

Scheduling Stress

Family and Health Outcomes of Shift Work and Schedule Control

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The effects of shift work and job schedule control on the family life and health of American workers are analyzed. Using data from the 1992 National Study on the Changing Workforce (N = 2,905), this article tests whether negative family and health outcomes associated with nonstandard job schedules result from (a) problems of adjusting to the times of nonstandard shifts and/or (b) the lack of scheduling control and (c) whether schedule control mediates the effects of nonstandard shifts. Multivariate results indicate that although nonstandard shifts have few effects, lack of scheduling control has strong negative effects on six of the eight family and health outcomes. There is no evidence that control mediates the effects of schedule times, nor that these effects vary by gender or family status. Implications of these results are discussed.

Dramatic changes that characterize the workplace at the start of the new millennium include increasing diversity of times people spend working on the job. By the early 1990s, only about one out of three employed Americans age 18 and older worked what has been considered the typical day shift—that is, daytime, 35 to 40 hours a week, 5 days a week, Monday through Friday (Presser, 1995). Although much of the increasing diversity of work schedules is due to the growth of part-time employment, even among full-time workers there is a substantial minority working nontraditional shifts—roughly two out of every five (Presser, 1995). Of these full-time workers, about 17% work nontraditional hours (e.g., evening, night, rotating shifts), whereas 34% work nontraditional days (e.g., weekends). Moreover, these categories overlap so that about 11% of full-time workers work both nontraditional hours and days (Presser, 1995).

Another measure of the increasing diversity of working times has been the trend toward flexible scheduling, which allows employees some choice as to the times they begin and end work. By 1997, more than one in four full-time em-

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AMERICAN BEHAVIORAL SCIENTIST, Vol. 44 No. 7, March 2001 1179-1198
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ployees in the United States worked flexible schedules, more than twice the figure from the previous decade (U.S. Bureau of Labor Statistics, 1998).

Along with these trends toward alternate work scheduling, there has been a growing body of research examining the physical, psychological, and social effects of such scheduling on workers. Although the results of these research studies have been as diverse as the types of schedules they examine, two general, but tentative, conclusions have emerged. One is that working nonstandard (i.e., nonday) shifts has significant negative effects on workers, particularly their personal health (see Akerstedt, 1990; Barton, 1994; Kawachi et al., 1995) and family life (see Kingston & Nock, 1985; Kinnunen & Mauno, 1998; White & Keith, 1990). On the other hand, a number of studies have found that flexible scheduling has significant positive effects on workers, especially in decreasing work-family conflict (see Staines & Pleck, 1984, 1986) and lowering perceived stress (see Fast & Frederick, 1996). However, these conclusions remain tentative because of conceptual and methodological limitations in much of this research.

Conceptually, most studies (e.g., Akerstedt 1990; Kawachi et al., 1995) have assumed that the negative effects of alternative schedules are a straightforward consequence of physiological, psychological, and/or social adjustment to working nonstandard times. No distinction is made between those who choose, for a variety of reasons, to work nonstandard shifts and those on whom irregular shifts are imposed by employer preference or the nature of the work. The few studies that have incorporated schedule flexibility (e.g., Barton, 1994; Staines & Pleck, 1986) view such control as a factor that offsets (mediates) the effect of schedule variations on the adjustment process by allowing workers to balance (somewhat) conflicting work and nonwork demands. But, in doing so, they have neglected an alternative explanation that it is schedule flexibility in itself—as a dimension of overall job control—that affects worker well-being, independent of schedule times.

Methodologically, much of the previous research is limited in that it relies almost exclusively on case studies or samples of workers in specific occupations where nonstandard shifts are common (e.g., nursing) or of types of workers who are thought to be most affected by shift work and/or flexibility (e.g., females, parents). Thus, the results are not based on representative samples of the overall labor force, raising serious questions concerning their generalizability to all workers. Also, because of the narrow design of many of these studies, they do not control for other characteristics of jobs, workers, or family conditions that could also contribute to the outcomes attributed to shift work or schedule flexibility. Many of these studies look only at persons working nonstandard shifts and thus do not contain data that permit comparisons with those working the standard day shift.

In this article, we will address these issues by analyzing simultaneously the effects of times (hours, days) of work schedules and the degree to which workers have control over their schedules on their health and family relations, control-

ling for work, family, and individual characteristics. Using data from the 1992 National Study of the Changing Workforce, a representative sample of the U.S. labor force, we will specifically test the assumption that the negative health and family outcomes of shift work are due to (a) problems of physiological, psychological, and social adjustments to the times worked and/or (b) the inability to personally control the times worked. By including appropriate controls, we will also be able to compare these effects with the effects of other relevant demographic, human capital, and job characteristics. In particular, given the focus of much of the research (discussed below), we will be able to test whether these effects vary between female and male workers and by family structure.

