The Relationship Between Job Demands and Key Performance Indicators: Moderating Effects of Job Resources in Call Centers

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The present study tested the direct and interactive effects of job resources (i.e., control, training, supervisor support, task identity, task significance, skill variety, and feedback) on the relationship between job demands (i.e., role demands, workload demands, and work pacing demands) and multiple indicators of performance (i.e., call duration, number of calls, and customer waiting time) in two call centers. Overall, our study found (1) that training moderated the relationships between role demands and performance, as well as customer waiting time and performance, (2) significant moderating effects of three job content variables (task identity, task significance, feedback) on the relationship between workload demands and performance outcomes, and (3) that control and feedback both interacted with work pacing demands to predict performance. Implications for managing call center employees and future research directions are discussed.

During the last 30 years, various studies of the now extensive literature on work stressors and negatively perceived job characteristics have concluded that prolonged exposure to conflicting and ambiguous role demands, heavy workloads, not enough

resources, and low decision latitude or control is dysfunctional to the organization and its members. More specifically, these have all been found to negatively affect psychological well-being, physical health, and job satisfaction (see Fox, Dwyer & Ganster, 1993; Ganster & Schaubroeck, 1991; Halbesleben & Buckley, 2004; Schaubroeck, Jones, & Xie, 2000). Other research findings report evidence of stressful demands leading to higher health care costs and more insurance claims (Ganster, Fox & Dwyer, 2001), higher rates of absenteeism and turnover (Bakker, Demerouti, & Schaufeli, 2003; Dwyer & Ganster, 1991; Spector, Dwyer, & Jex, 1988) and, to a lesser extent, decreased job performance (Dyne, Jehn, & Cummings 2002; Motowidlow, Packard, & Manning, 1986; Tuten & Neidermeyer, 2004).

The vast majority of studies in this area of research have included employees' mental and physical well-being as outcomes (e.g., somatic complaints, anxiety, burnout, indicators of cardiovascular health). Less attention has been given to the effect that these demands may have on actual work performance (see Baker, Demerouti, Verbeke, 2004; Beehr, 1995; & Jex, 1998 for a review). Jex (1998) suggests that job performance as a criterion has been neglected primarily because it is a complex, multidimensional variable that is often difficult to measure accurately. More specifically, there is often low variability in performance criterion measures due to a substantial amount of error in ratings. In essence, even though employees may actually perform at different levels, they often receive similar performance evaluations. Furthermore, it is difficult to obtain multiple measures of performance that include objective indicators (Beehr, Jex, Stacy & Murray, 2000). As a result, researchers have focused more on outcomes that are thought to affect the ability and motivation of the individual worker to perform (e.g., mental and physical health indicators commitment, and job satisfaction), rather than on actual performance outcomes themselves. Those studies that have included performance as an outcome have obtained a report of employee performance from either a supervisor, a peer, or, more commonly, the employee's own self-evaluation (Bakker et al. 2004; Jex, 1998), rather than from objective performance indicators.

The present study tries to gain insight into the effects that stressful job demands have on actual key performance indicators in a sample of call center employees. In addition, by extending the job demands-job resources (JD-R) model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), we examine whether certain job characteristics or job resources differ in their potential to reduce the negative effects that these job demands have on employees' actual job performance.

The Job Demands-Job Resources Model

Although employees in different occupations may be confronted with different types of job characteristics, the Job Demands-Job Resources Model suggests that most of them fall into two broad categories: job demands and job resources. *Job demands* can be social, physical, psychological, or organizational, and they represent aspects of the job that require considerable emotional or cognitive effort on the part of the employee, resulting in certain physiological, emotional, and/or psychological costs to the workers. Role conflict, heavy workloads, time pressures, and demanding

characteristics of the work environment are some examples of job demands. When dealing with such demands requires such high effort that the employee cannot adequately recover (Meijman & Mulder, 1998), the demands become sources of stress. This conceptualization of job demands is based on the influential Job Demands-Job Decision Latitude model proposed originally by Karasek (1979), but expands job demands to include other work characteristics, such as emotional demands, task characteristics, and problems with equipment (e.g., computers), in addition to Karasek's (1979) original conceptualization of workload and time pressure demands.

In addition to job demands, the (JD-R) model defines job resources as those physical, psychological, or social aspects of the job that (1) reduce the job demands and associated psychological or physical costs, (2) function to achieve work goals, or (3) stimulate personal growth and development. Resources are found at the organizational level (e.g., career opportunities, pay, security), at the interpersonal level (e.g., social support, team climate), at the level of organizing work (e.g., role clarity, participation, control), and at the task level (e.g., feedback, skill variety, task identify). The task level resources are essentially the classic job characteristics presented by Hackman & Oldman (1976).

In essence, the model proposes that employees who face high demands may exhaust their mental and physical resources, and this eventually leads to various health problems or burnout (e.g., Bakker, Demerouti, & Schaufeli, 2003). A second proposition suggests that the presence of adequate resources (e.g., social support, job knowledge, control, ability to use a variety of skills, performance feedback) tends to reduce the harmful effects that job demands have on well-being, and may actually foster motivation and performance.

