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Job Design and Ethnic Differences in Working Women's Physical Activity

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Abstract

Objective—To document the role job control and schedule control play in shaping women's physical activity, and how it delineates educational and racial variability in associations of job and social control with physical activity.

Methods—Prospective data were obtained from a community-based sample of working women (N = 302). Validated instruments measured job control and schedule control. Steps per day were assessed using New Lifestyles 800 activity monitors.

Results—Greater job control predicted more steps per day, whereas greater schedule control predicted fewer steps. Small indirect associations between ethnicity and physical activity were observed among women with a trade school degree or less but not for women with a college degree.

Conclusions—Low job control created barriers to physical activity among working women with a trade school degree or less. Greater schedule control predicted less physical activity, suggesting women do not use time “created” by schedule flexibility for personal health enhancement.

Keywords

physical activity; women; work organization; job control

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Human Subjects Statement

The HealthPartners Institutional Review Board approved all sampling, recruitment and data collection procedures. All participants provided signed informed consent.

Conflict of Interest Statement

The authors have no conflicts of interests to report.

Promoting regular physical activity (PA) is a core element of many worksite health promotion programs.¹ Employers create a variety of programmatic activities to encourage individual workers' physical activity habits, whether it is "motivating" inactive workers to begin engaging in regular physical activity or supporting continued physical activity among those who are already active. These individual-level programs can be effective at promoting regular physical activity among workers, although their effectiveness can vary widely.² Theoretically, best practice guidelines suggest that individual level programs will be more successful if they are buttressed by environmental supports;^{3,4} however, few health promotion programs recognize barriers to physical activity inherent in the way workers are expected to perform their jobs. Moreover, workers who engage in less physical activity, such as lower status or non-professional workers, are likely to be the same workers who confront work-related barriers to regular physical activity.⁵

Potential organizational threats to workers' physical activity can arise from the way jobs are designed. Job design reflects the architecture of a job, including how duties and tasks are to be performed, the required methods for performing tasks and duties including relationships between the job holder and relevant others (eg, coworkers, supervisors, etc), and the scheduling and location of where and when work is performed.⁶ Beliefs about a worker's ability to make decisions about different aspects of the required work is at the core of job design.⁷ Particularly salient in the contemporary workforce is job control, or the ability of workers to control what work is performed and how it is accomplished,⁶ as well as more specific features of control like how work-related time is spent.

Evidence suggests that different features of job control may shape workers' overall level of physical activity.⁸ Cross-sectional self-report data from a national survey of adults in the United States indicates that individuals with less control over their work also report less frequent leisure time physical activity.^{9,10} Similarly, evidence from the Whitehall II cohort of British Civil Servants¹¹ and Finnish public sector employees¹² suggests that low job control is associated with less frequent and regular physical activity. Schedule control, a time-specific form of job control, has long been held to be an essential element of effective wellness programs¹³ and has been linked with regular physical activity.¹⁴ Thus, evidence relying exclusively on self-reported measures of physical activity suggest that jobs designed in a way that prevent workers from controlling how job-related tasks are performed, including the temporal schedule of that work, may pose barriers to workers physical activities.

Interestingly, the very workers that are frequently hard to reach with worksite physical activity programs and would likely benefit the most from the programs are typically those with the least job control. In their recent qualitative review of the literature, Landsbergis et al⁵ found that individuals with less educational attainment as well as racial and ethnic minorities were among the least likely to have job control. They further proposed that differential access to job control likely contributed to and exacerbated occupational health disparities.

The role of job and schedule control in shaping workers' physical activity is ambiguous.⁸ Substantial theory suggests that job control shapes behavior off the job, and evidence

suggests the absence of control over job tasks may contribute to passivity off the job⁶ which can be observed in less involvement in leisure time physical activity. This hypothesis has found support among men but not women.¹¹ However, existing research has relied primarily on cross-sectional data, and it does not consider the possibility that some workers, such as ones with limited educational attainment, and racial minorities, may be more vulnerable to the effects of low job control. Further, existing research is limited by the absence of objective assessments of leisure time physical activity.⁸

