precedence to family demands over work demands, thus making them more vulnerable to experiencing conflict between the two. Research, however, provides mixed results and suggests that work-family conflict is not merely a mother's problem. Several studies find that work-family conflict is higher among women than among men (Hill 2005; Wharton and Blair-Loy 2006), but others reveal a small and nonsignificant difference in the report of work-family conflict by gender (Nomaguchi 2009; Winslow 2005). Much of this discrepancy results from the multifaceted character of the concept, and from the fact that empirical studies vary in the measures they use to tap work-family conflict: some studies focus on feelings of conflict, others on the lack of time due to competing responsibilities. For example, Jacobs and Gerson (2004) find that mothers are more likely than fathers to report that they cannot cope with multiple responsibilities, whereas fathers are more likely than mothers to report experiencing "a lot" or "some" interference between their job and family. Fathers are also more likely than mothers to complain about not spending enough time with their family (see also Bianchi and Wight 2010; Milkie et al. 2004; Roxburgh 2006).

WHAT WE KNOW ABOUT MULTITASKING

Multitasking may allow parents in dual-earner families to accomplish more tasks within a limited amount of time (Bianchi et al. 2006; Sayer 2007a, 2007b). However, scholars who study multitasking are not primarily interested in when people multitask and how they feel about it. Rather, this field is dominated by neuroscientists and cognitive psychologists who are interested in uncovering the cognitive functions and processes that allow people to perform several tasks at once. Studies in this field conclude that multitasking, which requires complex mental activities such as planning, prioritizing, and error monitoring, is critical for the performance of daily activities (Burgess 2000; Burgess et al. 2000; Burgess et al. 2008). Without the ability to multitask "one would have to always finish one task (e.g., cooking the vegetables for a meal) before starting another (e.g., cooking other parts of the main meal)" (Burgess et al. 2008:243).

Neuropsychological experiments, however, show that multitasking is often an inefficient way to accomplish tasks (Rogers and Monsell 1995) and that the amount of time lost and the likelihood of committing errors while switching repeatedly between two tasks increases as a function of the tasks' complexity (Rubinstein, Meyer, and Evans 2001). Overall, people can easily perform automatic and routine tasks together with more complicated tasks, such as eating and listening to the radio, but when tasks require conscious thought, attention, and planning, efficiency

likely decreases significantly. These findings, which have recently been the subject of extensive debate in the popular media, raise concerns about the consequences of multitasking for individuals' well-being and functioning (see Healy 2004; Javid and Varney 2007; Wallis 2006).

This study eschews the focus on cognitive mechanisms of multitasking in favor of an understanding of the broader social context in which multitasking likely occurs. Little is known about multitasking in real-life settings, in which mothers and fathers perform complex activities, often while interacting with other people. Examining not only the time spent multitasking but also the nature of what is occurring, with whom multitasking is done, and how people feel when they multitask will likely shed new information on differences in time-use patterns by gender.

IS MULTITASKING A SOURCE OF GENDER INEQUALITY AMONG DUAL-EARNER FAMILIES?

Are women more likely than men to multitask? Survey data tend to support gender differences, indicating that women report multitasking more frequently than do men. In the 2000 National Survey of Parents, 67 percent of married mothers, but only 42 percent of married fathers, indicate that they multitask "most of the time" (Bianchi et al. 2006). Percentages are substantially larger among dual-earner couples where both parents work 50 hours a week or more: 85.9 percent of women and 59.1 percent of men report frequently multitasking (Bianchi and Wight 2010). Galinsky and colleagues (2005) report similar results, noting that gender differences in multitasking account for women's higher rates of feeling overworked compared to men.

Qualitative research corroborates these findings. Hessing (1994), who interviewed women employed in clerical jobs, finds that many working mothers seek to save time by multitasking at home and at work. For these women, multitasking maximizes time use and serves as a time-management strategy that allows them to deal with the double duty they experience being wage earners and care givers (see also Hochschild 1989, 1997). As Arendell (2001) notes, for many working mothers multitasking is the "key to success." One of the middle-class working mothers Arendell interviewed reports: "My husband laughs at me, but I keep insisting that if *he'd* just *multitask* more, things would go more smoothly around here. . . . I do it all the time. So do most mothers I know, for that matter" (p. 179).

Time-use studies, on the other hand, indicate only a small gender gap in multitasking. Bianchi and colleagues (2006) show that the number of multitasking hours per week is almost identical among married mothers and fathers: 80 and 78 hours per week, respectively. However, studies focusing on specific activities, most notably housework and childcare, point to qualitative differences in the experience of multitasking by gender: accounting for secondary activities widens the gender gap in the time spent on unpaid work (Craig 2006, 2007; Ironmonger 2004; Lee and Waite 2005; Sayer 2007b). Sayer (2007a) calculates that in dual-earner families, mothers spend, on average, seven additional hours a week combining two unpaid work activities, either housework, shopping, or childcare, whereas fathers spend less than three hours on this type of multitasking.[1] In a more recent study, Sayer and colleagues (2009) find that in families in which both spouses work long hours, accounting for housework as a secondary activity increases the total workload of mothers more than that of fathers because women are more likely to combine unpaid work with either leisure or self-care (Sayer 2007b). Craig (2007) suggests that women are more likely than men to multitask in the domestic sphere because men have not increased enough of their share of housework and childcare following women's entry into paid work, leaving it to women to pick up the slack.

Focusing only on how many hours a week mothers and fathers multitask does not

necessarily explore the emotional burdens that accompany multitasking and how they may differ by gender. We argue that a relatively small gender gap in the overall frequency of multitasking may conceal large differences in how fathers and mothers feel when they multitask. Normative expectations require mothers in contemporary society to fulfill multiple roles as both wage earners and primary caregivers for their family, which presents them with contradictory ideological pressures. On the one hand, as workers in the market, women are expected to act in ways that fulfill a work ethic valuing speed and efficiency and prioritize work over family demands. On the other hand, as mothers and wives, they are expected to be fully committed to their family, attentive to their children's needs and highly involved in their development, and devote considerable time to managing their households (Hochschild 1989; Williams 2000). Because mothers are the ones who typically carry it all, we expect multitasking to be a more stressful and negative experience for them than for fathers. Additionally, because housework and childcare are still viewed as being the major responsibility of mothers, we expect the gender gap in the emotional costs associated with multitasking to be more pronounced in the home than in other contexts.