Theoretically, then, this is consistent with the predictions and findings of Karasek's (1979) Job Demands-Job Decision Latitude model of stress. However, it expands it by suggesting that different job resources can buffer different job demands or characteristics. Whereas Karasek (1979) posits that higher control or decision latitude overall may reduce the harmful effects that demands have on health and well-being, the (JD-R) model argues that many types of demands and resources may interact differently to predict various health outcomes.

Recent research using the (JD-R) model as a theoretical foundation has tested either a mediational or an interactional model. Bakker et al. (2003), in a study of call center employees, found that job demands predicted absenteeism indirectly through their relationship with burnout or exhaustion, and job resources predicted intent to turnover indirectly through their relationship with organizational commitment, operationalized as employee involvement. Additionally, Bakker, Demerouti, & Euwema (2005) also tested the moderating effects that job resources (e.g., autonomy, feedback) might have on stressful demands (e.g., work overload, emotional demands) in predicting job burnout. That is, they tested whether certain resources act as a buffer against the harmful effects of various demands at work. The authors found mixed results; however, in several of the interactions tested, workers reported more burnout (i.e., exhaustion) when high job demands coincided with low resources. More specifically, they discovered that autonomy and feedback seemed to buffer the negative effects of work overload. This pattern of results was also found with another type of

demand, namely work-home interface—a form of role conflict. Clearly, this is quite consistent with the results from studies of Karasek's (1979) Job Demands-Job Decision Latitude model where job latitude, defined as the "individual's potential control over his tasks and his conduct during the work day" (Karasek, 1979, pp. 289-290), has received considerable support as a moderator (see e.g., Dwyer & Ganster, 1991; Fox, Dwyer & Ganster, 1993; Karasek, 1979; Schaubroeck, Jones & Xie, 2001). Despite the findings from studies on both the Job Demands-Job Decision Latitude model and the (JD-R) model, most researchers have not obtained information about the effects on performance outcomes; yet, the model suggests that the presence of adequate resources should also foster motivation and enhance performance, as well as reduce problems with mental and physical health.

A more recent exception is a study by Bakker, Demerouti, & Verbeke (2004) that utilized a combination mediation/interaction model to examine the relationship between job characteristics, burnout, and others' ratings of performance This study distinguished between in-role performance and extra-role performance and used colleagues' perceptions of employees' performance; it did not employ any objective performance indicators. Bakker et al. (2004) suggest that one aspect of the (JD-R) model that has received less attention is moderator hypotheses in predicting health, and specifically, job performance. They suggest that more work is needed to affirm the notion that job resources might actually buffer the harmful effects of job demands on actual work performance.

Present Study

The primary aim of this study is to examine the potential interaction between job demands (i.e., role demands, workload demands, work pacing demands) and job resources (i.e., control, supervisor support, training, task identity, task significance, skill variety, feedback) to see if and how these resources buffer the negative effects of stressful job demands on actual performance indicators.

We chose to use call center employees as our sample for a variety of reasons. First, call centers have become increasingly common across a variety of industries world-wide, including telecommunications, retail, insurance, travel, mail order, and utilities, among others. In fact, many businesses rely on call centers exclusively to handle specific billing issues, new accounts, product and service information, rebate information, and customer complaints. Second, although call centers have benefited many organizations by reducing costs, Holman (2002) has argued that the actual call center employees may benefit much less. In other words, though some workers are satisfied with call center work, for others it is stressful, demanding, and offers relatively low wages. Call center employees often perform multiple tasks (usually on a computer) while simultaneously on the phone with customers. While working, they frequently encounter interruptions, as well as demanding and rude customers, and they continuously face performance requirements for higher quantity, efficiency, and quality of work. Third, call centers generally track their associates' performance by keeping objective records of call quantity and duration, as well as by engaging in more subjective evaluations of performance quality done by supervisors (e.g., call quality monitoring).

Recent research on call centers has supported the notion that role conflict, lack of training, and job control negatively affect mental well being (e.g., anxiety, depression, exhaustion), but have neglected to examine the effect that high job demands and low job resources might have on the actual job performance of the employees (e.g., see Bakker, Demerouti, & Schaufeli, 2003; Holman, 2002; Holman, Chissick, & Totterdell, 2002; Zapf, Isic, Rechtoldt, & Blau 2003). The relationships among these variables are depicted in Figure 1. Based on the general predictions of the (JD-R) model and the aforementioned findings, we tested the following hypotheses:

Hypothesis 1: There will be a direct, negative relationship between job demands (i.e., role demands, workload demands, work pace demands) and job performance.

Hypothesis 2: There will be a direct, positive relationship between job resources (i.e., control, training, skill variety, task identity, task significance, feedback, supervisor support) and job performance.

Hypothesis 3: Job demands will interact with job resources to predict job performance, such that the negative impact of job demands will be greater under conditions of low resource availability.

Methods

Sample

Participants for the study were drawn from two inbound call centers in northwest Ohio. The first call center (1) was a regional office of a national promotions organization employing approximately 138 customer service associates. 63 percent of the study participants (n=91) came from this call center. These workers were all engaged in a similar job that required them to take inbound calls from customers across the United States. The nature of the calls consisted of taking orders for customized products and assisting with questions associated with a customer's order.