This study addresses several gaps in previous research linking job design to physical activity. Using prospective data from a community-based cohort of working women with young children, this analysis: (1) describes variation in women's objectively measured physical activity over time; (2) determines if women with greater job control and schedule flexibility engage in more physical activity; and (3) delineates educational and racial variability in associations of job control and schedule flexibility with physical activity. Figure 1 summarizes the conceptual linkages among race and educational attainment, common bases of social stratification, job and schedule control as indicators of job design, and women's physical activity. Our project focuses on working women with young children because they represent a substantial proportion of the workforce, their participation in regular physical activity is typically low,¹⁵ and evidence suggests that women, particularly if in lower status jobs, may have less control on their jobs.⁵

METHODS

The data for this analysis are from a larger project designed to study working mothers physical activity and eating habits. This project recruited a sample (N = 302) of working women with young children that was stratified by race (Black and White) and educational attainment. The prospective study design involved data collection from each participant at 4-month intervals (ie, Baseline, T2 at 4 months, T3 at 8 months, T4 at 12 months).

Sampling

The sample design was created to obtain a sample of full-time employed women with young children, stratified by educational attainment (high, low) and race (White, Black). High education was defined as having earned an associate's degree or higher. Low education was defined as having earned a trade school degree or less. Sample inclusion criteria were: female of at least 18 years of age, self-reported race of "White only," "Black only," or "Black and other," working for pay a minimum of 35 hours per week, and having an oldest child in the household aged 4 to 9. Exclusion criteria were: not intending to work for the same employer for the next 12 months, being currently pregnant or having had a baby in the previous 12 months, reporting that a household member (including the participant) had a debilitating medical or developmental condition, being born outside the United States, or being deemed by our phone screener to be lacking sufficient English fluency or comprehension to respond meaningfully to our survey questions. Other racial groups and those lacking English fluency were excluded from the study because the larger project was designed to make comparisons between black and white women.

Administrative data systems of the HealthPartners (HP) health plan, accessible by investigators (ALC, BCM) in the research arm of the institution, provided the primary sample frame for identifying and contacting potential study participants. HP is an integrated, not-for-profit health care cooperative that provides health care services, health plan financing and administration, medical education and research. HP's operations are primarily carried out in the Minneapolis-St. Paul Metropolitan and surrounding region. HP membership is reflective of the Minneapolis-St. Paul region in terms of both demographic characteristics (eg, age, sex, educational attainment, occupational status) and health status (eg, BMI) and access to health care. Administrative data were available for both health plan insured members, and patients (regardless of whether they were insured by HealthPartners) making visits to any HealthPartners Medical Group (HPMG) clinics in the Twin Cities Metropolitan area.

Recruitment

Recruitment involved a 2-stage process. In the first stage, invitations were mailed in batches of 100 to 450 to women identified as potentially eligible based on membership data regarding their age and the age of the oldest child in the household. Additional information in the administrative data allowed for additional targeting of recruitment materials to black women. Race information was available for approximately one-third of women identified in the administrative data. Using this information, we classified women as being Black, White, other race, or unknown race. Women classified as "other race" were excluded from further recruitment efforts as the primary study questions focused on black and white women. Substantial effort went into locating potentially study eligible black women among those individuals classified as "unknown" race. Geocodes associated with the residential address of individuals of "unknown race" were used to identify the census tracts within which women lived. By appending year 2000 census data on the racial composition of census tracts in the Twin Cities Metropolitan area, we were able to "overweight" our invitation mailings towards women living in census tracts with high proportions of black women.

The second stage of recruitment involved attempted telephone contact with every individual sent a study invitation. Within a week of mailing out recruitment invitations, trained staff attempted phone contact. Multiple attempts were made on different days of the week and different times of day as needed to contact individuals. Once reached by phone, individuals were screened to determine their study eligibility with respect to the inclusion and exclusion criteria.

Individuals who declared as eligible by means of the telephone screening were assigned to an interviewer, based on race when possible. The interviewer contacted the individual by telephone to schedule a face-to-face baseline interview, and mailed a letter reminding the individual of the date and time of the interview, along with a physical activity monitor, the monitor instructions and a consent form. Individuals were asked to read the consent form and wear the physical activity monitor beginning 7 days prior to the scheduled interview.