ADJUSTMENT TO NONSTANDARD WORK SCHEDULES

The picture painted by much of the research on shift work is that such work schedules are generally undesirable and harmful to workers because they create physiological, psychological, and social adjustment problems. Epidemiological research has suggested that shift work increases the risk of various physiological and psychological problems because of disruptions of circadian rhythms and sleeping and eating patterns (Akerstedt, 1990; Bohle & Tilley, 1990; Moore-Ede & Richardson, 1985). Moreover, these relationships are consistent cross-culturally. For example, studies of female nurses in the United States (Kawachi et al., 1995) and male workers in a Swedish paper mill (Knuttsen, Akerstedt, Jonsson, & Orth-Gomer, 1986) produced almost identical results with regard to the relationship between shift work and coronary heart disease. In both studies, workers who had ever worked (night and rotating) shifts were 40% more likely to have had incidents of coronary heart disease than those who had never done shift work. Both studies also found that the likelihood of coronary disease increased to more than 200% with the duration of having worked rotating night shifts after 6 years. These results were adjusted for workers' ages, medical histories, and the presence of other coronary risk factors such as whether they smoked or had hypertension. But, shift work also increased these and other risk factors, including diabetes, and increased levels of serum cholesterol, glucose, uric acid, and adrenaline (De Backer, Kornitzer, Peters, & Dramaix, 1984; Kawachi et al., 1995; Knuttsen et al., 1986; Thelle, Forde, Try, & Lehman, 1976; Theorell & Akerstedt, 1976). Beyond the links to coronary and related diseases, shift work has also been associated with gastrointestinal and neurotic disorders (Costa, Lievore, Casaletti, Gaffuri, & Folkard, 1989), lower levels of psychological well-being (Bohle & Tilley, 1990), higher levels of perceived stress (Coffey, Skipper, & Jung, 1988) and chronic malaise (U.S. Congress, 1991).

The disruptive effects of shift work extend to social life as well. Working non-standard hours generally means that one's availability for social interaction and participation is out of sync with others (Carpenter & Cazamian, 1977; U.S. Congress, 1991). Family relations in particular seem to suffer. Staines and Pleck (1983)

found that for married couples and single mothers, shift work was associated with difficulties in scheduling family activities and less time spent in family roles. They also found that working nonstandard hours and/or days increased the level of work-family conflict and reduced the level of family adjustment (i.e., marital satisfaction, marital happiness, and family satisfaction). White and Keith (1990) also found that shift work reduced marital happiness while increasing couples' sexual problems and parents' problems with their children, all of which culminated in an increased likelihood of divorce throughout a 3-year period. As with the health effects of shift work, the effects on families are cross-cultural, with similar results reported for countries such as Canada (Fast & Frederick, 1996), Australia (Vandenhoevel & Wooden, 1995), Great Britain (Colligan & Rosa, 1990), and Finland (Kinnunen & Mauno, 1998).

Although shift work has been found disruptive to both men and women, there are reasons to believe that these effects, particularly on family relations, are greater for women. Foremost among these is that women retain higher levels of family obligations than their male counterparts (e.g., primary responsibility for child care). Thus, shift work creates greater work-family role conflict for women (Staines & Pleck, 1984) because it interferes with their more involved family roles (Kinnunen & Mauno, 1998). And, attempts to balance work-family role demands can lead to higher rates of job absenteeism for female workers (Vandenhoevel & Wooden, 1995). However, there is no consensus with regard to these results. White and Keith (1990) found no differences by gender in the effects of shift work on measures of marital satisfaction and family problems.

There is more of a consensus though that the demographics of shift work reflect gender differences in the need to balance work and family roles. Although about one third of both male and female full-time workers (35 or more hours per week) work nonstandard times, marital status and the presence of children affect the likelihood of women working nonstandard times but have no effects for men (Presser, 1995, 1999). Marriage reduces shift work for women but not for men. Married or not, women with preschool children (younger than 5 years old) are more likely to work nonstandard shifts than those without children, but those with school-aged children are less likely to do so. For men, the presence of children of any age has no effect (Hamermesh, 1996; Presser, 1995). Men and women also differ in the reasons they give for working alternate schedules (Presser, 1995). Of those queried in the May 1991 Current Population Survey (CPS), about two thirds of all men but only half of all women who work nonstandard shifts do so because of job requirements; all other shift workers do so for voluntary reasons such as child care arrangements or schooling. Indeed, among women with preschool children, child care arrangements are as important as job requirements for working nonstandard shifts. Among men, the presence of children makes little difference in the reasons for working nonstandard shifts (Presser, 1995).

SCHEDULE FLEXIBILITY AND CONTROL

Responses from the May 1991 CPS underscore the point that a sizeable proportion of shift workers choose to work nonstandard schedules. This runs counter to the assumption in much of the literature and in the popular discussions of shift work that it is disruptive and therefore harmful to the worker because it is imposed by the employer and/or the requirements of the job. However, if workers choose to work nonstandard schedules are the effects harmful or as harmful as on those for whom shift work is imposed? Does flexibility of scheduling mediate the harmful effects of nonstandard schedules?

