

## IT ROAD WARRIORS: BALANCING WORK–FAMILY CONFLICT, JOB AUTONOMY, AND WORK OVERLOAD TO MITIGATE TURNOVER INTENTIONS<sup>1</sup>

By: **Manju K. Ahuja**  
Operations and Decision Technologies  
Kelley School of Business  
Indiana University  
Bloomington, IN 47405-1701  
U.S.A.  
mahuja@indiana.edu

**Katherine M. Chudoba**  
MIS Department  
College of Business  
Florida State University  
Tallahassee, FL 32306-1110  
U.S.A.  
kchudoba@cob.fsu.edu

**Charles J. Kacmar**  
Department of Information Systems, Statistics,  
and Management Science  
Culverhouse College of Commerce  
University of Alabama  
Tuscaloosa, AL 35487-0226  
U.S.A.  
ckacmar@cba.ua.edu

**D. Harrison McKnight**  
Accounting and Information Systems Department  
The Eli Broad College of Business  
Michigan State University  
East Lansing, MI 48824  
U.S.A.  
mcknight@bus.msu.edu

**Joey F. George**  
MIS Department  
College of Business  
Florida State University  
Tallahassee, FL 32306-1110  
U.S.A.  
jgeorge@garnet.acns.fsu.edu

### Abstract

*This study examines the antecedents of turnover intention among information technology road warriors. Road warriors are IT professionals who spend most of their workweek away from home at a client site. Building on Moore's (2000) work on turnover intention, this article develops and tests a model that is context-specific to the road warrior situation. The model highlights the effects of work–family conflict and job autonomy, factors especially applicable to the road warrior's circumstances. Data were gathered from a company in the computer and software services industry. This study provides empirical evidence for the effects of work–family conflict, perceived work overload, fairness of rewards, and job autonomy on organizational commitment and work exhaus-*

---

<sup>1</sup>Ritu Agarwal was the accepting senior editor for this paper. Kathryn M. Bartol, Jo Ellen Moore, and Damien Joseph served as reviewers.

tion for road warriors. The results suggest that work–family conflict is a key source of stress among IT road warriors because they have to juggle family and job duties as they work at distant client sites during the week. These findings suggest that the context of the IT worker matters to turnover intention, and that models that are adaptive to the work context will more effectively predict and explain turnover intention.

**Keywords:** Turnover, turnover intention, IT personnel, road warrior, organizational commitment, work–family conflict, work overload, autonomy, fairness, work exhaustion

## Introduction

Scholars have learned a great deal about the antecedents of turnover intention in work organizations in which people are physically collocated (Cotton and Tuttle 1986; Mobley et al. 1979) and particularly among technical professionals (Igarria and Greenhaus 1992; Moore 2000). However, little is known about the causes of turnover intention among those we call information technology road warriors (RWs). We define IT RWs as IT consultants who spend most of their workweek at distant client sites (including overnight), representing their employer (Madden 1995). When not at a client site, they travel back to a home office. While management consultants, salespeople, and others may also be characterized as RWs, our focus is on those who (1) hold an IT position, (2) are from a primarily IT-based or IT-driven company, and (3) work at the client site for the sole purpose of IT support.

The number of IT RWs is significant and growing, although exact figures are not available. Studies suggest that outside consultants represent 12 to 23 percent of all IT staff in organizations today (King 2003), and sizeable numbers of these are RWs. Procurement of complex vendor software systems (e.g., ERP systems like SAP R/4) requires customization, installation, and support by either specialists from vendor firms or outside consultants. That there are such large numbers of these workers is partly due to the difficulty and expense of training in-house employees on a myriad of specialized skills and software tools. The trend toward outsourcing undoubtedly also increases the number of RWs.<sup>2</sup>

IT RWs are crucial to their own companies as well as to the clients they serve (Lovett et al. 1997). Turnover harms the client because much of the RW's knowledge is client-specific,

including how a vendor's system fits within the business processes and systems of the client. The RWs' employer organizations are impacted by turnover not only because they lose a consultant who has in the past represented them but also because it means the client has to train and socialize a new consultant, straining the vendor-client relationship.

This research examines the antecedents of turnover intention for the IT RW, responding to a call by Ang and Slaughter (2000) to study IT professionals within the context in which they work. While turnover models have been tested in many types of organizations, contextual factors may affect how these models work in a given context. Suggesting that context matters, Hom and Griffeth (1995) concluded their turnover meta-analysis by stating that "most correlations changed across settings or populations" (p. 37). Workplace attributes have been shown to be important predictors of perceptions about the job and turnover (Oldham and Rotchford 1983). Thus, it is important to study IT RW turnover in a context-sensitive manner.

Our contribution is to adapt and empirically test Moore's (2000) turnover intention model in the RW context. This is done by substituting work–family conflict (WFC) for Moore's role stressors and by adding organizational commitment, both of which we believe apply to the unique challenges of IT RWs. Like Moore, we examine the effects of autonomy, perceived work overload, work exhaustion, and fairness of rewards, all relevant in the RW context. We suggest the key source of stress among RWs is WFC, which we therefore substitute for Moore's role stressors, role conflict and role ambiguity. WFC is the role tension that occurs as job demands interfere with the performance of family duties (Netemeyer et al. 2004). Juggling family and job duties is more difficult for RWs since they work at distant client sites during the week. We also examine organizational commitment since IT RWs spend most of their time with clients instead of with other company personnel, straining ties to their employer. We propose the model as a parsimonious and context-appropriate way to study IT RW turnover intention.

The paper proceeds as follows. We begin by briefly discussing Moore's model and how it was adapted to IT RWs. We then present the details of our methodology. Next, the results of the data analysis are presented and discussed. We conclude with implications for research and practice.

## Theory Development

IT researchers have studied the causes of turnover since at least the 1980s (Baroudi 1985; Bartol 1983; Ditttrich et al.

<sup>2</sup>We are grateful to the senior editor for this insight.

1985), and several recent turnover models have significantly increased our understanding of IT turnover. Jiang and Klein (2002) produced a model predicting turnover indicators from the discrepancy between employee wants and how the organization satisfies those wants. Other models used job satisfaction and job utility to predict search and quit intentions (Thatcher and Stepina 2001), and organizational commitment as a mediator of job satisfaction and other turnover predictors (Thatcher et al. 2002). Speier and Venkatesh (2002) found that person-technology fit was negatively related to absenteeism and turnover. Igbaria and his associates developed influential models of turnover that included such factors as organizational commitment, career and job satisfaction, and role stressors (e.g., Igbaria and Greenhaus 1992; Igbaria and Guimaraes 1999).

We base our model on the influential recent IS turnover model proposed by Moore (2000). It suggests a key factor shaping IT turnover intention is work exhaustion, modeled first as fully mediating the effects of autonomy, perceived work overload, fairness of rewards, and two stressors, role ambiguity and role conflict. A second, partially mediated model with direct links from the other predictors to turnover intention had a better fit than the full mediation model. We build on Moore's model because it is influential, recent, and has many constructs applicable to the RW context, especially the potential for work overload and work exhaustion.

### **Adaptation of Moore's Turnover Model to IT Road Warriors**

The research model (Figure 1) was adapted from Moore. After a literature review, we conducted 12 semi-structured interviews with IT RWs in a large software company to uncover issues important to RW turnover. These interviews clarified how Moore's model applies to IT RWs. Several of Moore's constructs are important in the RW context. First, work exhaustion and work overload apply to RWs because of the long hours RWs often incur at the client site in order to accomplish their objectives before coming home on the weekend. Work overload has a strong influence on work exhaustion (Moore 2000), and this should hold for RWs because they can burn out when overburdened. Second, autonomy is important since most IT RW work is done at client sites, with few opportunities for corporate-based superiors to observe work directly. Autonomy provides RWs freedom and flexibility to manage their own workloads such that they do not unduly increase stress or work exhaustion. Third, fairness of rewards is important to RWs because they need to feel that the extra travel and offsite work they do will be rewarded, especially given the lack of counterbalancing

social interaction rewards they would experience if they worked at headquarters. Pay and reward equity was important to the RWs we interviewed, especially as they compared their job and career path to those at headquarters. Adopted from Moore's full-mediation model, then, we offer several hypotheses.

