

# THE INFLUENCE OF DEMANDS AND RESOURCES ON EMOTIONAL EXHAUSTION WITH THE INFORMATION SYSTEMS PROFESSION

*Completed Research Paper*

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## **Abstract**

*Using the Job Demands-Resources Model of Burnout as an organizing framework, this study examines multiple models of the antecedents of emotional exhaustion with the profession among IS workers via a new structural equation modeling software, WarpPLS. Data were analyzed from 293 IS professionals representing various industries across the United States. This study provides empirical evidence regarding the mediating role of the demands of the profession and the considerable influence of affective connections to the profession (i.e., career-family conflict, psychological contract violation and connection to the profession) on emotional exhaustion with the IS profession. These findings highlight the importance of understanding how complex relationships influence emotional exhaustion with the profession. Researchers interested in the causes of burnout in IS professionals may want to focus on further exploring the affective connections to the profession as they were found to be key factors directly and indirectly influencing emotional exhaustion with the profession.*

**Keywords:** IS Profession, structural equation modeling, emotional exhaustion

## Introduction

Information Systems (IS) has long been viewed as a profession with high turnover and one impacted dramatically by economic shifts, and changes in traditional organizational boundaries. Recent reports tell us that the supply of IS professionals is declining, while indicators predict increased demand (Panko 2008), highlighting retention, once again, as an important strategic issue. Many human resource professionals are asking how to retain valued IS employees of all generations during these unprecedented economic times. One avenue for retaining valued IS workers may be through the exploration of professional<sup>1</sup> burnout (i.e., an extreme state of psychological strain), as burnout has been found to be correlated with turnover (e.g., Blau 2007). Emotional exhaustion is widely viewed as the initial component of the burnout process (Maslach and Schaufeli 1993), and “reflects the feeling of being emotionally overextended and exhausted by one’s work” (Wright and Cropanzano 1998, p. 486).

We focus on the emotional exhaustion dimension of burnout within the IS profession and begin with the Job Demands-Resources Model of burnout (JD-R) originally proposed by Demerouti, Bakker, Nachreiner and Schaufeli (2001) as an organizing framework. One central assumption of the JD-R model is that it is possible to model the characteristics of a job into two broad categories - demands and resources (Bakker et al. 2005a; Demerouti et al. 2001). Job demands are “the physical, psychological, social or organizational features of a job that require physical and/or psychological effort from an employee” (Mauno et al. 2007, p. 152). Job resources are “the physical, psychological, social or organizational features of a job that are functional in achieving work goals, reduce job demands ... and stimulate personal growth and development” (Mauno et al. 2007, p. 152). Person resources were added to the model based on the work of Xanthopoulou et al. (2007), and are defined as “positive self-evaluations that are linked to resiliency and refer to individuals’ sense of their ability to control and impact upon their environment successfully” (Bakker and Demerouti 2008, p. 213).

Previous research has found that while emotional exhaustion is mainly predicted by demands, it has also been predicted by a lack of resources (Hakanen et al. 2008; Schaufeli and Bakker 2004). According to the ‘buffering hypothesis’ (Cohen and Willis 1985), employees who have access to more job resources are better able to cope with organizational change than employees who have less access to job resources. The buffering effects have commonly been operationalized as resources moderating the relationship between demands and burnout components. While researchers have explored the buffering model, Xanthopoulou et al. (2007) tested and did not find that personal resources moderated the demands – exhaustion relationship, but directly influenced emotional exhaustion. In several studies that did find a moderating effect, a main effect was also found (e.g., de Rijk et al. 1998; Kahn and Byosiere 1992; Koeske et al. 1993), while others have found that job resources had a weak direct influence on burnout (Hakanen et al. 2008; Ito 2003; Leiter and Maslach 1988; Russell et al. 1987), and still others found no relationship (Gakovic and Tetrick, 2003). Lee and Ashforth (1996) in their meta-analysis found that while some resources directly influenced emotional exhaustion, individuals are more sensitive to the demands placed on them than the resources received.

The extant research does not provide a conclusive result, and has yet to determine exactly *how* these antecedents actually influence emotional exhaustion. Therefore, a primary goal of this research was to expand the nomological network of relationships between the demands and resources of the profession and emotional exhaustion with the profession. “The nomological network refers to the pattern of theoretical and empirical relationships among different constructs and is used to establish construct validity” (Warner and Hausdorf, 2009, p. 131).

Our contribution is twofold. First, we contribute to the literature by providing a comprehensive test of the complex relationships using competing theoretical models that, to date, have not been fully tested. Many of the relationships may be nonlinear, yet mainstream structural equation modeling software tools do not estimate coefficients of association of nonlinear relationships. We utilize WarpPLS, a new structural equation modeling software designed to explore the potential complex nonlinear relationships. Second,

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<sup>1</sup> The terms occupation, profession and career have been used somewhat interchangeably in the literature. The term profession is used here to refer to the individual’s chosen field. This is in line with work by Greenwood (1972) indicating that all occupations have characteristics of a profession; they just vary in degree.

this research focuses on IS professionals in order to determine the generalizability of prior research in the US context. Not only are we utilizing an under researched group (IS workers), but also an under researched level of analysis (profession). Therefore, this study has the potential to move the literature forward by determining which of the prior competing models best explains the complex relationships between the demands and resources of the profession and emotional exhaustion with the profession.

## **Developing the Models**

In addition to the seminal work by Moore (2000), a few studies have addressed various antecedents and outcomes of *job-related* burnout among IS professionals. Some have used Moore's model as a foundation and added concepts such as social support (Korunka et al. 2008), supervisor's leadership style (Hetland et al. 2007) and emotional dissonance (Rutner et al. 2008); some have developed their own model (e.g., Pawlowski et al. 2007; Sethi et al. 2004); and still others have begun to explore more complex effects (e.g., moderation) (King and Sethi 1997). A few researchers have investigated job burnout for unique populations such as older IS workers (Kouvonen et al. 2005), software developers (Rajeswari and Anantharaman 2005), IT "road warriors" (Ahuja et al. 2007) and technical IS professionals (Rigas 2009).