Indeed, there is limited but consistent evidence suggesting that worker choice, or what many studies measure as schedule flexibility, is a crucial variable determining whether or not shift work is disruptive and harmful. In her study of hospital nurses (both female and male) in England and Wales, Barton (1994) found that those who chose to work night shifts had significantly lower symptoms of cardiovascular disease and fewer nondomestic disruptions (e.g., running daily errands) than those who did not choose their night shift schedules. Staines and Pleck (1986) found that the ability to change their work schedules (schedule flexibility) not only reduced but also in many cases reversed the negative effects of working nonstandard shifts on measures of the quality of family life among married couples and single parents in a national sample of the U.S. labor force. Negrey (1993) found that schedule control increased the well-being of women workers in the work site she studied because it increased the predictability of participating in nonwork social activities and roles. Data from the 1992 Canadian General Social Survey (Fast & Frederick, 1996) found that flextime (workers choose when they begin and end their work day) reduced perceived time stress (a scale measuring time demands at work and whether they interfere with time spent with family and friends). And, as with the negative effects of shift work per se reported by Staines and Pleck (1984) and Kinnunen and Mauro (1998), the positive effects of schedule flexibility on family outcomes have generally been found to be stronger for women than men (Fast & Frederick, 1996; Staines & Pleck, 1986). As conceptualized in these studies, schedule control has positive effects on well-being because it permits management of potentially conflicting time demands.

But, as mentioned earlier, there is also reason to believe that schedule control could benefit all workers, not just those with conflicting demands brought on by nonstandard scheduling. This interpretation is based on conceptualizing control over scheduling—that is, when the job is done—as a dimension of overall job control. Since the 1970s, a large number of studies of workers in North America and Europe have shown that having control over various aspects of one's job—such as the use of one's skills and how the job is done—significantly reduces the risks of various physiological and psychological illnesses. These include both direct and indirect risks (e.g., high blood pressure, serum cholesterol, smoking)

of coronary heart disease and cardiovascular diseases (Alfredsson, Spetz, & Theorell, 1985; Haan, 1985; Karasek, 1979, 1989; Karasek & Theorell, 1989; La Croix & Haynes, 1984) as well as the rates of attempted suicide, psychiatric, gastrointestinal, and alcohol-related illnesses (Karasek & Theorell, 1989) and the incidence of self-reported anxiety and depression symptoms (Fenwick & Tausig, 1994). In addition, Duxbury, Higgins, and Lee (1994) found that job control reduced family conflicts among their sample of workers in Canada. In turn, job control can also be seen as a component of the even broader concept of personal control that is strongly related to psychological well-being (Mirowsky & Ross, 1989; Ross & Sastry, 1999).

Overall, this line of research presents an additional way of conceptualizing the negative health and family outcomes associated with shift work: Rather than resulting from physiological, psychological, and social difficulties in adjusting to the actual clock time worked, these are the result of the lack of control over the time worked.

In the analysis that follows, we will examine the adjustment and job control propositions in detail, specifically that (a) negative family and health outcomes associated with working nonstandard (i.e., nonweekday, night, or rotating) shifts are consequences of the problems of adjustment to the actual times worked, (b) these negative outcomes are consequences of the lack of control or choice (flexibility) over the hours worked, independent of schedule, and (c) the level of schedule control mediates the negative effects of working nonstandard schedules by allowing workers to choose their schedules. We will also examine whether shift work and schedule flexibility are more consequential for some workers than others. In particular, the above discussion suggests that (d) because of greater potential stress associated with working nonstandard schedules, schedule control would have greater effects on those working nonstandard shifts than those on the standard day shift. And, given the prominence of gender differences and differences in family roles in the literature, we will examine (e) whether working nonstandard shifts and the degree of schedule flexibility are more consequential for women and (f) more consequential for workers most in need of coordinating their job schedules with other family members: dual career and single parents.

DATA AND MEASURES

Our analysis uses the 1992 survey from the National Study of the Changing Workforce conducted by the Families and Work Institute. The data consist of responses to telephone interviews with a randomly selected national sample of 3,381 employed men and women ages 18 to 64. For the current analysis, only the 2,905 persons who considered themselves to be full-time workers were included. Part-time workers are excluded from analysis because the potential physiological effects of scheduling variations are implicitly dependent on the

effects of longer work sessions that may compromise circadian patterns. Similarly, personal and family adjustment-related problems are likely to depend, in part, on the length of the work shift. All of our comparisons by shift are to the standard Monday through Friday, full-day shift.

DEPENDENT VARIABLES: INDIVIDUAL HEALTH AND FAMILY EFFECTS

The reported effects of scheduling variations include a range of physical, psychological, and social outcomes. Consequently, we assess a number of different dependent variables that reflect this range. To the extent that shift work affects circadian rhythms and disrupts sleep and eating patterns, we expect shift workers to report more episodes of physical illness. We measure days sick as a single item, asking for the number of days the respondent was absent from work in the past 3 months because of personal illness. We also measure poor general health status as a single item: "Overall, how would you say your physical health is these days, excellent, very good, good, fair, or poor?" Finally, we also measure minor health problems as a single item: "How often would you say you are bothered by minor health problems such as headaches, insomnia, upset stomach, and the like, never, seldom, occasionally, often, or quite often?"