The second call center (2), employing approximately seventy-five customer service associates, was a local provider of cable television and internet services. It provided 37 percent of the participants represented in the study (n=54). The call center employees in this case all were engaged in taking calls from local customers about their existing or new cable or internet services.

Each call center gave objective performance data directly to the researchers, but permitted us to collect individual data via questionnaire from voluntary participants. In both cases we were able to collect similar data from both organizations on the individual employees and from the organizational performance records. Thus, for all the analyses conducted, the data from both centers were aggregated, resulting in a sample size of 145 subjects. The average age of the respondents across both samples was 32.47 years, and their average tenure in the organization was 3.86 years. 90 percent of all respondents were female.

Procedure

Upon receiving approval to proceed with the project from the top management of

each organization, group meetings were conducted with the potential participants of the study to explain their involvement. Following this, the subjects were asked to voluntarily complete the self-report measures on the independent variables, as well as to provide demographic information. Performance data were also collected from existing company records. Although anonymity was not guaranteed to the participants, confidentiality was assured.

As part of the agreement with the participating organizations, we asked that they provide time for participants to complete the measures while at work and, in return, incentives (pizza and $5 gift certificates) were provided to increase participation. After all questionnaires were returned to the researchers, existing organizational data then was gathered concerning individual performance indicators for the previous and subsequent twelve month periods.

Measures

Existing measures with established reliabilities, along with objective performance data, were used to assess the various independent and dependent variables. The measures fall in two general categories: individual employee responses to questionnaire items and organizational records of job-specific key performance indicators for each employee.

Role Demands. The extent to which respondents experience role ambiguity and role conflict was assessed using a scale by House, Schuler and Levanoni (1983). Ten items asked employees to indicate how descriptive (1 = not at all descriptive, 4 = very descriptive) statements were of their jobs. Example items included "Receiving unclear instructions about what needs to be done," "Working with two or more persons who operate quite differently," "Working on unnecessary things." Reliability for this measure was .87.

Work Demands. The Caplan, Cobb, French, Harrison, and Pinneau (1975) scale assessed respondents' perceptions of the amount of their workload (e.g., "How often is there a great deal to be done?") and the pace of their work (e.g., "How often does your job require you to work very fast?"). The workload demands measure was comprised of five items (Cronbach's alpha = .64), and the work pace measure was comprised of four items (Cronbach's alpha = .70). On this scale, a "1" indicated low amounts, and a "5" indicated high amounts.

Control. Control perceptions were measured using a version of the 22-item scale reported in Dwyer and Ganster (1991). The aim of this scale is to directly measure control beliefs by asking subjects how much control they have in a variety of work domains, including the variety of tasks performed, the order of task performance, the amount of work, scheduling of rest breaks, pacing, procedures and policies at work, and the physical arrangement of the work environment. Reliability for this measure was .82.

Job Characteristics. Four job characteristics (task identity, task significance, skill variety, and feedback) were measured with the Job Diagnostic Survey (Hackman & Oldham, 1980). Based on the prior research findings discussed earlier (e.g., Spector & Jex, 1991; Kelloway & Barling, 1991) we decided not to aggregate these characteristics into one measure, but to measure and test each characteristic

independently. Skill Variety (e.g., "The job requires me to use a number of complex or high-level skills") was measured using three items. Reliability for this measure was .78. Task Identity (e.g., "The job provides me the chance to completely finish the pieces of work I begin") was measured using three items, and reliability was .69. Task Significance (e.g., "The job itself is not very significant or important in the broader scheme of things") was measured with three items and Cronnbach's alpha was .65. Feedback was a combined six-item measure of feedback from the job itself and from others (e.g., "The job can be done adequately by a person working alone—without talking or checking with other people") with a Cronbach's alpha of .82. We decided not to include the traditional measure of Autonomy from the JDS, because we already had a measure of control and felt that the JDS scale would be redundant.

Training. Prior customer service training was measured by asking respondents to indicate how many hours of this type of training they had received to date as part of their jobs with the call center. The reported range was from 0 to 78 hours ($\bar{x}$ = 57.88).

Supervisor Support. Supervisor support was measured using a version of the Likert-style questionnaire developed by Beehr, King, and King (1990). Respondents were asked how frequently (1=Never, 5=Always) they shared information with their supervisors, how often they talked with their supervisors about non-work events, etc. Cronbach's alpha for this scale was .90.

Work Performance. Key indicators of performance were gathered from organizational records for one calendar year prior to the collection of questionnaire data and one calendar year following. Both organizations record these key indicators monthly for both individual employees and the overall department. For this study, we looked at performance over the entire two-year period of time. First, the correlations between the first and second year for each indicator were examined to make sure there was no significant difference between the two. As a result of this, in subsequent analyses, both years' performance data were aggregated for each participant and an average indicator was computed for each of the three performance indices. This two-year aggregation was thought to provide a much more accurate and reliable representation of an individual's performance.

The following key performance indicators were used in this study: "Average Call Duration" is a measure of the amount of time (in minutes) an associate actually is on the phone with the customer; "Average Number of Calls" is a measure of the total number of monthly calls taken by the associate. "Average Customer Waiting Time" is a measure of the amount of time (in minutes) an associate keeps a customer on hold while checking information or doing other tasks related to the call, but is not engaged in conversation with the customer.