**H1:** Perceived work overload will positively influence work exhaustion among IT road warriors.

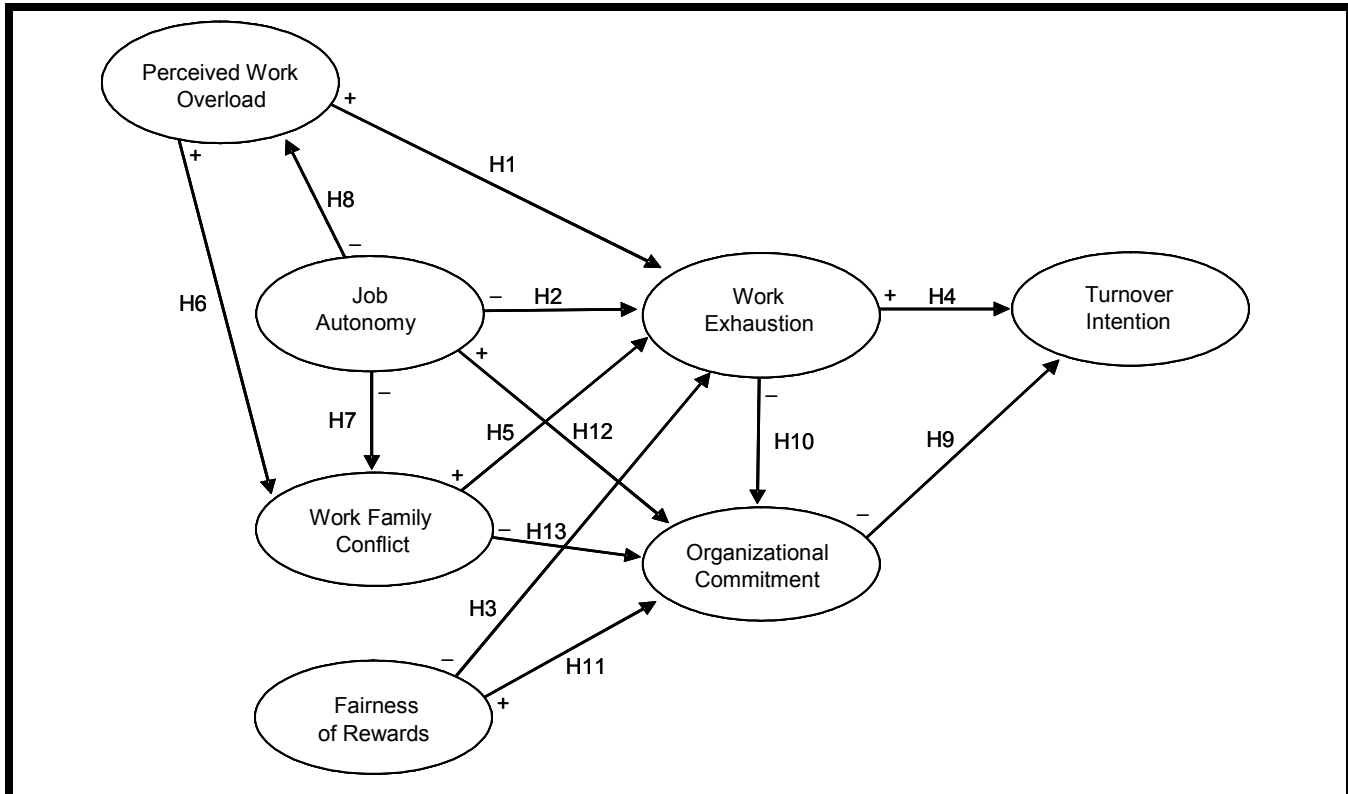
**H2:** Autonomy will negatively influence work exhaustion among IT road warriors.

**H3:** Fairness of rewards will negatively influence work exhaustion among IT road warriors.

**H4:** Work exhaustion will positively influence turnover intention among IT road warriors.

In adapting the Moore model to RWs, we add two constructs that we believe are very salient to RWs: WFC and organizational commitment (Figure 1). The pre-study interviews suggested that WFC was a very critical factor in the lives of RWs and a primary source of stress, making it worthy of further investigation. They had to balance work and family duties in creative ways because of their travel schedule. To our knowledge, WFC has been studied in other fields (Boles et al. 1997; Frone et al. 1992), but not in IT.

We predict that WFC will have stronger effects than the stressors Moore used, role ambiguity and role conflict, for a theoretical reason as well. Netemeyer et al. (2004) studied salespeople and used identity theory to argue that WFC has to do with both work and family role identities of the employee. Both roles are highly salient. The more salient the identity, the stronger its effect upon perceptions. Netemeyer et al. suggested "that clashes between salient role identities can have more pronounced effects than within-role clashes/conflicts" (2004, p. 51). Conflict involving work and family can cause serious distress, but role conflict and role ambiguity represent within-role conflicts, which are likely to be less salient than WFC because they pertain only to one's work role identity. Thus, WFC should be a stronger predictor of job outcome perceptions than role conflict and role ambiguity. Effects of WFC on turnover intention have been found to be significantly greater than the effects of role ambiguity, and the effects of WFC on job stress were greater than that of role conflict (Netemeyer et al. 2004). The differential effects of WFC will be magnified for RWs since family and work roles are difficult to manage because of frequent time away from home. Hence, we use WFC in lieu of Moore's stressor variables as an antecedent of work exhaustion and organizational commitment.



**Figure 1. Theoretical Model (Adapted from “One Road to Turnover: An Examination of Work Exhaustion in Technology Professionals,” J. E. Moore, MIS Quarterly (24:1), 2000.**

In addition, we incorporate organizational commitment in the model because RWs interact more frequently with clients than with members of their own organizations and may, in time, identify less with their employer, decreasing organizational commitment. Some RW interviewees were frustrated at not feeling connected with the company because of physical distance from both coworkers and supervisors. Their feelings of being alone were not cries for more supervision, as they valued their autonomy. Rather, RWs wanted to keep in touch with what their peers were doing and where the organization was headed in order to better understand how to move forward in the company. Not feeling fully connected with the company could lead to low commitment, which could affect turnover intention. In fact, organizational commitment has been found to be an influential and consistent predictor of turnover intention in both IT and other settings (Cotton and Tuttle 1986; Igbaria and Greenhaus 1992).

Control variables were also contextualized to fit the RW situation. Like Moore, we controlled for age and organizational tenure, both traditional turnover controls. Moore controlled for negative affectivity but did not find a significant

effect on turnover intention, so we excluded it. We included marital status since it may relate to the effects of WFC. Finally, we included promotability (Igbaria and Greenhaus 1992) in the model because RWs may be more willing to tip the balance toward work (and away from family) if they expect to be promoted in the near future. The RWs we interviewed said they often felt out of the loop regarding career paths and job opportunities at the headquarters.

**Work–Family Conflict as an Antecedent of Work Exhaustion**

WFC can be a source of occupational stress. In the “electronic briefcase” age, workers need not be physically located at the employer’s site, but can work from anywhere, anytime, and can communicate with colleagues electronically. Greenhaus and Beutell (1985, p. 77) define WFC as a “form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect.” We adapt this definition to include family, significant others, and close friends. Models of WFC suggest that

conflict arises when demands of participation in one domain of life are incompatible with demands of participation in another, and that this conflict can affect the quality of both work and family life (Greenhaus 1988; Greenhaus and Beutell 1985; Netemeyer et al. 1996). A European survey revealed travel/commuting was the single most stressful aspect of a worker's job because it led to family tension (<http://www.mori.com/polls/2001/mitel.shtml>). In virtual settings, a blurring of home and work boundaries has been linked with stress and exhaustion (Salaff 2002).

**H5:** Work–family conflict will positively influence work exhaustion among IT road warriors.

### **Antecedents of Work–Family Conflict**

Two antecedents of WFC may be especially salient to RWs: perceived work overload and autonomy. Perceived work overload—the perception that one has too much to do (Leiter and Schaufeli 1996; Schaufeli et al. 1995)—is associated with higher levels of WFC (Frone et al. 1997; Parasuraman et al. 1996). IT RWs may be especially susceptible to perceived work overload because of tensions inherent in their boundary spanner role (Singh et al. 1994), since they must meet the needs of both employer and client. Although IT RWs have easy access to information and communication technologies (ICT) to facilitate interaction with family and friends at home and are frequent ICT users in their role as boundary spanners, ICT use is not likely to be a sufficient substitute for face-to-face interaction with family members (Hinds and Kiesler 1995). Hence, work overload will have a positive influence on RW work–family conflict.

**H6:** Perceived work overload will positively influence work–family conflict among IT road warriors.

Job autonomy is “the degree to which the job provides substantial freedom, independence and discretion in scheduling the work and in determining the procedures to be used in carrying it out” (Hackman and Oldham 1975, p. 162). In its most general form, job autonomy influences employees' perceptions of their authority to initiate, perform, and complete tasks (Kaldenberg and Becker 1992; Xie and Johns 1995). It allows workers to manage WFC in a way that makes sense for them personally, given their personal constraints. Thomas and Ganster (1995) studied healthcare professionals and found higher autonomy was associated with lower levels of WFC. Likewise, the telecommuting literature suggests flexibility in the timing of work activities—autonomy over *when* work is done—can reduce WFC (Goldstein 2003; Pratt 1999).

Job autonomy is inherently higher in jobs that have a significant IT component in them because IT affords employees more opportunities to respond to their task demands through managing schedules and adapting technologies to fit the specific circumstances of their life (Ahuja and Thatcher, 2005). We suggest that when work is mediated by IT, as it is for RWs, it frees employees from rigid schedules or tight control systems. The employee can, therefore, balance competing demands more effectively.