The possible psychological costs of shift work are measured using three indicators. Burnout is a scale consisting of five items that ask respondents to describe feelings they have about their jobs: feeling emotionally drained, feeling used up, feeling tired in the morning, feeling burned out from work, and feeling frustrated by the job. The response categories for these indicators are *strongly disagree*, *disagree*, *neither agree nor disagree*, *agree*, and *strongly disagree*. This indicator reflects work-specific stress. The additive scale has an alpha coefficient of .89. Distress is an additive scale consisting of six items: In the past 3 months how often have you felt confident of your ability to handle personal problems (reversed), felt you were unable to control the important things in your life, felt nervous and stressed, felt things were going your way (reversed), found you could not cope with all the things you had to do, felt difficulties were piling up so high you could not overcome them? The response categories for these indicators are *never*, *rarely*, *sometimes*, *often*, and *very often*. This scale has an alpha reliability coefficient of .78. Dissatisfaction is measured by a single item: "All things considered, how do you feel about your life these days? The response categories for these indicators are *delighted*, *pleased*, *mostly satisfied*, *mixed*, *mostly dissatisfied*, *unhappy*, and *terrible*. These latter measures reflect more general psychological consequences that are not specifically related to work conditions.

To assess the effects of job scheduling on family life, we measure two forms of work-family problems. Lack of work-home balance is measured by a single item that asks respondents the extent to which they feel successful balancing work and personal or family life. The response categories for these indicators are *completely*, *a great deal*, *somewhat*, *not*, and *not at all*. We also measure work-

home conflict as a single item: "How much conflict do you face in balancing your work and family life? None at all, not too much, some, a lot, or quite a lot?"

INDEPENDENT VARIABLES: WORK SCHEDULES

Four dummy variables were created to categorize work-shift schedules. *M-F, day shift* (standard day shift) indicates workers who reported regular Monday through Friday daytime work hours. This dummy variable is the omitted comparison category in regression analysis. *Non-day shift* distinguishes workers reporting regular evening or night shift schedules from those reporting any other form of work schedule. *Non-M-F* (non-Monday through Friday shift) distinguishes workers who report working any schedule that is other than Monday through Friday from respondents reporting any other form of work schedule. *Rotating shift* distinguishes workers who work any form of rotating shift from those reporting any other work schedule.

SCHEDULE CONTROL

We measured worker schedule control from a single item: "Overall, how much control would you say you have in scheduling your work hours: none, very little, some, a lot, or complete flexibility?" This question does not allow us to distinguish between workers who choose to work a particular shift and those who may simply choose a starting time but not the shift. In either case, however, the question captures the worker's perception of control over the timing of his or her work.

CONTROL VARIABLES: WORK-RELATED CHARACTERISTICS

Although alternate work schedules are becoming more frequent, they are still more likely to occur in some industries and occupations than others. In addition, characteristics of each respondent's actual job are expected to affect their health independently of work schedule. To sort out the independent effects of alternative schedules, we include these as control measures in multivariate analysis. Workers were divided into four occupational categories, each of which was dummy coded: *Professional* indicates professional employment in legal, medical, teaching, engineering, and similar occupations (this is the omitted category in regression analyses); *white-collar* occupations consist of managers/administrators, technical positions, sales, and clerical positions; *blue-collar* occupations include craft, operator, skilled and manual labor, and farm work; and *service work* includes all service occupations. The economic sector in which respondents work is measured by three dummy variables: core, state, and periphery (omitted category). We also measure if the respondent is self-employed, the actual number of hours worked (per week), the size of the workplace (natural log

of the number of employees at the workplace), and whether the employee is a labor union member.

CONTROL VARIABLES: PERSONAL AND FAMILY CHARACTERISTICS

The health effect of nonstandard work schedules is also expected to be affected by personal and family-related characteristics; thus, we also include these as control measures. We measure respondents' gender (female = 0, male = 1), race (White = 0, non-White = 1), education (in categories from less than high school to post-B.A.), current school attendance (no = 0, yes = 1) and age (in years). Respondents' family status is measured as a combination of parental status, marital status, and, where meaningful, spousal work status. We computed six dummy variables: no children, unmarried (omitted category); no children (married), spouse not working; no children (married), spouse works; single parent (unmarried); two parents (married), spouse not working; and two parents (married), spouse works. These dummy variables permit us to estimate the effect of each marital, parental, and spouse employment combination on the dependent variables.

INTERACTION TERMS

We also constructed a number of two-way interaction terms to investigate particular hypotheses suggested by previous studies. Interaction terms include *Schedule Type* × *Schedule Control*, *Gender* × *Schedule Type*, *Gender* × *Schedule Control*, *Family Status* × *Schedule Type*, and *Family Status* × *Schedule Control*.

ANALYSIS

Table 1 reports the means and standard deviations for type of shift, schedule control, and outcome measures and, using *t* tests, compares these according to schedule type and control. It shows that 60% of workers have a regular Monday through Friday, day work schedule, whereas 31% work non-Monday through Friday schedules, 7.6% work nonday schedules, and 5.9% work rotating schedules (the numbers add to more than 100% because some workers have more than one form of alternate schedule). According to *t*-test results, workers with non-Monday through Friday day schedules report the greatest amount of schedule control compared to the overall mean, whereas workers with standard schedules and nonday schedules report relatively less schedule control.