DATA AND MEASURES

The 500 Family Study

Data for this study are based on the 500 Family Study,[2] a multi-method investigation of how middle-class families balance family and work experiences (Schneider and Waite 2005). The 500 Family Study collected comprehensive information from 1999 to 2000 on families living in eight urban and suburban communities across the United States. In each community, participating families were recruited mostly by mail or phone through local schools. Others were solicited by local newspaper advertisements or were referred to the study by participating families. Families in the study are a predominantly white, non-Hispanic, middle-class sample of dual-earner parents and their children. The majority of parents in the sample are highly educated and employed in professional occupations, and they work, on average, longer hours and report higher earnings than do middle-class families in other nationally representative samples (see Hoogstra 2005). Although the 500 Family Study is not a representative sample of families in the United States, it reflects one of the most time pressured segments of the population (Jacobs and Gerson 2004; Schneider and Waite 2005). Being highly educated, parents who participated in the study likely have demanding jobs that require them to work long hours and make their struggle to juggle work and family responsibilities challenging. Demands at work, together with the pressures of intense parenting that characterize middle-class families, may lead these parents to frequently multitask.

A major advantage of the 500 Family Study is the richness of its data on family members' time uses and emotional experiences. Data were collected using traditional survey research methods and a form of time diary, the Experience Sampling Method (ESM). The ESM collects information about activities and emotional experiences throughout the day in the course of a typical week (Csikszentmihalyi and Larson 1987). The ESM in this study used preprogrammed wristwatches that randomly beeped participants eight times during their waking hours each day for seven consecutive days. When signaled, respondents were asked to complete a short questionnaire, providing information about their activities, location, surroundings, and how they were feeling. The ESM provides a unique and invaluable opportunity for examining real-time activities as they occur in their natural setting and assessing how respondents subjectively interpret their daily experiences (Hektner, Schmidt, and Csikszentmihalyi 2007). Unlike full-day diary

reports, which are based on recollection of prior events and activities, the ESM is less vulnerable to recall bias (Marini and Shelton 1993; Mulligan, Schneider, and Wolfe 2005) and provides detailed descriptions of the multiple activities respondents are engaged in simultaneously (Hektner et al. 2007; Schneider 2009).

Analyses in this study are based on a subsample of fathers and mothers in dual-earner families who completed both the ESM and the survey questionnaire. This subsample includes 368 mothers with 16,878 beeps and 241 fathers with 9,482 beeps.[3] ESM response rates were 78 percent among mothers and 73 percent among fathers. Consistent with other ESM studies, we exclude from the sample participants who responded to less than a fourth of the beeps (i.e., 11 fathers and 15 mothers). Scholars have criticized the ESM for being burdensome and some argue that this could be a source of nonresponse bias (e.g., if busy people were less likely to participate in ESM studies). However, similar to other ESM studies (see Drago and Stewart 2010), we do not find such a bias in the 500 Family Study. Preliminary analyses show no significant differences among characteristics of respondents who had complete ESM data, those who responded to more than a quarter but not to all beeps, and those who responded to fewer than one fourth of the beeps. We imputed missing data in the survey and the ESM using the Multiple Imputation (MI) technique with the software *AMELIA II* (Honaker, King, and Blackwell 2009) to create five complete datasets.[4]

Measures

Multitasking (MT). The ESM asks mothers and fathers to report on their primary activity ("What was the main thing you were doing?") and secondary activity, if they had any ("What else were you doing at the same time?"). We use these two items to construct a *multitasking* variable (i.e., MT beep) indicating whether respondents engaged in two simultaneous activities when signaled (0 = no, 1 = yes). Trained coders coded open-ended responses to the primary and secondary activity questions into more than 400 different types of activities (inter-rater reliability for this coding ranges from .79 to .95). We use the scheme employed by Bianchi and Wight (2010) to classify these activities into seven broad categories. (1) *Work:* income-producing activities in the labor market, including work activities at work, at home, and in other settings. (2) *Housework:* domestic duties that constitute unpaid work, such as food preparation, house cleaning and maintenance, shopping, laundry, gardening, and car repair. (3) *Childcare:* maintenance, supervisory, and interactive activities that revolve around the needs of children, such as feeding, bathing, putting to sleep, assisting with homework, playing with, cuddling, and soothing. (4) *Personal care:* time dedicated for self-care, including activities such as eating and grooming. (5) *Communication:* interactive activities such as talking on the phone, conversing, and e-mailing (for non–work-related purposes). (6) *Transportation:* commuting to and from work and traveling and chauffeuring children to school and other activities. (7) *Mental labor:* various thoughts related to work and family matters, such as thoughts about the coordination of schedules and time constraints.[5] Consistent with the approach adopted by Bianchi and colleagues (2006), we exclude all free-time activities (either as primary or secondary activities) from our multitasking measure. Preliminary analyses (not shown) reveal that combining a free-time activity with another activity, such as folding the laundry while watching TV or driving while listening to the radio, is a relatively positive, pleasurable, and relaxing experience (see also Sayer 2007b).

ESM and survey measures of well-being. Well-being is a broad and widely used concept in the social sciences that refers to the subjective assessment of one's psychological state and evaluation of life quality. In this

study, we obtained measures of well-being from the ESM and the survey.

The five composite measures of well-being we constructed from the ESM include the mean of (1) *positive affect*—feeling cheerful, relaxed, and good about oneself when beeped (α = .807); (2) *negative affect*—feeling irritated, frustrated, and nervous (α = .854); (3) *stress*—feeling stressed and strained (α = .802); (4) *productivity*—feeling hardworking, productive, active, and successful about what one was doing at the time of the beep (α = .738); and (5) *focus*—feeling in control, concentrated, and able to deal with the situation (α = .769).[6] Response categories for all these ESM items are 0 = not at all, 1 = a little, 2 = somewhat, and 3 = very much. As Table 1 shows, none of the gender differences in the ESM emotional outcomes are statistically significant.

We also examine the association between multitasking and several measures of well-being from the survey. We measure *psychological distress* with the 20-item Center for Epidemiological Studies Depression (CES-D) Scale, in which mothers and fathers were asked to indicate how often they experienced a number of feelings during the past week, such as "I did not feel like eating," "I felt depressed," and "I felt that everything I did was an effort" (Radloff 1977). Response categories range from 0 = rarely or none of the time (less than 1 day) to 3 = most or all of the time (5 to 7 days) (α = .89). *Perceived stress* is an index based on mean responses of four items drawn from Cohen's Perceived Stress Scale (Cohen and Williamson 1988) that asked respondents how often the following statements applied to them: "I feel on top of things" (reverse coded), "I feel stressed," "I feel I can't cope with everything I have to do," and "I feel confident about my ability to handle personal or family matters" (reverse coded). Response categories range from 0 = never to 4 = very often (α = .74). We measure *work-family conflict* with the question "how often do you feel that work roles and family roles conflict?"; *family time guilt* refers to the question "I feel guilty that I don't spend more time with my family" (both measures have response categories of 1 = never, 2 = rarely, 3 = sometimes, and 4 = often). As Table 1 indicates, mothers are slightly more likely than fathers to report stress, but while significant, the difference is small. Additionally, we find no significant gender differences for any of the other survey well-being measures.