A total of 6374 individuals were mailed an invitation to participate in the study or were self-referred for screening. Of these, 3539 were contacted successfully and 2230 were screened for eligibility. Overall, 369 of the contacted and screened individuals were determined to be

eligible for the study, and 82% (N = 302) of these provided signed informed consent and completed the baseline interview. Participant retention was strong. Time 2 data, collected approximately 4 months after the baseline interview, were obtained from 96.4% of enrolled participants (N = 291). Time 3 and 4 data, collected approximately 8 and 12 months after baseline, were each obtained from 93.4% of enrolled participants (N = 282).

Measures

Physical activity—The dependent variable in this analysis was average steps taken per day. Participants were given a New Lifestyles 800 (NL-800) activity monitor at the beginning of the study. The NL-800 is an accelerometer-based pedometer that uses a patented piezoelectric mechanism for accurate step counting on all body types, including potentially overweight or obese participants.¹⁶ The NL-800 automatically resets itself each day and stores up to 7 days of daily step counts, retaining the most recent 7-day period data if worn for more than 7 days. Participants were given the pedometer at enrollment and were asked to keep the device for the duration of the study. Participants who lost or misplaced their device received another without cost. Participants were asked to wear the NL-800 for 7 consecutive days leading up to the baseline data collection and all subsequent interviews. The step counter on the NL-800 was not masked; consequently, participants could see and potentially monitor their steps. We had strong adherence to the study protocol: greater than 95% of active study participants provided 6 or more days of step counts at each observation.

Job design—*Job control* was measured with 2 items from the Job Content Questionnaire (JCQ)^{6,17} during the baseline interview. The items were: “How often do you have the freedom to decide how you do your work?” and “How often do you have a lot of say about what happens on your job?” The items were modified to use a frequency based response set ranging from “never” (1) to “always” (5). Item ratings were averaged with higher values indicating greater job control (Cronbach’s alpha = 0.66). *Schedule control* was assessed during the baseline interview with an existing 7-item instrument.¹⁸ The items assess the degree to which workers believe they have control over different aspects of their work schedule, including the length of the workday, the starting and stopping times of the workday, as well aspects of scheduling such as taking breaks and vacations. Response options range from “not at all” (1) to “completely” (5). Item ratings were coded and averaged such that higher scores indicate greater schedule control (Cronbach’s alpha = 0.84).

Personal characteristics—Asking participants their highest level of education completed assessed educational attainment. Responses were dichotomized such that individuals who earned a trade school degree or less were classified as “low education,” whereas individuals who earned an associate’s degree or higher were classified as “high education.” The set of questions and racial classifications used by the US Census Bureau was used to assess race, and asking participants to select the racial classifications that best describe their heritage. Participants selecting Black, alone or in addition to another classification, were categorized as such. Participants selecting White alone were classified as such.

The date of each interview was recorded, and subsequently classified into season based on the lunar calendar. Temporal location of observation was necessary to capture and model well-established seasonal effects in physical activity in the upper Midwest.¹⁹

Analyses

The overarching objectives of these analyses were to assess the direct relationships between race or education, work organization (ie, job control, schedule flexibility) and physical activity; and to quantify potential indirect relationships among race, education and physical activity through work organization. The direct relationships among race, education and physical activity were estimated from a multi-level regression model in which up to 4 repeated physical activity (number of steps per day/1,000) observations at baseline, T2, T3 and T4 for each participant were nested within participant. All days of step counts at each observation were analyzed. Main effects for race (reference = white), education (reference = high education) and age at the first (T1) interview (centered around mean) at the participant level, and for season in which interview took place (ref = winter) and interview quarter (ref = T1) at the observation level, were included as fixed effects. Significant 2-way interactions involving race and education were assessed individually and retained if significant ($p < .05$). A random participant intercept accounted for interpersonal differences in physical activity.