**H7:** Job autonomy will negatively influence work–family conflict among IT road warriors.

### **Effects of Autonomy on Perceived Work Overload**

Because of the flexibility it provides, autonomy should also have a negative influence on perceived work overload. RWs can easily become overburdened with many tasks, but autonomy allows them to make adjustments to accommodate other aspects of their lives as needed, offsetting negative implications of high workload. Empirical examination of the relationship between task dimensions like autonomy and stressors like perceived work overload have produced ambiguous findings (see Aryee et al. 1999; Mannheim and Schiffrin 1984; Singh et al. 1996); however, in a meta-analysis, Lee and Ashforth (1996) demonstrate a relationship between perceived work overload and lack of autonomy. Moore also found that autonomy was correlated with perceived work overload.

**H8:** Autonomy will negatively influence perceived work overload among IT road warriors.

### **Organizational Commitment: Effects and Antecedents**

#### **Effects on Turnover Intention**

Organizational commitment is the extent to which one is involved in, and identifies with, one's organization (Mowday et al. 1982). When employees feel committed to an organization, they are likely to stay with the organization (Cotton and Tuttle 1986; Igarria and Greenhaus 1992; Mobley et al. 1979). Both the physical isolation of RWs and their proximity to clients put tension on their organizational commitment, which could easily erode. Because working continually in isolated locations requires high commitment to the firm, RW commitment should be a strong predictor of turnover intention.

**H9:** Organizational commitment will negatively influence turnover intention among IT road warriors.

### **Work Exhaustion**

RWs frequently face long hours, excessive travel, and stress associated with project deadlines (Goff 2001), making them susceptible to work exhaustion. The literature shows that the consequences of work exhaustion include reduced organizational commitment (Lee and Ashforth 1996; Leiter and Maslach 1988; Thomas and Williams 1995). RWs will likely decrease their organizational commitment as their work exhaustion increases, because they will lose faith that the company can take care of them by providing an acceptable work life. Regular IT workers experiencing work exhaustion can socially interact with others at the firm as they commiserate over the work conditions in a positive manner (“we’re all in this together”). Such social interaction may mitigate the effects of work exhaustion on organizational commitment. With RWs, on the other hand, physical distance severely restricts face-to-face social interaction, which means that the effects of work exhaustion on organizational commitment will not be mitigated.

**H10:** Work exhaustion will negatively influence organizational commitment among IT road warriors.

### **Fairness of Rewards**

Social exchange theory, based on the role of relationships between employees (Cropanzano, Rupp, and Byrne 2003; Cropanzano et al. 2001), suggests employees are inclined to form social exchange relationships with others so long as they perceive they are fairly and reciprocally receiving benefits of value to them as a result of the social exchange. In turn, social exchange relationships affect organizational commitment (Cropanzano et al. 2001). RWs isolated at clients’ sites may believe it is more difficult to both detect fairness violations and to correct any that arise, so they will be more sensitive about fairness issues. For regular IT employees, social interaction rewards might mitigate the effects of reward fairness on commitment. However, the lack of social interaction for RWs means that fairness of rewards will have a significant influence on organizational commitment.

**H11:** Fairness of rewards will positively influence organizational commitment among IT road warriors.

### **Autonomy**

Eby et al. (1999) found that autonomy was positively related to organizational commitment. Autonomy may be especially

important to IT RWs since it provides them the freedom to perform their work independently, reducing frustration from actions like playing telephone tag to get approval for work activities from remote supervisors who may not understand the circumstances at a particular site. Research on IT workers who telecommute found positive relationships between autonomy and organizational commitment (Bailyn 1994; Belanger 1999; Hill et al. 1998).

**H12:** Job autonomy will positively influence organizational commitment among IT road warriors.

### **Work–Family Conflict**

Ability to work from home on days in which family responsibilities require attention can be an important consideration in evaluating other job opportunities (Pratt 1999), suggesting a likely relationship between WFC and organizational commitment. RWs, who are susceptible to WFC issues, may decrease their commitment as WFC increases because high WFC indicates the company is placing undue burdens that cannot be reconciled with family duties.

**H13:** Work–family conflict will negatively influence organizational commitment among IT road warriors.

### **Mediating Role of Work Exhaustion and Organizational Commitment**

The research model depicts work exhaustion and organizational commitment as the proximal antecedents of turnover intention, mediating the effects of all other factors. Because of their conceptual diversity, using both work exhaustion and organizational commitment as mediators increases the likelihood that the other model antecedents will be fully mediated. For example, if autonomy is not mediated by the effects of work exhaustion alone, it may be mediated by the effects of organizational commitment. In contrast, Moore tested a single mediator, work exhaustion, and found that it only partially mediated the effects of other variables. The two mediators represent key, powerful, and complementary reasons one might decide to exit a company. If one does not feel committed to the organization, then one will have less positive beliefs about the company, its management, and anything else one associates with the company, such as its responsiveness to one’s career desires and needs. This tie-in to global beliefs and feelings about the company is one reason why organizational commitment has been a powerful turnover intention antecedent in prior research. Work exhaustion, on the other hand, is about the work itself and reflects salient frustration about job outcomes (Moore 2000), making it a key

**Table 1. Demographics of Sample**

| Total Responses: 171                                  |           |     |
|---|-----------|-----|
| <b>Gender</b>   | Female    | 54% |
|   | Male      | 46% |
| <b>Age</b>  | 22–30     | 27% |
|   | 31–40     | 28% |
|   | 41–50     | 33% |
|   | > 50      | 13% |
| <b>Marital Status</b>                                 | Single    | 41% |
|   | Married   | 59% |
| <b>Responsible for dependents on a regular basis?</b> | Yes       | 36% |
|   | No        | 64% |
| <b>Tenure at company</b>                              | ≤ 2 years | 34% |
|   | 2–5 years | 48% |
|   | > 5 years | 18% |

indicator of dissatisfaction levels that likely lead to turnover intention. The two variables are complementary both because one is about the job while the other is about the organization, and because organizational commitment inheres positive affect while work exhaustion inheres negative affect. They should, therefore, fully mediate the effects of the other factors.

**H14:** Work exhaustion and organizational commitment will fully mediate the effects of job autonomy, perceived work overload, work–family conflict, and fairness of rewards on turnover intention among IT road warriors.

## Method

We studied employees at a company in the computer and software services industry, with over 3,000 employees, most residing at company headquarters located in a large Midwestern U.S. city. Of these, about 700 employees are RWs because they work at client sites to install and maintain the information management systems developed at company headquarters. The company permits RWs to live wherever they wish and then travel to client sites, typically on a Monday morning through late Thursday schedule, with Fridays spent at home completing paperwork. When possible, RWs are assigned to clients located within the same region of the country as their home to minimize travel time. RW engagements range from several days to more than a year, with most lasting 3 to 6 months.

Background data were gathered during six hour-long telephone interviews with human resource representatives who supported RWs. Next, three researchers visited two client sites and conducted semi-structured interviews with twelve RWs, each lasting 45 to 60 minutes. RWs described positive and negative characteristics of their jobs. They reported on such topics gleaned from the telephone interviews as project teams, employee–manager relationships, maintaining a sense of community, and compensation. They completed a series of ranking exercises around the theme, “What really frustrates me at [company name] is . . . .” Interviews were tape-recorded.

Company management sent an e-mail to the 700 RWs, asking them to complete a web-based questionnaire. The questionnaire was server-hosted at a researcher’s university. A second e-mail was sent 10 days after the first, reminding RWs to complete the questionnaire. Of the 700 RWs contacted, 171 completed the instrument for a 24.4 percent response rate. Demographics of the sample are shown in Table 1. The respondents ranged from 22 to 50 years in age, with the 22–30, 31–40, and 41–50 age-groups represented almost evenly. Despite this wide range, 82 percent had 5 years or less of company tenure.

## Measures

The questionnaire items, mainly from existing scales, are listed in the Appendix, along with their sources. The autonomy measure was adapted from the organization behavior and social psychology literature (Beehr 1976). This approach differs from Moore’s (2000) measure in that her items reflect

input in decision-making, while ours reflect input regarding how, when, and what work is done.

WFC was measured using items from Adams et al. (1996). Turnover intention was measured using a four-item scale adapted from Moore (2000). Our work exhaustion scale is taken from Moore, whose items originated from eight items developed by Maslach (1982) and Maslach and Jackson (1984). Of the five items Moore selected, other researchers have reported reliability problems with the item "Working with people all day is really a strain for me" (e.g., Boles et al. 2000; Kickul and Posig 2001), so it was removed.

## Results

### *Response Bias and Common Method Variance Testing*

Response bias was assessed on gender, age, education, marital status, number of dependents, tenure with the company, tenure in current position, tenure in current project, and perceived promotability, using the Armstrong and Overton (1977) procedure. The sample was divided into three parts, with early, middle, and late respondents categorized by the date the questionnaire was received. An analysis of variance contrasting the early third of respondents with the late third of respondents indicated a nonsignificant difference for all variables but gender ( $F(9,89) = 5.04, p = .027$ ). During the early period, 24 females and 30 males responded while during the late period 30 females and 15 males responded.

We used the procedure recommended by Widaman (1985), combined with Williams et al. (1989), to test for the effects of common method variance. Following this approach, four models are estimated: (1) a null measurement model, (2) a model with all items pointed to a single method factor, (3) a multifactor trait measurement model with items pointed to the proposed latent constructs, and (4) a trait measurement model like model 3 but with an additional method factor. If a method effect of some magnitude exists, model 4 will fit the data significantly better than model 3. Next, this procedure allows the researcher to determine the amount of variance in the model contributed by the method factor by computing the average variance extracted (AVE) for the latent constructs vis-à-vis the method factor (Chin 1998). The variance explained by the method factor should be less than 25 percent of total (Williams et al. 1989).