The growing use nationally and internationally of call centers has made their efficiency paramount for the organizations that use them; thus, the requirement for call center employees to field a large volume of calls and to do so efficiently and effectively keeps call centers in business. Both participating call center organizations in this study considered higher performance to equate with lower average call duration, lower average waiting time, and higher average number of calls. Means and standard deviations for all performance measures can be found in Table 1.

Control variables. Because individual demographic differences are often correlated with

both independent and dependent variables of interest, "age" and "organizational tenure" were used as control variables in all tests of hypotheses. In addition, "organization" was also controlled for, since it was likely that the quantity and nature of the calls in each organization may contribute to variability in the individual worker's performance.

Table 1: *Descriptive Statistics and Correlations*

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Org ID	1.37	.49	-															
2. Org Tenure	3.86	4.11	-.11	-														
3. Age	32.47	9.98	-.10	.25**	-													
4. Avg. Duration of Call	22.82	21.54	.76***	.03	-.03	-												
5. Avg. Number of Calls	291.19	295.68	-.44**	-.11	.18	-.46***	-											
6. Avg. Waiting Time	1.42	.54	.83***	.05	-.04	-.10	-.36**	-										
7. Hrs. of Customer Training	57.88	14.35	-.05	-.19*	-.03	.01	-.01	-.10	-									
8. Perceived Control	2.97	1.47	.29**	.00	-.02	.34**	-.12	.29**	.25**	-								
9. Workload	3.32	.53	.16	.02	.07	.31**	-.20*	.23*	.08	.17	-							
10. Work Pace	3.14	.48	.18	-.07	.06	.06	-.04	.01	.17	-.20*	.37**	-						
11. Role Demands	2.24	.63	.09	-.20*	-.49***	-.12	-.13	.17	.09	-.31**	.21*	.09	-					
12. Task Identity	2.98	.58	.17	-.03	.02	.30**	-.20*	.33**	.05	.05	-.03	-.09	-.15	-				
13. Task Significance	3.19	.63	.08	-.10	.20*	.04	-.03	.10	.07	.17	.06	.26**	-.14	.05	-			
14. Skill Variety	2.67	.65	.08	.06	.17	.14	-.25*	-.02	-.02	.13	.20*	.09	-.05	.13	.11	-		
15. Feedback	2.83	.72	.14	-.21*	.14	.16	-.03	.13	.06	.25**	-.01	.14	-.36**	.26**	.30**	.09	-	
16. Supervisor Support	2.48	.73	.01	.02	.14	.05	.04	.09	-.10	.18	.14	.12	-.17	-.07	.13	.06	.32**	-

** = p < .05, ** = p < .01, *** = p< .001*

Data Analysis

The individual employee is the level of analysis for our study. The general analytic strategy is hierarchical multiple regression analysis to test the direct, main effects of the job demands and job resources on the performance indicators, as well as the interactive effects of the job resources.

Each of the three dependent variables was tested using hierarchical multiple regression in which the control variables were entered on step 1. In step 2, the independent variables of job demands (i.e., workload, work pace, and role demands) and job resources (i.e., control, training, task identity, task significance, skill variety, feedback, and supervisor support) were entered. In step 3 we entered each of the interaction terms—i.e., each of the job demand variables multiplied by each of the job resource variables.

Results

Direct Effects

Table 1 presents the means, standard deviations, and correlations for the variables. Younger workers and those workers with less tenure in the organization experienced greater role demands. This is no doubt due to their lack of experience with the initial ambiguity and role conflict often associated with a new job. There was no significant relationship for any of the control variables with work pace or workload demands. Lower tenured workers reported receiving more job feedback and more training, while workers younger in age did not perceive as much task significance in their jobs as workers older in age.

The role demand and workload demand measures were positively correlated with each other ($r = .21$, $p < .05$), as was workload and work pace ($r = .37$, $p < .01$). As would be expected, role demand ($r = -.31$, $p < .01$) and work pace ($r = -.20$) were negatively correlated with control.

Perceived workload demands were significantly related to all three objective performance measures: call duration ($r = .31$, $p < .05$), number of calls ($r = -.20$, $p < .05$), and wait time ($r = .23$, $p < .05$). Conversely, role demands and work pace do not seem to correlate with work performance in this study.

Significant relationships were found for control with two out of the three dependent variables, call duration ($r = .34$, $p < .01$) and waiting time ($r = .29$, $p < .01$), as well as with training ($r = .25$, $p < .01$), indicating that more training seemed to engender greater perceptions of control on the job. Task identity was also found to vary with all three objective performance measures: call duration ($r = .30$, $p < .01$), number of calls ($r = -.20$, $p < .05$), and waiting time ($r = .33$, $p < .01$). Skill variety ($r = -.25$, $p < .05$) is related to number of calls. Notice that an *opposite* relationship exists for duration, waiting time, and number of calls, such that more control and higher task identity are felt as the duration of calls and waiting time increases, but task identity and skill variety decrease as number of calls increase.