ESM contextual measures. To examine the context in which multitasking is likely to occur, we include several additional measures from the ESM. We measure *location* with two dummy variables indicating whether the respondent is at home or at work when beeped (0 = no, 1 = yes), being in a public place is the reference category. We include three measures to tap the presence of others when signaled: *child* indicates whether at least one child was present; s*pouse* whether one's spouse was present; and *others* whether other people, such as friends, coworkers, or relatives, were present at the time of the beep. Compared to fathers, mothers report spending more time at home and more time in the company of children, but less time at work and less time in the presence of their spouse, when signaled (see Table 1). The latter finding is consistent with previous research showing some disagreement between wives and husbands about when they are together, with wives being less likely to reciprocate when their partner indicates being "with their spouse" (Larson and Richards 1994).

Work and family characteristics. Job demands and resources, which research shows to be consequential for individuals' well-being (Bellavia and Frone 2005; Schieman et al. 2009; Voydanoff 2004), likely affect parents' workloads and their need to multitask. We focus on three work characteristics: work hours, work schedule, and job autonomy. Parents were asked how many hours they spend working in a typical week. The original variable included seven response categories (i.e.,

Table 1. Descriptive Statistics for Well-Being Outcomes, Contextual Measures, and Work and Family Characteristics

	Mothers		Fathers	
	Mean (SD)	95% CI	Mean (SD)	95% CI
Emotional Well-Being (ESM)				
Positive affect	1.769 (.392)	1.729–1.809	1.782 (.386)	1.733–1.831
Negative affect	.359 (.228)	.335–.382	.36 (.24)	.33–.39
Stress	.466 (.327)	.433–.499	.418 (.315)	.378–.458
Productivity	1.804 (.318)	1.772–1.837	1.79 (.32)	1.75–1.831
Focus	2.196 (.3)	2.165–2.227	2.209 (.302)	2.171–2.247
Well-Being (survey)				
Psychological distress	8.394 (.721)	7.655–9.133	8.277 (.648)	7.455–9.099
Perceived stress	2.103 (.614)	2.041–2.166	1.938*** (.614)	1.86–2.016
Work-family conflict	2.283 (.835)	2.198–2.369	2.268 (.712)	2.177–2.358
Family time guilt	2.664 (.92)	2.57–2.758	2.669 (.813)	2.566–2.772
Contextual Measures (ESM)				
Location (public setting is the reference category)				
Home	.539 (.161)	.523–.556	.417*** (.167)	.396–.439
Work	.214 (.147)	.199–.229	.346*** (.162)	.326–.367
Presence of others: child (no child present is the reference category)	.316 (.173)	.298–.333	.217*** (.127)	.201–.234
Presence of others: spouse (no spouse present is the reference category)	.184 (.129)	.171–.197	.214** (.124)	.198–.23
Presence of others: others (no others present is the reference category)	.271 (.138)	.257–.285	.283 (.149)	.264–.301
Work and Family Characteristics (survey)				
Long work hours	.224 (.414)	.181–.266	.578*** (.487)	.517–.64
Regular work schedule	.70 (.457)	.654–.748	.837*** (.369)	.79–.884
Work autonomy	3.183 (.84)	3.097–3.269	3.239 (.817)	3.136–3.343
Number of Children (three or more children is the reference category)				
One or Two Children	.609 (.489)	.559–.659	.548 (.499)	.484–.611
Age of youngest child (older than 6 years is the reference category)				
Under 2 years	.065 (.247)	.04–.091	.066 (.249)	.035–.098

(continued)

Table 1. *(continued)*

	Mothers		Fathers	
	Mean (SD)	95% CI	Mean (SD)	95% CI
Between 2 and 6 years	.233 (.423)	.19–.277	.228 (.42)	.175–.282
Controls (survey)				
Age	44.86 (6.19)	44.224–45.494	45.84 (6.49)	45.014–46.662
Graduate/professional degree (no graduate or professional degree is the reference category)	.821 (.383)	.782–.861	.869** (.306)	.858–.935

Note: N = 368 mothers (16,878 beeps) and 241 fathers (9,482 beeps).
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$ (two-tailed tests).

1 to 15, 16 to 25, 26 to 37, 38 to 45, 46 to 50, 51 to 60, and more than 60). Because responses were highly skewed, we recoded this variable into a dummy, *long work hours,* indicating whether the respondent worked 46 or more hours a week (0 = no, 1 = yes). Among fathers and mothers, 58 and 22 percent, respectively, report working 46 or more hours a week (see Table 1). *Regular work schedule* indicates whether the respondent worked on a regular daytime schedule (0 = no, 1 = yes). The percentage of fathers working on a regular schedule (83.7 percent) is higher than the percentage of mothers (70 percent). *Job autonomy* refers to the mean responses of three items asking how true the following statements about the respondent's job were: "I have a lot of opportunity to make my own decisions," "I have a lot of say over what happens on my job," and "I can design or plan most of my daily work" (1 = not true at all, 2 = somewhat true, 3 = true, 4 = very true; α =.88). We find no significant difference by gender with respect to job autonomy.

Similarly, family characteristics likely affect demands at home and contribute their share to parents' workloads. Especially important in this context are parental demands, which are, to a large extent, a function of the number and ages of children in the household (Craig and Bittman 2008; Jacobs and Gerson 2004; Voydanoff 2004). Extensive parental responsibilities likely make increased claims on parents' time and reduce the time available to devote to other tasks, thus increasing the need to multitask. We measure *number of children* with a dummy variable indicating whether the respondent has one or two children; three or more children is the reference category. We measure *age of youngest child* as two dummies (i.e., youngest child is below age two and youngest child is between 2 and 6 years; youngest child is older than 6 years is the reference category). More than half the respondents have one or two children and almost a third have at least one child under the age of two (see Table 1).

Finally, we include demographic controls for age and education. *Age* refers to the respondent's age in years. We measure education with a dummy variable indicating whether the respondent has a *graduate or professional degree* (0 = no, 1 = yes). Parents in this sample are highly educated (86.9 and 82.1 percent of fathers and mothers, respectively, hold a graduate or professional degree, see Table 1).