The direct relationships among race, education and work organization were estimated from 2 general linear models predicting job control and schedule flexibility, both measured at the baseline interview. These models included parameters for race, education and age, and they retained significant 2-way interactions ($p < .05$). These models also provided the preliminary evidence for assessing the extent to which job control and flexibility (mediators) mediated relationships between race and education (predictors), and physical activity (outcome). The multi-level model estimated the strength and significance of the predictor-outcome relationships (the X-Y paths), and linear models estimated the predictor-mediator relationships (the X-M paths). Inclusion of significant interactions for the race and education predictors made it possible to quantify conditional predictor-mediator ($X1*X2-M$) and predictor-outcome ($X1*X2-Y$) relationships (ie, moderated-mediation, conditional indirect effects).²⁰

The final pieces of evidence for assessing mediation, the mediator-outcome (M-Y) relationships, were gathered from 2 multi-level models that predicted physical activity from race, education, age at first interview, season, and interview quarter; either the job control or schedule flexibility mediator; and the 2-way interactions that had predicted job control (or schedule flexibility) or physical activity in prior models. None of the predictor-mediator interactions ($X1*M-Y$, $X2*M-Y$) were significant, so they were not retained in the final models. Repeated physical activity observations were nested within participants, all predictors were treated as fixed effects, and a random participant intercept was estimated.

The magnitude of the conditional indirect effects were calculated using a product of coefficients approach, $X-M*M-Y$. Because we found significant $X1*X2-M$ and $X1*X2-Y$ relationships but no $X*M-Y$ relationships, the conditional indirect effects of Black-mediator*mediator-PA were calculated separately for women with lower and higher education. Significance of the conditional indirect effects was assessed by using the

PRODLIN program²¹ to calculate asymptotic 95% confidence limits around each indirect effect.²² Confidence limits that did not include zero were considered statistically significant ($p < .05$).

RESULTS

Enrolled participants were, on average, 36 years of age ($SD=5.9$) and nearly 70% reported being currently married or in a marriage-like relationship (Table 1). Over one-third of the sample ($N = 104$) was classified as Black, and 58% ($N = 174$) reported completing an Associate's degree or higher. The median number of children reported by participants was 2. Almost half of the participants (47%) had only school-aged children; nevertheless, 40% had a combination of school-aged and preschool-aged children, and 12% had preschool-aged children only. The modal category of household earnings was \$45,000 to \$74,999, which is consistent with the \$57,000 estimated median household income from 2006–2010 American Community Surveys. Participants reported working an average of 42 hours/week ($SD=7.3$), and approximately one-fourth reported having a job requiring a nonstandard schedule. Participants reported a wide variety of occupations; most participants ($N = 125$) were in service-oriented occupations such as secretaries, customer service representatives, library assistants, and accounting clerks. A sizeable number of participants ($N = 96$) were in management and business occupations such as educational administration, accounting/auditing, and management analysts. The smallest group ($N = 76$) included individuals in professional occupations such as lawyers, nurses, and teachers.

There was substantial variation in the average number of steps taken by race, educational attainment, and season (Table 2). Black women and women with a trade school degree or less walked fewer steps than white women and women with a college degree or higher. However, there was significant race x education interaction effect such that elevated physical activity was associated with advanced education benefits for Whites but not Blacks (Figure 2). An expected seasonal effect in steps taken was observed such that the average number of steps taken per day was higher in the spring, summer, and fall compared to winter. However, there was also a significant race x season interaction such that increases in physical activity in the spring, summer, and fall compared to winter only held for white women; there was no seasonal variation in steps taken per day for black women.

Documenting race differences in job control and schedule control is the first step in determining whether job design factors explain ethnic differences in women's physical activity. There is no evidence that race or educational attainment alone had significant effects on job control (Table 2, column 2), but there was modest evidence of association with schedule control (Table 2, column 3). Analyses revealed significant race x education interaction effects on job control ($p < .05$) and schedule control ($p < .01$), such that black women with low educational attainment have especially low job control and schedule control. Collectively, this evidence suggests that job control and schedule control may be viable mediators of race differences in women's physical activity among women with a low level of education.