In the case of the relationships within the job resources themselves, feedback was positively correlated with control ($r = .25$, $p < .05$), with task identity ($r = .26$, $p < .05$), with task significance ($r = .30$, $p < .01$), and with supervisor support ($r = .32$, $p < .01$). Training was not correlated with any other variable except control, as mentioned before. Overall, these direct relationships indicate that job resources—in this case, control, training, skill variety, feedback, task identity, task significance, and supervisor support—do relate to workers' perceptions of some of their job demands and their actual job performance. However, the two organizations in this study considered higher performance to be lower call duration and higher number of calls. The findings from these direct relationships suggest that employees who perceive that they have greater job resources spend more time on the phone with customers and take fewer calls. We explore this in more detail by looking at the moderating effect of these job resources on the relationships between job demands and objective indicators of performance.

Moderating Effects of Job Resources on Job Demands-Performance Relationships

Based on the theory that having adequate and available resources will help reduce the stressful nature of job demands and result in higher performance, we tested each of the seven job resource moderators and their effects on the demands-performance relationship. We present the three job demands (role, workload, and work pace) and their interactions in Tables 2, 3 and 4 for comparison purposes. Additionally, in order to get a better understanding of the form of significant interactions, we plotted them and provide one example for each performance dimension in Figures 2, 3 and 4.

Role Demands

Training was the only job resource that significantly moderated the role demands-call duration relationship ($\beta = -1.27$, $p < .05$). Our results show that as role demands increase, training plays an important part in how long a call center employee stays on the phone with the customer. We alluded earlier to the fact that role demands did not correlate with any of the performance measures; however, as this test of the moderating effect of training shows, call duration actually increases as role demands increase for those with higher levels of training, a finding opposite of what we

predicted. We might explain this by noting that training provides more knowledge and ability to the individual employee. As such, even in the face of conflicting and ambiguous demands on the worker, more training allows them to answer questions and solve problems for the customer, a result that likely takes longer on the phone, but is more satisfactory for the customer.

Table 2: *Regression of Performance Measures on Role Demands and Job Resources*

		Avg. Call Duration			Avg. Number of Calls			Avg. Waiting Time		
	Independent Variable	**R^2**	**Std Err**	**β [1]**	**R^2**	**Std Err**	**β**	**R^2**	**Std Err**	**β**
Step 1	Org ID			-.06			.12			.01
	Org tenure			-.30			.17			-.01
	Age			.02			-.28			-.03
		.07	.97		.03	303.87		.17	.51	
Step 2	Customer Service Training			.17			.50			.75
	Perceived Control			-.54			.02			.02
	Supervisor Support			-.21			.28			.05*
	Task Identity			-1.12			-1.37**			.02
	Task Significance			.00			-.98*			-.14*
	Skill Variety			-.47			-.23			.01
	Feedback			.79			1.75**			-.05
	Role Demands			-2.71			1.20			-.05
	Workload			-.03			-.02			.06
	Work Pace			-.21			-.07			.07
		.29	.95		.13	211.09		.22	.51	
Step 3	Role*Control			1.09			-.20			-.05
	Role*Training			1.27*			-.49			.01
	Role*Significance			.15			1.48*			-.09
	Role*Identity			1.51			1.92**			.10
	Role*Feedback			-1.20			1.89**			.00
	Role*Variety			.55			.62			-.01
	Role*Support			.54			-.37			-.21
		.38	.89		.36	302.99		.33	.50	
	Overall Model F	2.646*			7.584**			1.51		
	df	19			19			19		

[1] Regresssion weights are standardized coefficients taken at the final step of the equation

** = p < .05, ** = p < .01, *** = p<.001*

Three job resources, Feedback (β = 1.89, p <.01), Task Identity (β = 1.92, p <.01), and Task Significance (β = 1.48, p <.05) interacted with role demands to predict number of calls. In its relationship with number of calls, as role demands increase, employees who perceive they have more job content resources take more calls. This may be due to the fact that as they face increased and conflicting demands (i.e., help the current customer vs. respond quickly to the next customer), they choose to do what they are primarily rewarded for doing, acting efficiently. Figure 2 portrays the task identity-role demands interaction with number of calls.

Workload Demands

Training provided the only job resource interaction with workload. The significant interactions were between workload and training in predicting both call duration (β = 1.16, p <.05) and waiting time (β = -2.43, p <.05). Figure 3 portrays the relationship between workload and the amount of wait time at high and low levels of training. It is clear from this finding that waiting time virtually remains the same (higher) when training is lower, even as workload demands increase. However, there is a noticeable drop in waiting time at high levels of training. Again, employees who receive more

training in solving customers' problems or to sort out their issues can reduce the time on hold, even in the face of increasing workload.

Table 3: *Regression of Performance Measures on Workload and Job Resources*

		Avg. Call Duration			Avg. Number of Calls		
	Independent Variable	R^2	Std Err	β [1]	R^2	Std Err	β
Step 1	Org ID			.96*			2.45**
	Org tenure			-.34			-.19
	Age			.04			.31
		.07	.97		.06	308.78	
Step 2	Task Identity			.41			-.78
	Skill Variety			-.13			-.36
	Task Significance			-.37			-.46
	Feedback			.80			-1.49
	Perceived Control			.27			.68
	Customer Service Training			.12			-.56
	Supervisor Support			-1.23			.45
	Workload			-.26			-.04
	Work Pace			.05			-1.18
	Role Demands			-.22			.02
		.30	.94		.17	311.89	
Step 3	Workload*Identity			.46			.68
	Workload*Significance			-.01			.78
	Workload*Variety			-.40			.27
	Workload*Feedback			-1.21			1.65
	Workload*Control			-.29			-1.06
	Workload*Training			1.16*			-.65
	Workload*Support			.66			.63
		.34	1.01		.24	313.45	
	Overall Model F	3.834*			.99		
	df	19			19		