ANALYTIC PLAN

We begin by describing how frequently mothers and fathers in dual-earner families

multitask, the contexts in which they are likely to do so, and the types of activities they engage in when multitasking. We employ multilevel modeling (with HLM6 by Raudenbush et al. 2004) to examine the likelihood of multitasking. The advantage of a multilevel model is that rather than using aggregated measures at the individual level, this method allows a within-individual analysis of real-time experiences by incorporating information at the beep level (Raudenbush and Bryk 2002; Schneider 2006). Because we use a binary outcome variable (i.e., having an MT beep), we estimate a multilevel model using the binomial sampling distribution and the logit link function:

$$\eta_{ij} = \log(\varphi_{ij} / \{1 - \varphi_{ij}\})$$

where η_{ij} is the log of the odds and φ_{ij} is the probability of having an MT episode. After estimating a fully unconditional model, we add level-1 and level-2 predictors. Beep-level predictors allow us to examine the contextual background of multitasking, that is, how the location and presence of other people affect a respondent's probability of multitasking. The equation for level 1 is

$$\eta_{ij} = \beta_{0j} + \beta_{1j}(\text{home})_{ij} + \beta_{2j}(\text{work})_{ij} + \beta_{3j}(\text{child})_{ij} + \beta_{4j}(\text{spouse})_{ij} + \beta_{5j}(\text{others})_{ij}$$

where all level-1 predictors are entered as uncentered dummies. Using information drawn from the survey, we examine the extent to which the likelihood of multitasking is related to work, family, and demographic characteristics by including them in the model as level-2 variables. The level-2 equation for the intercept is

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{long work hours})_j + \gamma_{02}(\text{regular work schedule})_j + \gamma_{03}(\text{job autonomy})_j + \gamma_{04}(\text{children 1–2})_j + \gamma_{05}(\text{youngest child} < 2)_j + \gamma_{06}(\text{youngest child 2–6})_j + \gamma_{07}(\text{age})_j + \gamma_{08}(\text{graduate/professional degree})_j + \nu_{0j}$$

where all dummy level-2 predictors are entered uncentered, continuous level-2 predictors are centered around their grand mean, and ν_{0j} is the person-level error term assumed to be normally distributed with mean zero and unknown variance.

To test the association between multitasking and parents' emotional well-being as measured by the ESM, we estimate a series of hierarchical linear models in which MT beep is the major level-1 predictor of positive affect, negative affect, stress, productivity, and focus, controlling for work, family, and demographic characteristics at level 2. In these analyses, coefficients obtained for MT beep indicate the difference in emotional well-being between multitasking and monotasking (i.e., having an MT beep versus not having an MT beep). We then test whether the association between multitasking and well-being varies by context, by adding interaction terms between MT and location and between MT and the presence of others at level 1. Finally, we examine whether multitasking is associated with the survey measures of well-being. To test these associations, we first calculate for each respondent the proportion of multitasking episodes (out of a respondent's total number of beeps). We do these multitasking calculations in the different contexts and then use these aggregated measures of multitasking in a series of Ordinary Least Squares regression models to predict the survey well-being outcomes.

RESULTS

Predicting the Probability of Multitasking

How frequently do mothers and fathers in dual-earner families multitask and how does their likelihood of multitasking vary by contextual factors? Results displayed in Table 2 show that multitasking is highly prevalent among both mothers and fathers. To learn about the magnitude of variation in multitasking between mothers and fathers, we estimate a fully unconditional hierarchical model. In this model, the intercept refers to the average log-odds of multitasking across individuals.

Table 2. HLM Estimates Predicting the Log-Odds of Multitasking

	Mothers		Fathers	
	1	2	3	4
	b (SE)	*b* (SE)	*b* (SE)	*b* (SE)
Intercept	–.276***	–.552***	–.633***	–.58**
	(.033)	(.102)	(.043)	(.225)
Beep-Level				
Home		–.086		–.398***
		(.051)		(.077)
Work		.714***		.51***
		(.063)		(.088)
Child		.885***		.82***
		(.048)		(.07)
Spouse		.343***		.628***
		(.052)		(.067)
Others		.175***		.128*
		(.047)		(.056)
Person-Level				
Long work hours		.072		.05
		(.086)		(.09)
Regular work schedule		–.089		–.043
		(.065)		(.122)
Job autonomy		.065		–.058
		(.037)		(.061)
Children age 1 to 2 years		.004		–.086
		(.065)		(.088)
Youngest child under age 2 years		.021		–.091
		(.092)		(.114)
Youngest child age 2 to 6 years		.083		–.154
		(.104)		(.176)
Age		.001		–.02*
		(.006)		(.008)
Graduate/professional degree		–.24**		–.394*
		(.089)		(.168)
Random effect				
Between-person variance τ_{00}	.295	.281	.321	.342
Chi-square (intercept)	1462.677***	1343.828***	876.049***	870.181***
Reliability (intercept)	.754	.738	.722	.722

Note: N = 16,878 beeps for 368 mothers; 9,482 beeps for 241 fathers.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$ (two-tailed tests).

Results of the fully unconditional models show that mothers' average log-odds of multitasking is –.276 (Column 1), which corresponds to a predicted probability of .431 ($1 / [1 + e^{.276}]$), and fathers' average log-odds of multitasking is –.633 (Column 3), which corresponds to a predicted probability of .347 ($1 / [1 + e^{.633}]$).[7] This finding suggests that fathers multitask more than a third, and mothers more than two-fifths, of their waking time.[8]

How much time do parents spend doing two activities simultaneously? To derive a weekly estimate of the amount of time parents

spend multitasking, we multiply the predicted probability of multitasking by 112 (16 average waking hours per day multiplied by 7 days a week).[9] We find that mothers spend 48.3 hours a week (.431 x 112), and fathers 38.9 hours a week (.347 x 112), doing two activities at once. These estimates clearly suggest that parents in dual-earner families spend much time multitasking and reveal a gender gap of approximately 10 hours a week, with mothers multitasking more than fathers.

Next we examine the contextual and individual factors associated with the likelihood of multitasking by estimating a conditional model that includes contextual variables at level 1 and work, family, and demographic characteristics at level 2. Results shown in Columns 2 and 4 of Table 2 indicate that for mothers and fathers, the probability of multitasking increases when they are at work compared to when they are in a public place (the reference category). Expected odds of multitasking at work are 2.04 ($e^{.714}$) and 1.67 ($e^{.51}$) times the odds of multitasking in public for mothers and fathers, respectively. For fathers, being at home compared to being in a public place reduces the odds of multitasking by over 30 percent ($1 - e^{-.398}$). We observe no such effect, however, for mothers. Even after controlling for the presence of children, mothers' likelihoods of multitasking at home and in public are similar.

Table 2 also shows that the likelihood of multitasking increases in the company of children. For both mothers and fathers, the expected odds of multitasking when children are present are more than two times the odds of multitasking when their children are not present (the relative odds ratio is $e^{.885} = 2.42$ for mothers and $e^{.82} = 2.27$ for fathers). These results do not necessarily mean that mothers and fathers are similarly likely to engage in childcare activities while multitasking in the company of their children. The likelihood of multitasking for both mothers and fathers increases when in the company of their spouse or when other people are present.