The factors included in this study were chosen for their relevance to the IS profession, conceptual similarity to constructs found to be associated with work-related emotional exhaustion and their potential links to emotional exhaustion with the IS profession. The inclusion of these variables meets the criterion for self-contained models to incorporate variables that are related to other causes explicitly included in the model *and* make a unique and significant contribution to the prediction of the dependent variable (James et al. 1982). We systematically analyzed each concept for its applicability to the IS profession. The concepts retained from the initial screening were triangulated with those in the Moore (2000) and Ahuja et al. (2007) models. Finally, we added concepts to our model that, while not prominent in the job-related burnout literature, are prominent in the IT workforce literature and we believed would be suited to the context of the IS profession (e.g., psychological contract violation). An in-depth examination of each potential antecedent is beyond the scope of this manuscript, and thus we briefly explain those antecedents that we have retained for this study. We begin by discussing the demands of the profession, then the resources of the profession, and finally the resources of the person.

### ***Demands of the Profession***

The following discussion presents the three specific antecedents that are appropriate for consideration as demands of the IS profession: career-family conflict, uncertainty, and psychological contract violation.

#### **Career-family conflict**

Work-family conflict has been defined as the incompatible pressures that work and family roles can place on an individual (Duxbury and Higgins 1991). Conflict involving work and family can be extremely stressful (e.g., Netemeyer et al. 2004), and cause work-related emotional exhaustion (Bakker et al. 2005b). Work-family conflict has been found to influence satisfaction with one's career as well as intention to withdraw from a profession (Greenhaus et al. 2001; Martins et al. 2002).

We focus on "career" instead of "work" because careers demand greater dedication than do a succession of jobs, and we recognize career-family balance as achieving satisfying experiences in career and family (e.g., Clark, 2000). Individuals working in the IS profession are known to work long hours, be on call, etc... (Ahuja 2002). These characteristics of the profession have often been viewed negatively and the pressures of meeting these demands can impact the individual (e.g., Riemenschneider et al. 2006). We assert that because these characteristics are found across the IS profession; career-family conflict (CFC) is a function of the professional environment. We believe that there will be a relationship between CFC and emotional exhaustion with the profession as CFC transcends any one job and permeates the IS culture. Having to continuously face the often conflicting demands of home and career will increase his or her exhaustion with the profession.

## **Uncertainty**

Uncertainty has been defined as “an individual’s perceived inability to predict something accurately” (Milliken 1987, p. 136), and uncertainty regarding an individual’s work life has been found to be a cause of burnout (Lee and Ashforth 1996). The volatility in the IS profession, marked by such events as the perceived boom (Y2K) and bust (dot com bubble burst), and periods of IS workforce expansion and contraction (movement to offshoring and outsourcing), creates a perception of uncertainty within the profession. “Change and uncertainty have undoubtedly characterized the working climate for today’s IS professional.” (Kaluzniacky 1999, p. 823). Uncertainty related to a profession captures a holistic perception of the outlook of the profession. The inability to predict one’s environment is stressful because it is difficult to adequately prepare for, or deal with, the unknown. Not knowing how change in the profession will impact an individual’s career (e.g., advancement opportunities, training/retooling needed) can be stressful and exhausting.

## **Psychological contract violation**

The current economic conditions provide an opportunity to explore additional elements that have been to-date largely ignored. “IT professionals asked to do more work for less pay and fewer benefits might be able to forgive their employers’ financial choices, but industry watchers say high-tech workers won’t soon forget being treated poorly during the most recent economic recession” (Dubie 2009, p. 2). Psychological contracts (PCs) are one type of social exchange and can be defined as “a set of beliefs about what each party is entitled to receive and obligated to give” in an exchange relationship (Morrison and Robinson 1997, p. 228). PCs represent employees’ beliefs about obligations between them and the organization rather than any specific agent of the organization (Morrison and Robinson 1997). We assert that if an individual can have beliefs toward an abstraction such as their “organization” then they can also have beliefs toward their “profession”. Thus a contract can exist between an individual and a profession, and individuals can perceive promises (such as rapid career advancement) from the profession.

As a contract exists, it can also be broken. With a violation responses are more intense because a ‘promise’ has been broken and it is more personal (Rousseau 1989). Based on the work of Morrison and Robinson (1997), we define PCV with the IS profession as the perception that the IS profession has failed to adequately fulfill its obligations to the individual. One of the primary causes of PCV is incongruence (Morrison and Robinson 1997), which “occurs when there are different expectations or understandings about the agreed-upon obligations, even when there is no explicit contract violation” (Pavlou and Gefen 2005, p. 374). IS personnel who feel that their contract with the profession has been violated may face increased exhaustion with regard to their place in the profession. The idea that the profession has not lived up to the perceived promises made to the individual can be frustrating and stressful, and over one’s career emotionally exhausting.

## ***Resources of the Profession***

We assert that resources are the features of the profession that help achieve goals, attenuate demands and stimulate personal growth. Person resources refer to individuals’ sense of their ability to manage their environment. To better understand the role of resources in predicting outcomes, we use the distinction of person versus profession to further explore the direct impact of specific types of resources on the demands of the profession and indirect impact on emotional exhaustion with the IS profession. The following addresses three resources of the profession: supervisor support for the family, control and fairness.