The *t*-test results also show that outcomes vary significantly by schedule type and control. Workers with standard schedules are less likely to report work-home imbalance and work-home conflict, whereas workers with non-Monday through Friday schedules are more likely to report lack of balance and conflict.

TABLE 1: Means and Standard Deviations for Shift, Schedule Control, and Outcome Variables and Comparisons of Means by Schedule Type and Schedule Control (N = 2,905)

Variables	Grand M (N = 2,905)	SD	Schedule Type				Schedule Control ^a	
			Regular M-F Day (n = 1,732)	Non-Day (n = 217)	Non M-F (n = 880)	Rotating (n = 170)	High Control	
Schedules								
Regular M-F day ^b	0.596	0.49						
Non-day	0.076	0.26						
Non-M-F	0.312	0.46						
Rotating	0.059	0.24						
Schedule control	2.79	1.49	2.67***	2.31***	2.97***	2.65		
Conflict and health outcomes								
Lack of work-home balance	1.75	0.69	1.71***	1.74	1.84***	1.80*	1.67***	
Work-home conflict	2.49	1.08	2.42***	2.42	2.62***	2.64	2.47	
Burnout	3.09	1.01	3.06	3.07	3.15*	3.06	2.94***	
Distress	14.09	4.26	14.09	14.34	14.09	14.31	13.43***	
Dissatisfaction	1.81	0.71	1.79*	1.81	1.86	1.88	1.71***	
Days sick past 3 months	1.49	5.55	1.62	1.36	1.32	2.00	1.52	
General health (poor)	1.80	0.72	1.81	1.83	1.79	1.83	1.71***	
Minor physical problems	2.44	1.04	2.47*	2.43	2.39	2.45	1.79***	

NOTE: Regular M-F day = workers who reported regular Monday through Friday daytime work hours, Non-day = workers who reported regular evening or night shift work hours, Non-M-F = workers who reported working any schedule that is other than Monday through Friday, and Rotating = workers who reported working any form of rotating shift.

a. Control of schedule for the column was recoded as follows: *none, very little, some control* = 0 = low control of schedule; *a lot, complete flexibility* = 1 = high control of schedule.

b. The sum of cases for Monday through Friday day shift workers and alternative shift workers exceeds the sample total because there is overlap among shift categories: 128 workers are both non-day workers and work a shift other than Monday through Friday; 116 workers work both a rotating shift and a non-Monday through Friday schedule.

* $p \leq .05$. *** $p \leq .001$.

Concerning physical and psychological health outcomes, workers with non-Monday through Friday schedules report slightly higher levels of burnout; workers with standard schedules report less dissatisfaction but slightly increased minor physical problems. Workers with a high level of schedule control report fewer family and health problems for six of the eight outcomes measured (all but days sick and work-home conflict).

Results for the multivariate analysis of the effects of job schedules and schedule control on family and health outcomes are presented in Table 2. To control for the potential spuriousness of these effects due to their common associations with individual (age, level of education, gender, race), family (marital and parental status), and other work characteristics (e.g., type of job and industry), we have included these variables in our regression equations. However, because the specific effects of these control variables are not central to our hypotheses or discussion, we have chosen to report them in the Appendix rather than in Table 2. Briefly, we note that the effects of these variables are consistent with past research. Women report higher levels of all forms of physical and psychological problems. Single parents have higher levels of work-home conflict, distress, and dissatisfaction, whereas being childless decreases work-home problems and dissatisfaction. Age reduces work-home and psychological problems but increases reports of poor general (physical) health. Increasing educational levels increases work-home problems but reduces distress and reported poor health. Working longer hours increases work-home problems, burnout, and distress. These effects are prior to entering schedule type and control into the regression equations. However, the effects are not altered when the scheduling variables are included.

Table 2 shows the multivariate effects of schedule type and control on family and health outcomes net of the effects of the individual, family, and work variables. To test Hypothesis 3, that schedule control mediates the effects of schedule type, we have entered these variables into the regression equations in two stages: (a) schedule type and (b) schedule control. If mediation occurs, significant effects of schedule type should reduce to nonsignificance when control is entered. However, the results of Table 2 provide no evidence of mediation. Indeed, the most significant observations to be made in this table are the relative absence of direct effects attributed to schedule type on physical and psychological health problems and the consistent importance of schedule control on these same dependent outcomes. Contrary to Hypothesis 1, schedule types have few effects on the various outcomes. Only non-Monday through Friday schedules have significant effects, and these are limited. Workers with non-Monday through Friday schedules report both increased work-home conflict and lack of balance, but the latter effect occurs only when schedule control is also in the equation. Likewise, these workers report more burnout but, again, only when control is added to the equation. The absence of other schedule effects, especially by rotating and non-day shifts, are not explained by inclusion of the

TABLE 2: The Effects of Schedule Type and Schedule Control on Work-Family Balance, Work-Family Conflict, Psychological Distress, and Physical Health Status (Controlling for Personal/Family and Work/Employment Variables)