Finally, the conditional models test effects of work, family, and demographic characteristics on parents' probability of multitasking. We find significant variation among respondents in the likelihood of multitasking, which the model fails to explain. We observe no significant reduction in between-person variance after we add predictors at level 2. Of all the level-2 variables included in the model, only education and fathers' age are significantly associated with the likelihood of multitasking. Better-educated parents (i.e., those with a graduate or professional degree) are less likely to multitask compared to their less well-educated counterparts. For fathers, older age is associated with a decreased likelihood of multitasking. These findings suggest that multitasking constitutes an important feature of adults' everyday life in dual-earner families, regardless of their obligations at work and at home. One should recall, however, that the sample used in this study may be too restricted to capture variation in multitasking by type of work and other family characteristics.

Distribution of Multitasking Activities

What do mothers and fathers in dual-earner families do when they multitask? To learn what types of activities parents engage in jointly, we first constructed a two-way matrix table by cross-tabulating primary and secondary activity categories. Cells in this table refer to the percentage of MT episodes (i.e., beeps) obtained for each of the 49 possible combinations of activities out of the total number of MT episodes (results not shown). Because there is no analytic justification for distinguishing between primary and secondary activities *within* each combination, we collapsed them into one category. For example, we created one category for the combinations of housework as a primary activity and childcare as a secondary activity and for childcare as a primary activity and housework as a secondary activity. Table 3 presents these results.

Overall, mothers and fathers in dual-earner families have relatively similar patterns of multitasking with respect to the types of activities that they engage in jointly. Gender

Table 3. Distribution of Multitasking Episodes by Activity Combination: Percentages

	Mothers	Fathers
Work		
Work	23.4	36.0***
Housework	1.3	.8*
Childcare	1.2	1.1
Personal care	1.7	2.2
Communication	1.7	1.4
Transportation	1.2	2.6***
Mental labor	2.0	2.1
Housework		
Housework	7.7	4.6***
Childcare	10.1	4.4***
Personal care	3.0	2.5
Communication	7.1	5.2***
Transportation	1.1	.6*
Mental labor	1.4	1.1
Childcare		
Childcare	4.2	2.7***
Personal care	4.7	4.1
Communication	2.9	1.8*
Transportation	3.4	2.7
Mental labor	.5	.4
Personal Care		
Personal care	2.3	2.2
Communication	9.2	9.3
Transportation	.9	.8
Mental labor	1.8	1.9
Communication		
Communication	.9	1.0
Transportation	3.5	5.5***
Mental labor	.6	.1**
Transportation		
Transportation	.4	.6
Mental labor	1.8	1.9
Mental Labor		
Mental labor	.1	.1
Total	100	100

Note: Percentages for each combination are calculated out of the total number of multitasking beeps.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$ (two-tailed tests).

differences in the percentages obtained for most combinations are rather small, even if statistically significant. Nevertheless, several important discrepancies by gender are noteworthy. An examination of within-gender differences shows that the most prevalent combination for both mothers and fathers is to simultaneously perform two work-related activities, but cross-gender differences indicate that this is more frequently done by fathers than by mothers. Engaging simultaneously in two work-related activities accounts for more than a third of all multitasking episodes among fathers (36 percent) and close to a quarter among mothers (23.4 percent). Fathers are slightly more likely than mothers to engage in a work-related activity while they travel or commute but they are less likely to

combine it with housework. Although significant, these differences are small.

Mothers are significantly more likely than fathers to simultaneously engage in two housework activities or two childcare activities and they combine housework with childcare more frequently than do fathers. Mothers are about two times more likely than fathers to simultaneously engage in housework and childcare activities (this combination accounts for 10.1 percent of all multitasking episodes among mothers, whereas among fathers it accounts for only 4.4 percent). This gender difference is also salient when we restrict our analysis to multitasking at home. We find that when they multitask at home (results not shown), mothers are significantly more likely than fathers to engage in housework (52.7 percent of all multitasking episodes at home among mothers compared to 42.2 percent among fathers) and childcare (35.5 percent of all multitasking episodes at home among mothers, compared to 27.9 percent among fathers). Table 3 further shows that mothers are slightly more likely than fathers to engage in a communication-related activity, such as talking on the phone or conversing with a third person, while doing housework or taking care of their children. They are less likely than fathers, however, to engage in a communication-related activity while commuting or traveling.

Interestingly, we find no differences by gender with respect to mental labor. Among both fathers and mothers, engaging in mental labor while doing something else accounts for approximately 8 percent of all multitasking episodes. Moreover, an examination of what parents think about during these multitasking episodes (results not shown) reveals that fathers and mothers report similar levels of thinking about family matters (about 13 percent of all MT episodes that include mental labor) and their schedules or the things they have to do (approximately 20 percent). Fathers, however, more frequently report thinking about work-related matters (20 versus 11 percent of all MT episodes that include mental labor for fathers and mothers, respectively), whereas mothers more frequently report thinking about time constraints or about being late (6 versus 2 percent for mothers and fathers, respectively). These results suggest that even if fathers and mothers are similarly likely to engage in mental labor while they multitask, their worries and concerns, at least to some degree, are different.

MULTITASKING AND WELL-BEING

Predicting Emotional Well-Being Using ESM Outcomes

How do mothers and fathers in dual-earner families feel when they multitask? Tables 4 and 5 (for mothers and fathers, respectively) display results obtained from a series of HLM models that estimate the association between multitasking and well-being using ESM emotional outcomes. The small differences in positive affect we initially find between mothers and fathers do not remain when we include interaction terms in the model; instead, we find that mothers and fathers report lower positive affect when they multitask at home (.034 + {–.207} = –.173 for mothers; .035 + {–.137} = –.102 for fathers) and at work (.034 + {–.204} = –.17 for mothers; .035 + {–.177} = –.142 for fathers) compared to when they monotask. Furthermore, mothers and fathers alike report higher positive affect when they multitask in the company of their children, spouse, or when other people are present compared to when they monotask.

Results for negative affect are somewhat different. Although multitasking in general is associated with increased negative affect for both mothers and fathers, the source of this effect differs by gender. Among mothers and fathers, multitasking at work is associated with increased negative affect, but only among mothers is increased negative affect also associated with multitasking at home (.05 + .05 = .1) and in public (.05 + .11 = .16). Both mothers and fathers report lower negative affect when multitasking in the company

of their spouse compared to monotasking, but only among mothers is lower negative affect associated with multitasking in the presence of others. We observe similar gender discrepancies for stress. Fathers and mothers alike report higher levels of stress when they multitask at work compared to when they monotask, and both report lower levels of stress when they multitask in the presence of their spouse or other people. Only among mothers, however, is multitasking at home and in public associated with increased stress.