In assessing whether either mediator was associated with physical activity once race and education were accounted for, greater job control predicted more physical activity (Table 3), as expected. There was no evidence that the association of job control with average steps taken was moderated by race or education, although we did observe that education moderated the association of race with job control (Table 2). Therefore, we estimated the magnitude of the indirect association of race with average steps taken per day, through job control, separately for each educational category (ie, moderated mediation; Table 4, Panel A). Among high education women there was a null indirect association between race and physical activity through job control, because there was no difference in job control between Whites and Blacks. Among low education women, however, black women had less job control ($b = -0.41$), and less job control was related to less physical activity ($b = 0.39$).

Contrary to expectation, greater schedule control predicted less physical activity (Table 3). As with job control, there was no evidence that the association of schedule control with average steps taken per day was moderated by race or education. Again, because education moderated the association between race and schedule control, we estimated the magnitude of the indirect association of race with average steps taken per day, through schedule control, separately for each educational category. Among high education women there was a null indirect association of race with average steps taken per day through schedule control. Among low education women the indirect association of race with physical activity through schedule control was negative for Whites and positive for Blacks (Table 4, Panel B). Because schedule control has a negative relationship with the physical activity ($b = -0.31$), Black women's lower schedule control ($b = -0.43$) produced a positive overall indirect association between race and steps taken per day (2 negative associations). Conversely, low education black women's lower level of schedule control protected their physical activity levels, whereas low education white women's high level of schedule control undermined their physical activity.

DISCUSSION

Many worksite health promotion programs attempt to promote regular physical activity among employees, frequently using incentive systems to "motivate" behavior change. Generally missing from this literature is critical consideration of the potential barriers to regular physical activity imposed by job design, or the way that employees' jobs are structured and managed. Theory and evidence suggest the absence of job control, or workers' ability to make decisions about their work, and limited control over work schedules likely impedes regular physical activity.^{6,9-12} However, previous research has been limited by reliance on cross-sectional data,¹¹ by self-reported measures of physical activity, and by inadequate attention to the possibility that job design factors are most relevant to lower status workers who traditionally lack these resources. This study used prospective data from an ethnically and educationally diverse cohort of working women to address these limitations.

Women's overall levels of physical activity, assessed in terms of average number of steps taken per day across a 7-day period, differed by both ethnicity and education. Consistent with previous research,^{15,23,24} our results indicated that black women and those with a trade

school degree or less took fewer steps per day, on average, than did white women and those with a college degree. However, we also documented a significant interactive effect indicating the association of education with average physical activity held only for white women. Additionally, a significant race x season interaction indicated that white women's physical activity was higher in the spring, summer and fall relative to winter, but seasonal variation in physical activity was not observed for black women. Although seasonal variation in physical activity has been observed in previous studies,¹⁹ our results are the first to suggest that black women's physical activity remains stable across the calendar, whereas white women's physical activity increases during warmer seasons.

Whereas self-reported physical activity measures typically focus on leisure-time physical activity, they also tend to be better at capturing episodes of scheduled, intentional, and programmatic types of physical activity than they are at capturing non-scheduled, incidental and work-related physical activity.²⁵ By contrast, accelerometers and pedometers are more likely to capture a broader range of movements (particularly those above light intensity) that may be experienced more sporadically throughout the day.²⁶ Because our primary outcomes are accelerometer-based pedometer counts of average daily steps, our measures likely reflect a fuller range of physical activity than have been examined in prior studies relying on self-reports. To the extent that seasonal variability might be more anticipated for leisure-time and programmatic (eg, "exercise") physical activity than for work-related or non-programmatic types of physical activity, the lack of seasonal differentials for black women leads us to ponder potential differences in the composition of the types of physical activity in which these groups of women are engaged. A possible explanation for our finding of seasonal differentials for white but not black women might be that Whites' overall steps are differentially weighted toward leisure-time, exercise-based movements, whereas those of Blacks are differentially weighted toward non-exercise based movement. If this is the case, it may be important to consider how better to incorporate physical activity into the non-exercise-based daily activities of black and lower education women. Considering how greater physical activity might be designed into their jobs would be one obvious way to do this.