Independent Variables	Dependent Variables															
	Lack of Work-Home Balance		Conflict Between Work-Home		Burnout		Distress		Dissatisfaction		Days Sick Past 3 Months		Poor General Health		Minor Physical Problems	
Schedule Types																
Non-day	-.014 (.054)	-.030 (.053)	-.095 (.086)	-.102 (.086)	-.006 (.080)	-.029 (.080)	.056 (.341)	-.025 (.340)	-.029 (.057)	-.046 (.057)	-.483 (.523)	-.430 (.524)	-.022 (.057)	-.034 (.057)	-.091 (.083)	-.105 (.083)
Non-M-F	.059 (.032)	.067* (.031)	.184** (.051)	.188*** (.051)	.082 (.047)	.093* (.047)	-.036 (.201)	.003 (.201)	.056 (.034)	.065 (.034)	-.134 (.319)	-.158 (.319)	-.028 (.034)	-.022 (.034)	-.014 (.049)	-.077 (.049)
Rotating	.055 (.060)	.052 (.060)	.103 (.096)	.101 (.096)	-.053 (.090)	-.057 (.089)	.436 (.383)	.417 (.381)	.104 (.064)	.101 (.064)	.953 (.597)	.960 (.597)	.046 (.064)	.043 (.064)	.083 (.093)	.081 (.093)
Schedule control		-.164*** (.015)		-.073 (.047)		-.230*** (.043)		-.823*** (.186)		-.172*** (.031)		.464 (.297)		-.116*** (.031)		-.132** (.045)
ΔR^2	.002	.004 ^a	.006 ^a	.007 ^a	.001	.011 ^a	.000	.008 ^a	.003	.014 ^a	-.002	.001	.001	.006 ^a	.001	.004 ^a

NOTE: Numbers in parentheses are standard errors ($N = 2,905$). Non-day = workers who reported regular evening or night shift work hours, Non-M-F = workers who reported working any schedule that is other than Monday through Friday, and Rotating = workers who reported working any form of rotating shift.

a. Increment in R^2 from equation with covariates only (see Appendix) is significant.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

control variables in the regression equation. Even when these variables are omitted, neither rotating nor non-day shifts have significant effects on family and health outcomes.

On the other hand, schedule control adds significant explained variance to six of the eight outcomes and does so independent of schedule type. Lack of schedule control significantly increases the lack of work-home balance, burnout, distress, dissatisfaction, poor general health, and minor physical problems. Thus, consistent with Hypothesis 2, negative family and health outcomes appear to result from lack of control rather than lack of problems of physiological, psychological, or social adjustment to nonstandard schedules.

In Table 3, we test some specific assumptions raised in the literature that schedule type and control are more consequential for some workers than others, based mainly on differences in gender and family characteristics—Hypotheses 4 through 6. (Because of the large number of potential interactions and limited space, we present only significant interactions.) Few interactions add significantly to the explained variance in the prior regression models. In fact, the number of significant interaction terms observed could be the result of random chance when this number of interaction terms is tested. But, most of these are consistent with previous results and assumptions. For example, control reduces minor physical problems among those on rotating shifts (Hypothesis 4) and poor general health and days ill among workers in dual career families (Hypothesis 6). Women on rotating shifts report more minor physical problems (Hypothesis 5), as do dual career workers on nonday shifts, whereas single parents working rotating shifts report higher levels of work-home imbalance (Hypothesis 6). On the other hand, single parents working non-Monday through Friday shifts report less dissatisfaction, and married, one-earner parents on non-Monday through Friday schedules report less distress but more dissatisfaction. In sum, these results indicate that, for the labor force in general, gender and family role-specific effects of shift work and schedule control are sporadic rather than systematic.

However, one pattern of interactions yields an interesting and quite serendipitous result: Parents working non-Monday through Friday schedules have less work-family imbalance than those without children. Although a detailed explanation of this result is beyond the scope of the present article, we can offer some tentative speculation. Workers on non-Monday through Friday schedules stand apart from other workers in three important ways: They are almost twice as likely as other workers to be self-employed, they work the most number of hours (data available on request), and they have the most control over their schedules (see Table 1). It may be then that the presence of children forces these workers to use their control to accommodate both family and work obligations in ways that those without children do not have to do (and, thus, focus more on work).

TABLE 3: Non-Linear Effects of Schedule Type and Schedule Control by Each Other, Gender, and Family Status