If multitasking reflects individuals' tendency to get more things done in less time, then we would expect to find a positive association between multitasking and the subjective feeling of being productive. Results displayed in Tables 4 and 5 provide evidence that supports this idea. Both mothers and fathers report feeling more productive when they multitask at home and at work compared to when they monotask. Multitasking at home is associated with increases in mothers' and fathers' subjective sense of productivity of .153 (.034 + .119) and .222 (.014 + .082) points, respectively, and multitasking at work is associated with increases of .40 (.034 + .366) and .34 (.014 + .326) points, respectively. Interestingly, the association between multitasking at home and productivity is slightly stronger for fathers than for mothers, whereas the association between multitasking at work and productivity is slightly stronger for mothers than for fathers. Only among mothers is multitasking in the company of children associated with an increased sense of productivity. For both fathers and mothers, a sense of decreased productivity is associated with multitasking in the company of one's spouse. Only among mothers, however, do we observe a negative association between feeling productive and multitasking in the company of others.

Multitasking at work is not only associated with higher levels of subjective productivity, but for both mothers and fathers it is also associated with higher levels of focus. By contrast, multitasking at home is associated with decreased focus among fathers and mothers alike. These findings are not surprising considering that many work-related activities likely require concentration and thought, particularly in this sample of highly educated and predominantly professional respondents. Housework tasks, on the other hand, are more routine and can often be accomplished in conjunction with others tasks relatively easily and without drawing on mental resources.

Results further show that among mothers, multitasking in the company of one's spouse is associated with decreased focus whereas multitasking in the presence of other people is associated with increased focus. Only among fathers is multitasking in the company of children related to increased focus. On its face, this finding resonates with prior research showing that compared to mothers, fathers spend a larger share of their time with children in interactive activities that not only require great investment and focus but that are also more pleasurable than routine childcare tasks (Bianchi et al. 2006). This finding suggests that even when fathers multitask, they are more likely to engage in the more pleasurable and interactive aspects of childcare (Sayer 2007b). However, when we examine the types of activities parents engage in when they multitask in the company of children, we find that even though fathers and mothers are equally likely to spend direct time with their children (i.e., engaging in two childcare activities at the same time) *when they multitask in the company of their children,* fathers are significantly more likely than mothers to simultaneously engage in two activities that are *not* related to their children (e.g., conversing with other people or engaging in self care). In other words, although fathers report greater focus when they multitask in the company of their children compared to when they monotask, their attention is not necessarily directed to their offspring.

Predicting Well-Being Using Survey Outcomes

Table 6 summarizes results obtained from a series of OLS regression models that estimate

Table 4. HLM Estimates Predicting ESM Well-Being Outcomes: Mothers

	Positive Affect		Negative Affect		Stress		Productivity		Focus	
	b (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)
Intercept	1.859***	1.864***	.394***	.393***	.515***	.512***	1.808***	1.802***	2.203***	2.201***
	(.064)	(.064)	(.037)	(.037)	(.057)	(.057)	(.058)	(.057)	(.055)	(.055)
Beep-Level										
MT beep	−.032**	.034	.07***	.05**	.087***	.049*	.169***	.034	−.027**	−.002
	(.011)	(.021)	(.008)	(.017)	(.01)	(.019)	(.013)	(.021)	(.01)	(.018)
MT x Home		−.207***		.05**		.06**		.119***		−.095***
		(.022)		(.017)		(.018)		(.019)		(.019)
MT x Work		−.204***		.11***		.157***		.366***		.104***
		(.028)		(.023)		(.026)		(.026)		(.025)
MT x Child		.042*		−.005		.019		.047**		−.01
		(.018)		(.015)		(.018)		(.017)		(.02)
MT x Spouse		.0149***		−.053***		−.09***		−.172***		−.038*
		(.022)		(.016)		(.018)		(.019)		(.016)
MT x Others		.0132***		−.062***		−.058***		.019		.039*
		(.019)		(.016)		(.017)		(.018)		(.017)
Random Effects										
Within-person variance σ^2	.368	.361	.245	.244	.293	.292	.353	.351	.276	.272
Between-person variance τ_{00}	.133	.132	.036	.036	.088	.088	.089	.089	.08	.08
Chi-square (intercept)	6297.516***	6374.332***	2706.88***	2713.2056***	5114.272***	5113.5242***	4434.135***	4575.139***	5070.986***	5188.219**
Reliability (intercept)	.941	.942	.867	.868	.93	.93	.916	.918	.927	.929

Note: MT = multitasking. All models control for level-2 variables (i.e., age, number of children, age of youngest child, education level, long work hours, regular work schedule, and job autonomy). N = 16,878 beeps for 368 mothers.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$ (two-tailed tests).

Table 5. HLM Estimates Predicting ESM Well-Being Outcomes: Fathers

	Positive Affect		Negative Affect		Stress		Productivity		Focus	
	b (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)
Intercept	2.038***	2.035***	.136***	.143***	.129**	.137**	1.791***	1.805***	2.203***	2.212***
	(.09)	(.091)	(.039)	(.039)	(.054)	(.054)	(.087)	(.087)	(.082)	(.082)
Beep-Level										
MT beep	.029*	.035	.048***	.034	.053***	.019	.119***	.014	−.003	−.035
	(.013)	(.027)	(.01)	(.02)	(.011)	(.021)	(.018)	(.029)	(.013)	(.027)
MT x Home		−.137***		.003		.038		.082**		−.05*
		(.029)		(.019)		(.022)		(.027)		(.024)
MT x Work		−.177***		.121***		.17***		.326***		.125***
		(.031)		(.027)		(.03)		(.035)		(.032)
MT x Child		.139***		−.02		−.017		.04		.044*
		(.028)		(.02)		(.021)		(.026)		(.023)
MT x Spouse		.134***		−.038*		−.056**		−.17***		−.025
		(.026)		(.019)		(.019)		(.027)		(.023)
MT x Others		.072***		−.024		−.037*		.031		.026
		(.02)		(.016)		(.016)		(.02)		(.019)
Random Effects										
Within-person variance σ^2	.265	.259	.166	.164	.18	.178	.35	.34	.24	.238
Between-person variance τ_{00}	.11	.11	.032	.032	.058	.058	.091	.092	.079	.08
Chi-square (intercept)	4169.187***	4216.003***	1962.248***	1973.138***	3025.738***	3054.538***	2618.638***	2701.472***	3310.951***	3354.329**
Reliability (intercept)	.939	.939	.878	.879	.922	.923	.903	.908	.924	.925

Note: MT = multitasking. All models control for level-2 variables (i.e., age, number of children, age of youngest child, education level, long work hours, regular work schedule, and job autonomy). N = 9,482 beeps for 241 fathers.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$ (two-tailed tests).