### **Supervisor support for the family**

Generally speaking, support helps individuals cope with stressful situations. As career-family conflict is included as a demand of the profession in the model, we include perceived supervisor support related to the IS professionals’ family as a resource of the profession. Professional women report that having children makes career development more difficult (Betz and Fitzgerald, 1987). Organizational and supervisor support have been shown to impact overall well-being for individuals (Stinglhamber and Vandenberghe 2003), and social support in the workplace has been shown to reduce stress (Kahn and Byosiere, 1992; Russell, Altmaier, and Van Velzen, 1987), and unpleasant supervisor interaction was positively related to emotional exhaustion (Leiter and Maslach, 1988). While not a component of their

model, Ahuja et al. (2007) call for research including social support to help “mitigate stress felt due to WFC” (p. 12). Therefore, we believe that consistent support of supervisors for family related issues over the course of one’s career can possibly reduce emotional exhaustion with the profession.

## **Control**

At the profession-level, control includes an evaluation of an individual’s abilities related to the broader environment. Control is defined as a subjective reflection of an individual’s beliefs in his /her ability to effect change on his/her environment (Greenberger and Strasser 1986). Control, as placed directly within the context of the profession or career, “reflects the extent to which individuals believe they can predict and influence the direction of their careers” (Ito and Brotheridge 2001, p. 410). A related concept, power, encompasses an individual’s perception of his/her ability to counteract threats identified in the environment (Ashford et al. 1989). In essence, individuals who have a strong sense of power generally see environmental events as having less impact on them, and believe that they have the power to neutralize threats that the environment might pose (Ashford et al. 1989; Bordia et al. 2004).

Our conceptualization of control is broad as it involves individuals’ sense of their ability to predict and influence the direction of their career within the IS profession and to mitigate threats to their career progression within the professional environment. As we are interested in the global perception of control, and in an effort to avoid conceptual confusion, the term ‘control’ is used to reflect the concept as a resource of the profession. The overarching idea behind our conceptualization is that individuals are in charge of their own career path. Control may provide opportunities for individuals to select challenging positions over the course of their career in which they can continue to develop their skills and abilities, in turn mitigating threats of obsolescence. For example, Boswell et al. (2001) found that business students perceived that they needed to promote their own career development as opposed to perceiving it as the responsibility of their employer.

Control also plays a role as the profession is one often-described in conjunction with the phrase “constant change,” and an underlying theme for those in the IT profession is that of dealing with change (Koong et al. 2002; Nielsen et al. 2005). A lack of control over issues of personal significance (e.g., career) can lead to feelings of being overwhelmed and dissatisfied by events. A few studies have even found a direct negative relationship between control and emotional exhaustion at the level of the profession (Ito and Brotheridge 2001 – federal civil service; Landsbergis 1998 – nurses).

## **Fairness**

There are two sources of justice commonly used in the literature: distributive justice, which describes the fairness of outcomes; and procedural justice, which describes the fairness of the procedures used to determine those outcomes (Folger and Greenberg 1985). Ahuja et al. (2007) hinted at the importance of looking beyond the job toward the profession when looking at fairness. They indicated that “pay and reward equity was important to the RWs [road warriors] we interviewed, especially as they compared their job and career path to those at headquarters” (p. 3). This suggests that fairness of rewards and the importance of fairness extend beyond any one particular job. Because procedural justice is more closely tied to a specific organizational process and we are looking at fairness of the IS profession, we use the distributive justice component as a resource of the profession. If an IS professional perceives that he or she is consistently being treated unfairly over the course of his or her career, then the unfairness may be mentally linked with the profession and not just a job, supervisor, or organization.

## ***Resources of the Person***

A resource of the person refers to individuals’ sense of their ability to manage their environment, and within the context of the IS profession, a resource of the person aids understanding and coping with issues specific to the profession. Personal resources were not originally part of the model but were added later based on the work of Xanthopoulou et al. (2007) and Bakker and Demerouti (2008) who found that personal resources are significant predictors of burnout independent of work resources.

### Connection to the profession

A key resource that ties individuals to their profession is the inherent connection that they have to the profession. Connection to the profession can be thought of as a type of psychological bond. In this study we examine connection to the profession as a psychological attachment to the IS profession that portrays a high level of positive affect for the IS world. This attachment is expected to influence an individual's emotional exhaustion with the profession.

While several of these antecedents have been explored with regard to emotional exhaustion on the job, very few have been examined with regard to the profession, and even fewer with regard to the IS profession. To address this gap, these various relationships need to be investigated in one study with competing models to determine which one provides the most explanatory power in assessing the impact of demands and resources on emotional exhaustion with the IS profession.

### Control variables

The control variables age, tenure in the profession, negative affectivity, and gender were included in the models to be consistent with previous IS research on exhaustion (Ahuja et al. 2007; Moore 2000) and to recognize the role of individual differences related to emotional exhaustion with the IS profession.

### The Current Study

A total of four competing models are tested that depict the relationships among demands and resources of the profession and person, and emotional exhaustion with the IS profession.

Model 1 (Figure 1) is the *full mediation antecedent model* depicting the demands of the profession (career-family conflict, uncertainty, and psychological contract violation) as mediators between resources and emotional exhaustion with the profession. This model assumes no direct effects between the resources of the profession or person and emotional exhaustion. The resources are influencing the demands of the profession, which in turn influence emotional exhaustion.