Job design characteristics reflecting job control and schedule control were each associated with women's average steps taken per day. We found that greater job control was associated with more average steps taken per day. These results are consistent with previous research using cross-sectional data and self-reported measures of physical activity that found that individuals with less control over their work also reported less frequent leisure time physical activity.^{9,10,12} Our results extend this research by showing that job control predicted objectively assessed physical activity over a one-year period. Interestingly, we also found that greater schedule control was associated with fewer average steps taken per day. These results are inconsistent with previous findings;¹⁴ however, the previous study documented a prospective association between perceived flexibility and self-reported frequency of physical activity. Thus, the inconsistency could be attributed to common method variance, or the possibility that perceived workplace flexibility is referring to something other than schedule flexibility. In light of evidence suggesting that women may use schedule control to fit more into their day rather than use the time for personal benefit,²⁷ additional research is needed to delineate the potential of schedule control in promoting healthy physical activity habits.

Variation in job design explains a portion of ethnic differences in women's physical activity. Our analyses indicated evidence of mediated-moderation;²⁸ that is, black women with a trade school degree or less reported the lowest level of job control, and that this lower level of job control explained a fraction of the ethnic difference in physical activity among women with a low education. Job control did not explain any of the ethnic difference in physical activity among women with a college degree or higher. These results are consistent with a qualitative review of the literature suggesting that differences in job design may play a role in creating and exaggerating health disparities.⁵ Replication of these results is needed to draw stronger conclusions; nevertheless, they are provocative because they suggest that worksite health promotion programs that seek to promote physical activity among low education black women may need to move beyond motivational strategies to overcome barriers to physical activity imposed by their jobs.

Our analyses suggest that schedule control may also play a role in ethnic differences in women's physical activity, although the observed results were counter-intuitive because schedule control was associated with less rather than more physical activity. Among women with a high education there was no indirect association between ethnicity and average steps taken. By contrast, among women with low education, black women's lower level of schedule control was associated with elevated physical activity and white women's higher level of schedule was associated with reduced levels of physical activity. These counter-intuitive results suggest that cultural variation in expectations about balancing work and family^{29,30} may shape how working women use workplace supports in their daily lives, and they raise the possibility that widespread acceptance of the idea that schedule flexibility is an essential component of worksite health promotion³ may not hold true for lower status workers. This area is an important one for future research.

The results of this study must be interpreted in light of the study's limitations. First, the sample was restricted to employed women with young children; therefore, it is unclear if the observed results will hold for childless employed women or working men. Next, the sample was drawn from one specific geographic region. Although the results of this study should generalize to other metropolitan areas in the upper Midwest, generalizations to other regions of the country should be made cautiously. Moreover, research focused on other racial and ethnic groups such as Mexican-American women is needed. Next, our pedometer-based assessment of physical activity captures total physical activity, not leisure-time physical activity; consequently, we are unable to discern the extent to which observed associations of job and schedule control with steps per day are confounded with variation in actual job tasks that may require movement. Finally, the sample was relatively small. One implication of the small sample is relatively large standard errors and the possibility of unreliable parameter estimates. Therefore, the results should be interpreted as preliminary rather than definitive.

Weaknesses notwithstanding, this study also has several strengths. The prospective design allowed examination of physical activity across a 12-month period and purposeful consideration of seasonal effects in women's physical activity. Next, our use of pedometers allowed objective assessment of physical activity and minimized threats to external validity resulting from common method variance. Finally, our focus on job design characteristics shifts attention to modifiable aspects of the work environment that may need to be changed

to support healthy behavior change among vulnerable segments of the workforce. The overall pattern of results is suggestive: differences in job control and schedule control explain a small portion of ethnic differences in physical activity among women with a trade school degree or less. The practical implication of these findings and related research is that worksite health promotion programs serving primarily low education women may need to partner with their Human Resource units to redesign jobs in a way that enables greater control over work tasks and responsibilities. Although additional replication research is needed, these results suggest that the way work is organized may initiate or exaggerate health disparities by contributing to differences in physical activity habits.