Table 6. OLS Regression of Aggregated Multitasking Measures on Survey Well-Being Outcomes

	Psychological Distress		Perceived Stress		Work-Family Conflict		Family Time Guilt	
	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers
	b (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)
MT at Home	9.521*	−4.87	.571	−.676	1.028	−.341	−.193	−1.07
	(4.829)	(6.442)	(.42)	(.614)	(.563)	(.74)	(.615)	(.836)
MT at Work	9.362	−4.816	.345	−.111	.471	.202	1.4*	1.53
	(5.72)	(6.71)	(.497)	(.639)	(.667)	(.771)	(.729)	(.871)
MT in Public	11.607	−7.895	1.096	−.533	2.92***	.292	1.518*	−.359
	(6.614)	(.36)	(.575)	(.820)	(.772)	(.988)	(.843)	(1.116)
MT with Child	−6.29	1.608	−.28	.547	−1.643*	.98	−.689	.39
	(5.205)	(8.081)	(.452)	(.77)	(.607)	(.928)	(.663)	(1.049)
MT with Spouse	−16.502*	−11.328	−.863	−1.721*	.127	−.247	−.695	.386
	(5.902)	(8.229)	(.513)	(.784)	(.689)	(.946)	(.752)	(1.068)
MT with Others	−9.533	4.579	−.185	−.203	−.565	−.381	.082	−.692
	(5.811)	(7.522)	(.505)	(.177)	(.678)	(.864)	(.741)	(.976)
Intercept	14.966***	19.44***	2.49***	2.812***	2.002***	2.751***	3.444***	3.011***
	(4.058)	(4.798)	(.351)	(.457)	(.471)	(.551)	(.515)	(.623)
R^2	.085	.131	.047	.12	.07	.049	.086	.077

Note: MT = multitasking. All models control for age, number of children, age of youngest child, education level, long work hours, regular work schedule, and job autonomy. $N = 368$ mothers; 241 fathers.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$ (two-tailed tests).

the association between multitasking and the survey of well-being outcomes, controlling for work, family, and demographic characteristics. The major predictors are the aggregated measures of multitasking in the different contexts (i.e., multitasking while at home, at work, in public, with children, with spouse, and with other people). Results show that only among mothers is multitasking at home associated with increased psychological distress, and multitasking at work with increased family time guilt. Moreover, only among mothers is multitasking in public positively related to work-family conflict and family time guilt. Among mothers, however, multitasking in the company of children is also associated with decreased work-family conflict. Finally, consistent with HLM results suggesting that multitasking in the company of one's spouse is overall a positive experience, Table 6 shows that multitasking in this context is associated with decreased psychological distress for mothers and decreased perceived stress for fathers.

SUMMARY OF FINDINGS

This study's results highlight the subtle and context-dependent gender differences in multitasking. Multitasking in the company of one's spouse is, on the whole, a positive experience for both mothers and fathers. Mothers and fathers report higher levels of positive affect and lower levels of negative affect and stress when they multitask in this context compared to when they monotask. These findings suggest that multitasking may allow parents in dual-earner families to increase their time together, which has significantly declined since the mid-1970s (Bianchi et al. 2006), and make non-leisure activities more enjoyable (recall that analyses exclude

multitasking episodes that involve free-time activities). Similarly, multitasking in the company of children is related to positive affect for both mothers and fathers. This is consistent with previous studies showing parents' high levels of enjoyment when engaging in activities with their children (Bianchi et al. 2006; Mattingly and Bianchi 2003). Findings suggest that as with free-time activities (Bianchi et al. 2006), to maximize time with children, parents may include them in nonleisure activities such as shopping, running errands, or cleaning. However, our findings show that this is more frequently done by mothers than by fathers. We find that mothers are more likely than fathers to engage in a childcare activity when they multitask in the company of children, suggesting that the positive experience of multitasking in the company of children among fathers is not necessarily related to fathers' interactions with their children. Moreover, only among mothers is multitasking in the company of children associated with increased productivity.

Unlike multitasking in the company of one's spouse or children, multitasking in the context of work is predominantly a negative experience. Within-gender comparisons reveal that for both fathers and mothers, engaging simultaneously in two work-related activities is the most prevalent multitasking combination. For mothers and fathers, multitasking at work is associated not only with an increased sense of productivity and a higher level of focus but also with decreased positive affect and increased negative affect and stress. For mothers, multitasking at work is also associated with feeling guilty about not spending enough time with their family. One could argue that these findings reflect the nature of work for people in highly skilled professional and managerial jobs, which may require women and men to frequently multitask to meet job demands and deal with job pressures.

Yet, despite these broad similarities, this study also reveals some important differences in the experience of multitasking by gender. First, we find that, overall, mothers multitask more frequently than do fathers. Second, consistent with prior research, mothers are significantly more likely than fathers to multitask while doing housework, including performing two housework tasks at the same time. Third, after controlling for the presence of other people, multitasking at home is predominantly a negative experience for mothers, but not for fathers. Whereas both fathers and mothers report feeling more productive when they multitask at home compared to when they monotask, multitasking at home is also associated with increased negative affect, stress, and psychological distress for mothers. Fourth, only among mothers is the likelihood of multitasking at home similar to the likelihood of multitasking in public, and only among mothers is multitasking in public associated with increased negative affect, stress, work-family conflict, and family time guilt. These results are not surprising considering that many of the chores mothers typically assume the responsibility for take place in public settings, such as running errands, shopping, and attending PTA meetings (Arendell 2001; DeVault 1999; Hochschild 1989). Findings suggest that multitasking at home and in public are somewhat similarly negative experiences for mothers.

DISCUSSION AND CONCLUSIONS

Multitasking is an important feature of contemporary dual-earner families' fast-paced life and high degree of busyness. We found that parents frequently multitask: on average, mothers spend 48 hours, and fathers 39 hours, per week on the performance of two concurrent activities. The question then, is how pervasive is multitasking? Has multitasking become a way of life in contemporary society in general, or are certain people more likely than others to multitask? In other words, has life sped-up for everyone, or is multitasking a strategy predominantly used by parents in dual-earner middle-class families in their struggle to meet the multiple and often conflicting demands of work and family? The

severe time squeeze that parents in dual-earner families typically experience (Jacobs and Gerson 2004) suggests that these families would be particularly likely to multitask. Because the sample used in this study is not representative of all families in the United States, we were unable to empirically address this issue. Prior research, however, provides inconclusive results that call for further investigation. Sayer (2007a) finds that mothers in male breadwinner families multitask more frequently than do mothers in dual-earner families, and her study reveals no difference in the frequency of multitasking between fathers in the two types of families. Additionally, although one could argue that having fewer financial resources and lacking a spouse or partner to share housework and childcare may make multitasking a particularly useful strategy for single parents, research indicates that the rate of multitasking among single mothers is very similar to rates found among married fathers and mothers (Bianchi et al. 2006).