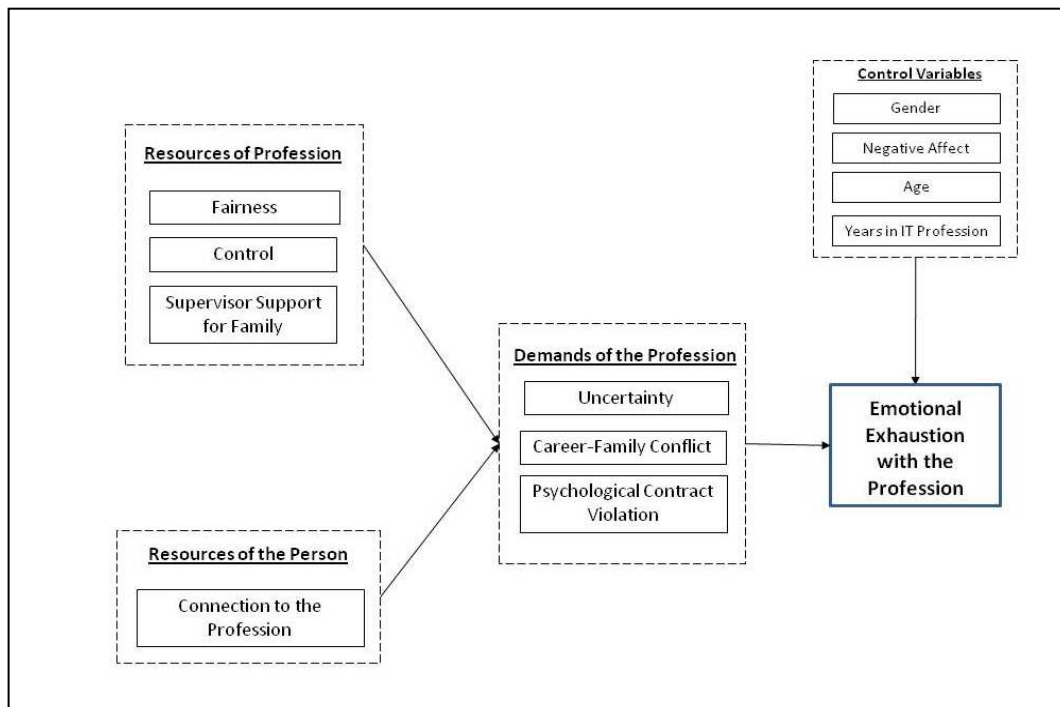


Figure 1. Model 1: Full Mediation

Model 2 (Figure 2) is the *partial mediation antecedent model* depicting the demands of the profession (career-family conflict, uncertainty, and psychological contract violation) as mediators between resources and emotional exhaustion with the profession. This model addresses the potential direct effects of resources on emotional exhaustion with the IS profession.

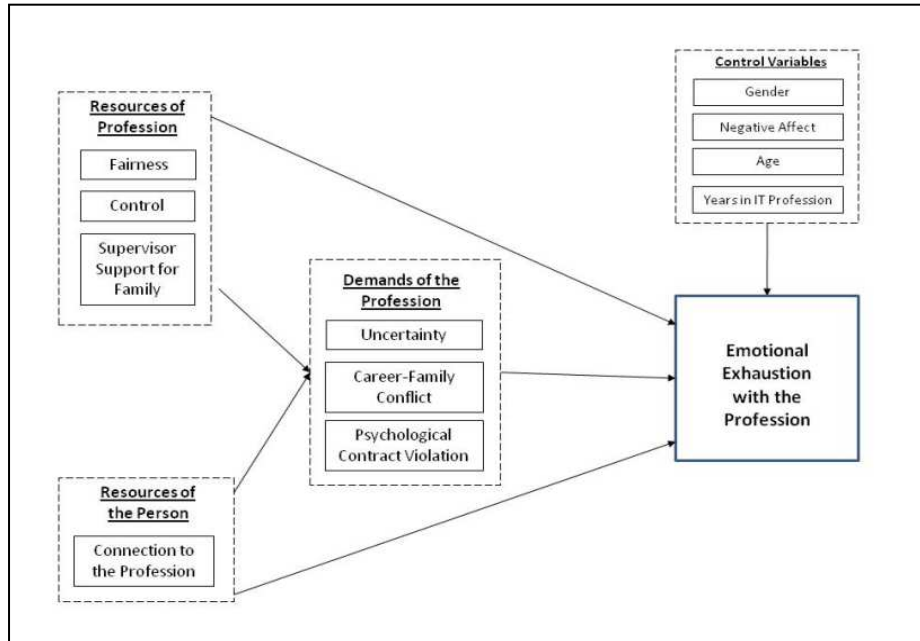


Figure 2. Model 2: Partial Mediation

Model 3 (Figure 3) is the *moderation model* and depicts the resources (profession and person) as moderating the relationship between the demands (career-family conflict, uncertainty, psychological contract violation) and emotional exhaustion with the profession.