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Figure 1.
Conceptualization of Differential Access to, and Salience of, Job and Schedule Control for Women's Physical Activity

Figure 2.
Race and Educational Differences in the Average Number of Steps/Day by Working Women

Table 1

Sample Characteristics

	M	SD	N	%
<u>Personal Characteristics</u>				
Age	35.8	5.9		
Race				
Black			104	34.4
White			198	65.6
Educational Attainment				
Low (trade degree or less)			128	42.4
High (associates degree or higher)			174	57.6
Marital Status				
Separated, divorced, never married			89	29.5
Currently married, living as married			211	69.9
<u>Household Characteristics</u>				
Number of Children	1.77	0.68		
Preschool-aged child only			37	12.3
Preschool- and school-aged child			121	40.3
School-aged child only			142	47.3
Household Income				
\$44,999			65	21.9
\$45,000 – \$74,999			72	24.3
\$75,000 – \$99,999			56	18.9
\$100,000 – \$149,999			62	20.9
150,000			42	14.1
<u>Work Characteristics</u>				
Work Hours	42.3	7.3		
Work Schedule				
Standard work schedule			228	75.5
Nonstandard work schedule			74	24.5

Table 2
Racial and Educational Variation in Working Women's Physical Activity and Job Design

	Physical Activity		Job Design	
	Steps per day/1,000 b	(SE)	Job Control b	Schedule Control b
Race				
Black	-2.02	(0.44)***	-0.02	0.26
				(0.15) [†]
Educational Attainment				
Low	-1.34	(0.34)***	-0.05	0.27
				(0.14) *
Season				
Winter	Reference		n/a	n/a
Spring	1.15	(0.21)***	n/a	n/a
Summer	1.38	(0.22)***	n/a	n/a
Fall	0.67	(0.22)**	n/a	n/a
Interaction				
Black * Low education	1.62	(0.57)**	-0.38	-0.68
			(0.19) *	(0.23) **
Black * Spring	-1.12	(0.35)**	n/a	n/a
Black * Summer	-1.06	(0.36)**	n/a	n/a
Black * Fall	-0.58	(0.36)	n/a	n/a
Intercept	8.18	(0.27)***	0.07	0.09

[†] p < .10

* p < .05

** p < .01

*** p < .001 (two-tailed)

Note.

All models control for age; the steps per day model also controls for interview quarter.

Table 3

Associations of Job Control and Schedule Control with Physical Activity (steps per day/1000)

	Job Control		Schedule Control	
	b	(SE)	b	(SE)
Race				
Black	-2.00	(0.43)***	-1.93	(0.43)***
Educational Attainment				
Low	-1.34	(0.33)***	-1.27	(0.34)***
Job Design				
Job control	0.39	(0.17)*		
Schedule control			-0.31	(0.14)*
Season				
Winter				
Spring	1.18	(0.21)***	1.18	(0.21)***
Summer	1.38	(0.20)***	1.37	(0.20)***
Fall	0.72	(0.21)***	0.70	(0.21)***
Interactions				
Black * Low education	1.80	(0.57)**	1.43	(0.57)**
Black * Spring	-1.17	(0.35)**	-1.17	(0.35)***
Black * Summer	-1.06	(0.36)**	-1.05	(0.36)**
Black * Fall	-0.66	(0.36) [†]	-0.63	(0.36) [†]
Intercept	7.96	(0.26)***	7.97	(0.26)***

[†] p < .10

* p < .05

** p < .01

*** p < .001 (2-tailed)

Note.

All models control for age and interview quarter.

Indirect Associations of Race with Working Women’s Physical Activity through Job Control or Schedule Control by Education Level

Table 4

Panel A. Black race → Job Control (JC) → Physical Activity						
	Race → JC link		JC → Physical Activity link ^a		Total Indirect Effect	
	b	(SE)	b	(SE)	b	(95% CI)
High Education	-0.01	(0.11)	0.39	(0.17)	-0.01	(-0.10 – 0.09)
Low Education	-0.41	(0.16)			-0.16	(-0.38 – -0.01)

Panel B. Black race → Schedule Control (SC) → Physical Activity						
	Race → SC link		SC → Physical Activity link ^a		Total Indirect Effect	
	b	(SE)	b	(SE)	b	(95% CI)
High Education	0.26	(0.16)	-0.31	(0.14)	-0.08	(-0.23 – 0.01)
Low Education	-0.43	(0.18)			0.14	(0.01 – 0.33)

Note.

^a Associations do not differ by educational attainment; consequently, the parameter estimates are reported only once to avoid redundancy.