<i>Interaction Effects</i>	<i>Dependent Variable</i>							
	<i>Lack of Balance</i>	<i>Work-Home Conflict</i>	<i>Burnout</i>	<i>Distress</i>	<i>Dissatisfaction</i>	<i>Days Sick</i>	<i>General Health</i>	<i>Minor Physical Problems</i>
Schedule × Control (ΔR^2)	.001	.001	.000	.001	.001	.001	.000	.002
Rotating × Control ^a								-.130* (.065)
Schedule × Gender (ΔR^2)	.001	.002	.002	.001	.000	.004	.000	.002
Women × Rotating ^a								.400* (.191)
Control × Gender (ΔR^2)	.000	.000	.001	.001	.000	.000	.000	.000
Schedule × Family Status (ΔR^2)	.009	.007	.003	.006	.008	.006	.009	.006
Children, Spouse Not Working × Not-M-F ^a	-.342** (.112)			-1.794* (.712)	.246* (.119)			
Children, Spouse Works × Not-M-F ^a	-.181* (.079)							
Children, Spouse Not Working × Rotating ^a		-.905* (.407)						
Children, Spouse Not Working × Non-Day ^a						.516* (.199)		
Children, Spouse Works × Non-Day								.790** (.280)
Single Parent × Not-M-F ^a	-.342* (.115)				-.377** (.122)			
Single Parent × Rotating	.651** (.230)							
Control × Family Status (ΔR^2)	.003	.001	.002	.001	.002	.03*	.004*	.002
Children, Spouse Works × Control						-.525* (.241)	-.050* (.025)	

NOTE: Numbers in parentheses are standard errors ($N = 2,905$).

a. Unstandardized regression coefficient for the specific interaction.

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

DISCUSSION

Until recently, most full-time employees worked a Monday through Friday day shift. Indeed, one could argue that such a work schedule was so standard (and biologically normal) that other forms of activity—family and social life, in particular—were organized on the assumption of such scheduling. School schedules parallel this work schedule. Baseball and soccer practice are in the evening, and the weekend is defined as a time for leisure and family activity. Yet, this situation has certainly changed. Forty percent of full-time workers now work nonstandard work schedules, and there is increased concern among researchers and policy makers about the effects of such schedules on physical, psychological, and social adjustment. Part of this concern is driven by the notion that nonstandard work schedules disrupt circadian rhythms, thereby producing physiological stress. Part is driven by concerns related to the ability to meet parental and family responsibilities (particularly among women). But, at the same time, the existence of alternate scheduling possibilities is seen by many as enabling workers to achieve control of demands and responsibilities in both their work life and nonwork life.

A review of the research into these issues, however, reveals serious conceptual and methodological limitations that have prevented us from drawing general conclusions about the effects of alternate work schedules on workers and their families. Most research on shift work (nonstandard schedules) has not examined the effects of who controls scheduling, assuming (at least implicitly) that they are imposed schedules to which workers are forced to adjust and to which many do not. Studies that have included measures of schedule control (e.g., flexibility, flextime) have found that control generally mediates the negative effects of shift work but have not gone farther to investigate whether it is control itself that makes a difference, regardless of schedule. Methodologically, most studies are limited to samples of workers thought to be most at risk from shift work, based on type of work (e.g., nursing) or family role (e.g., working mothers). Thus, we know little about how widespread the effects of scheduling and its control are within the overall labor force nor whether other characteristics of jobs or family roles produce the effects attributable to scheduling.

In this article, we have sought to overcome these limitations to provide a more comprehensive understanding of the effects of job schedules—their times and control—on the family life and health of American workers. We have done so by including both measures of schedule type and control and by considering and testing alternative conceptualizations of control: as mediating the negative effects of nonstandard schedules and as a dimension of overall job control having effects independent of schedules. We then tested our hypotheses on a random sample of full-time workers in the U.S. labor force.

Based on our results, two general conclusions can be drawn. First, the negative effects of working nonstandard shifts on the overall U.S. labor force appear to be more limited than what previous studies have found when looking at

specific occupations and types of workers. For the labor force as a whole, only working non-Monday through Friday shifts had significant negative effects on family conflict and balance and on worker burnout. By contrast, those shifts thought to produce the greatest problems for workers and their families—non-day and rotating—had no effects. Nor do the effects of nonstandard shifts differ systematically by gender or family role. When all workers in the labor force were examined, single mothers and dual career parents were no more affected by shift work than singles. In reaching this conclusion, however, it would be a mistake to dismiss the results of previous research. Clearly, there are circumstances when working nonstandard shifts is stressful. Rather, we are suggesting that, given the overall diversity of schedules and reasons for working them, general statements about the stressful nature of shift work for all workers are unwarranted.

On the other hand, control over scheduling matters a great deal. Of the eight family and health outcomes examined in this article, control over scheduling had highly significant ($p = .001$) positive effects on six. Moreover, as suggested in the job and personal control literature, control matters for all workers in the labor force, those on the standard shift as much as those on nonstandard shifts. And, as with the effects of shift work per se, the effects of schedule control do not vary systematically by gender or family status. Controlling one's time at work is as important for a traditional, single-earner parent as for a dual career parent. Although previous research has examined schedule control in the limited role of mediating the effects of shift work, we are suggesting that its effects are far more general. Just as workers in general benefit from control over how they do their work, regardless of what work they do, so they also benefit from control over when they work, regardless of the actual clock times they work.