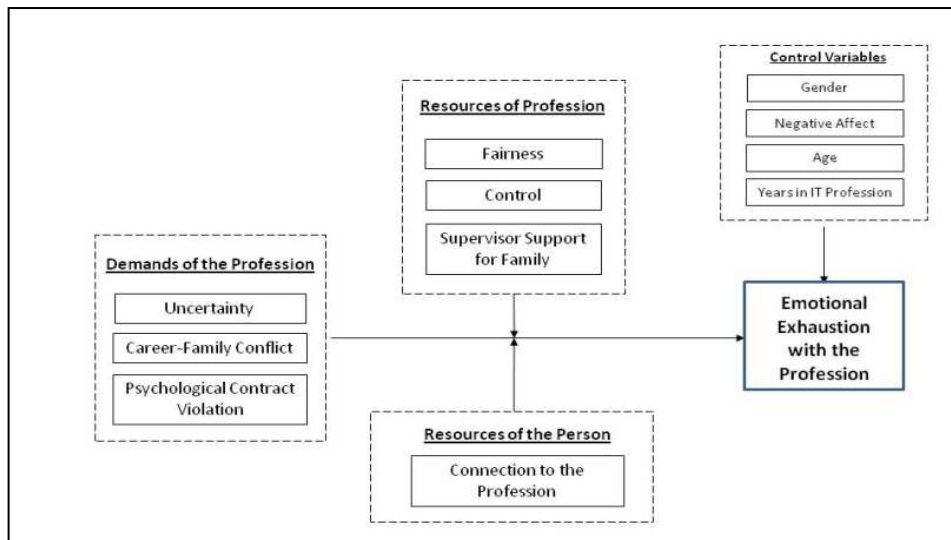
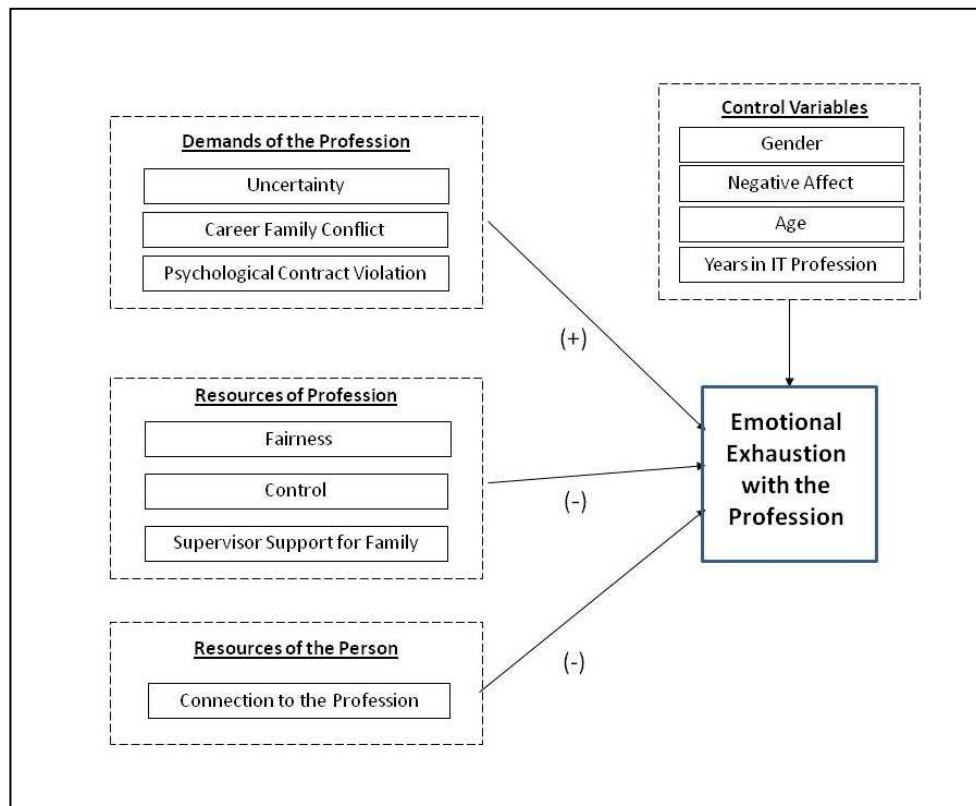


Figure 3. Model 3: Moderation

The final model (Figure 4) is the *independent antecedent model* (i.e., null model) and depicts the demands and the resources as independent antecedents of emotional exhaustion with the IS profession. It is assumed that the demands of the profession will positively influence emotional exhaustion with the IS profession and resources will negatively influence it.



**Figure 4. Model 4: Independent Antecedent**

## Method

It is important to note that all of the predictor variables were anchored to the profession, not to an organization, or a job. That is, rather than asking respondents about their experiences within the current organization, we asked them to report on perceptions developed across all of their experiences in IS.

## Study Design

Participants for this study included individuals working in the IS profession across several industries, including healthcare, government, IS services / software, and transportation. The data for this study was collected as part of a larger three-year study. Initially, the researchers contacted the CIO of several firms in the south central United States. Each CIO solicited input and participation from his/her IS employees. Individuals who had responded to the first year's data collection were sent an email explaining the purpose of the ongoing study. The email contained a link to the web survey and requested participation. Responses were received from 348 individuals of the 500 that were contacted, representing an overall response rate of 69.6%. The final sample consisted of 293 usable responses, and a table providing the detailed demographics for the sample is available from the first author. Briefly, the average age of the 293 participants was approximately 40 with 58% of the respondents being male. A large percentage of the participants worked full time (94.5%), had an undergraduate degree or higher (74.5%), and represented a variety of IS positions and industries. Ninety-three percent (93.5%) of the sample identified themselves as white, providing for a 6.5% minority representation. The average number of organizations worked for as an IS professional was 2.7 and the average number of years working in the IS profession was 14.4.



**Measures**

The questionnaire items were either adopted or closely adapted from previously validated instruments. All items were measured on a 7-point Likert-type scale. For the control construct, as we are interested in broad perceptions of control over an individual’s career, items from both the control (Bordia et al. 2004) and power (Ashford et al. 1989) scales were included. For the fairness variable, in contrast to Moore (2000), who focused on the rewards component of the measure, as we were interested in a more holistic view of fairness within the profession, we chose to utilize the entire distributive justice measure.

When considering the control variables affect can either be a state or a trait. State affect is defined as a “state of feeling, usually described in terms of emotions” (Thorsen et al. 2003, p. 914). Trait affect (i.e. affectivity) “indicates the dispositional tendency to experience certain affective states over time” (Thorsen et al. 2003, p. 915) and is a stable personality dimension (Roberts and DelVecchio 2000). We measured negative affectivity as a trait as it represents consistent feelings of anger, guilt, fear, and/or nervousness (Watson 2000). See the Appendix for a listing of the main constructs, sample items, and their sources. Due to space limitations the full instrument may be obtained from the first author.

**Analysis and Results**

Path analysis was used to assess the relative fit of the models to draw conclusions regarding the underlying relationships among the variables. Testing moderation and mediation using path analysis was chosen over multiple regression because the main goal of the current study was to compare the overall fit of multiple theoretical models.

**Measurement Model Assessment**

Before examining the path model, general information (means, standard deviations, and correlations) about the constructs were evaluated in SPSS (results are provided in Table 1). WarpPLS version 2.0 (2011), obtained from <http://www.scriptwarp.com/warppls/> was used for reflective measures to evaluate construct reliabilities and the convergent and discriminant validity of the model, and was also used to examine the proposed path models.