Four models were estimated in LISREL 8.71 using a covariance matrix of the observed variables as input. We

obtained the following results: Null model ( $\chi^2 = 1088.21, df = 406$ ); measurement model with a single factor ( $\chi^2 = 4281.84, df = 377, p = .00, RMSEA = .246, NFI = .75, NNFI = .76, CFI = .78, AIC = 4398$ , and standardized RMR = .15); multi-trait model: ( $\chi^2 = 678.77, df = 356, p = .00, RMSEA = .073, NFI = .94, NNFI = .97, CFI = .97, AIC = 837$ , and standardized RMR = .058); multi-trait model with a method factor—a measurement model with items assigned to both their respective latent factor (i.e., seven factors) as well as to the method factor ( $\chi^2 = 524.47, df = 327, p = .00, RMSEA = .059, NFI = .95, NNFI = .97, CFI = .98, AIC = 740$ , and standardized RMR = .050).

As expected, model 4, with the addition of the method factor, improved fit (Williams et al. 1989).  $\chi^2$  difference tests among the models were performed, with the result that model 4 fit the data better than did model 3 ( $\Delta \chi^2 = 154.30, df = 29$ ). The improvement in fit was nominal, however, with both sets of fit statistics falling in the ranges recommended by Hu and Bentler (1999). The loadings for the items from model 4 were then used to compute the AVE (Barclay et al. 1995; Chin 1998) for each latent construct, including the method factor. Results indicated that the method factor accounted for 7 percent of the variance in the model. Since the AVE's for all other latent constructs met or exceeded the minimum cutoff of 0.50 (Chin 1998), and since the percent variance explained by the method factor was less than the critical method factor effect value of 25 percent as recommended by Williams et al. (1989), we concluded that common method variance was not a significant contributor to study results.

Partial least squares (PLS) was selected for data analysis,<sup>3</sup> using a two-step analytic approach (Anderson and Gerbing 1988). First, the measurement model is evaluated to assess the validity and reliability of the measures, and once it is accepted, the structural model is evaluated to assess the strength of the hypothesized links among the variables.

### *Measurement Model Evaluation*

Means, standard deviations, reliability measures (ICR), average variance extracted (AVE), and correlations for the variables are shown in Table 2. The lowest ICR in Table 2 is 0.87, well above the accepted level of 0.70 (Fornell and Larcker 1981). For convergent validity, PLS requires that AVE figures be 0.50 or above as an indicator that the items within a variable converge (Chin 1998). As Table 2 shows, each construct exceeds this requirement.

<sup>3</sup>PLS was chosen over LISREL because of the complexity of the model to be tested (i.e., the number of constructs and links; see Barclay et al. 1995; Chin 1998).



**Table 2. Descriptives, Correlations, and Measurement Model Statistics**

| Variable  | Mean | Std. Dev. | ICR  | 1          | 2          | 3          | 4          | 5          | 6          | 7          | 8           | 9           | 10          | 11          |
|---|------|-----------|------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| 1. Work–Family Conflict                         | 5.04 | 1.37      | .95  | <b>.79</b> |            |            |            |            |            |            |             |             |             |             |
| 2. Job Autonomy                                 | 5.05 | 1.12      | .87  | -.20**     | <b>.63</b> |            |            |            |            |            |             |             |             |             |
| 3. Work Overload                                | 4.10 | 1.46      | .94  | .48**      | -.31**     | <b>.79</b> |            |            |            |            |             |             |             |             |
| 4. Work Exhaustion                              | 3.59 | 1.37      | .94  | .52**      | -.34**     | .65**      | <b>.80</b> |            |            |            |             |             |             |             |
| 5. Organizational Commitment                    | 5.29 | 1.21      | .93  | -.32**     | .55**      | -.41**     | -.49**     | <b>.76</b> |            |            |             |             |             |             |
| 6. Fairness of Rewards                          | 4.36 | 1.30      | .95  | -.32**     | .58**      | -.33**     | -.40**     | .60**      | <b>.80</b> |            |             |             |             |             |
| 7. Turnover Intention                           | 2.55 | 1.35      | .95  | .22**      | -.32**     | .25**      | .42**      | -.67**     | -.38**     | <b>.82</b> |             |             |             |             |
| 8. Tenure at Organization                       | 1.80 | 1.74      | 1.00 | .13        | .25**      | .17*       | .22**      | .03        | .01        | -.04       | <b>1.00</b> |             |             |             |
| 9. Age  | n/a  | n/a       | 1.00 | .17*       | -.06       | .06        | -.05       | .09        | .02        | -.20**     | .08         | <b>1.00</b> |             |             |
| 10. Promotability                               | 4.69 | 1.86      | 1.00 | -.15       | .40**      | -.17*      | -.27**     | .51**      | .49**      | -.46**     | -.17*       | -.15*       | <b>1.00</b> |             |
| 11. Marital Status<br>(1 = Single; 2 = Married) | n/a  | n/a       | 1.00 | .05        | -.01       | -.02       | -.03       | .02        | -.01       | -.05       | .07         | .31**       | -.07        | <b>1.00</b> |

**Notes:** 1. Average Variance Extracted (AVE) is on the diagonal.  
 2. ICR refers to internal composite reliability.  
 3. Significance of correlations: \*\*p < .01; \*p < .05

Discriminant validity was assessed using the Fornell and Larcker (1981) test. First, each latent variable correlation should be less than the square root of the AVE on the same row and column. We apply a more stringent test—that the correlation be less than the AVE itself, as Table 2 shows. For example, the correlation between WFC and job autonomy (-0.20) would be compared to the bold diagonal items above it (0.79) and to its right (0.63) to verify that it does not exceed either diagonal element. Comparing each correlation against its corresponding diagonal figure, each correlation is less than the numbers on the diagonal, indicating that the discriminant validity test is met (Chin 1998). The highest correlation was between turnover intention and organizational commitment (0.67). These constructs passed the stringent version of the Fornell and Larcker test in that their respective AVEs were 0.82 and 0.76. Given that the measures demonstrated adequate construct validity, the measurement model was accepted, and we proceeded to test the structural model.

**Structural Model Results**

Figure 2 reports the results of the structural model test. We used a PLS bootstrapping technique with 100 resamples to assess the significance of model linkages. Control variables were entered as predictors of turnover intention, organiza-

tional commitment, and work exhaustion. Overall, we found support for the proposed model; specifically, 11 of the 14 hypotheses were supported. As predicted, both work exhaustion and organizational commitment (H4, H9) were significant turnover intention predictors, although the latter was more predictive. From the original Moore hypotheses, perceived work overload had a strong, positive influence on work exhaustion (H1), and autonomy negatively influenced work exhaustion (H2). Fairness of rewards did not significantly impact work exhaustion (H3). Importantly, WFC was positively associated with work exhaustion (H5) and perceived work overload affected WFC (H6), as predicted. Surprisingly, autonomy had no effect on WFC (H7), even though it influenced perceived work overload (H8). Work exhaustion (H10), fairness of rewards (H11), and autonomy (H12) significantly predicted organizational commitment, but WFC did not (H13).

To confirm full mediation by organizational commitment and work exhaustion (H14), we added direct paths to turnover intention from job autonomy, WFC, perceived work overload, and fairness of rewards and then reran the PLS structural model. None of the added links were significant in predicting turnover intention. They had only a minor effect, increasing the variance in turnover intention explained from 52 percent to 54 percent. Thus, H14 was supported.