[1] Regresssion weights are standardized coefficients taken at the final step of the equation

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table 4: *Regression of Performance Measures on Work Pace and Job Resource*

		Avg. Call Duration			Avg. Number of Calls			Avg. Waiting Time		
	Independent Variable	R^2	Std Err	β [1]	R^2	Std Err	β	R^2	Std Err	β
Step 1	Org ID			.67*			.76*			-.55*
	Org tenure			-.24			-.18			.14
	Age			.04			.25			-.12
		.01	6.74		.11	309.47		.03	.59	
Step 2	Customer Service Training			1.72			1.59			.25
	Perceived Control			.57*			.26			-.05
	Supervisor Support			-1.26			-.25			-.37
	Task Identity			.77			.37			.90
	Task Significance			.10			1.23			.47
	Skill Variety			-1.06			-.70*			.04
	Feedback			1.20			-.20			2.16*
	Role Demands			-.20			-.06			.17
	Workload			.00			-.08			-.09
	Work Pace			1.09			1.35			2.17
		.24	6.53		.13	315.39		.08	.58	
Step 3	Workpace*Identity			-1.15			-.52			-1.09
	Workpace*Significance			-.23			-1.97			-.50
	Workpace*Variety			1.03			.53			.03
	Workpace*Feedback			-1.78			.23			-2.64*
	Workpace*Control			-.78*			-.45			.01
	Workpace*Training			-1.36			-1.55			-.33
	Workpace*Support			1.67			.32			.28
		.30	6.71		.22	319.34		.18	.53	
	Overall Model F	2.89*			1.80			3.44*		
	df	19			19			19		

[1] Regresssion weights are standardized coefficients taken at the final step of the equation

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

On the other hand, call duration increases at high levels of training (much the same way it operated for role demands). Thus, it is likely that despite increasing demands of the job, highly trained call center employees will focus on solving the problem or answering the question, no matter how long it takes, rather than focusing primarily on the sheer number of calls they take.

Figure 1: *Model of the Job Demands-Performance Relationship with Job Resources as Moderators*

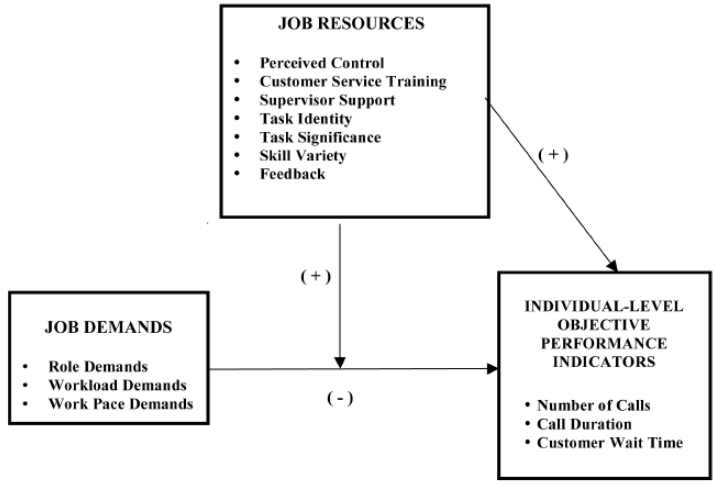
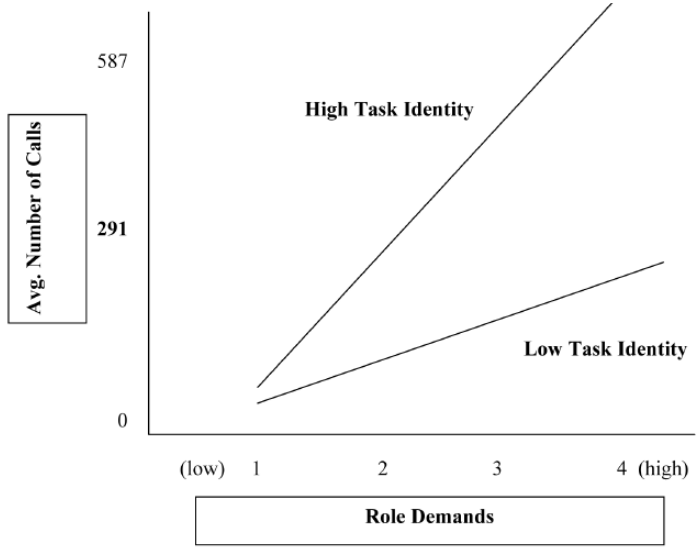


Figure 2: *Moderating Effect of Task Identity on the Role Demands-Number of Calls Relationship*