Table 1. Descriptive Statistics								
	EE	SSF	PCV	CFC	CTRL	UNC	CP	FAIR
EE	<b>0.9097</b>							
SSF	-.189**	<b>0.8272</b>						
PCV	.592**	-.360**	<b>0.8544</b>					
CFC	.464**	-.318**	.392**	<b>0.9239</b>				
CTRL	-.327**	.235**	-.460**	-0.106	<b>0.7942</b>			
UNC	.270**	-.258**	.253**	.215**	-.352**	<b>0.8989</b>		
CP	-.441**	.153**	-.481**	-.151**	.406**	-.191**	<b>0.8936</b>	
FAIR	-.475**	.422**	-.640**	-.531**	.297**	-.228**	-.376**	<b>0.8235</b>
Mean	4.40	5.61	2.86	3.78	3.8	3.45	5	5.24
SD	1.65	1.33	1.39	1.56	1.11	1.24	1.2	1.15

\*\*Correlation Significant at .01 Level

Note: the diagonals are the square roots of the average variance extracted (AVE) for each factor.

EE = emotional exhaustion with the profession, SSF = supervisor support for the family, PCV = psychological contract violation, CFC = career-family conflict, CTRL = control, UNC = uncertainty, CP = connection to the profession, FAIR = fairness

We began with a review of the individual items in a confirmatory factor analysis. Problems with high cross loadings showed that six items should be removed. These items were deleted prior to performing the remaining measurement assessments.

Reliability provides a measure indicating the consistency of subjects' responses to a scale and provides one measure indicating adequate convergence of constructs. Both Cronbach's  $\alpha$  and composite reliability were examined and the results are provided in Table 2. Cronbach's  $\alpha$  for each construct was above the recommended value of .70 (Hair et al. 2006) and composite reliability ranged from 0.896 (supervisor support: family) to 0.959 (career-family conflict). An additional measure of convergent validity requires that each construct's average variance extracted (AVE) exceed 0.50 (Chin 1998; Fornell and Larcker 1981). The measurement model AVEs ranged from 0.631 for control to 0.854 for career-family conflict (also shown in Table 2), satisfying this requirement.

<b>Construct</b>	<b>Average Variance Extracted</b>	<b>Cronbach's Alpha</b>	<b>Composite Reliability</b>
Emotional Exhaustion (EE)	0.828	0.931	0.951
Supervisor Support: Family (SSF)	0.684	0.846	0.896
Psychological Contract Violation (PCV)	0.730	0.907	0.931
Career-Family Conflict (CFC)	0.854	0.943	0.959
Control (CTRL)	0.631	0.884	0.911
Uncertainty (UNC)	0.808	0.941	0.955
Connection to the Profession (CP)	0.799	0.874	0.923
Fairness (FAIR)	0.678	0.881	0.913

"Common methods bias is the magnitude of the discrepancies between the observed and the true relationships between constructs that results from common methods variance" (Doty and Glick 1998, p. 36). To overcome the concern of common methods bias in the survey design, we included reverse scored items to reduce compliance problems (Lindell and Whitney 2001). In addition, consistent with previous research (e.g., Moore 2000) negative affectivity was measured and statistically controlled.

We assessed the extent of common method variance (CMV) in the data with two tests. First, we performed Harmon's one factor test (Podsakoff and Organ, 1986) by including all reflective items in a principal components factor analysis. The results revealed nine factors with no single factor accounting for a majority of variance (i.e., largest factor variance was 29.6%), suggesting no substantial CMV among the scales. We then followed the procedure recommended by Podsakoff et al. (2003) which specifies that besides theoretical constructs, a common method construct (that includes all the indicators) be used in the empirical research model. We assessed the variance explained by the common method construct relative to the variance explained by the substantive constructs. The average variance explained by the substantive constructs is 0.74 while the average variance explained by the common method construct is 0.02. Together, these analyses indicate that common method bias did not significantly affect our results.

In order to evaluate the discriminant validity of the constructs presented in our model, the more stringent approach recommended by Fornell and Larcker (1981) was utilized. This approach states that if the square root of the AVE is greater than the correlation between each pair of constructs in the model, then discriminant validity has been shown. The square root of the AVE shown on the diagonal in Table 1 indicates that all comparisons meet this test.

**Structural Model Assessment**

The structural research models were tested in WarpPLS and the control variables were included as predictors of emotional exhaustion. Prior to evaluating the models, the significance of the control variables was examined. Only two of the control measures (gender with a p-value less than .05 and negative affectivity with a p-value less than .001) were found to be significantly related to emotional exhaustion. Each of the constructs in the structural model was analyzed as a reflective construct.

**Model Estimation and Parameter Estimates**

Table 3 shows the fit indices for the sample. When assessing the model fit with WarpPLS, the following criteria are recommended: (a) p values for both the average path coefficient (APC) and average R-squared (ARS) should be lower than 0.05; that is, significant at the .05 level; and (b) the average variance inflation factor (AVIF) should be lower than 5.0 (Kock, 2011). From the WarpPLS 2.0 User Manual (Kock, 2011, p. 23), “Typically the addition of new latent variables into a model will increase the ARS, even if those latent variables are weakly associated with the existing latent variables in the model. However, that will generally lead to a decrease in APC, since the path coefficients associated with the new latent variables will be low. Thus, the APC and ARS will counterbalance each other, and will only increase together if the latent variables that are added to the model enhance the overall predictive and explanatory quality of the model. The AVIF index will increase if new latent variables are added to the model in such a way as to add multicollinearity to the model, which may result from the inclusion of new latent variables that overlap in meaning with existing latent variables.”