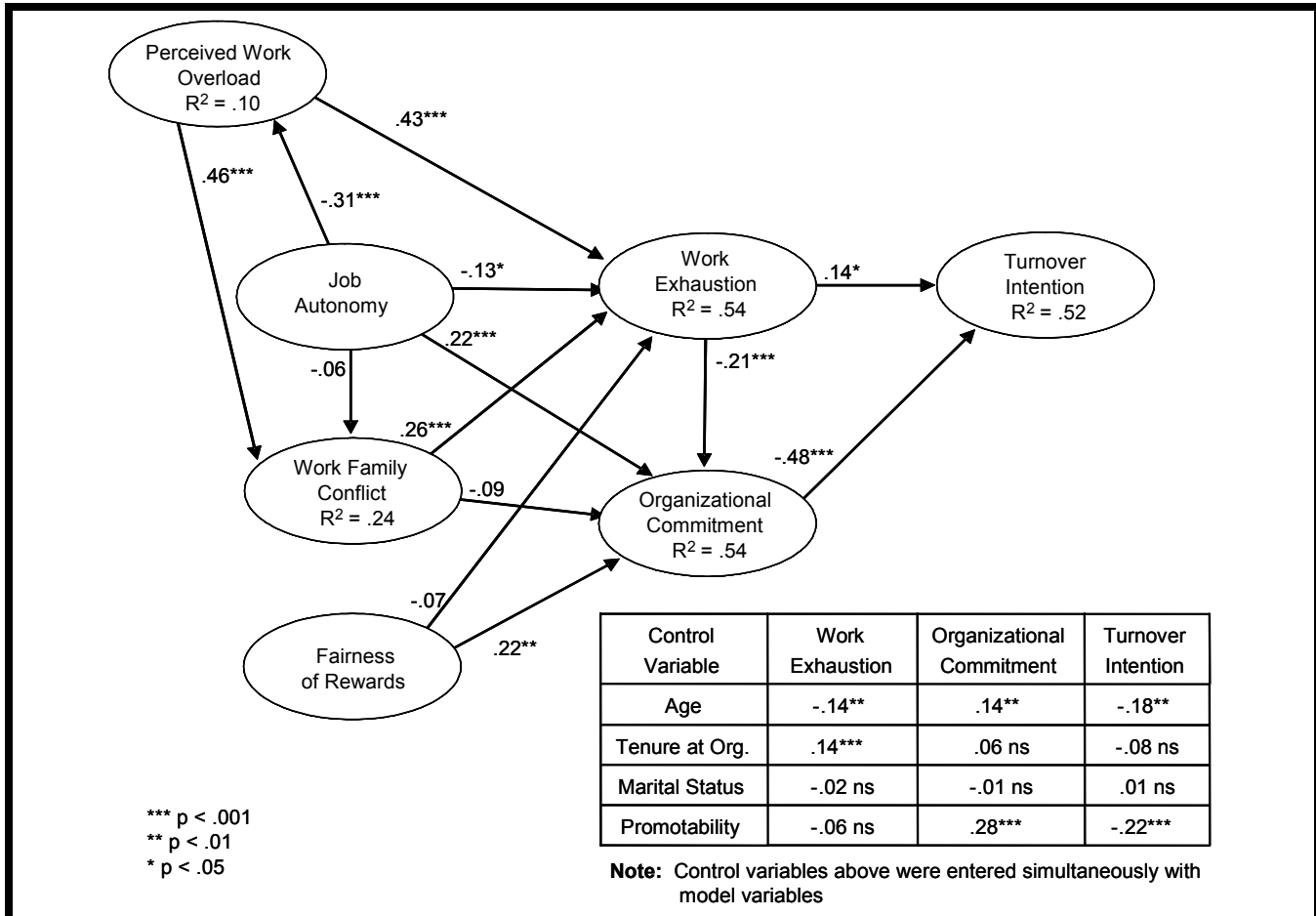


Figure 2. Structural Model

The variables in the Figure 2 model explained 10 percent of the variance in perceived work overload with one predictor, 24 percent of the variance in WFC with two predictors, and over 50 percent of the variance in work exhaustion, organizational commitment, and turnover intention with the predictors shown.

Among the control variables, the most pronounced effects were those of promotability on organizational commitment ( $\beta = 0.28***$ ) and turnover intention ( $\beta = -0.22***$ ). Age had modest but significant effects on organizational commitment, work exhaustion, and turnover intention, with the older workers being less exhausted, more committed, and less likely to turnover. By contrast, longer company tenure was related to more work exhaustion, indicating the toll the RW role pays over time. Tenure did not affect commitment or turnover intention. Marital status had no effect. To verify that we did not ignore relevant variables, we next added the control variables of gender and number of dependents (one at a time)

to the Figure 2 model but found no significant effect on any of the three dependent variables.

## Discussion

The model had reasonable explanatory power, accounting for slightly over half of the variance in turnover intention, implying that work exhaustion and organizational commitment are key RW turnover factors. These antecedents of turnover intention also had slightly over half of their variance explained. The results imply that WFC is an important predictor of work exhaustion for IT RWs and, through work exhaustion, affects organizational commitment. Autonomy is also salient for RWs, positively affecting organizational commitment and negatively affecting work exhaustion. This is not a comprehensive model, however, as many other factors such as role conflict and role ambiguity could be used.

The unique nature of the IT RW provides insight into several of our results, such as the link from autonomy to perceived work overload. In her study of IT workers, Moore (2000) found that these two variables correlated at  $r = -0.20$ . In this study, they correlated at  $-0.31$ . Thus, autonomy becomes even more important to work overload perceptions for RWs.

While autonomy correlated with WFC in the direction hypothesized, it did not significantly influence WFC, contrary to findings with virtual workers who telecommute (Goldstein 2003; Pratt 1999). In contrast to telecommuters, IT RWs do not have the option of taking a mid-day break to watch a child's soccer game or attend to family needs. Hence, IT RWs may not experience reduced WFC resulting from the job autonomy they experience because they live away from home for much of the week. This helps explain why autonomy affected both work overload and work exhaustion while not affecting WFC.

The indirect effect of WFC on organizational commitment implies that WFC creates sufficient energy drain to cause exhaustion but does not directly make one feel less committed to the organization. Low fairness of rewards, on the other hand, may make RWs feel bitter toward the organization and may reduce commitment directly, but does not cause them to feel work exhausted. This finding was corroborated by several interviewed RWs, who mentioned that they did not feel that superiors at headquarters were necessarily aware of their work performance, indicating some distrust in their performance evaluations.

Before moving on to discussing the implications of our findings, it is important to acknowledge several limitations. First, all data were collected from one organization, with one type of IT professional—the RW; hence, the results should not be generalized to other types of IT workers or organizations. Since the study began with a series of interviews that enabled us to contextualize the hypotheses to the work context, it is not surprising that the model applies well to this group of workers. While the constructs that predicted turnover intention antecedents—autonomy, work overload, WFC, and fairness of rewards—appear to be generic enough that they may apply to IT RWs in other organizations, future researchers should empirically test this. Another limitation is the moderate 24.4 percent response rate on the questionnaire. Company management indicated they considered this a relatively high rate and were pleasantly surprised. Concurrent with administration of the instrument, RWs were encouraged to maximize billable hours, and the questionnaire took about 30 minutes to complete. Management also confirmed that the demographic characteristics of our sample (see Table 1) closely matched the demographics of all RWs, suggesting our

sample was representative within the organization. However, it is possible, although we have no evidence for or against it, that those who filled out the questionnaires were those who were less work exhausted than average. Another limitation is that the questionnaire was administered at one point in time, making it impossible to prove that the model links are causal. For example, while we show that work exhaustion leads to organizational commitment, it is possible that the converse is true, as Kalliath et al. (1998) found. Also, we adapted previous scales rather than adopting them as-is. This implies that our results cannot be compared directly with the results of previous research.

### **Implications for Research**

Future work should test this model with other IT RWs in order to extend its generalizability beyond the subject organization. The extent to which the model's constructs apply to other IT workers should then be tested empirically. We believe that whenever significant work pressures exist that cause WFC, the variables in this model will capture a large share of the variance. The model should also be extended longitudinally to include actual turnover. We note that meta-analyses report that turnover intentions correlate with actual turnover only from .31 to .36, which means that turnover intention should not be used as a surrogate for turnover (Dalton et al. 1999; Hom and Griffeth 1995). Turnover intention does not always result in turnover because a number of other factors enter the equation. Missing factors include geographic or locality preferences, the availability of outside job opportunities (Igbaria and Greenhaus 1992), the expected utility of those opportunities (Mobley et al. 1979), intention to search for another job (Arnold and Feldman 1982), and shock events that produce job-related deliberations (Lee and Mitchell 1994). Future research should explore other predictors that might help determine the point at which an RW moves from a state of casual consideration of how long one might stay at the company to a state of active, outside-company job seeking.

This study suggests that more research should be done to ferret out the motivational differences between RWs and telecommuters or other IT workers. For example, while prior research of telecommuters has found a strong negative relationship between autonomy and WFC (Goldstein 2003; Pratt 1999), this relationship was not found to be significant for RWs. This and other differences between telecommuters and road warriors need to be explored further. Thus researchers must take care to understand the contextual characteristics of the work environment to create better models.

This study extends past research by showing that the prime factors of turnover intention (organizational commitment and work exhaustion) have their own small set of causal factors (work overload, autonomy, fairness of rewards, and WFC), at least among IT RWs. This extends the nomological network of turnover model constructs so that researchers can move closer to the root causes of turnover. If it is important to ask, “What factors lead to turnover?” then it is also important to ask, “What determines the predictors of turnover intention?” While this study has used several factors, more should be identified that relate to the employee’s work, work–family situation (such as work-life balance and lifestyle accommodation), and stress. For example, additional antecedents and moderators of WFC should be researched. It is possible that social support of an IT RW might mitigate stress felt due to WFC. Individual differences such as extraversion and neuroticism may affect the positive or negative interpretation of work events, as might the organizational climate (Hart and Cooper 2001). Also, task complexity might moderate the effects of job autonomy on WFC (Mack and McGee 2001).

This model did not examine the effects of model variables on absenteeism, client satisfaction, or job performance, each of which is a possible extension. For instance, it may be that the levels of stress—WFC, work overload, and work exhaustion—that lead to turnover intention also decrease job performance, making them even more critical to ameliorate. Researchers should explore whether this is the case or whether some inverted-U curve exists between types of stress and job performance, as has been proposed (Muse et al. 2003).