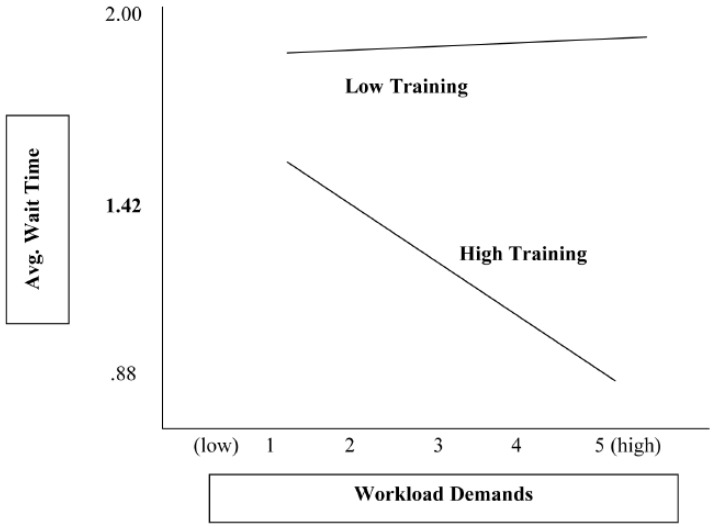
Work Pace Demands

Table 4 indicates two significant interactions with work pace for two of the performance measures. Feedback moderates the work pace-wait time relationship (β = -2.64, p <.05) while control interacts with work pace to predict call duration (β = -.78, p <.05). Both of these job resources act to reduce the call duration as the pace picks up.

In Figure 4, we plot the control-work pace interaction for call duration. Note that at low levels of control employees actually increase slightly the time spent on calls, even when the pace increases. But, at high levels of control, the duration sharply decreases as the pace gets faster. Employees who perceive they have control over their work day likely choose to spend time only on customers that they can readily help, perhaps referring customers who have longer, more time-consuming questions or problems to a technical person or a supervisor.

In sum, our results partially support all three hypotheses for objective measures of performance. However, not all performance indicators are created equal. Clearly, the performance of call center employees is affected by the role, workload, and pacing demands of their jobs. Just as clear, however, is the ability of some job resources to help ameliorate the negative effects of those demands on performance. In the next section, we discuss the implications of these findings for future research and for managing call centers.

Figure 3: *Moderating Effect of Customer Service Training on the Workload Demands-Customer Waiting Time Relationship*



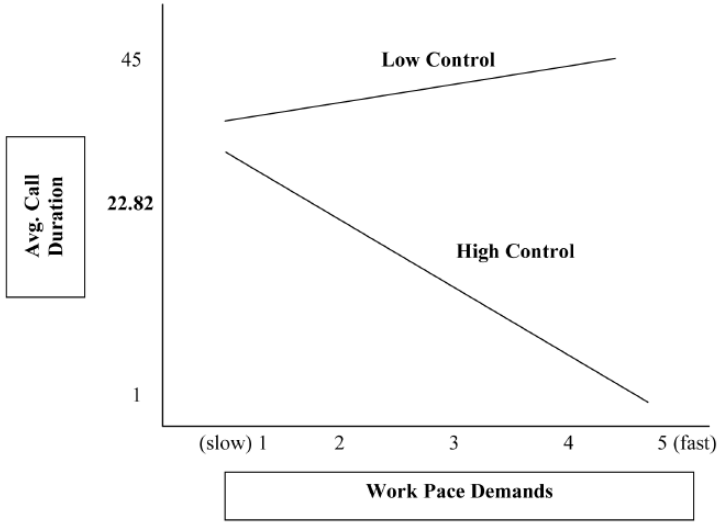
Discussion

Our study investigated the moderating effect of job resources (control, training, supervisor support, and four job content characteristics) on the relationship between job demands and performance. Workload demands, work pace demands, and role demands were presumed to be undesirable to employees and, therefore, would result in overall lower job performance. Job resource variables (feedback, task identity, task significance, skill variety, control, training, and supervisor support) were presumed to be desirable for employees and, logically, should result in overall higher job performance.

In contrast with the findings of Spector, Dwyer & Jex (1988) and Glaser, Tatum, Nebaker, Sorenson, & Aiello (1999), our study found a relationship between job demands and performance that differed depending on the levels of perceived available resources at the individual employee level. The overall results here support the notion that although these demands negatively affect performance, the influence of greater job resources seems to result in differential effects on performance. One such anomaly found in our study was that call duration seemed to increase as the level of some job resources increased, even in the face of increased job demands.

In this, our findings support those of Tuten & Neidermeyer (2004), Slater (1999), and Weitzman (2000) in their view that call centers *hope* that call center employees will resolve complex and time-consuming customer issues, but *reward* them based on having a large number of calls and a shorter length of time on the phone. As a preliminary suggestion for call center managers, we would encourage the re-thinking of call center performance measures and the restructuring of the performance management approaches used with customer service and sales associates in call centers.

Figure 4: *Moderating Effect of Control on the Work Pace-Call Duration Relationship*



We did not find that the effects of the job resource variables were very similar across the three performance indicators. However, the notion that these can vary in their ability to predict health and performance indicators is consistent with studies by Kelloway & Barling (1991) and Xie & Johns (1995) who also found support for some of job content variables, but none for others. In our study, it makes some sense that training, task identity, task significance, feedback, and control tend to be the primary resources. Clearly, employees who see "wholeness" to their work (i.e., solving customer concerns, using their full abilities), have good job knowledge, feel as if the job is important, and feel control over their tasks are more likely to spend more time and energy with customers, be able to handle a high number of incoming calls, and adjust their performance in the face of increased workload, role conflicts, and pace. What is most interesting, we believe, is how they choose to do that.