APPENDIX
The Effects of Personal and Family Characteristics and Work and Employment Characteristics
on Work-Family Balance, Work-Family Conflict, Psychological Distress, and Physical Health Status

<i>Independent Variables</i>	<i>Lack of Work-Home Balance</i>	<i>Conflict Between Work-Home</i>	<i>Burnout</i>	<i>Distress</i>	<i>Dissatisfaction</i>	<i>Days Sick Past 3 Months</i>	<i>Poor General Health</i>	<i>Minor Physical Problems</i>
Personal and family characteristics								
Age	-.004** (.001)	-.010*** (.002)	-.013*** (.002)	-.033*** (.008)	-.001 (.001)	-.016 (.013)	0.005*** (.001)	-.001 (.002)
Sex (male = 0, female = 1)	-.004 (.028)	.109* (.045)	.354*** (.042)	1.65*** (.180)	.094** (.030)	.785** (.288)	.123*** (.030)	.504*** (.044)
Race (White = 0, non-White = 1)	-.085** (.031)	-.106* (.050)	-.119* (.047)	-.083 (.199)	-.010 (.033)	.272 (.318)	.070* (.033)	-.054 (.048)
High school graduate	.071 (.053)	-.036 (.086)	-.121 (.079)	-.877* (.338)	-.005 (.057)	-.631 (.526)	-.168** (.056)	-.168* (.082)
Some college	.147** (.055)	.113 (.088)	-.059 (.081)	-.628 (.348)	.063 (.058)	-.182 (.544)	-.204*** (.058)	-.164 (.084)
Bachelor's degree	.154* (.062)	.208* (.099)	-.046 (.092)	-.968* (.393)	.003 (.066)	-.466 (.616)	-.328*** (.066)	-.173 (.096)
Post baccalaureate degree	.207** (.066)	.283** (.105)	-.078 (.098)	-1.117** (.419)	.114 (.070)	-.466 (.657)	-.287*** (.070)	-.198 (.102)
Currently attending school	.008 (.041)	.154* (.065)	.082 (.060)	.224 (.258)	.024 (.043)	.659 (.407)	.027 (.043)	.087 (.063)
No children, spouse not working	-.138** (.051)	.129 (.082)	.047 (.076)	-.194 (.326)	-.219*** (.055)	-.577 (.505)	.011 (.055)	-.072 (.079)
No children, spouse works	-.208*** (.039)	-.122* (.062)	-.057 (.057)	-.943*** (.246)	-.314*** (.041)	-.164 (.386)	-.038 (.041)	-.094 (.060)
Single parent	.046 (.050)	.372*** (.081)	.058 (.075)	.940** (.320)	.154** (.054)	.734 (.533)	.080 (.054)	.061 (.078)

(continued)

APPENDIX Continued

<i>Independent Variables</i>	<i>Lack of Work-Home Balance</i>	<i>Conflict Between Work-Home</i>	<i>Burnout</i>	<i>Distress</i>	<i>Dissatisfaction</i>	<i>Days Sick Past 3 Months</i>	<i>Poor General Health</i>	<i>Minor Physical Problems</i>
Children, spouse not working	-.010 (.052)	.287** (.082)	-.095 (.077)	-.347 (.327)	-.161** (.055)	.280 (.523)	.078 (.055)	.069 (.080)
Children, spouse works	-.027 (.035)	.304*** (.056)	.007 (.052)	-.054 (.221)	-.147*** (.037)	.020 (.360)	.028 (.037)	.094 (.054)
<i>Work and employment characteristics</i>								
Core	-.020 (.033)	.038 (.052)	.035 (.049)	-.088 (.208)	-.004 (.035)	-.015 (.331)	-.020 (.035)	-.011 (.051)
State	-.161** (.046)	-.028 (.073)	-.004 (.068)	-.275 (.290)	-.138** (.049)	.589 (.467)	-.040 (.049)	-.066 (.071)
Self-employed	.029 (.048)	.083 (.076)	-.135 (.071)	-.406 (.303)	-.033 (.051)	.137 (.476)	-.023 (.051)	-.130 (.074)
White collar	-.019 (.041)	.021 (.065)	-.055 (.061)	-.122 (.258)	.020 (.044)	.164 (.421)	.050 (.043)	.044 (.063)
Service	.020 (.057)	.040 (.091)	.045 (.084)	.156 (.360)	-.010 (.061)	.270 (.571)	.111 (.060)	.036 (.088)
Blue collar	-.003 (.052)	.065 (.083)	-.079 (.077)	.372 (.331)	.059 (.056)	.625 (.532)	.089 (.055)	.064 (.080)
Hours/week	.011*** (.001)	.016*** (.002)	.018*** (.002)	.017* (.009)	.002 (.001)	-.020 (.014)	.002 (.001)	-.000 (.002)
Size of firm	.002 (.008)	.005 (.012)	.014 (.011)	.064 (.048)	-.009 (.008)	.131 (.077)	.014 (.008)	.025* (.012)
Union member	.006 (.037)	-.068 (.059)	-.018 (.055)	-.216 (.234)	-.015 (.039)	.331 (.367)	.023 (.039)	.038 (.056)
<i>R</i> ²	.068	.081	.080	.071	.056	.020	.046	.073

NOTE: Numbers in parentheses are standard errors ($N = 2,905$). Omitted categories: Education = non-high school graduate, Family composition = unmarried without children, Economic sector = periphery, and Occupation = professional.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

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