Commitment and work exhaustion may also have an interactive effect on turnover intention, which is beyond the scope of this study. Further research is needed to tease out and more fully explain these relationships. The differential effects of role conflict, role ambiguity, and WFC should be examined to understand in what context one is more salient than another. Researchers may also want to study how specific aspects of the RW job contribute to work exhaustion and WFC.

### **Implications for Practice**

The findings of this study suggest that managers of RWs should focus on providing autonomy to their workers and providing them enough flexibility to reduce the WFC they feel as a result of the structure of their work situation. Managers should also be sure those who are promotable are told they are promotable, as this may compensate for the WFC stresses they experience as RWs, improve organizational commitment, and lower the risk of turnover.

The result that work exhaustion was a less important turnover intention predictor than organizational commitment may be due to the Monday-to-Thursday road schedule practiced by the subject firm, which may have decreased the salience of work exhaustion. If so, it suggests that setting favorable travel policies and practices is important to decreasing work exhaustion.

This study points to the value of fostering interpersonal networks between RWs and key experts at headquarters for companies to encourage and support autonomy for IT RWs. Our respondents reported that they not only felt emotionally isolated but also felt disconnected from the knowledge of work practices and processes. Interpersonal networks in the form of knowledge repositories and employee directories, which include areas of expertise and job responsibility, may help IT RWs find answers to questions on their own or know who to call. In addition, when IT RWs return to company headquarters for training or other reasons, organizations can encourage face-to-face meetings between RWs and the headquarters experts who support them. Personal relationships between IT RWs and experts may mean that phone calls and e-mails with requests for help are answered promptly.

Researchers may identify additional factors that help support an autonomous work environment. For example, it is possible that training in project management, problem-solving, and interpersonal skills will help give IT RWs greater confidence in interacting with clients and managing their work environment.

In practice, many companies face the issue of the effects of WFC and autonomy on work exhaustion and find that it has affected morale and commitment in their organizations (e.g., Rothbard et al. 2001). The pressures of work, especially for those working in areas related to information technologies, have intensified in recent decades. This, when combined with a need to travel and be away from family and home, can accelerate the burnout rate. The IT organization should try to accommodate the complete life needs of each employee (Agarwal and Ferratt 1999). We suggest that training in managing life-styles involving virtual work be a part of the support available to IT RWs. Employees should also be provided with options for counseling on clarifying their life-priorities. Based on these priorities, they can work with a company mentor to create a custom-career for themselves.

Our research is also important to practice because it points to factors that managers can influence. For example, instead of trying to change work exhaustion perceptions, managers can more easily influence work overload by reducing what is on an employee’s plate. In the current study, work overload is

the major cause of both work exhaustion and WFC. Instead of trying to address organizational commitment head-on, a manager can control the amount of job autonomy granted and the fairness of rewards. A manager can also take specific steps (outlined above) to reduce WFC among RWs. Hence, these secondary antecedents are important because management can more easily address them than broader and more abstract concerns like commitment.

## Conclusion

In this study, we investigated IT road warriors and the factors related to turnover intention. IT road warriors are IT professionals who are consultants located at client sites and, as such, spend most of their work time on the road. We adapted Moore's turnover model to apply to these RWs. The results show that the traditional turnover factors, organizational commitment and work exhaustion, were related to turnover intention. Of greater interest, however, we clarified the effects of four important antecedents of RW organizational commitment and work exhaustion: WFC, work overload, fairness of rewards, and autonomy. We also found that autonomy might be experienced differently among virtual workers, depending on the characteristics of the work environment. Although previous research with telecommuters found that autonomy could mitigate WFC, our study showed that while autonomy is important to IT RWs, it did not have a significant effect on WFC. Overall, the study shows that turnover models become more predictive when researchers contextualize to the circumstances of the particular type of IT employee under examination.

## Acknowledgments

We are very grateful to the managers and employees of our research site for their help and cooperation with this project. We would also like to thank Senior Editor Ritu Agarwal, our AE and reviewers, and Michael Dickey, Jason Thatcher, and Molly Wasko for their guidance and suggestions. An earlier version was published in the electronic *Proceedings of the 35<sup>th</sup> Annual Hawaii International Conference on System Sciences*.

## References

- Agarwal, R., and Ferratt, T. W. *Coping with Labor Scarcity in Information Technology: Strategies and Practices for Effective Recruitment and Retention*, Pinnaflex Education Resources, Inc., Cincinnati, OH, 1999.
- Adams, G. A., King L. A., and King D. W. "Relationships of Job and Family Involvement, Family Social Support, and Work-Family Conflict with Job and Life Satisfaction," *Journal of Applied Psychology* (81:4), 1996, pp. 411-420.
- Ahuja, M., and Thatcher J. "Moving Beyond Intentions and Toward Theory of Trying: Linking the Work Environment and Gender to Post-Adoption Information Technology Use," *MIS Quarterly* (29: 3), 2005, pp. 427-459.
- Anderson, J. C., and Gerbing, D. W. "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin* (103:3), 1988, pp. 411-423.
- Ang, S., and Slaughter, S. "The Missing Context of Information Technology Personnel: A Review and Future Directions for Research," in *Framing the Domains of IT Management*, R. Zmud (ed.), Pinnaflex Education Resources, Inc., Cincinnati, OH., 2000, pp. 305-327.
- Armstrong, J. S., and Overton, T. S. "Estimating Nonresponse Bias in Mail Surveys," *Journal of Marketing Research* (16), 1977, pp. 396-402.
- Arnold, H. J., and Feldman, D. C. "A Multivariate Analysis of the Determinants of Job Turnover," *Journal of Applied Psychology* (67), 1982, pp. 350-360.
- Aryee, S., Luk, V., Leung, A., and Lo, S. "Role Stressors, Interrole Conflict, and Well-Being: The Moderating Influence of Spousal Support and Coping Behaviors among Employed Parents in Hong Kong," *Journal of Vocational Behavior* (54), 1999, pp. 259-278.
- Bailyn, L. "Toward a Perfect Work Place? The Experience of Home-Based Systems Developers," in *Information Technology and the Corporation of the 1990s*, T. Malone and M. S. Scott Morton (eds.), Oxford University Press, New York, 1994, pp. 410-428.
- Barclay, D., Higgins, C., and Thompson, R. "The Partial Least Squares (PLS) Approach To Causal Modeling," *Technology Studies* (2:2), 1995, pp. 285-309.
- Baroudi, J. J. "The Impact of Role Variables on IS Personnel Work Attitudes and Intentions," *MIS Quarterly* (9:4), 1985, pp. 341-56.
- Bartol, K. M. "Turnover Among DP Personnel: A Causal Analysis," *Communications of the ACM* (26:10), 1983, pp. 807-811.
- Beehr, T. "Perceived Situational Moderators of the Relationship between Subjective Role Ambiguity and Role Strain," *Journal of Applied Psychology* (61), 1976, pp. 35-40.
- Belanger, F. "Workers' Propensity to Telecommute: An Empirical Study," *Information & Management* (35:3), 1999, pp. 139-153.
- Boles, J., Dean, D., Ricks, J., Short, J., and Wang, G. "The Dimensionality of the Maslach Burnout Inventory Across Small Business Owners and Educators," *Journal of Vocational Behavior* (56), 2000, pp. 12-34.
- Boles, J., Johnston, S. M., and Hair, J. Jr. "Role Stress, Work-Family Conflict and Emotional Exhaustion: Inter-Relationships and Effects on Some Work-Related Consequences," *The Journal of Personal Selling & Sales Management* (17:1), Winter 1997, pp. 17-28.
- Chin, W. W. "The Partial Least Squares Approach to Structural Equation Modeling," in *Modern Methods for Business Research*, G. A. Marcoulides (ed.), Lawrence Erlbaum, Mahwah, NJ, 1998, pp. 295-336.