Increased call duration allows trained employees to solve customer problems. Given that they receive direct feedback from the job itself, it makes sense that successful employees are reinforced for being customer-centered and, thus, must reduce the number of calls they can handle successfully in a given time period. However, in the face of a conflict over "quantity vs. quality," it appears from our study that employees who see less control, are not as well-trained, and who don't see a lot of motivating potential in their call center jobs tend to follow the reward structure: that is, whatever the call center indicates is the primary reward, that is what they will do. Because the "number vs. duration" issue is problematic to discern what constitutes an acceptable balance, call center managers need to be explicit in their expectations for employees. On the other hand, those call center employees who are better trained and see their job as solving customers' problems and providing service, may choose to reduce the volume of calls they take and concentrate on the service aspect, despite the organization's emphasis on call volume.

It is interesting, too, that we found no significant role for supervisor support in moderating any demand-performance relationship. One explanation might be that it is the supervisors who are creating some of the job demands, and so they not perceived by employees to be particularly supportive overall.

Both customer service training and employee control seem crucial in providing coping mechanisms for demanding job tasks in call centers. Moreover, organizations that provide a combination of training and enhanced control would likely find even higher performance on some tasks. We echo the call by Xie & Johns (1995) for more research on the effects of enriched and challenging tasks on performance. We would encourage future research to investigate the myriad of ways that employees can have more job resources at hand to deal with the ever-increasing and ever-changing nature of their work demands. In our study, we looked at only three types of demands: role, workload, and work pace. We might also suggest that other demands (e.g., time demands and deadlines, emotional demands, cognitive demands, etc.) may require different types of resources (e.g., supervisor support, time, structure, etc.) to provide individual employees with what they need to insure high performance and their own well-being. In addition, there may still be some question on the effect of training and control on other job resources themselves. Because our sample size did not permit that we test a structural path model, it may be beneficial to see whether higher training

and greater control actually lead to perceptions of higher task identity, task significance, feedback, and skill variety, supervisor support, etc. If so, then some of the conflicting findings (e.g., Bakker, Demerouti, & Euwema, 2005) on the JD-R may be able to be resolved.

Our study, like most, had some limitations. The size of the sample was somewhat modest and consisted of 90 percent women. Research on gender and performance doesn't really even exist. Moreover, the research on gender and stress is also in its infancy and has primarily investigated the different types of experienced stress, as well as women's health responses compared to men's health responses, across job types or even across occupations (Frankenhaeuser, Lundberg & Chesney, 1991). These studies have generally yielded mixed findings. In a meta-analytic review of studies on gender differences in work stress, Marticchio & O'Leary (1989) found no significant difference in occupational stress between men and women. McDonald & Korabik (1991), however, found that women reported being subjected to different types of stress than did men. That is, female managers reported more stress from work-family interface and gender-based barriers than did male managers. Similarly, Nelson, Quick, Hitt & Moesel (1990) noted in their study that female HR professionals reported significantly more stress as a result of organizational politics than their male counterparts. In contrast, Tung's (1980) study of educational administrators suggests that women perceive significantly lower levels of occupational stress than men. Of course, these studies did not deal directly with performance outcomes, so it is difficult to predict whether the relationships posited in our study would be different if the vast majority of customer service employees were men or if we had done a similar study in another industry.

The strength of this study, however, lies in some of the methodological refinements we were able to make over previous studies, such as gathering objective performance data over two years and obtaining multiple objective indicators of performance. We believe that future studies should continue to include objective measures of performance, in addition to more subjective ratings, to investigate the potential effects of job demands, and to look more closely at the role of job resources in those relationships. In addition, research that employs longitudinal designs is needed to gain a better understanding of those specific job demands and job resources that may be predictive of actual job performance over time.

Given the increasing use of call centers in the U.S. and abroad (particularly India and Latin America), we suggest that future research also look at comparative studies of performance, job resources, and job demands that are similar to and different from those in the United States. At present, comparisons between the quality of customer service provided by domestic and international customer service representatives have been largely anecdotal. For example, performance comparisons on specific behaviors, such as service orientation (courtesy and professionalism toward customers), communication (clarity of speech and grammar), and call management (using time efficiently on the phone and the number of repeat calls, (calls in which the customer indicated that he/she was calling back about an issue that wasn't resolved on a previous call)), may prove to be different for each location. Moreover, job resources, such as training, control, and supervisor support, may interact differently with role and

workload demands for international call center representatives than they do for domestic call center representatives, particularly if the culture of the international country holds these jobs higher in social status than we do in the U.S.

Such questions should be the focus for future call center research, particularly given that call center offshore outsourcing is currently one of the largest trends in the U.S. call center industry, particularly in India (where 350,000 people are employed in the outsourcing industry each year, with 150,000 new jobs added every twelve months) and Central America (where the number of call-center workstations will hit 730,000 in 2008, up from 336,000 in 2004). Clearly, there are other potential health, compensation, performance, customer service, and management research questions that will need to be asked so that we better understand how to effectively lead and manage call center employees in the 21st century.

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