**Table 3. Fit Indices for the Four Models**

Model	APC	ARS	AVIF	% Paths Significant
Full Mediation (Model 1)	-0.079***	0.386***	1.207	87
Partial Mediation (Model 2)	-0.083***	0.392***	1.344	74
Moderation (Model 3)	0.037**	0.527***	2.039	2
Independent Antecedents (Model 4)	0.034	0.528***	1.446	57

\*\*\*P<0.001, \*\*P<.01

APC: average path coefficient      ARS: average R-squared      AVIF: average variance inflation factor

Given the criteria, models 1 and 2 produced the best overall fit. Model 1 demonstrated a slight advantage over Model 2 across all indicators with the exception of the ARS; however, these average values can be misleading because of the variation among the coefficients. In the absence of formal statistical tests for determining the significance of these differences, both models warrant further investigation.

**Mediation Test**

According to Hoyle and Kenny (1999), to establish mediation in a structural equation context we need to show that: (i) the independent variables (e.g., supervisor support for family) must significantly affect the outcome variable (e.g., emotional exhaustion with the profession) in the absence of the mediator and (ii) the direct effect of the independent variable (e.g., supervisor support for family) on the outcome variable must decrease upon the addition of the mediator (e.g., career-family conflict). This two-step approach to examining mediation can be used to judge whether mediation is occurring.

In order to establish the mediating effect, the indirect effect must be significant; this can be determined using a Sobel Z-statistic (Helm et al. 2010). We conducted a Sobel (1982) test of the indirect effect of supervisor support for family, control, fairness, and connection to the profession on emotional exhaustion with the profession via career-family conflict, uncertainty, and psychological contract violation to evaluate

whether each mediator carried the influence of the independent variable to the dependent variable. A Z-test of the indirect effect was conducted using a ratio of the indirect coefficient to its standard error. A significant Z value indicates that the indirect effect of the independent variable on the dependent variable via the mediator is significantly different from zero. The results are presented in Table 4 and show that career-family conflict mediates the relationship between fairness and emotional exhaustion with the profession ( $p < .001$ ) while psychological contract violation mediates the relationship between three of the four resources (control ( $p < .001$ ), fairness ( $p < .001$ ), and connection of the profession ( $p < .01$ ) and emotional exhaustion with the profession.

**Table 4. Mediation Tests**

Relationship		Path coefficient P value	Mediated Relationship	Sobel Statistic	Std Error	Sobel Z P value	VAF
CP	> EE	0.01					
CP	> PCV	0.001	<b>CP-PCV-EE</b>	-2.8686	0.0211	0.004	<b>0.2905</b>
PCV	> EE	0.001					
CP	> EE	0.01					
CP	> UNC	Ns	CP-UNC-EE	-0.3334	0.0060	0.739	N/A
UNC	> EE	0.05					
CP	> EE	0.01					
CP	> CFC	Ns	CP-CFC-EE	0.6449	0.0131	0.519	N/A
CFC	> EE	0.001					
CTRL	> EE	Ns					
CTRL	> PCV	0.001	<b>CTRL-PCV-EE</b>	-3.2985	0.0198	0.001	<b>0.8459</b>
PCV	> EE	0.001					
CTRL	> EE	Ns					
CTRL	> UNC	0.001	CTRL-UNC-EE	-1.7882	0.0135	0.074	N/A
UNC	> EE	0.05					
CTRL	> EE	Ns					
CTRL	> CFC	Ns	CTRL-CFC-EE	0.9416	0.0129	0.346	N/A
CFC	> EE	0.001					
FAIR	> EE	Ns					
FAIR	> PCV	0.001	<b>FAIR-PCV-EE</b>	-4.0466	0.0329	0.000	<b>0.6207</b>
PCV	> EE	0.001					
FAIR	> EE	Ns					
FAIR	> UNC	Ns	FAIR-UNC-EE	-1.0082	0.0067	0.313	N/A
UNC	> EE	0.05					
FAIR	> EE	Ns					
FAIR	> CFC	0.001	<b>FAIR-CFC-EE</b>	-3.5748	0.0307	0.000	<b>0.5741</b>
CFC	> EE	0.001					

**Table 4. Mediation Tests, continued**

Relationship	Path coefficient P value	Mediated Relationship	Sobel Statistic	Std Error	Sobel Z P value	VAF
SSF > EE	Ns					
SSF > PCV	0.05	SSF-PCV-EE	-1.8415	0.0134	0.066	N/A
PCV > EE	0.001					
SSF > EE	Ns					
SSF > UNC	0.05	SSF-UNC-EE	-1.5338	0.0093	0.125	N/A
UNC > EE	0.05					
SSF > EE	Ns					
SSF > CFC	Ns	SSF-CFC-EE	-1.6741	0.0146	0.094	N/A
CFC > EE	0.001					

To assess the magnitude of the indirect effect (Helm et al. 2010), we used the VAF (variance accounted for) as shown in the last column of Table 4. The VAF indicates the portion of the individual path effect that can be attributed to the indirect effect (i.e., the distal independent variable working through the proximal independent variable). To illustrate, from Table 4, the VAF for CTRL-PCV-EE of 84.59% shows that almost all of the total effect of the path from control through psychological contract violation to emotional exhaustion with the profession is explained by the indirect effect. The effect of the resources of the profession, control and fairness, on emotional exhaustion with the profession was fully mediated by the demands of the profession (career-family conflict and psychological contract violation). In contrast, the effect of connection to the profession on emotional exhaustion with the profession was partially mediated by PCV (a demand of the profession).

## Discussion

The primary goal of the current study was to test the direct and indirect relationships among the demands/resources and emotional exhaustion with the IS profession. The impetus of this investigation was to determine the dominant relationship regarding the role of demands and resources with the profession in reducing emotional exhaustion with the IS profession.