- Cotton, J. L., and Tuttle, J. M. "Employee Turnover: A Meta-Analysis and Review with Implications for Research," *Academy of Management Review* (11:1), 1986, pp. 55-70.
- Cropanzano, R., Rupp, D., and Byrne, Z. "The Relationship of Emotional Exhaustion to Work Attitudes, Job Performance, and Organizational Citizenship Behaviors," *Journal of Applied Psychology* (88:1), 2003, pp. 160-169.
- Cropanzano, R., Rupp, D., Mohler, C., and Schminke, M. "Three Roads to Organizational Justice" in *Research in Personnel and Human Resources Management*, J. Ferris (ed.), JAI Press, Greenwich, CT, 2001, pp. 1-113.
- Dalton, D. R., Johnson, J. L and Daily, C. M. "On the Use of 'Intent to...' Variables in Organizational Research: An Empirical and Cautionary Assessment," *Human Relations* (52), 1999, pp. 1337-1350.
- Dittrich, J. E., Couger, J. D., and Zawacki, R. A. "Perceptions of Equity, Job Satisfaction, and Intention to Quit among Data Processors," *Information & Management* (9:2), 1985, pp. 67-75.
- Eby, L. T., Freeman, D. M., Rush, M. C., and Lance, C. E. "Motivational Bases of Affective Organizational Commitment: A Partial Test of an Integrative Theoretical Model," *Journal of Occupational and Organizational Psychology* (72), 1999, pp. 463-483.
- Fornell, C., and Larcker, D. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18:3), 1981, pp. 39-50.
- Frone, M., Russell, M., and Cooper, M. "Antecedents and Outcomes of Work-Family Conflict: Testing a Model of the Work-Family Interface," *Journal of Applied Psychology* (77), 1992, pp. 65-78.
- Frone, M., Yardley, J., and Markel, K. "Developing and Testing an Integrative Model of the Work-Family Interface," *Journal of Vocational Behavior* (50), 1997, pp. 145-167.
- Goff, L. J. "Balancing Acts," *Computerworld*, May 7, 2001, p. 49.
- Goldstein, N. *IT at Work: Information Technologies and Remote Working in the United States*, SRI International, Arlington, VA, 2003.
- Greenhaus, J. H. "The Intersection of Work and Family Roles: Individual, Interpersonal, and Organizational Issues," *Journal of Social Behavior and Personality* (3), 1988, pp. 23-44.
- Greenhaus, J. H., and Beutell, N. J. "Sources of Conflict Between Work and Family Roles," *Academy of Management Review* (10), 1985, pp. 76-88.
- Hackman, J., and Oldham, G. "Development of the Job Diagnostic Survey," *Journal of Applied Psychology* (60), 1975, pp. 159-170.
- Hart, P. M., and Cooper, C. L. "Occupational Stress: Toward a More Integrated Framework," in *Handbook of Industrial, Work and Organizational Psychology*, N. Anderson, D. S. Ones, H. K. Sinanil, and C. Viswesvaran, (eds.), Sage Publications, London, 2001, pp. 93-114.
- Hill, E. J., Miller, B. C., Weiner, S. P., and Colihan, J. "Influences of the Virtual Office on Aspects of Work and Work/Life Balance," *Personnel Psychology* (51:3), 1998, pp. 667-683.
- Hinds, P., and Kiesler, S. "Communication Across Boundaries: Work, Structure, and Use of Communication Technologies in a Large Organization," *Organization Science* (6:4), 1995, pp. 373-393.
- Hom, P. W., and Griffeth, R. W. *Employee Turnover*, International Thompson Publishing, Cincinnati, OH, 1995.
- Hu, L., and Bentler, P. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling* (6), 1999, pp. 1-55.
- Igbaria, M., and Greenhaus, J. H. "Determinants of MIS Employees' Turnover Intentions: A Structural Equation Model," *Communications of the ACM* (35:2), 1992, pp. 35-49.
- Igbaria, M., Greenhaus, J. H., and Parasuraman, S. "Career Orientations of MIS Employees: An Empirical Analysis," *MIS Quarterly* (15:2), 1991, pp. 151-168.
- Igbaria, M., and Guimaraes, T. "Exploring Differences in Employee Turnover Intentions and its Determinants Among Telecommuters and Non-Telecommuters," *Journal of Management Information Systems* (16:1), 1999, pp. 147-164.
- Jiang, J. J., and Klein, G. "A Discrepancy Model of Information Systems Personnel Turnover," *Journal of Management Information Systems* (19:2), 2002, pp. 249-272.
- Kalliath, T., O'Driscoll, M., and Gillespie, D. "The Relationship Between Burnout and Organizational Commitment in Two Samples of Health Professionals," *Work and Stress* (12:2), 1998, pp. 179-185.
- Kaldenberg, D. O., and Becker, B. W. "Workload and Psychological Strain: A Test of the French, Rodgers, and Cobb Hypothesis," *Journal of Organizational Behavior* (13), 1992, pp. 617-624.
- Kickul, J., and Posig, M. "Supervisory Emotional Support and Burnout: An Explanation of Reverse Buffering Effects," *Journal of Managerial Issues* (8:3), 2001, pp. 328-344.
- King, J. "On-the-Fly IT," *Computerworld* (37:36), September 8, 2003, p. 35.
- Lee, R. T., and Ashforth, B. E. "A Meta-Analytic Examination of the Correlates of the Three Dimensions of Burnout," *Journal of Applied Psychology* (81:2), 1996, pp. 123-133.
- Lee, T. W., and Mitchell, T. R. "An Alternative Approach: The unfolding Model of Voluntary Employee Turnover," *Academy of Management Review* (19), 1994, pp. 51-89.
- Leiter, M. P., and Maslach, C. "The Impact of Interpersonal Environment on Burnout and Organizational Commitment," *Journal of Occupational Behavior* (8), 1988, pp. 297-308.
- Leiter, M. P., and Schaufeli, W. B. "Consistency of the Burnout Construct Across Occupations," *Anxiety, Stress, and Coping* (9), 1996, pp. 229-243.
- Lovett, S., Harrison, D., and Virick, M. "Managing the Boundary Spanner—Customer Turnover Connection," *Human Resource Management Review* (7:4), 1997, pp. 405-424.
- Mack, D. A., and McGee, J. E. "Occupational Stress and the Small Business Owner: The Role of Task Complexity and Social Support," working paper, University of Texas at Arlington, 2001 (<http://www.usasbe.org/knowledge/proceedings/2001/045.pdf>).
- Madden, J., "Road Warriors," *American Demographics*, October 1995, pp. 4-9.

- Mannheim, B., and Schiffrin, M. "Family Structure, Job Characteristics, Rewards and Strains as Related to Work-Role Centrality of Employed and Self-Employed Professional Women with Children," *Journal of Occupational Behavior* (5:2), 1984, pp. 83-107.
- Maslach, C. *Burnout: The Cost of Caring*, Prentice-Hall, Englewood Cliffs, NJ, 1982.
- Maslach, C., and Jackson, S. E. "Burnout in Organizational Settings," in *Applied Social Psychology Annual: Applications in Organizational Settings* (5), S. Oskamp (ed.), Sage Publications, Beverly Hills, CA, 1984, pp. 133-153.
- Mobley, W. H., Griffeth, R. W., Hand, H. H., and Meglino, B. M. "Review and Conceptual Analysis of the Employee Turnover Process," *Psychological Bulletin* (86), 1979, pp. 493-522.
- Moore, J. E. "One Road to Turnover: An Examination of Work Exhaustion in Technology Professionals," *MIS Quarterly* (24:1), 2000, pp. 141-168.
- Mowday, R. T., Porter, L. W., and Steers, R. M. *Employee-Organization Linkages: The Psychology of Commitment, Absenteeism, and Turnover*, Academic Press, New York, 1982.
- Muse, L. A., Harris, S. G., and Field, H. S. "Has the Inverted-U Theory of Stress and Job Performance Had a Fair Test?," *Human Performance* (16:4), 2003, pp. 349-364.
- Netemeyer, R. G., Boles, J. S., and McMurrian, R. "Development and Validation of Work-Family Conflict and Family-Work Conflict Scales," *Journal of Applied Psychology* (81:4), 1996, pp. 400-410.
- Netemeyer, R. G., Brashear-Alejandro, T., and Boles, J. S. "A Cross-National Model of Job-Related Outcomes of Work Role and Family Role Variables: A Retail Sales Context," *Journal of the Academy of Marketing Science* (32:1), 2004, pp. 49-60.
- Oldham G. R., and Rotchford, N. L. "Relationship Between Office Characteristics and Employee Reactions: A Study of the Physical Environment," *Administrative Science Quarterly* (28), 1983, pp. 542-556.
- Parasuraman, S., Purohit, Y., Godshalk, V., and Beutell, N. "Work and Family Variables, Entrepreneurial Career Success, and Psychological Well-Being," *Journal of Vocational Behavior* (48), 1996, pp. 275-300.
- Pratt, J. *Costs/Benefits of Teleworking to Manage Work/Life Responsibilities*, International Telework Association and Council (ITAC), 1999 (available from joannepratt@post.harvard.edu).
- Rothbard, N. P., Dumas, T. P., and Phillips, K. W. "Role Conflict, Work-Family Policies, and Employee Preferences for Segmentation," in *Proceedings of the International Association for Conflict Management 14<sup>th</sup> Annual Conference*, Cergy (Paris), France, June 24-27, 2001.
- Salaff, J. W. "Where Home Is the Office: The New Form of Flexible Work," working paper, Department of Sociology, Centre for Urban and Community Studies, University of Toronto, 2002.
- Schaufeli, W. B., Leiter, M. P., and Kalimo, R. "The General Burnout Inventory: A Self-Report Questionnaire to Assess Burnout at the Workplace," in *Proceedings of the Work, Stress and Health '95: Creating Healthier Workplaces*, Washington, DC, September 1995, pp. 10-23.
- Singh, J., Goolsby, J. R., and Rhoads, G. "Behavioral and Psychological Consequences of Boundary Spanning: Burnout for Customer Service Representatives," *Journal of Marketing Research* (31), 1994, pp. 558-669.
- Singh, J., Verbeke, W., and Rhoads, G. "Do Organizational Practices Matter in Role Stress Processes? A Study of Direct and Moderating Effects for Marketing-Oriented Boundary Spanners," *Journal of Marketing* (60:3), 1996, pp. 69-86.
- Speier, C., and Venkatesh, V., "The Hidden Minefields in the Adoption of Sales Force Automation Technologies," *Journal of Marketing* (66:3), 2002, pp. 98-111.
- Thatcher, J. B., and Stepina, L. P. "Information Technology Worker Turnover: An Integrative Model and Empirical Test," in *Proceedings of the 22<sup>nd</sup> International Conference on Information Systems*, W. J. Orlikowski, S. Ang, P. Weill, H. C. Krcmar, and J. I. DeGross (eds.), Brisbane, Australia, December 10-13, 2001, pp. 285-288.
- Thatcher, J. B., Stepina, L. P., and Boyle, R. J. "Turnover of Information Technology Workers: Examining Empirically the Influence of Attitudes, Job Characteristics, and External Markets," *Journal of Management Information Systems* (19:3), 2002, pp. 231-261.
- Thomas, K. M., and Williams, K. L. "The Role of Burnout on Organizational Attachment and Career Mobility," in *Proceedings of the Work, Stress and Health '95: Creating Healthier Workplaces*, Washington, DC, September 1995, pp. 265-273.
- Thomas, L. T., and Ganster, D. C. "Impact of Family-Supportive Work Variables On Work-Family Conflict And Strain: A Control Perspective," *Journal of Applied Psychology* (80), 1995, pp. 6-15.
- Tsui, A., Pearce, J. L., Porter, L. W., and Tripoli, A. M. "Alternative Approaches to the Employee-Organization Relationship: Does Investment in Employees Pay Off?," *Academy of Management Journal* (40:5), 1997, pp. 1089-1121.
- Widaman, K. "Hierarchical Nested Covariance Structure Models for Multitrait-Multimethod Data," *Applied Psychological Measurement* (9), 1985, pp. 1-26.
- Williams, L., Cote, J., and Buckley, M. "Lack of Method Variance in Self-Reported Affect and Perceptions of Work: Reality or Artifact?," *Journal of Applied Psychology* (74), 1989, pp. 462-468.
- Xie, J. L., and Johns, G. "Job Scope and Stress: Can Job Scope Be Too High?," *Academy of Management Journal* (38:5), 1995, pp. 1288-1309.