Several other methodological limitations are noteworthy. First, the cross-sectional nature of the data did not allow us to draw causal conclusions. We were unable to determine, for example, whether parents are more likely to multitask at work because they feel stressed or whether their need to perform several work-related tasks at once increases their level of stress. Second, the ESM collected data in the course of one week only, but individuals' likelihood of multitasking may change over time following the occurrence of various life-events (e.g., the birth of a child or a job promotion). The lack of longitudinal data did not allow us to examine such trends. Third, although it provides invaluable information about time uses and emotional experiences, the ESM did not record the duration and sequences of activities. Therefore, we could not examine whether mothers' episodes of multitasking were longer and whether they were sequentially closer to each other than those of fathers. This information may have important implications for the gender gap in well-being because one can plausibly expect the emotional costs of multitasking to be heavier after multitasking for long periods of time than after multitasking for short episodes.

Finally, our findings clearly suggest that gender differences in multitasking were not only a matter of quantity but also, and maybe more importantly, a matter of quality. In other words, the gender gap in multitasking was not only related to how frequently fathers and mothers multitasked (we found that mothers multitasked, on average, about 10 hours more a week than fathers), but it was also related to the contexts in which they were likely to do so. This study helps elucidate the contradiction between results obtained in time-use studies that show relatively similar workloads by gender, on the one hand, and ethnographic studies that underscore mothers' greater sense of burden, on the other hand. Overall, our findings suggest that multitasking plays an important role in mothers' experiences of emotional stress. Specifically, we found that when multitasking was done at home and in public, where mothers typically perform housework and chores, their experience of multitasking is significantly more negative and stressful than that of fathers. These findings, which resonate with research indicating that mothers report feeling rushed more frequently than do fathers (Bianchi et al. 2006; Mattingly and Sayer 2006; Roxburgh 2004), relate to the double burden that middle-class mothers in contemporary society typically assume and to their role as household managers. Normative expectations require middle-class mothers to run their households smoothly, engage in intensive parenting, and maintain a lifestyle that will help the family maintain its status and class privileges, through the purchase of goods, use of up-to-date technological devices, and enrolling children in numerous enriching activities (Lareau 2003; Nelson 2010). Mothers may therefore feel particularly stressed when multitasking at home and in public because, being highly visible to people in their proximate surroundings, their ability to fulfill their role as good mothers can be easily judged and criticized.

Our findings that mothers were more likely than fathers to multitask at home and in public and that multitasking in these contexts was predominantly a negative experience for mothers, lead to the conclusion that, on the whole, multitasking likely takes a heavier toll on mothers' well-being than on fathers' well-being. Furthermore, our findings may provide conservative estimates of the negative association between multitasking and emotional well-being. If, as research suggests, mothers are more likely than fathers to take for granted, and consequently to underreport, activities that they disproportionately perform, most notably household chores and childcare tasks (Schneider 2006), then the gender gap in multitasking is likely even more pronounced, and its implications for mothers' emotional well-being more severe, than what this study reports.

Funding

This research was supported by the Alfred P. Sloan Center on Parents, Children, and Work at the University of Chicago.

Acknowledgments

We thank the *ASR* editors and anonymous reviewers for their helpful comments. We also thank Jerry Jacobs for commenting on an earlier draft of this work, Kathleen Christensen, and the Sloan Foundation for its generous support.

Notes

1. Sayer (2007a) also finds a small and nonsignificant difference in the overall amount of time spent on multitasking by gender (11.5 and 10.2 hours a day for mothers and fathers, respectively). However, Sayer focuses on two main types of activities: "unpaid work" includes housework, shopping, and childcare; "other" includes paid work, self-care, and leisure. Given that Sayer combines different types of activities into one category and that she accounts for leisure activities, her results cannot be compared to those obtained by Bianchi and colleagues (2006).
2. The 500 Family Study data are available through the Inter-University Consortium for Political and Social Research (ICPSR) and can be downloaded at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/4549 or http://dx.doi.org/10.3886/ICPSR04549.
3. Although the 500 Family Study was intended to collect data on dual-earner families, a very small number of respondents were not employed at the time of the survey. We excluded these respondents from the sample (i.e., 2 fathers and 13 mothers who had both survey and ESM data).
4. We imputed missing data at levels 1 and 2. Survey items had 1.8 to 7.1 percent, and ESM items 4.1 to 6.7 percent, missing data. Missing data at level 1 is usually not problematic when using multilevel models because respondents can miss some beeps, or some items in a beep, and still be included in the model. Imputing for missing data at level 1 allowed us to include five additional parents in the analyses who would have been excluded because of missed items. Imputing for missing data does not yield significantly different results.
5. One could argue that mental labor is different from activities that require investment of physical resources. We argue, however, that mental labor can be highly draining and stressful. Moreover, it likely requires concentration and focus, which can distract a person from other tasks. For these reasons, we believe it is important to consider mental labor in the study of multitasking and decided to include it in our measure. This approach is consistent with prior research (see, e.g., Bittman and Wajcman 2000; Lee and Waite 2005).
6. We calculated these reliability estimates using aggregated data and they provide information about the internal consistency of emotional measures at the person level. Emotional states are idiosyncratic, however, and likely vary from beep to beep within the same individual. To account for this source of variation, we also computed reliability of within-person measures by centering the data at the group mean. Even though these estimates (positive affect .691; negative affect .712; stress .698; productivity .719; and focus .519) have lower reliability coefficients than the ones based on aggregated data, they remain quite robust.
7. These numbers are consistent with the ones we calculated for the proportion of MT beeps at the aggregated level (.357 for mothers and .436 for fathers, $p < .001$).
8. We also estimated HLM models using the pooled sample with gender as a level-1 predictor. In the model predicting the likelihood of multitasking, the coefficient obtained for gender (–.218; $p < .01$) indicates that fathers are approximately 20 percent less likely than mothers to multitask. We then reran the HLM models with gender as a predictor of all the slopes. Results are consistent with those presented in the article. For ease of presentation, and in line with other studies in the field, we report results obtained from analyses conducted on mothers and fathers separately.
9. Quantifying time spent on secondary activities is problematic as scholars are still debating the issue of how to count such activities (Drago and Stewart 2010; Ironmonger 2004). In this study, so as not to double count secondary activities and remain within the limits of the 24-hour day, we simply refer to the number of hours per

week that parents spend doing two activities simultaneously. These estimates indicate how frequently time is "deepened" via the performance of secondary activities (see Bianchi et al. 2006).

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