While several of the variables under study have been found to play a role in emotional exhaustion with a job (e.g., fairness), this study addresses the need to examine the complex relationships among all of these variables within one study to determine the process by which the exhaustion is exacerbated or ameliorated. Two models (Models 1 and 2) best represented the relationships among the variables. Moreover, although the moderation model (Model 3) is intuitively appealing (and well supported in the job-related burnout literature), our findings indicate that it produced the worst fit to the data. When reviewing models 1 and 2 we assert that the “best” fit to the data is a hybrid model. The findings can be summarized as: the relationships between connection to the profession and emotional exhaustion with the profession was partially mediated by psychological contract violation (PCV), control was fully mediated by PCV; fairness was fully mediated by PCV and career-family conflict (CFC); and supervisor support for the family (SSF) did not directly or indirectly influence emotional exhaustion with the profession. Before discussing the implications of this research, the limitations of the study need to be addressed.

## Limitations

The sample drawn for this study consisted of 293 IT professionals working in various organizations and industries throughout the United States and, as such, should be fairly generalizable. While very few

studies have examined exhaustion at the level of the profession, it is hoped that additional studies will be conducted using the measures identified here to more tightly define the boundaries of generalizability. While all of the scales utilized in this study were adapted from validated instruments, and demonstrated acceptable reliability, many of the scales were adapted from the job-related work exhaustion literature to fit the context (i.e., profession as opposed to job). As such, our results cannot be compared directly with previous research.

Additionally, because the variables were measured by self-report methods, common methods variance must be addressed. Steps were taken to reduce the likelihood of this bias, but future research to further assess the construct validity is necessary and would benefit the literature. Finally, the fact that the CIO of each organization encouraged employee participation may have the potential for response bias. However, considering this data is part of a longitudinal study, the CIO contact was made only at the first data collection time. The remaining points of data collection contact were made only by the researchers (not the CIO), anonymity of each respondent was guaranteed, and results were reported only in the aggregate.

## **Implications**

This study makes two principle contributions to research. Our first contribution is the exploration of the emotional exhaustion construct at the level of the *IS profession*. While previous research has explored this construct and its impact on various outcome variables at the job level, limited exploration of its impact at the level of the profession has occurred to date. Future research may utilize the theory presented here as a foundation to explore other antecedents (e.g., professional identity; self-efficacy) and outcomes (e.g., affective commitment, turnover intention) important to the IS profession. In addition, future research could extend to the broader international community to assess the applicability of the additional contextual factor of national culture on emotional exhaustion with the IS profession.

Our second contribution is the presentation of competing models of the antecedents of emotional exhaustion with the IS profession. We utilized WarpPLS, a new structural equation modeling software designed to explore complex nonlinear relationships. Based on our findings, future research on the antecedents to emotional exhaustion with the IS profession will want to explore the direct and indirect influence of resources of the profession and the extent of mediation of the demands of the profession. In addition, the discovery of the roles that psychological contract violation and connection to the profession play with regard to emotional exhaustion provides new insights on the affective aspect of exhaustion. Researchers interested in the causes of burnout of IS professionals may want to focus on further exploring the affective connections to the profession (i.e., career-family conflict, PCV and connection to the profession) which were found to be key factors directly and indirectly influencing emotional exhaustion with the profession. Potentially, managers in the profession could minimize emotional exhaustion with the profession by addressing perceived psychological contract issues before they reach the violation stage.

Identifying ways in which demands and resources of the profession may work in tandem to reduce emotional exhaustion with the profession has practical implications for organizations aiming to reduce stress and turnover of their employees from the IS profession. Where possible, managers should implement primary interventions that reduce demands (e.g., psychological contract violation) and increase resources (e.g., control). In addition, professional organizations (e.g., AIS, AITP, ACM) may want to focus on providing new and potential entrants to the field with a realistic picture of the demands and resources of the IS profession.

## **Conclusion**

This study contributes to research on emotional exhaustion within the IS profession by examining multiple models of the antecedents of emotional exhaustion with the profession among a group of IS workers via a new structural equation modeling software, WarpPLS. Data were analyzed from 293 IS professionals representing various industries across the United States. This study provides empirical evidence regarding the mediating role of the demands of the profession and the considerable influence of affective connections to the profession (i.e., career-family conflict, psychological contract violation and connection to the profession) on emotional exhaustion with the profession. These findings highlight the importance of understanding how complex relationships influence emotional exhaustion with the profession.

## Appendix

Construct	Source	Response Scale	Sample Items
Uncertainty	Brooks, 2011		Please indicate your degree of uncertainty regarding these items as they relate to the IS profession.
		UC	Security of jobs in the IS profession
		UC	Outlook for the IS profession
Career-family Conflict	Netemeyer et al. 1996		Throughout my IT career...
		7	The amount of time my job takes up makes it difficult to fulfill family responsibilities.
PC Violation	Robinson and Morrison, 2000		When I think about what I've given to the IS profession and what I think I should receive in return, I feel...
		7	Cheated
Fairness	Niehoff and Moorman, 1993	7	My work schedule has been fair.
		7	I think that my level of pay has been fair.
Control	Bordia et al. 2004	7	I feel I am in control of my future in the IS profession.
Power	Ashford et al. 1989	7	I have enough power to control events that might affect my IT career.
Supervisor Support for the Family	Shinn et al. 1989		In my experience in the IT profession, supervisors have generally...
		7	Switched scheduled (hours, vacation) to accommodate my family responsibilities.
Connection to the Profession	Crank et al. 1987	7	I really don't feel a sense of pride or accomplishment as a result of the type of work that I do. – R
Emotional Exhaustion	Maslach and Jackson, 1981	7	I have felt emotionally drained from my work.
		7	I have felt used up at the end of the workday.

7 – indicates use of a 7 point Likert scale with “strongly disagree” and “strongly agree” as anchors

UC - indicates use of a 7 point Likert scale with “highly certain” and “highly uncertain” as anchors

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