## About the Authors

**Manju Ahuja** is an assistant professor of MIS at the Kelley School of Business, Indiana University. Her publications have appeared in journals such as *MIS Quarterly*, *Management Science*, *Organization Science*, *Communications of the ACM*, *Journal of Management*, *European Journal of Information Systems*, *Small Group Research*, *Decision Support Systems*, *The Database for Advances in Information Systems*, and *The Journal of Computer-Mediated Communications*. She is an associate editor at *Information Systems Research* and also serves on the review boards of *Decision Sciences* and *Journal of the Association for Information Systems*. She has served as a guest coeditor for *Information, Technology, and People* (2005-2006)

and *The Database for Advances in Information Systems* (2004). Dr. Ahuja is actively involved in research on issues related to virtual communities, virtual teams, and management of human resources in IT professions. Recently, she was awarded a National Science Foundation grant to examine Information Technology workforce issues. Her research has been cited by publication such as *Wall Street Journal*, *Strategy+Business*, and *Computerworld*.

**Katherine M. Chudoba** is an assistant professor of MIS at Florida State University. Dr. Chudoba's research interests focus on the nature of work in distributed environments, and how ICT are used and integrated into work practices. She earned her Ph.D. at the University of Arizona, and her bachelor's degree and MBA at the College of William and Mary. Prior to joining academe, she worked for 8 years as an analyst and manager in the information technology industry. Her research has been sponsored by companies such as Intel and Xerox, and published in *Organization Science*, *Information Systems Journal*, *Database, Information & Management*, *Information Technology & People*, and *Information Research*.

**Charles J. Kacmar** is an associate professor in the MIS Department at the University of Alabama. He received his Ph.D. in computer science from Texas A&M University. His research interests include behavioral and organizational information systems, human-computer interaction, collaborative systems, and hypertext/hypermedia. He has published in *Academy of Management Journal*, *Information Systems Research*, *Journal of Strategic Information Systems*, *Communications of the ACM*, *ACM Transactions on Information Systems*, *Hypermedia*, and *Behaviour*, and *Information Technology*. He is a member of the Association for Information Systems and the ACM.

**D. Harrison McKnight** received his Ph.D. in Management Information Systems from the University of Minnesota. He is an assistant professor in the College of Business at Michigan State University. His research interests include trust building within e-commerce and organizational settings and the retention and motivation of information systems professionals. His work has appeared in such journals as *Information Systems Research*, *Journal of Strategic Information Systems*, *International Journal of Electronic Commerce*, *Electronic Markets*, and the *Academy of Management Review*.

**Joey F. George** is a professor of Information Systems and the Thomas L. Williams Jr. Eminent Scholar in Information Systems in the Management Information Systems Department in the College of Business at Florida State University. He received his Ph.D. from the University of California, Irvine, in 1986, and an A.B. from Stanford University in 1979. His research interests focus on the use of information systems in the workplace, including the detection of deceptive computer-mediated communication, computer-based monitoring, and group support systems. Dr. George has published over 40 articles in such journals as *Information Systems Research*, *MIS Quarterly*, *Communications of the ACM*, *Journal of MIS*, *Communication Research*, and *Small Group Research*. Dr. George is co-author of several textbooks, including the bestselling *Modern Systems Analysis and Design*, fourth edition (Prentice Hall, 2004). He is currently the editor-in-chief for *Communications of the AIS* and recently served as a senior editor for *MIS Quarterly*. Dr. George served as the Conference Co-Chair for the 2001 International Conference on Information Systems (ICIS) in New Orleans and as Co-Chair of the Doctoral Consortium for ICIS 2003 in Seattle, WA.

## Appendix

### Measurement Scales

#### Job Autonomy (Beehr 1976)

Indicate the extent to which these statements reflect your feelings about your current job. (1-7, with ends and midpoint anchors)

1. I control the content of my job.
2. I have a lot of freedom to decide how I perform assigned tasks.
2. I set my own schedule for completing assigned tasks.
4. I have the authority to initiate projects at my job.

#### Work-Family Conflict (Adams et al. 1996)

If you are not married and/or do not have children, you can choose to respond to these questions in terms of your life outside of work in general (for example, replace "family" with "friends" and think of your other commitments, such as gymnasiums, book clubs, or any other hobbies) (1-7, with ends and midpoint anchors).

1. The demands of my work interfere with my home and family life.
2. The amount of time my job takes up makes it difficult to fulfill family responsibilities.
3. Things I want to do at home do not get done because of the demands my job puts on me.
4. My job produces strain that makes it difficult to fulfill family duties.
5. Due to work-related duties, I have to make changes to my plans for family activities.



**Organizational Commitment** (Tsui et al. 1997)

Think about your organization. Indicate the extent to which you agree or disagree with these statements (1-7, with ends and midpoint anchors)

1. I am willing to put in effort beyond the norm for the success of the organization.<sup>4</sup>
2. For me, this is the best of all possible organizations for which to work.
3. I am extremely glad to have chosen this organization to work for over other organizations.
4. This organization inspires the very best in the way of job performance.
5. I show by my actions that I really care about the fate of this organization.

**Work Exhaustion** (Moore 2000; used the first four of Moore's items; scaling the same as Moore)

(0 = never; 1 = A few times a year or less, almost never; 2 = Once a month or less, rarely; 3 = A few times a month, sometimes; 4 = Once a week, rather often; 5 = A few times a week, nearly all the time; 6 = Daily)

1. I feel emotionally drained from my work.
2. I feel used up at the end of the work day.
3. I feel fatigued when I get up in the morning and have to face another day on the job.
4. I feel burned out from my work.

**Perceived Work Overload** (Moore 2000; items same; scaling adapted for items 1 and 2)

(1 = Daily; 2 = Almost every day; 3 = About once a week; 4 = Two or three times a month; 5 = About once a month; 6 = A few times a year; 7 = Once a year or less) (Reverse scored)

1. I feel that the number of requests, problems, or complaints I deal with is more than expected.
2. I feel that the amount of work I do interferes with how well it is done.
3. I feel busy or rushed.
4. I feel pressured.

**Fairness of Rewards** (new items) (1-7, with ends and midpoint anchors)

1. My organization has processes that assure that all team members will be treated fairly and equitably.
2. I work in an environment in which good procedures make things fair and impartial.
3. In my workplace, sound practices exist that help ensure fair and unbiased treatment of all team members.
4. Fairness to employees is built into how issues are handled in my work environment.

**Turnover Intention** (Moore 2000; items same; scaling altered for items 3 and 4)

(1 = very unlikely; 5 = very likely)

1. How likely is it that you will be working at the same company this time next year? (R)
2. How likely is it that you will take steps during the next year to secure a job at a different company?

(7-point scale; 1 = very unlikely; 4 = Neutral; 7 = very likely)

3. I will be with this company five years from now. (R)
4. I will probably look for a job at a different company in the next year.

---

<sup>4</sup>Item dropped after initial inspection of outer model loadings.

Copyright of *MIS Quarterly* is the property of *MIS Quarterly* & The Society for Information Management and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.